10th INTERNATIONAL EDUCATIONAL TECHNOLOGY CONFERENCE

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Acknowledgement

Dear Guests…

Welcome to the 10th International Educational Technology Conference IETC-2010.

"The International Educational Technology Conference (IETC)" series is an international educational activity for academics, teachers and educators. This conference is now a well known educational technology event and the number of paper submissions and attendees increase every year. It promotes the development and dissemination of theoretical knowledge, conceptual research, and professional knowledge through conference activities, the conference proceeding book, and the Turkish Online Journal of Educational Technology (TOJET). Its focus is to create and disseminate knowledge about the use of instructional technology for learning and teaching in education. This year, IETC-2010 received almost 700 applications. The conference academic advisory board accepted 350 applications.

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

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

Without the authors and participants, IETC-2010 would, of course, have been impossible. We would like to sincerely thank all of you for coming, presenting, and joining in the academic activities. We would also like to thank all of those who contributed to the reviewing process of the "IETC - 2010" conference papers, which will be also published in TOJET. And finally, we would like to thank Sakarya University, Bogazici University, organizing team and The Turkish Online Journal of Educational Technology (TOJET) for successfully organizing and hosting "IETC-2010" in Istanbul, Turkey.

We have lots of participants from 19 different countries. These countries are Algeria, Argentina, Australia, Croatia, Cyprus, Georgia, Greece, Hungary, Iran, Italy, Japan, Lithuania, Malaysia, Netherlands, Nigeria, Portugal, Romania, Serbia, Slovakia, Slovenia, South Korea, Spain, Taiwan, The Former Yugoslav Republic of Macedonia, Turkey, Turkish Republic of Northern Cyprus, United Arab Emirates and United States.

Should you have any enquiries regarding IETC conference, please do not hesitate to contact with us for any additional information you may require.

Finally, we would like to wish you all a pleasant stay in Istanbul-Turkey and safe return back home. I hope that IETC-2010 will be a meeting you will pleasantly remember.

I hope we will meet again at the 11th International Educational Technology Conference - IETC-2011.

Thank you...

Prof. Dr. Aytekin İŞMAN

General Coordinator & Founder of IETC

Editor in Chief of TOJET

April, 26 2010

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Date	Time	Topic	Keynote Speaker	Session Chair
26-04-2010	13:00 - 14:00	Work based learning at Middlesex University	**Prof. Dr. Paul GIBBS**	Hamdi ERKUNT
27-04-2010	09:00- 10:00	Personalized Journal Of Educational Technology In Turkey	**Prof. Dr. H. Ferhan ODABAŞI**	Mehmet GÜROL
27-04-2010	13:00 - 14:00	Building Transparency into Assessment: Technology as an Alignment Tool	**Prof. Dr. Colleen M. SEXTON**	Arif ALTUN
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3G TECHNOLOGY: CEIT STUDENTS' OPINIONS ABOUT ITS EDUCATIONAL POTENTIALS AND PENETRATION

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Özet
Üçüncü nesil anlamına gelen 3G terimi genel anlamıyla kablosuz bilgi ve iletişim teknolojilerin günümüzde ulaştığı noktayı temsil etmektedir. İlgili alan yazın, medya ve çeşitli tanıtım faaliyetlerinden elde edilen bilgilere göre 3G teknolojisi e-posta, web sayfası görüntüleme ve faks gibi özelliklerinin yanı sıra ses, görüntü, video-konferans ve uzaktan yönetim gibi gelişmiş özellikler sunmaktadır. Ayrıca, 3G yüksek hızda İnternet erişimine de fırsat verecek potansiyele sahiptir (Ödemir, 2008). Bu çalışmanın amacı Abant İzzet Baysal Üniversitesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü (BÖTE) öğrencilerinin 3G teknolojisi hakkındaki görüşlerini incelemektir. Veriler kişisel bilgi formu (cinsiyet, mobil telefon kullanımı) ve 3G hakkındaki bilgilerini ve görüşlerini yoklayan çoktan seçmeli ve yarı yapılandırılmış sorulardan oluşan anket formuyla toplanmıştır. Araştırmaya 89 BÖTE öğrencisi katılmıştır. Araştırmada öğrencilere: 3G teknolojisi kullanıp kullanmadıkları, kullanmıyorlarsa nedenleri, 3G teknolojisi hakkındaki bilgileri, 3G'nin eğitimsel potansiyelleri hakkındaki görüşleri, ve 3G teknolojisinin Türkiye'deki eğitim ortamlarında yaygınlaşıp yaygınlaşmayacağına ilişkin görüşleri sorulmuştur.
Anahtar kelimeler: 3G teknolojisi, BÖTE öğrencileri, 3G hakkında görüşler

Abstract
In general the term 3G, means third generation, represents the point that wireless information and communication technologies have reached today. According to the information obtained from the related literature, meadia and promotional activities, 3G technology offers advanced features such as audio, video, video-conferencing and remote management besides its other features such as fax, e-mail and web page display. Additionally, 3G has the potential to give the opportunity to the high-speed Internet access. The purpose of this study is to investigate the opinions of Computer Education and Instructional Technology (CEIT) students at Abant Izzet Baysal University about 3G technology. The data were collected through personnel information form (e.g., gender, mobile telephone usage, etc) and a questionnaire that covers multiple and semi-structured questions about 3G technology. Eighty-nine CEIT students participated in the study. The students were asked: whether they use 3G technology, if they do not its reasons, their knowledge about 3G technology, their opinions about educational potentials of 3G technology, and their opinions about whether 3G will penetrate into the educational environments in Turkey.
Keywords: 3G technology, CEIT students, opinions about 3G.

GİRİŞ

3G teknolojisi son zamanlarda oldukça sık telaffuz edilen bir kavram haline gelmiştir. Yazılı ve görsel basında çok sık bahsedilip tanıtımı ve reklamı yapılmaktadır. Mobil telefon şirketleri yaygınlaşması için kampanyalar yapmakta ve tanıtım etkinliklerinde bulunmaktadırlar. O halde 3G teknolojisi nedir? 3G üçüncü nesil bilgi iletişim teknolojilerinin ulaştığı son noktayı temsil etmekte olan bir teknolojidir. 3G teknolojisine gelene kadar iki nesil geçildi. Bunlar 1G ve 2G teknolojileri olarak bilinmektedir (Ödemir, 2008).
1G teknolojisi dönemi 1970'lerin sonları ve 1980'lerin ilk yılları olarak kısa bir süreyi kapsamaktadır. 1G teknolojisi ilk gerçek mobil telefon sistemlerini temsil etmektedir. Bu sistem analog ses sinyalleri ile çalışmaktaydı ve amatör radyo operatörlerinin kullandığı ağa göre biraz daha karmaşık bir sistemdi (Ödemir, 2008).
2G teknoloji dönemi ise 1990'larda başladı ve halen dünyada yaygın olarak kullanılıyor. 1G'ye göre 2G dijital sistemlerle daha kaliteli ses hizmetlerinin yanı sıra SMS gibi basit veri hizmetleri de sunulabilir hale geldi (Alkan, 2010). Elektronik ya da dijital ses kodlama yapabilen bu sistem zaman içerisinde geliştirilerek multimedya öğelerle güçlendirildi (Ödemir, 2008). Fakat, 2G teknolojisi veri aktarımından çok ses aktarımı üzerine odaklanmaktaydı. 3G teknolojisine evrimde ara geçişler olmuştur 3G'ye geçişin ilk temelleri GPRS (Genel Paket Radyo Servisi) sayesinde gerçekleşmiştir. Bazı operatörler bunu 2.5G teknolojisi olarak adlandırmışlardır (Vikipedi, 2010).
3G günümüzde Uluslararası Telekomünikasyon Birliği tarafından GSM EDGE, UMTS, CDMA2000, DECT ve WiMAX teknolojilerini kapsayan bir standartlar ailesi olarak tanımlanmaktadır (Vikipedi, 2010). 3G bir önceki nesil 2G'ye göre teoride 100, pratikte ise 10 kat daha hızlı bir mobil bağlantı teknolojisidir (Çetin, 2010). 3G'nin sunduğu hizmetler mobil kullanıcılar için geniş-alanda kablosuz telefon görüşmeleri, görüntülü aramalar ve kablosuz veri aktarımı olarak sıralanabilir. 2G ve 2.5G hizmetlerine kıyasla 3G eşzamanlı konuşma ve veri hizmetleriyle daha yüksek veri hızlarını desteklemektedir (Vikipedi, 2010). Ayrıca, mobil telefonla görüntülü konuşma dönemini başlatacak olan 3G teknolojisiyle, İnternete hızlı erişim yaygınlaşacak (NTV MSNBC, 2007).

Araştırmanın Amacı

Bu çalışmanın amacı oldukça güncel bir teknoloji olan 3G teknolojisi konusunda Abant İzzet Baysal Üniversitesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü (BÖTE) öğrencilerinin görüşlerini incelemektir. Bir başka ifadeyle araştırmada BÖTE öğrencilerinin 3G teknolojisi hakkındaki bilgileri, kullanıp kullanmama durumları, kullanmıyorlarsa temel nedeni ya da nedenleri, 3G teknolojisinin eğitimsel potansiyellere sahip olup olmadığı konusundaki görüşleri, 3G'nin hangi özellik ya da özelliklerinin eğitim ortamları için faydalı olacağı konusundaki görüşleri, ve 3G'nin Türkiye'deki eğitim ortamlarında yaygınlaşıp yaygınlaşmayacağı konusundaki görüşleri incelenmektedir.

YÖNTEM

Katılımcılar

Araştırmaya gönüllü olarak 2009-2010 eğitim-öğretim yılı Güz döneminde Abant İzzet Baysal Üniversitesi BÖTE bölümünde öğrenim gören 89 öğrenci (43 kız, 46 erkek) katılmıştır (Bakınız Tablo 1).

Tablo 1. Sınıf ve cinsiyete göre araştırmaya katılan BÖTE öğrencilerinin dağılımı.

	Cinsiyet		
Sınıf	Kız	Erkek	Toplam
BÖTE 1	13	5	18
BÖTE 2	10	21	31
BÖTE 3	12	8	20
BÖTE 4	8	12	20
Toplam	43	46	89

Araştırmaya katılan öğrencilerin çok büyük bir bölümü (N=82) kişisel bilgisayar sahibi olduğunu beyan etmesine rağmen az sayıda öğrenci (N=7) kişisel bilgisayarlarının olmadığını beyan etmişlerdir. Ayrıca öğrencilerin nerdeyse tamamı (N=87) mobil telefon sahibi olduğunu fakat iki öğrenci mobil telefon kullanmadıklarını belirtmiştir. Öğrencilerin çok büyük bir bölümü (N=87) mobil telefon sahibi olmasına rağmen çok az sayıda öğrenci (N=3) 3G teknolojisi kullandığını belirtmiştir. Fakat, 69 öğrenci (%77,5) ileride 3G teknolojisi kullanmayı düşündüklerini belirtmişlerdir.

Veri Toplama Araçları

Veriler kişisel bilgi formu (cinsiyet, Internet ve mobil telefon kullanımı) ve 3G hakkındaki bilgilerini ve görüşlerini yoklayan çoktan seçmeli ve yarı yapılandırılmış sorulardan oluşan anket formuyla toplanmıştır. Kişisel bilgi formundaki sorulardan sonra öğrencilerin 3G teknolojisi hakkındaki görüşleri aşağıdaki sorularla tespit edilmeye çalışılmıştır:

1. *3G teknolojisi hakkında yeterli bilgiye sahip misiniz?*
2. *Evet ise 3G teknolojisi ne anlama geliyor?*
a. 3 boyutlu kablosuz iletişim teknolojilerini temsil ediyor,
b. Ses, data, görüntü gibi multimedya özellikler ve kablosuz Internet erişimi sağlayan 3. nesil iletişim teknolojilerini temsil ediyor,
c. 3. nesil dijital ses kodlama ve iletimini yapan bir sistemi temsil ediyor.
3. *3G teknolojisi kullanıyor musunuz?*
4. *Kullanmıyorsanız 3G teknolojisini ileride kullanmayı düşünüyor musunuz?*
5. *3G teknolojisinin şu anda kullanmayı düşünmüyorsanız temel nedeni ya da nedenleri ne olabilir? Birden fazla seçenek işaretleyebilirsiniz.*
a. Pahalı olması,
b. Yeterli alt yapısının olmaması
c. Yeterince yaygınlaşmaması,
d. *Sesli iletişim dışında diğer özelliklerinin şu anda benim için gereksiz olması,*
e. Diğer (Lütfen belirtiniz)
6. *3G teknolojisinin eğitimsel potansiyellere sahip olduğuna inanıyor musunuz?*
7. *Evet ise 3G'nin hangi özellik ya da özelliklerinin eğitim ortamları için faydalı olacağına inanıyorsanız? Birden fazla işaretleyebilirsiniz.*
a. Kablosuz sesli iletişim
b. Kablosuz multimedya (metin, görsel, ses, görüntü, video, vs) özellikleri,
c. Kablosuz Internet ve Web erişimi,
d. Kablosuz Video konferans
8. *3G'nin Türkiye'deki eğitim ortamlarında yaygınlaşacağına inanıyor musunuz?*
9. *Neden inanıyor ya da inanmıyorsunuz? (Lütfen belirtiniz)*

Veri Analizi

Verilerin büyük bir bölümü (kişisel bilgi formundaki sorular ve yukarıdaki 1, 2, 3, 4, 5, 6 ve 7 sorular aracılığıyla toplanan veriler) SPPS programında betimsel istatistikler kullanılarak analiz edilmiştir. Bunun yanı sıra, yukarıdaki 5. sorunun *e* seçeneği ve 9. soru aracılığıyla toplanıp da açıklama içeren ya da öğrenci görüşlerini içeren veriler nitel analiz yöntemlerinden kategori oluşturma yöntemi kullanılarak analiz edilmiştir. Nitel analiz işlemleri yapılmadan önce her bir katılımcıya doldurdukları anket formları üzerinde bir kod numarası verilmiştir ve öğrencilerin bu sorulara verdikleri cevaplar bu kod numaralarının altında soru numarasıyla birlikte bir kelime işlemci programına aktarılmıştır. Daha sonra, kelime işlemciye (MS Word) aktarılan verilere üzerinde veri birimlerinin kotlanmasıyla kavramsal kategorilerin yaratılması işlemini kapsayan kategori oluşturma yaklaşımı uygulanmıştır (Bogdan & Biklen, 1992). Bu işlemden sonra, herhangi bir kategori kapsamına girmeyen ilgisiz veriler elenerek kavramsal kategori kodları ve isimleri verilen veriler uygun kategori başlıkları altında (örneğin, eğitimsel potansiyelleri ve avantajları, vs) MS Word kelime işlemci programı içerisinde gruplanmıştır. Elde edilen bulgular bu kategoriler kapsamında rapor edilmiştir. Bulguların raporlaştırılması sırasında araştırmaya katılan öğrencilerin gerçek isimleri değil takma isimleri kullanılmıştır.

BULGULAR

3G Teknolojisi Hakkında Bilgi Sahipliği

Araştırmaya katılan öğrenciler (N=89) arasından 48 öğrenci (%53,9) "3G teknolojisi hakkında yeterli bilgiye sahip misiniz?" sorusuna "evet" cevabı verirken 41 öğrenci (%46,1) "hayır" cevabı vermişlerdir. Ayrıca, "3G teknolojisi ne anlama geliyor?" sorusuna 51 öğrenci (%57,3) doğru seçenek olan "Ses, data, görüntü gibi multimedya özellikler ve kablosuz Internet erişimi sağlayan 3. nesil iletişim teknolojilerini temsil ediyor" seçeneğini işaretleyerek cevap vermişlerdir. Bu soruya 26 öğrenci hiçbir cevap vermezken 12 öğrenci de yanlış seçenekleri (7 öğrenci *a* seçeneğini, 5 öğrenci *c*) işaretlemişlerdir. Bu sonuçlar dikkate alındığında araştırmaya katılan öğrencilerin yarısından fazlasının (%57,3) 3G teknolojisinin anlamını doğru bildiği ve yarısından daha az öğrencinin ise (%42,7) bilmediği söylenebilir.

3G Teknolojisi Kullanım Durumu ve Kullanmama Nedenleri

Öğrencilerin çok büyük bir bölümü (N=87) mobil telefon sahibi olmasına rağmen çok az sayıda öğrenci (N=3) 3G teknolojisi kullandığını ve büyük bir bölümü (N=86) 3G teknolojisi kullanmadığını belirtmiştir. Ancak, araştırmaya katılan öğrenciler içersinden 69 öğrenci (%77,5) ileride 3G teknolojisi kullanmayı düşündüklerini belirtmişlerdir. Öğrencilerin "3G teknolojisinin şu anda kullanmayı düşünmüyorsanız temel nedeni ya da nedenleri ne olabilir?" sorusuna verdiği cevapların dağılımı Tablo 2'de verilmektedir.

Tablo 2. Öğrencilerin 3G teknolojisini şu anda kullanmayı düşünmemelerinin temel nedenleri

Temel Nedenler	Evet N (%)	Hayır N (%)	Toplam
Pahalı olması	47 (%52,8)	42 (%47,2)	89
Yeterli alt yapısının olmaması	23 (%25,8)	66 (%74,2)	89
Yeterince yaygınlaşmaması,	33 (%37,1)	56 (%62,9)	89
Sesli iletişim dışında diğer özelliklerinin şu anda gereksiz olması,	18 (%20,2)	71 (%79,8)	89

3G Teknolojisinin Eğitimsel Potansiyellerine İlişkin BÖTE Öğrencilerinin Görüşleri

Öğrenciler , "3G teknolojisinin eğitimsel potansiyellere sahip olduğuna inanıyor musunuz?" sorusuna %74,2 (N=66) oranında "evet" %25,8 (N=23) oranında hayır cevabı vermişlerdir. Öğrencilerin cevabınız "evet" ise "3G'nin hangi özellik ya da özelliklerinin eğitim ortamları için faydalı olacağına inanıyorsanız?" sorusuna verdiği cevapların dağılımı Tablo 3'de verilmektedir.

Tablo 3. BÖTE öğrencilerin 3G teknolojisinin eğitim ortamları için faydalı olacağını düşündükleri özellikleri

3G Özellikleri	Evet N (%)	Hayır N (%)	Toplam
Kablosuz sesli iletişim	32 (%36)	57 (%64)	89
Kablosuz multimedya (metin, görsel, ses, görüntü, video, vs) özellikleri	57 (%64)	32 (%36)	89
Kablosuz Internet ve Web erişimi	56 (%62,9)	33 (%37,1)	89
Kablosuz Video konferans	43 (%48,3)	46 (%51,7)	89

Öğrencilerin 3G'nin Türkiye'deki eğitim ortamlarında yaygınlaşmasına ilişkin Görüşleri

Öğrenciler, "3G'nin Türkiye'deki eğitim ortamlarında yaygınlaşacağına inanıyor musunuz?" sorusuna %64 (N=57) oranında "evet" ve %36 (N=32) oranında hayır cevabı vermişlerdir. Öğrencilerden bu konuda daha detaylı bilgiler elde etmek için, "Neden inanıyor ya da inanmıyorsunuz?" sorusu sorulmuştur. Bu soruya 16 öğrenci cevap vermezken 73 öğrenci cevap vermiştir. Öğrencilerin verdikleri cevaplardan elde edilen bulgular, "teknoloji kullanımı için toplumsal potansiyel", "3G'nin eğitimsel potansiyelleri", "3G'nin avantajları", "alt yapı problemleri" ve "maliyetinin yüksek olması" kategorileri altında toplanmıştır. İki öğrencinin verdiği cevaplar ise çok net olmadığından herhangi bir kategoriye dahil edilememiştir.

Teknoloji Kullanımı için Toplumsal Potansiyel

Araştırmaya katılan 18 öğrenci benzer ifadelerle Türkiye'de teknoloji kullanmaya istekli bir toplum yapısı ya da teknoloji kullanımı için toplumsal bir potansiyel olduğu için 3G teknolojisinin yaygınlaşacağına inandıklarını belirtmişlerdir. Örneğin, bir öğrenci, Esma, bu konuda düşüncesini, "Millet olarak böyle şeylere karşı çok meraklıyız, bakmak görmek istiyoruz" şeklinde ifade etmiştir. Bir başka öğrenci, Ali, bu konudaki düşüncesini, "Türkiye'de teknolojiyi kullanmasını bilmediği halde geri kalmak istemeyen birçok insan var. Küçücük çocukların bile ellerinde cep telefonu var. Yakında 3G'de olur" biçiminde ifade etmiştir. Benzer olarak bir diğer öğrenci, Murat, 3G'nin Türkiye'de yaygınlaşacağına ilişkin düşüncesini, "Günümüzde eğitimde İnternet kullanımı oldukça yaygın ve gün geçtikçe artmakta. Ülkemizde de her yeni teknoloji hızla yayılmakta. 3G teknolojisi de ilgi görecek. Bu da farklı alanlarda kullanım yolları açacak" şeklinde ifade etmiştir.

3G'nin Eğitimsel Potansiyelleri

Araştırmaya katılan 17 öğrencinin verdiği cevaplar içerik olarak 3G'nin eğitimsel potansiyelleri kategorisinde toplanmıştır. Öğrenciler benzer ifadelerle 3G'nin eğitimsel potansiyellere sahip olduğunu ya da eğitimsel açıdan faydalarını işaret ederek 3G'nin Türkiye'deki eğitim ortamlarında yaygınlaşacağına inandıklarını belirtmişlerdir. Örneğin, Emel, "Çünkü eğitim açısından son derece faydalı bir sistem, hatta şu anda bir takım özel okullarda uygulamaya koymayı düşündüklerini biliyorum. Ucuzlamaya başlayınca yaygınlaşacaktır." Bir başka öğrenci, Atıf, 3G'nin Türkiye'de neden yaygınlaşacağı konusundaki düşüncesini, "Öğrenci sayısına paralel olarak okul sayısı yeterli değil, bu yüzden uzaktan eğitim sistemi geliştirilecek, 3G kullanımı artacak ve yaygınlaşacaktır" şeklinde ifade etmiştir. Araştırtmaya katılan bir diğer öğrenci, Tülay, bu konudaki düşüncesini, "Teknolojiye duyulan ihtiyacın artmasından dolayı bu teknolojiyle eğitimin daha verimli bir şekilde olacağını düşünüyorum" biçiminde belirtmiştir.

3G'nin Avantajları

Araştırmaya katılan 6 öğrencinin verdiği cevaplar içerik olarak 3G teknolojisinin avantajları kategorisinde toplanmıştır. Öğrenciler 3G teknolojisinin istenilen bilgilere daha çabuk ulaşma (N=2), zamandan tasarruf (N=1), Internet erişiminde pratiklik (N=3) gibi avantajlar sağlayacağına inanmaktadırlar. Örneğin, bir öğrenci, Serpil, 3G ile istenilen bilgilere daha çabuk ulaşma konusunda düşüncesini, "İstediğimiz bilgilere anında ve kolaylıkla ulaşma imkanı olduğundan ilerde yaygınlaşacaktır" sözleriyle ifade etmiştir. Bir başka öğrenci, Tamer, 3G'nin zamanda tasarruf sağlaması konusundaki düşüncesini, "İnanıyorum çünkü zamanında bilgisayar da yaygın değildi ama şimdi yaygın. Zaman tasarrufu sağlamak adına yaygınlaşacağına inanıyorum" şeklinde belirtmiştir. Bir diğer öğrenci, Esra, Internet erişimi konusundaki düşüncesini, "İnanıyorum çünkü 3G ile internet daha pratik" şeklinde ifade etmiştir.

Alt Yapı Sorunları

3G'nin Türkiye'deki eğitim ortamlarında yaygınlaşmasına ilişkin öğrencilere, "Neden inanıyor ya da inanmıyorsunuz?" sorusu sorulduktan sonra 16 öğrenci 3G kullanımı konusunda yeterli alt yapının henüz tam olarak oluşmadığını bu yüzden eğitim ortamlarında yaygınlaşmasının zaman alacağını işaret etmişlerdir. Örneğin, bir öğrenci, Erol, bu konudaki düşüncesini, "Gerekli alt yapı ve donanım sağlandığı sürece

eğitim ortamında yaygınlaşacağına inanıyorum, teknoloji ve eğitim ayrı düşünülemez" şeklinde belirtmiştir. Bir başka öğrenci, Semih, 3G teknolojisinin eğitim ortamlarında yaygınlaşıp yaygınlaşmayacağı konudaki düşüncesini, "Daha bilgisayarlı eğitimi yaygınlaştırmaya çalışıyoruz. Çok zaman alır" biçiminde ifade etmiştir. Ayrıca, başka bir öğrenci, Burak, bu konudaki düşüncesini, "Türkiye'de her zaman alt yapı sorunları olmuştur. Bu haliyle eğitimde kullanılması da öğrenciler açısından çok yararlı olmaz" şeklinde ifade etmiştir.

Maliyetinin Yüksek Olması

Araştırmaya katılan 14 öğrenci benzer ifadelerle 3G kullanımının eğitim ortamlarında yaygınlaşmasının maliyetinin yüksek olması nedeniyle zaman alacağını belirtmişlerdir. Örneğin, bir öğrenci, Tekin, bu konusundaki düşüncesini, "Şu an için çok pahalı, bu şekilde devam ederse yaygınlaşmaz" şeklinde belirtmiştir. Bir diğer öğrenci, Ekin, benzer bir şekilde 3G'nin maliyetiyle ilgili düşüncesini, "Türkiye şartlarında 3G teknolojisinin pahalı ve kullanılmasının zor olduğunu düşünüyorum. Önümüzdeki 5 yıl 3G'nin eğitimde kullanılabileceğini düşünmüyorum" sözleriyle ifade etmiştir. Başka bir öğrenci, Mustafa, 3G'nin maliyeti ve eğitim ortamlarında yaygınlaşmasıyla ilgili düşüncesini, "Pahalı bir teknoloji olduğu için yaygınlaşması çok uzun sürer" sözleriyle açıklamıştır.

TARTIŞMA VE SONUÇ

3G teknolojisi genel anlamıyla üçüncü nesil kablosuz bilgi ve iletişim teknolojilerin günümüzde ulaştığı noktayı temsil etmektedir. Son yıllarda medya ve çeşitli tanıtım faaliyetleri aracılığıyla oldukça popüler hale gelen 3G teknolojisi ses, görüntü, video-konferans ve uzaktan yönetim gibi gelişmiş özelliklerinin yanı sıra, e-posta, web sayfası görüntüleme, faks gibi özellikler sunmakta ve yüksek hızda İnternet erişimine de fırsat verecek potansiyele sahiptir (Ödemir, 2008). Bu çalışma Abant İzzet Baysal Üniversitesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü (BÖTE) öğrencilerinin 3G teknolojisi hakkındaki görüşlerini incelemek için yapılmıştır.

Araştırmaya katılan öğrenciler (N=89) içerisinden 48 öğrenci (%53,9) 3G teknolojisi hakkında yeterli bilgiye sahip olduklarını beyan ederken 41 öğrenci (%46,1) yeterli bilgiye sahip olmadıklarını belirtmişledir. Ayrıca, 89 öğrenci arasından 51 öğrenci (%57,3) verilen üç seçenek içerisinden 3G'nin anlamını en doğru şekilde belirten seçeneği işaretleyerek cevap vermişlerdir. Bu sonuçlara göre araştırmaya katılan öğrencilerin yarısından fazlasının (%57,3) 3G teknolojisinin anlamını doğru bildiği ve yarısından daha az öğrencinin ise (%42,7) bilmediği söylenebilir.

Öğrencilerin yarısından fazlasının anlamsal bazda 3G hakkında bilgi sahibi olmasına rağmen çok az sayıda öğrenci (N=3) 3G teknolojisi kullandığını beyan etmişledir. Elde edilen bu bulgu 3G'nin henüz Türkiye'de yaygınlaşmadığını belirten alan yazını destekler niteliktedir. Örneğin, 2009 verilerine göre Avrupa'da 3G yaygınlık oranı %20 iken bir Turkcell yetkilisi Türkiye'de bu orana 1-2 yıl içerisinde ulaşılmasının hedeflendiğini belirtmiştir (Total Telecom, 2009).

Araştırmaya katılan öğrencilerin çok büyük bir bölümü şu anda 3G kullanmamasına rağmen yine büyük bir bölümü (%77,5) ileride 3G teknolojisi kullanmayı düşündüklerini belirtmişlerdir. Öğrencilerin 3G teknolojisini kullanmama nedenleri arasında *pahalı olması seçeneği* (%52,8) en önemli neden olarak ön plana çıkmaktadır. Ayrıca, öğrenciler tarafından 3G teknolojisini şimdilik kullanmayı düşünmemelerinin diğer temel nedenleri sırasıyla 3G'nin yeterince yaygınlaşmaması (%37,1), yeterli alt yapının olmaması (%25,8) ve sesli iletişim dışında diğer özelliklerinin şu an için gereksiz olması (%20,2) olarak ortaya çıkmıştır.

Araştırma bulgularına göre, öğrencilerin büyük bir çoğunluğu (%74,42) 3G teknolojisinin eğitimsel potansiyellere sahip olduğunu düşünmektedirler. Öğrencilere, "3G'nin hangi özellik ya da özelliklerinin eğitim ortamları için faydalı olacağına inanıyorsanız?" sorusu sorulduktan sonra kablosuz multimedya (metin, görsel, ses, görüntü, video, vs) (%64) ve kablosuz Internet ve Web erişimi (%62,9) seçenekleri ya da özellikleri ön plana çıkmıştır. Bunlarla birlikte nispeten daha az sayıdaki öğrenci 3G'nin kablosuz video konferans (%48,3) ve kablosuz sesli iletişim (%36) özelliklerinin eğitim ortamları için faydalı olacağına inandıklarını belirtmişlerdir.

Ayrıca, öğrencilerin çoğunluğu (%64) 3G'nin Türkiye'deki eğitim ortamlarında yaygınlaşacağına inanmaktadırlar. Öğrencilere 3G'nin Türkiye'de eğitim ortamlarında yaygınlaşmasına ilişkin "Neden inanıyor ya da inanmıyorsunuz?" sorusu sorulmuştur. Araştırmaya katılan 18 öğrenci benzer ifadelerle Türkiye'de teknoloji kullanımı için *toplumsal potansiyel* olduğunu belirtmişlerdir. Ayrıca, 17 öğrenci benzer ifadelerle 3G'nin *eğitimsel potansiyellere* sahip olduğunu ya da eğitimsel açıdan faydalarını işaret ederek 3G'nin Türkiye'deki eğitim ortamlarında yaygınlaşacağına inandıklarını belirtmişlerdir. Bunlarla birlikte, araştırmaya katılan 6 öğrenci 3G teknolojisinin istenilen bilgilere daha çabuk ulaşma (N=2), zamandan tasarruf (N=1), İnternet erişiminde pratiklik (N=3) gibi *avantajlar* sağlayacağına inanmaktadırlar.

Fakat, 16 öğrenci 3G kullanımı konusunda yeterli *alt yapının* henüz tam olarak oluşmadığını bu yüzden Türkiye'de eğitim ortamlarında yaygınlaşmasının zaman alacağını işaret etmişlerdir. Ayrıca, 14 öğrenci benzer ifadelerle 3G kullanımının eğitim ortamlarında yaygınlaşmasının maliyetinin yüksek olması nedeniyle zaman alacağını belirtmişlerdir. Sonuç olarak, pahalı olması, yaygınlaşması için alt yapı problemlerinin olması gibi nedenlerle araştırmaya katılan öğrencilerin çok azı 3G teknolojisi kullanmasına rağmen büyük bir bölümü (%77,5) ileride 3G teknolojisi kullanmayı düşündüklerini belirtmişlerdir. Ayrıca, öğrenciler teknoloji kullanımı için Türkiye'deki *toplumsal potansiyel* ve 3G'nin *eğitimsel potansiyelleri* nedenleriyle Türkiye'deki eğitim ortamlarında 3G teknolojinin ileride yaygınlaşacağına büyük oranda inanmaktadırlar.

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A COMPARATIVE ANALYSIS OF TEACHERS' AND ADMINISTRATORS' PERCEPTIONS OF PERFORMANCE MANAGEMENT AND THEIR ATTITUDES TOWARDS USING TECHNOLOGY IN THE SECONDARY SCHOOLS OF THE TRNC

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Abstract
The main aim of this research was to analyse the teachers' and administrators' perceptions of performance management conducted in the schools they work and their attitudes towards technology. The sample of the study comprises 302 participants. The findings of the study indicated that there was not a significant difference between teachers' and administrators' perceptions of performance management and how often they resorted to computers for educational purposes. The study indicated that there was not a significant difference between the educational level of the participants and how often they utilized computers for educational purposes. Results indicated that there was not a significant difference between how often the participants used computers and their gender. The study also revealed that there was a significant difference between the participants' ages and their attitudes towards using technology. The findings also showed that the participants who are employed in state schools use computers for educational purposes more than the participants who work in private schools. Thus, a significant difference in favour of the participants who work in state schools was found. The findings also revealed that there was not a significant difference between the participants' majors and how often they used computers.
Key words: performance management, technology, secondary schools, teachers and administrators

INTRODUCTION

In our modern world, educational scientists place enormous value on the necessity for individuals to get quality education. One way to achieve perfection in education is to raise teaching standards through planning, evaluation and rewarding (Watkins, 2006:1).
Research in the field shows that for a long time the measurement of performance evaluation was the main interest and the other domains were neglegted. (Sayılar, 2003:121). To Canman
(2000) and Boyacı (2006), performance evaluation is a general concept which comprises various domains. Organizations can achieve success via the regulations that will improve and change them. The most salient of all these regulations is performance management. Compared to conventional management systems, regulations in paralel to performance management system foster performance for the individual and the organization in reaching the goals of the organization (Coşkun, 2006, Barutcugil, 2002). Akal (2002) describes performance management as a process of starting some regulations and carrying them out by gathering data and making comparisons as to the future of the organization.
In general, performance management system comprises the evaluation, improvement, measurement and paying for the work performance of the individuals. Actually, as performance management introduces the concept of management with goals, it enables individual employees to focus on what they do and to have commitment. It also helps to set goals to improve the potential already present and to find out to what extent these goals are fulfilled (Barutcugil, 2002:125).
Performance management includes all kinds of evaluations to measure the extent to which the organizational aims are achieved. With this regard, performance management should be evaluated as having two goals. The organizational aims should be considered to improve the organizational performance and the individual goals should be taken into account to enhance the performance of the employees (Coskun, 2006, Bostancı 2004:1).
It is at times impossible for the employee to perform in a desirable way resulting from several reasons: sometimes the goals are not set clearly, the indivudual differences of the employees are disregarded, everyone is expected to perform in the same way and the importance of leadership and motivation is not recognised (Barutcugil,2002). To Coşkun (2006), one of the main reasons for low performance is the lack of motivation and a rewarding system.
Today, as human factor has come to the fore in organizations, the performance evaluation system becomes more important. Performance evaluation is used as an instrument in evaluating employees (Şenol, 2007). Performance management system has been developed through evaluating human resources management as a strategical unit. This system is a systematical management in which employees are motivated to get the best of them (Işığıçok, 2007). The philosophy of total quality management in organization aims to achieve quality as well. In a world of competition, total quality management comprises performance management systems. Despite the advances in technology, the employee factor did not lose its importance. On the contrary, it gained importance and employers started to encourage their employees to foster efficacy and harmony. In organizations, they started to take into consideration such topics as motivation, setting goals, trust, communication skills and harmony. Performance management system resulted from this need. To adapt to the changing conditions, every organization seeks new ways to make the most of their employees. To be able to reach the organizational efficacy, it is important to identify the strengths and weaknesses of employees. For the survival of an organization, it is essential to check the employees' levels of success in reaching the goals, to help them overcome their weaknesses and to reward success (Palmer, 1993, Gürüz, 2006, Bostancı, 2004, Boyacı, 2006).
As numerous developments in technology are affecting education, the traditional ways of teaching and learning are changing. The traditional ways of teaching are lecture-based only, and this type of teaching appeals to a small minority of learners. Research indicates that learning takes place best when there is visual, auditory and written information. Experts and instructors have attempted to integrate some technological tools in implementation to offer students better educational possibilities and in this respect, the internet is becoming an increasingly important part of the educational process. The findings of the Pew Internet & American Life Project indicate that over 98% of American public schools have internet access for students, and 77 % of instructional classrooms have internet connections (Lenhart, Simon, Graziano, 2001). For this reason, technology has become an increasingly important feature of the learning environment, especially at universities. İşman (2002) lists the advantages of using educational technologies as follows:

1. To transfer knowledge that is developing and changing fast.
2. To offer students individual learning and teaching.
3. To manage long lasting benefits of learning.
4. To enable students to improve effectiveness in communication skills.
5. To provide global education opportunities (İşman, 2002).

The reasons mentioned above foster the importance of educational technologies in education, and it could be suggested that computer assisted teaching and learning will gain more importance in the future. In order to be able to carry out effective techniques for computer assisted teaching and learning, teachers and administrators must also have positive attitudes towards technology, and schools must provide

teachers with appropriate environment, and easy access to the Internet must also be provided at all times. Research results on this subject indicate that students perceive teachers who use technology in their classes as creative and unique (Forman,1997).
Technology was integrated into education in the beginning of the 20th century as it was realized that the use of technology can significantly foster students' critical thinking, which includes understanding problems, building knowledge, solving problems and produce appropriate solutions (Laney,1990;31). In support of this issue, Jonassen (1995:61) suggests that technology consists of techniques that engage students in cognitive learning strategies and critical thinking. Furthermore, Rice and Wilson (1999) put forward that the technologies that offer elaborate visual formats enable students to construct intellectual models and provide them with scenarios that enhance critical thinking.

THE AIM OF THE RESEARCH

This study aims to analyse the performance management perceptions of the teachers and the administrators who are employed in the secondary schools of the TRNC; and their attitudes towards educational technology.
There are four research questions that this paper aims to answer;

1. How often do the teachers and administrators resort to computers to exchange information?
2. Is there a significant difference between how often the teachers and the administrators use technology and their educational level?
3. Is there a significant difference between how often the teachers and the administrators use technology and their gender, ages, types of school and majors?
4. Is there a significant difference between teachers' and the administrators' perceptions of performance management and how often they resort to computers?

METHOD

The questionnaire for performance management is Boyaci's scale, which was used to evaluate the performance management system in primary schools. The performance management scale comprises 30 items. Data of the study were analysed with SPSS program. T – tests and ANOVA were conducted to determine the differences between parametric variables. Pearson correlation matrix was used for correlation analysis.

Population and Sample

The population of the study comprises 49 (28 males and 21 females) secondary school administrators and 253 (90 males and 163 females) teachers who are employed in the schools of the Ministry of Culture and National Education. The sample was chosen according to school type (public and private) and region.
The researchers used the theoretical sample size table to determine the appropriate sample size for the study. For a population size of 1,000 people, the appropriate sample size was 277 (95% reliability level, alpha=.05, and 5% tolerance). Then, teachers to be included in the sample were determined. 253 teachers from a total of 870 secondary school teachers and 49 administrators from a total of 77 secondary school administrators were included in the sample.

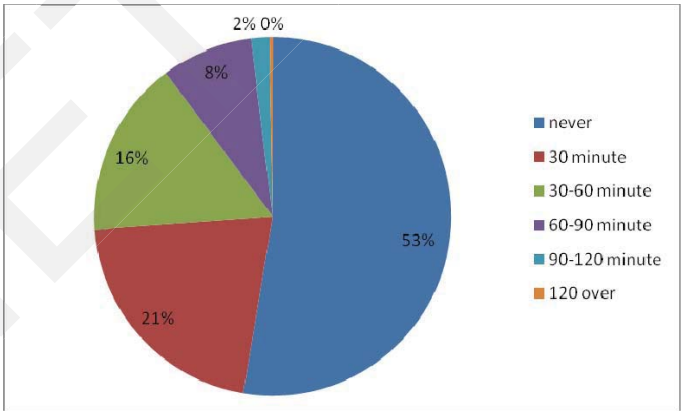
Findings of the Research

69.5% of the participants work in state schools and 30.5% of them are employed in private schools. 13.2% (n=40) of them were pututors, 24.5% (n=74) of them were science and maths teachers, 15.6 (n=47) of them were teachers of social sciences, 11.9% (n=36) of them were teachers of Turkish language, 14.6% (n=44) of them were foreign language teachers and 20.2% (n=61) of them were teachers of technical courses.

1. How often do the teachers and administrators resort to computers to exchange information?

Results showed that 52.6% (n=159) of the participants never resorted to computers. 21.2% (n=64) of them used computers for 30 minutes a day. 15.9% (n=48) of them utilized computers for 30-60 minutes a day. 8.3% (n=25) of them used computers for 60-90 minutes a day. 1.7% (n=5) of them resorted to computers for 90-120 minutes daily.

Table:1 The frequency of the participants' computer usage



2. Is there a significant difference between how often the teachers and the administrators use technology and their educational levels?

No significant difference was found between the educational levels of the participants and how often they used computers ($F_{(2-295)}$ =2,50 p<0,05) .

Table 2: Anova test results of how often the participants use computers and their educational levels

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	5,978	2	2,989	2,509	,083
Within Groups	356,180	299	1,191		
Total	362,159	301			

3. Is there a significant difference between how often the teachers and the administrators use technology and their gender, ages, types of school and majors?
Results showed that there was not a significant difference between how often the participants used computers and their gender(t (300) = 259 p>0,05)..

Table 3: T-test results of how often the teachers and the administrators use technology according to gender

	Gender	N	X	S	Sd	T	P
how often the teachers and the administrators use technology	Male	118	1.88	1,14	**300**	**259**	**.796**
	Female	184	1.85	1,07			

Results indicated that there was a significant difference between how often the teachers and administrators use computers and their ages ($F_{(6-295)}$ =20,54 p<0,01). 96.7% of the 21-25 year old participants, 78.6% of the 26-30 year old participants, 47.5% of the 31-35 year old participants, 34.3% of the 36-40 year old participants, 24.3% of the 41-45 year old participants, 53.8% of the 46-50 year old participants and 15.6% of the 51 and older than 51 year old participants never used computers. It is interesting that 21-30 year old participants hardly ever used computers to exchange information. Sheffe test results showed that there was a significant difference between the participants who were 21-25 years old and the ones who were 36 and older, between the participants who were 26-30 years old and the ones who were 36 and older and between the participants who were 31-35 years old and the ones who were 41 and older.

Table 4: Anova test results of how often the teachers and the administrators use technology according to their ages

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	106,727	6	17,788	20,543	,000
Within Groups	255,431	295	,866		
Total	362,159	301			

T-test results showed that 48.1% of the participants who are employed in state schools and 63% of the participants who work in private schools never used computers to exchange information. Between these two variables a significant difference was found in favour of the participants who work in state schools ($t_{(300)}$ = 4,118 p<0,01).

Table 5: T-test results of how often the teachers and the administrators use technology according to school type

	Schooltype	N	X	Std.	Df	T	p
Time spent with technology	state school	210	2,03	1,186	300	4,118	0,01
	private school	92	1,48	,733			

No significant difference was found between the participants' majors and how often they used computers ($F_{(5-296)}$ =1,57, p>0,05).

Table 6: Anova test results of how often the teachers and the administrators use technology according to their majors

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	9,364	5	1,873	1,571	,168
Within Groups	352,795	296	1,192		
Total	362,159	301			

4. Is there a significant difference between teachers' and the administrators' perceptions of performance management and how often they resort to computers?
T-test results indicated that there was not a significant difference between the participants' perceptions of performance management and how often they used computers ($t_{(300)}$ = -,258 and1,093 p<0,05).

Table 7: T-test results of the difference between teachers' and the administrators' perceptions of performance management and how often they resort to computers

		N	Mean	Std.	Df	T	P
The frequency of computer usage	teacher	253	1,85	1,087	300	-,258	,797
	administrator	49	1,90	1,159			
Total performance management	teacher	253	95,62	20,195	300	1,093	,275
	administrator	49	92,22	18,450			

DISCUSSION and CONCLUSION

In the current study, the aim has been to find out the attitudes of the teachers and administrators who are employed in the secondary schools of the TRNC towards technology for educational purposes and their perceptions of performance management conducted in the schools they work. Quality education is the ultimate aim of educational scientists. Computers, being undeniable parts of the educational process in our modern world, lead the way to quality education. For this reason, in order to reach quality education, the teachers and administrators should have positive attitudes towards technology. Research in the field shows that students perceive teachers who use technology as creative and unique (Forman, 1997). Unfortunately, this study indicated that about half of the participants never used technology for educational purposes. The study also indicated that there was not a significant difference between the participants' educational levels and how often they utilized computers.

There has been a controversy regarding a person's gender and his/her attitude towards using computers. Robertson and his colleagues found that females were less positive than males towards computers (1995). Some other research suggested that males tend to have more positive attitudes towards computers (Dupagne&Krendi,1992;Ertmer,Addison, Lane, Ross&Woods,1999). Ho and Lee (2001) suggest that males have more computer experience than females. On the other hand, some research showed that the gender differences did not have an effect on peoples' attitudes towards computers (Gressard&Loyd,1986;Woodrow,1992). The findings of this research go in line with Gressard's, Loyd's and Woodrow's findings. Our present study showed that there was not a significant difference between the teachers' and administrators' attitudes towards computers in terms of gender.

As for the age variable, many studies indicate that there is no significant difference between age and the attitudes towards computers (Handler,1992;Woodrow,1992). On the other hand, some other studies show that the participants' ages have important effects on their attitudes towards computers (Blankenship,1998;Chio,1992;Deniz,2005). Chio's study revealed that older teachers had more positive attitudes towards computers(1992). Deniz (2005) determined the age of 36 as a 'breaking point' for the positive attitudes of the participants. In our study, a significant difference was found between teachers' and administrators' ages and their attitudes towards computers, which backs up Deniz's findings.

As far as the variables of school type and the participants' majors are concerned, a significant difference was found between the participants who were employed in state schools and the ones who work in private schools in favour of the participants who work in state schools and we found that there was not a significant difference between the participants' majors and how often they used computers.

Performance management is a systematical management in which employees are motivated to get the best of them (Işığıçok, 2007).The human factor is still important although there are many advances in technology. In our present study, we did not find a significant difference between the participants' perceptions of performance management and how often they resorted to computers.

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A COMPARISON OF STUDENT ENGAGEMENT BETWEEN A BLENDED LEARNING AND A TRADITIONAL LEARNING COURSE IN HIGHER EDUCATION

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Abstract
The purpose of this research is to explore the effects of a blended learning environment on students' academic engagement. 34 junior level pre-service teachers in a large state university in Turkey took a student engagement survey to report their level of engagement in two courses; a course taught with blended learning approach and another course taught with traditional lecture based approach. Comparisons between two courses show that students are scored higher in active learning, interaction, and personal development aspects of student engagement with the blended learning approach than with traditional lecture based approach. Instructional designers, faculty, and administrators in higher education need to be encouraged to design and use blended learning environments in college courses.

Introduction

Increasing drop out rates from high schools and colleges, students' dissatisfaction from school and disrespect to the authority in schools forced educational researchers to seek for reasons and potential solutions for the current problem (Greenwood, Horton, & Utley, 2002; Legters, Balfanz, & McPartland, 2002; Perie, Moran, & Lutkus, 2005). These efforts gave rise to "Student Engagement" concept in education. Fredricks, Blumenfeld and Paris (2004) emphasize that student engagement is a multifaceted concept to study and describe 3 dimensions of it; behavioral, cognitive, and emotional engagement. Behavioral engagement refers to student's academically meaningful interaction with teachers, other students and the course materials. It includes students' participation to activities related to academic work and student personal development. Cognitive engagement refers to students' willingness to invest efforts in studying and mastering the skills and knowledge that are related to academic work such as developing self learning strategies, attempt to achieve more than minimum requirements of a course, and preference for a challenge. Finally, emotional engagement refers to students' affective reactions to peers, teachers and the institution such as sense of being part of the institution. Although, as Fredricks, Blumenfeld and Paris (2004) put it, these concepts have been studied previously and overlap with similar concepts in the literature, they were not gathered under the umbrella of student engagement before.

Most of the comprehensive research studies on student engagement come from higher education literature. Research on college outcomes puts forward that students' academic and personal development depends on the time and efforts they put into academically meaningful activities (Astin, 1993; Pascarella & Terenzini, 1991). Thus a strong relationship exists between student engagement and student success in school or college.

One of the best known frameworks for designing engaging instruction is "Seven Principles for Good Practice in Undergraduate Education" by Chickering and Gamson (1987). The framework also serves as the checklist for evaluating engagement level of the students in educational institutions. These practices include encouraging student-faculty contact, establishing collaboration among students, presenting active learning opportunities, providing prompt feedback, emphasizing time on task, communicating high expectations, and respect for diverse talents and ways of learning. Interaction between faculty and students increases and maintains student motivation towards the learning activities (Bennett & Lockyer, 2004; Lundberg & Schreiner, 2004; Umbach & Wawrzynski, 2005). Providing instructional activities that establish collaboration among students enhances students' learning and skills to work together (Cohen, 1994; Johnson, Johnson, & Smith, 1998; Waite & Davis, 2006). Learning is not a passive action, students must actively involve in their learning process via reading, writing, reflecting, and involving in projects (Meyers & Jones, 1993; Prince, 2004). Providing timely feedback for students about how they do in their learning process improves student motivation and learning (Hyland, 2003). Instructors should set high expectations from students and provide students with challenging instructional tasks. Finally, not all students learn in the same way, instructional environments addressing different learning needs and ways, and inclusive for all students are important to student learning and motivation (Hu & Kuh, 2003). Similar to higher education context, research from K-12 context concludes similar findings for engaging learning environments. Providing timely feedback for students, active learning opportunities, challenging learning tasks, and cooperative student work improves student learning (Brophy & Good, 1986; Good & Brophy, 1990). Educational institutions allocating resources towards providing instructional environments designed with above principles significantly contribute to student learning and personal development (Kuh, 2001).

Most of the research studies on student engagement and impacting factors were conducted in traditional learning settings where instruction takes place in face to face classrooms. While face to face learning environments have strengths on student-faculty interaction and prompt feedback, online learning environments have strengths for addressing different learning needs and styles. Combination of face to face and online learning environments gave rise to a new concept; Blended Learning Environments (BLE). BLEs combine strengths of face to face and traditional classroom learning environments and it is an opportunity to design engaging learning environments for students. However, there is a lack of research in literature about level of student engagement in blended learning environments and comparison of student engagement between blended learning and face to face learning environments to support the claims that blended learning environments have ability to support student engagement better than traditional learning environments. The purpose of this study is to explore the level of student engagement in blended learning environments and compare the student engagement with face to face learning environments.

Methods

This study was designed as a survey research. Students in a teacher education program enrolled a junior level course offered as a blended learning environment in spring of 2008 semester. At the end of the course, students took a student engagement survey to measure level of their engagement with the blended learning course and a similar course taught with traditional learning environment in the same program for comparison purposes.

Context

The context of the study is located a large state university in Ankara, Turkey. The schools and departments in the university can be characterized as mainly teaching oriented. The research context is a junior level computer networking course offered to pre-service teachers in the school of education of this university. The instructional language of the school is Turkish.

The purpose of the course is to inform pre-service teachers about setting up, securing, and maintaining computer networks. The course is offered to students who are in their third year or up in the university. The course is designed as blended learning environment where students and instructor met weekly face to face and receive course teaching materials online. Online part of the course was designed by the instructors and students accessed the course content, quizzes, and upload their projects. The course met twice a week, first meeting as a large group instruction and discussion and second meeting was for performing hands on laboratory applications. In addition to the class meetings and hands on applications, students had to complete a group project and present it in the class at the end of the semester.

A similar course that was taught with traditional lecture based approach was used as a comparison course. The content of the course was about visual programming. The same students who were enrolled to the computer network course were also enrolled to the visual programming class.

Participants

Participants of this study were 38 pre-service teacher students who were registered to the course from Computer Education department. The graduates of the department become Computer teachers and work in elementary and high schools to teach courses on information technologies. 17 of them were male and 21 of them were female students.

Since these students were accepted to the college after a competitive national entrance exam, their prior academic abilities were very similar to each other. The mean student GPA was 2.83 with .41 standard deviation. Parents' education level was also very similar among students; 80% of the mothers had elementary education or less, and 45% of the fathers had high school or more education.

Data Instruments and Data Collection

Data instrument of this study was the Student Engagement Survey developed by the National Survey of Student Engagement at Indiana University. The researchers established a protocol with NSSE to use the survey in this study. The original survey language was English and it was translated into Turkish. Translations were checked by the experts to ensure that the translated items conveyed the same meanings. The survey measured 4 different constructs of student engagement in blended learning and traditional learning environment; active and collaborative learning, time on task, level of academic challenge, and interaction. Student satisfaction from the course was also measured. In the engagement survey, students responded to the items in two ways a) their response for the item about the problem based blended learning course and b) their response for the same item about a traditional lecture based course. While time on task construct asked students how many hours in a week on average they spent on academic activities, other constructs had 5-point likert scale. The survey was administered to the students as paper based at the end of the semester.

Data Analysis

In order to analyze the student engagement differences between blended learning and traditional learning environments, student mean scores were compared using a paired sample t-test. Since there is only one group of students, paired sample t-test can be used to determine the differences in student engagement.

Results and Discussion

34 students, out of 38 registered students, completed the Student Engagement Survey. Students responded to the same items for their Blended learning class and traditional learning environments class on a 5-point Likert scale. Means and standard deviations of engagement measures are presented in Table 1.

Table 1. Level of student engagement in Blended and Traditional Learning Environments

	N	Mean	Std. Deviation
Active Learning for BLE	34	3.32	.675
Active Learning for TLE	34	2.56	.734
Interaction for BLE	34	2.72	.954
Interaction for TLE	34	2.28	.835
Personal Development for BLE	34	3.41	.782
Personal Development for TLE	34	2.97	.855
Level of Challenge for BLE	34	3.35	.849
Level of Challenge for TLE	34	3.18	1.086

BLE = Blended Learning Environment
TLE = Traditional Learning Environment

Initial results show that mean scores of all student engagement measures are higher in the blended learning class in comparison to traditional learning environment. In order to understand if these differences are significant, paired sample t-test was utilized for all engagement measures. Table 2 shows the results of t-test analysis.

Table 2. Results of t-test analysis

	Mean Difference	t	df	Sig.
Active Learning	.758**	5.828	33	.000
Interaction	.440**	2.706	33	.011
Personal Development	.443**	3.993	33	.000
Level of Challenge	.176	1.099	33	.280

** p<0.01

The class designed as Blended Learning Environment has significantly higher student engagement scores in comparison to the traditional learning environments in most of the measures (see Table 2). Active learning referred to the students' actively searching for information and completing the learning activities by their own. The class designed with blended learning approach guided students to be active learners better than the traditional approach. Interaction measure referred to the students' interaction with other students and with the instructors in the class. Students in the blended learning environment class have better interaction with their peers and the class's instructors in comparison to the class designed with traditional lecture approach. Similarly students indicated blended learning environment contributed more to students' personal development in general such as career plans, educational aspirations, and communication skills.

Only measure that did not show any difference between two approaches was level of challenge that students felt in the classroom. In both classes, students were equally challenged to do the best work they can do. The interpretation of these results show that the computer networking course designed with blended learning environment approach contributes more to student engagement than traditional lecture based approach.

Conclusion

One of the important educational outcomes during the educational process is student engagement. In simplest terms, student engagement can be defined as students' actively involvement in their learning process. Similar to the student learning, student engagement is affected by many factors one of which is instructional environment and methods. This study compared the student engagement in a class designed with blended learning approach with another similar class designed with traditional lecture based approach. Results showed that students were more engaged with academic activities in the class designed with blended learning approach and it has positive effects on their personal development. In addition to increased academic engagement, students did not feel much more challenged in the class designed with blended learning approach. A recommendation to instructional designers, faculty, and administrators in the higher education is to redesign the current course to teach them in blended learning approach and encourage the ongoing efforts to teach the current courses with blended learning approach.

As in any educational research this study is also bound with some limitations. Self reports of student engagement, small number of participants and use of the same group to rate two different classes they take bring limitations to the study. Future research should be conducted with large group and full experimental research design to improve the generalization ability of the study.

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A COMPUTER-ASSISTED LEARNING MODEL BASED ON REWARD SYSTEM IN DIGITAL GAMES

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Abstract
This research aims to construct a motivated experiential learning model to stimulate learners to be more voluntary and pro-active in using digital games by offering players more freedom and control of the game. The theoretical framework of this research lays the foundation for a pedagogical learning model based on digital games which are well studied in the academe. A noticeable viewpoint within this research is that the pedagogical function formula can be derived from analysis of the Reward System in digital games that motivates players to take part actively. Applying this result to some educational algorithms associated with the field of artificial intelligence, motivated learning and emergent learning, it is possible to form a model for the computer-assisted learning adequate for each level of learners.
Keywords: Digital games, Reward System, Pedagogical function formula, Computer–assisted learning model

INTRODUCTION

This research analyzes the important factors of teenagers' enthusiasm towards digital games that arises from questioning whether teenagers are capable of applying the mechanisms of digital game into their field of learning model.
Digital-game-based pedagogical experiential learning provide learners with easier opportunities early in their lives in order to participate actively in learning fields through virtual worlds due to its characteristics that treats amusement as a game (Killi, 2005; Rosinski & Squire,2009; Roth et al., 2008; Shultz Colby & Colby 2008).
Recent studies on digital experiential learning receive much attention from constructivists on its effective method of solving problems, that is, emergent learning, leading to self-organized learning through digital media (Browne, 2003; Calendra & Lee, 2005; Campos, 2005; Finneran & Zhang, 2003; Juul, 2002; Perkins, 1991; Prensky, 2001; Radford, 2001; Vygotsky, 1986).
From this point of view, this paper presents a set of designs for an effective digital pedagogy based on previous studies. It takes the important step of analyzing as Level based EXP as the main factor in the continuous active commitment of players in digital games. In guaranteeing the objectivity of the analysis, this work focuses on two types of digital games for the comparative analysis and experiments.
In order to ensure the objectivity of the comparative analysis and experiments, we use two types of digital games made in South Korea and USA. One is two cases of Educationally Emphasized Digital Games made in South Korea, which are available to all ages and also have over 10 million members belonging to the student-age group around the world. The other is two cases of representative Massive Multiplayer Online Role-Playing-Game (MMORPG) in Amusement Emphasized Digital Games available to 18 ages over.
Data from the analysis is examined on an experimental basis through the process called normalizational evaluation. Experimental results suggest the pedagogical function formula and the computer–assisted learning model based on digital games are very similar to the active absorption factor that is inherent in games that is played voluntarily by teenagers.

RELATED WORKS

Experiential Learning Framework based on Digital Games

Figure 1 shows the schematization of the pedagogy theory by constructivists who suggest an educational method with problem-solving based on digital games. This model shows the concrete and specific steps related to experimental learning within the Chaotic Butterfly Framework of the pedagogy theory (Killi, 2005; Rea, 2003).

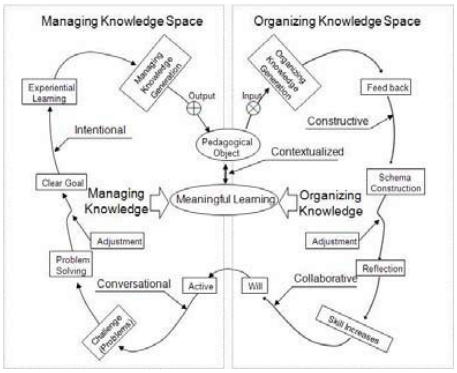

Figure 1. Experiential Learning based on Digital Games.

According to the Chaotic Butterfly Framework, learners would operate Organizing Knowledge Space, next examine the problems, and accomplish Active after referring to schemata containing knowledge previously obtained. Learners access the problems in the course of its construction of Conversation and increased Skills gradually gained from their own schema. Learners, who experienced Active

experimentation accumulate their required knowledge with the reflections describing the step reflection. Reflective Generator, one of the peculiar devices in this system, functions as adjustment in order to attain the first goal, effectively leading learners to Clear Goal Generator, by helping learners to choose useful information as well as check errors due to learners' false information.
In situated learning & meaningful learning, learners release their various problems and difficulties, they accumulate their schemas and abilities in solving problems at higher levels on account of accomplished knowledge from imaginary experiences. Learners, in the step of Flow based on a series of learning courses, advance actively into another Task which includes meaningful problems for the purpose of solving new ones, and also improve their own knowledge through the course of learning voluntarily and repeatedly.
Figure 1 is divided into two separate areas, namely Managing Knowledge Space and Organizing Knowledge Space. However, the interaction between two areas occurs in the step Meaningful learning. This interaction leads to a further result that is the butterfly effect based on Experiential Learning (Rea, 2003).

Problem-Solving Solutions and Reward System in Digital Games

Experience Point in Digital Games
Experience Point (EXP) is a reward system in digital games; a presentation mode of a numerical form on extrinsic motivation. EXP, also abbreviated as XP is the points expressed numerically in compensation for the active participation of players in digital game playing (Koster, 2005). EXP is generally determined in the commitment to quest, for instance, player makes use of increased ability of character to destroy or go through monster or another obstacle. Most digital games have been designed to challenge players milestones (Koster, 2005). Therefore, players will acquire points on skill only if they put greater effort in game play.

Relationship between Experience Point and Pedagogical Schema
Considering that a large number of students take part voluntarily in digital games, digital pedagogy tries to figure out the best way of making use of the sense of pleasure in playing games to educate in order to maximize learning. When it comes to the surrounding conditions that the computer–assisted learning model would be designed essentially for forms similar to Level based EXP applicable to the digital game domain, it is possible for the computer–assisted learning model to be regarded as a useful mechanism to cause meaningful learning in a way learners would participate voluntarily in the learning courses. If we examine closely the main reason that compels learners to participate voluntarily in these courses, it comes down to the mechanic system having the rewards and compensations for learning. This happens to bring about their amusement as well. This is why the computer–assisted learning model puts great effort in constructing the framework similar to EXP in digital games so as to reach out the effective result from learning for amusement (Killi, 2005). These features in the computer–assisted learning model based on digital games show how important the computer–assisted learning model has to be done with the structures that cause the increase in levels from the accumulations of schema.
Schema is generally regarded as a direct element in determining one's behavior within knowledge of some particular things in the world understood by this schema. Most people make the decision for their behaviors due to the direction automated and derived from their schema. In terms of this, one of the core factors and essential issue in the computer–assisted learning model is associated with how to deal with schema. In order to inspire learners to accumulate schema, it is very important how it is managed to draw out which sort of imaginary experience can be given (Jonassen, 2006; Moreno, 2006; Stevenson, 2007). Furthermore, it is absolutely necessary to consider how to go for Active with the concern in voluntariness and how it leads to Meaningful learning.
The study of the above is also proposed by Killi (2005) who describes game-based learning model in detail using the Flow theory of Csikszentmihalyi (1990). He emphasizes the importance of schemata as a factor enhancing player's ability via player's skill level increase, and being creative in problem solving in digital games (Killi, 2005; Pilke, 2004).

Reword System in Digital Games
The general Reward System in digital game has three parts of features, as Level based EXP, Skill based Progression, and Freeform Advancement (Koster, 2005). However, the issue on this study has a different concept from those features, focusing on Level based EXP, that is defined to the accurate numerical points representing overall ability and experience quantified with and gained up gradually from the increase in EXP.
It is known that the Reward System in digital games originated from the idea of level up system in Dungeon, a traditional model of Role Playing Games (RPG). Since then, Reward System have evolved in various forms and contents. There are many types of Reward System ranging from simple ones that require merely moving from a position A to a position B, to complex ones that rewards certain items after overcoming a variety of obstacles in a limited time. To level up in digital games, it is generally designed in relation to the game character, and depends on the game objective. EXP for level up is also influenced by other factors like unique game maps.
It is normal for digital games to be designed around certain characters in a game, thus making it very effective for level up system. Characters in games are generally regarded as a factor in level up system. However, one of the most important calculating factors for level up is the EXP value changes gained by monsters in most of digital games aimed for entertainment. Players in digital games experience the motivation inspired actively by a Reward System expressed as Level based EXP so that they could continue playing the game actively. Thus, Reward System is important element motivated learning model.

ANALYSIS OF REWARD SYSTEM IN DIGITAL GAMES

Attribute Selection
Data in Table 1 to Table 4 are based on open source provided by each digital game production company. While the general digital games level up system is designed by mathematical formulas, it is often designed to customize manufacturing companies in a variety ways by considering their characteristics. The digital games level up system is open to public in general for players to help game-play, or otherwise it is analyzed and open to public for general users through the expert sites related to the digital game analysis. In order to get most appropriate date, we selected 10 various players and 40 total from novice players who only played for a year to experienced players who played more than three years in each game. We had them play at five levels lower than they use to play at. As a result, we proved that research was correct.
Digital games in Table 1 and Table 2 are popular games over the generations. Tales Runner in Table 1 is the racing game integrated athletic sports with an imaginary world in a fairy tale. Maple Story in Table 2 is featured with an exploration and imaginary world in an adventure form. Table 1 and Table 2 are the lists of Level based EXP appearing in both games. Figure 2 shows the graphs produced from the table sheet in Table 1 to Table 4. Level up system in these games was actually projected up to about 130 levels, but the graphs show only up to 50 levels in order to be effective in experiments. Furthermore, Tales Runner and Maple Story put an emphasis on learning purpose in playing games, different from other digital games violent in nature. It is sure that digital games have inclinations toward this sort of features. As a matter of fact, it is very suitable for these digital games to be used for statistical research in correlation with digital pedagogy based on digital games. These games are driven to be taken part voluntarily by most of the young generation all over the world.

These examples of Level based EXP are the values compromised through the process of testing several times with common users since it was first manufactured in a game company. Particularly, Maple Story, a sampling case in Table 1, has been enjoyed by over fifty million members who joined from over 10 countries such as Korea, Japan, China, Taiwan, Thailand, Singapore, Malaysia, America, Canada, and EU, since it was released in Korea, 2003. The game, on the average, has more or less 210,000 people simultaneously connected users.
Table 3 and Table 4 show EXP Sheets from both Suddernattack produced by GAMEHI & CJ Internet Co Ltd and World of Warcraft (WOW) manufactured by BLIZZARD Entertainment Co Ltd which is an icon for digital games for entertainment available to anyone over fifteen years old around the world.
Compared with the cases given in Table 1 and Table 2 available for all the generations with emphasis on educational purpose, Table 3 and Table 4 show significant meaning in comparative sampling as analytic explanation for domain structure since these cases are about representative digital games for fun and enjoyable to over tens of millions of members of all ages throughout the world.

Data Analysis

Category 1- Comparative Analysis to Level based Experience Point

There are two common characteristics in the groups of Educationally Emphasized Digital Games of Table 1 and Table 2. One is the fact that level up could be easily achieved through a small amount of effort to escape from Apathy until the levels 15 to 20 corresponding to the beginning of playing games (Figure 2 (a) and (b)). The other is the situations that level up becomes more difficult when players reach out toward certain steps playing with their own will and effort. This is because the system in this digital game is constituted as a function of logarithm which makes it difficult to achieve level up when certain time and situation come.
In managing in a comparative manner two types of Amusement Emphasized Digital Games groups, two cases of Educationally Emphasized Digital Games groups in analysis features systematically the emphasis on motivation which consists of three different areas, Powerful Level up Area, Adjustment Level up Area, and Level up Area similar to the learning theories related to step learning in the constructivist's educational pedagogy. The degree of difficulty is designed by dividing sections by stages, as shown in Figure 2 (a) and (b). This form is common to all general groups in Educationally Emphasized Digital Games. This style in design is thought of as a similar model using a traditional theory related to constructivist's pedagogy, that is to say that learning with media should provide learners the motivation and opportunity given absolutely in an active and voluntary way fertilizing the fields of motivation.
Table 3 and Table 4 are expressed as graphs in Figure 2 (c) and (d). It is found that the model of Amusement Emphasized Digital Games in Figure 2 (c) and (d) has short term lines in Powerful Level up Area providing players with motivation. These features are very different from Figure 2 (a) and (b). The line in Figure 2 (a) and (b) can be seen as the forms of rapidly increasing drawing that requires EXP.
Figure 2 (c) and (d) is a typical model that shows an extremely form of digital game that has a goal of entertainment. However, some structures such as in Figure 2 (c) and (d) may cause social problems that lead players to have excessive desire for compensation because it consists of structures that make it irresistible and urgent to get rewards from some events in the domain.
The irregular lines in Figure 2 (b) and (c) are impact cause for the players, which prevents them from Anxiety or Boredom. This area is designed with various scenarios possibly occurring within digital games, and the lines are expressed in an irregular way.

Table 1. *Maple Story Level based EXP sheet*

EXP	Level	EXP	Level
15	1	54900	26
34	2	63666	27
57	3	73080	28
92	4	83720	29
135	5	95700	30
372	6	108480	31
560	7	122760	32
840	8	138666	33
1242	9	155540	34
1716	10	174216	35
2360	11	194832	36
3216	12	216600	37
4200	13	240500	38
5460	14	266682	39
7050	15	294216	40
8840	16	324240	41
11040	17	356916	42
13716	18	391160	43
16680	19	428280	44
20216	20	468450	45
24402	21	510420	46
28980	22	555680	47
34320	23	604416	48
40512	24	655200	49
47216	25	709716	50

Table 2. *Tales Runner Level based EXP sheet*

EXP	Level	EXP	Level
0	1	143400	26
600	2	167400	27
1200	3	191400	28
1800	4	215400	29
2700	5	265400	30
3600	6	365400	31
4500	7	465400	32
5400	8	565400	33
6900	9	665400	34
8400	10	765400	35
9900	11	865400	36
11400	12	1065400	37
14400	13	1315400	38
17400	14	1665400	39
20400	15	2015400	40
23400	16	2415400	41
29400	17	2865400	42
35400	18	3365400	43
41400	19	4365400	44
47400	20	5365400	45
59400	21	6365400	46
71400	22	7365400	47
83400	23	8365400	48
95400	24	9365400	49
119400	25	10365400	50

Table 3. *Suddenattack Level based EXP Sheet*

EXP	Level	EXP	Level
2,999	1	1524999	26
8,999	2	1674999	27
17999	3	1824999	28
29999	4	1974999	29
44999	5	2174999	30
64999	6	2374999	31
84999	7	2574999	32
104999	8	2774999	33
134999	9	2974999	34
164999	10	3174999	35
194999	11	3474999	36
224999	12	3774999	37
274999	13	4074999	38
324999	14	4374999	39
374999	15	4674999	40
424999	16	4974999	41
474999	17	5374999	42
574999	18	5774999	43
674999	19	6174999	44
774999	20	6574999	45
874999	21	6974999	46
974999	22	7374999	47
1074999	23	7874999	48
1224999	24	8374999	49
1374999	25	8874999	50

Table 4. *WOW Level based EXP Sheet*

EXP	Level	EXP	Level
0	1	338000	26
400	2	374400	27
1300	3	413300	28
2700	4	454700	29
4800	5	499000	30
7600	6	546400	31
11200	7	597200	32
15700	8	651700	33
21100	9	710300	34
27600	10	773100	35
35200	11	840200	36
44000	12	911800	37
54100	13	987900	38
65500	14	1068700	39
78400	15	1154400	40
92800	16	1245100	41
108800	17	1340900	42
126500	18	1441900	43
145900	19	1548200	44
167200	20	1660000	45
190400	21	1777500	46
215600	22	1900700	47
242900	23	2029800	48
272300	24	2164900	49
304000	25	2306100	50

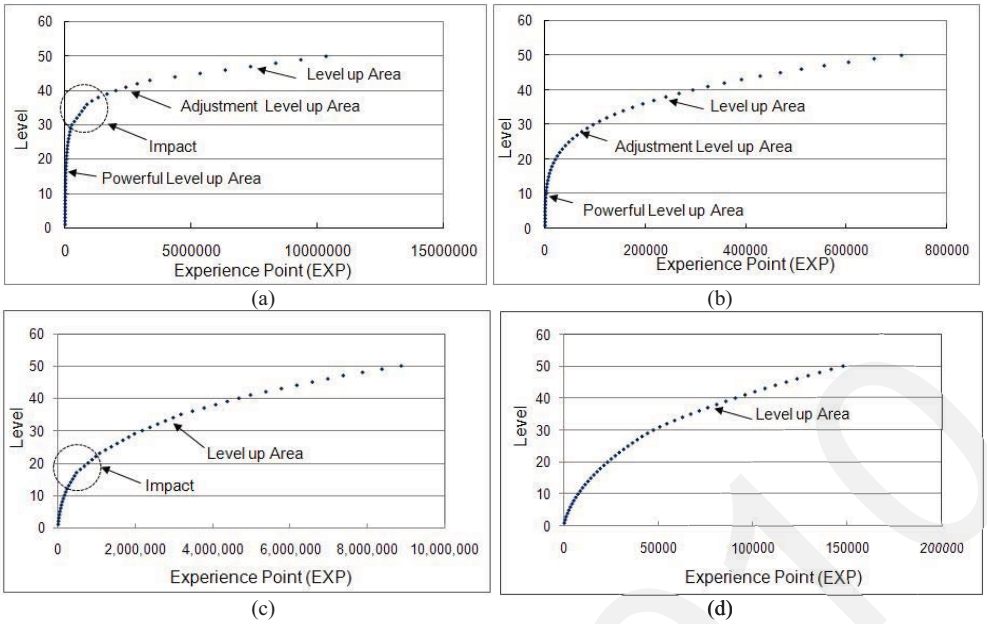

Figure 2. Level up curve, (a) Maple Story, (b) Tales Runner, (c) Suddenattack, (d) *WOW*.

Category 2- Active Elements in Game-play

Figure 3 is expressed as a model of the step-by-step courses in playing digital games, presented in the analysis on Figure 2. Motivation was focused on Powerful Level up Area. Players experienced Motivation (a) possess Will (b) in the course of adjustment. Players with this background are well-developed to commit playing the game (c) with their own skills knowing they are going to be faced with difficult problems to solve in certain situations.

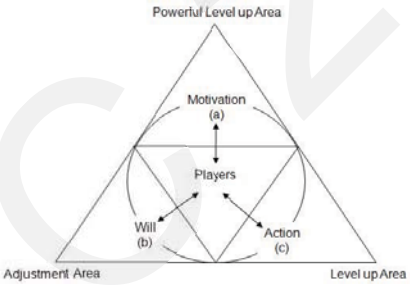

Figure 3. Active elements in Game-play.

Adjustment Level up Area has the support functions and knowledge useful in gaining an edge against fellow players. Players can accumulate their skills from this area. Motivation and Will presented in Figure 3 (a) and (b) can be thought of as mental rewards provided for players in the areas of Powerful Level up Area and Adjustment Level up Area with educational goals. Players will have the confidence to play these courses. Level up Area, common to be dealt with the groups of both Educationally Emphasized Digital Games and Amusement Emphasized Digital Games, has a little amount of rewards compared to player's own efforts alone. However, other types of level up system like in Figure 2 (d) are possible to be designed to be much fun so that it could motivate players to actively partake in playing games.

Category 3- Experience Point Data Modeling

Figure 4 is a form of modeling in order to drive the functional formulary shown in Figure 2. It shows that it is easy to increase from level E_1 to E_3 on the x-axis, and it is seen as a gentle slope from A of E_3 on the x-axis according to the degree of difficulty. It is possible to make Figure 4 the model with a formula:

$$Level = K \log_e EXP$$

$Level$ = game level; K = a constant: the degree of difficulty in digital games; e = exponential; EXP = Experience Point.

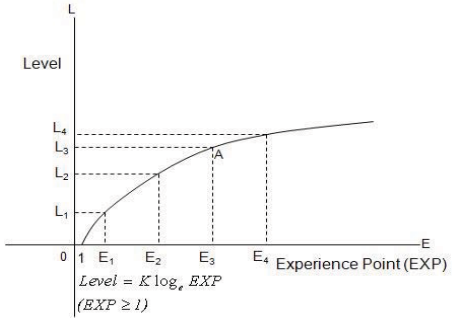

Figure 4. Experience Point Data Modeling.

According to Figure 2, in the case of Figure 4 being designed with a fan-shaped structure in which the levels on y-axis increase consistently, it is very easy for players to lose interest in them such that they could fall into the conditions of Anxiety or Boredom. However, players who experienced E_1 to E_3 get in the state of having accumulated certain amount of skills gained from 1 to A. Therefore, players are continuously challenged by means of high numerical points in Will toward the performance in Active.

DATA FITTING AND FORMULA

Data Normalizations and Fitting

Level sheet in four cases of digital games from Table 1 to Table 4 went through the process of normalization as a percentage. It results in the fitting model of Figure 5. The main characteristics in each groups presented in the comparative analysis on the fitting model of four cases of Educationally Emphasized Digital Games and Amusement Emphasized Digital Games in Figure 5 are as follows:

- The data obtained from the normalization can be found as similar in form with Figure 2, however in case of drawing the trend line, it is certain that Figure 5 (a) and (b) in the fitting model put an emphasis on Powerful Level up Area, which is a section of Motivation.
- A section of Powerful Level up Area appears clearly and distinctly in two cases of Educationally Emphasized Digital Games such as the cases in Figure 5 (a) and (b), but a section of Powerful Level up Area can be drawn as short term or cannot be drawn in two cases of Amusement Emphasized Digital Games such as in Figure 5 (c) and (d).
- The fitting graph shows in a concrete way that Figure 5 (c) and (d) are drawn towards the above more than Figure 5 (a) and (b) as corresponding to the changes at x-axis in the gradual process of Level up Area.
- The functional values in each group of two cases of both Educationally Emphasized Digital Games and Amusement Emphasized Digital Games are different from each other at the functional formula made on the basis of the trend line.

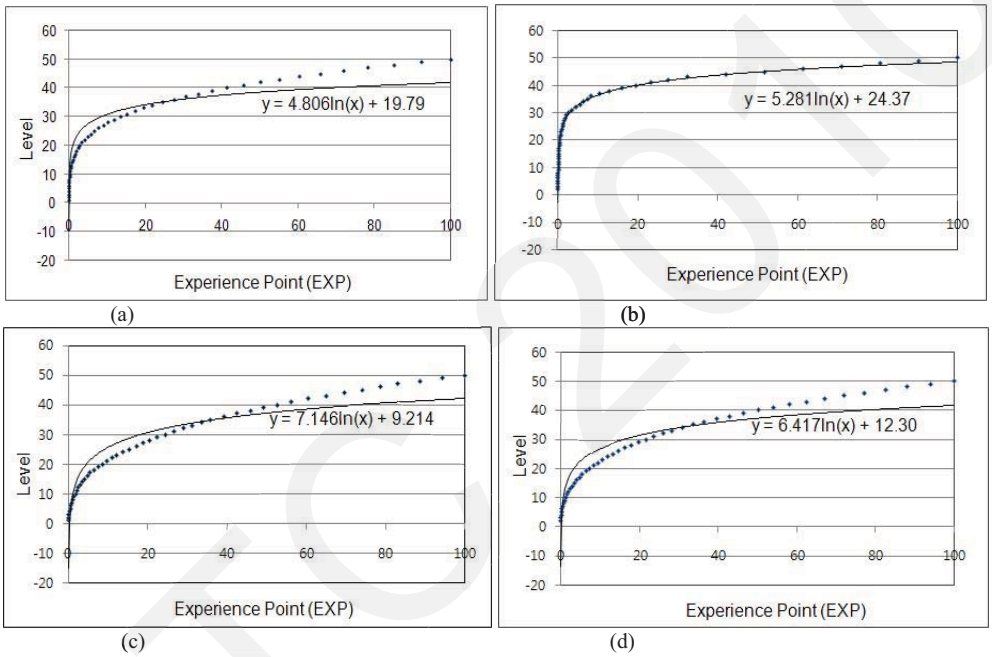

Figure 5. Data fit, (a) Maple story, (b) Tales Runner, (c) Suddernattack, (d) *WOW*.

Motivated Parameters Evaluation in Digital Games

Table 5 is a functional formula induced by means of trend line. A functional formula induced by trend line doesn't always mean the accurate normalized values in the parameters, but values and a functional formula can be induced with a certain type that makes it possible to understand well:

$$Level = K \ln EXP \pm W$$

$Level$ = game level; K = a constant: the degree of difficulty in digital games; $\ln$ = logarithm; EXP = Experience Point; W = a constant: motivated elements.

Table 5. *Fitted Parameters K and W for digital games*.

	K	W
Figure 5 (a)	$Level$=4.806*ln EXP+19.79	
Figure 5 (b)	$Level$=5.281*ln EXP+24.37	
Figure 5 (c)	$Level$=7.146*ln EXP+9.214	
Figure 5 (d)	$Level$=6.417*ln EXP+12.30	

The group of Amusement Emphasized Digital Games in Figure 5 (c) and (d) has a constant K that defines the width of its graph. Comparing with the group of Educationally Emphasized Digital Games, the value of the constant K in Amusement Emphasized Digital Games group is expressed highly. The structure in Amusement Emphasized Digital Games group is designed to make the whole line to be radically drawn upward when game playing is being processed more and more. A constant K in Educationally Emphasized Digital Games group is lower relatively with values 4.806 and 5.281, compared with the constant K in Amusement Emphasized Digital Games set highly to 7.146 and 6.417.

The values 19.79, 24.37 and 9.214, 12.30 corresponding to the first, second, third, and fourth entries of W in Table 5, the functional formula are the constants that influence the width in motivation which reflects on the design with the purpose of deriving motivation from players in

the section of Powerful Level up Area. When W is measured highly as the first and second entries in Table 5, graph moves towards the left side to present the section of Powerful Level up Area long and actively as in Figure 5 (a) and (b). On the other side, when the value is low as in entry number three and four in Table 5, the section of Powerful Level up Area is short and expressed slightly as in Figure 5 (c) and (d). W As well as K has its distinct differences from each groups.

These results make it easy to draw the borderline between Educationally Emphasized Digital Games and Amusement Emphasized Digital Games that have been difficult to divide into two parts clearly in an academic way until now. Furthermore, this result could be adapted to possible construction of models through some adjustments in the functional values for an effective the computer–assisted learning model suitable for each age level and average of learners in relation to educational anthropology such as a course workshop in education.

THE COMPUTER-ASSISTED LEARNING MODEL MODELING

Plotting Result

Figure 6 is derived from the process of plotting the functional formula induced by Table 5 using MATLAB™. The groups in Educationally Emphasized Digital Games and Amusement Emphasized Digital Games take a common form as a logarithm, however it is easy to see that there are differences in fan-shaped lines of all the groups.

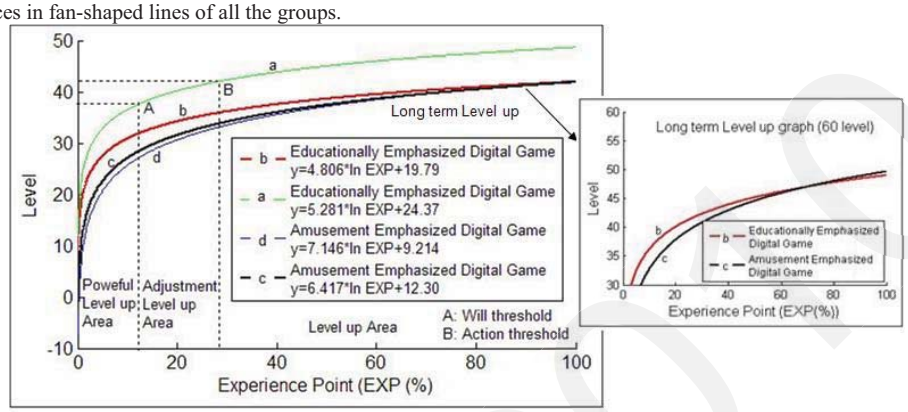

Figure 6. Plotting result, Educationally Emphasized Digital Games and Amusement Emphasized Digital Games groups.

Green ‘a’ and red ‘b’ lines in Figure 6 are Educationally Emphasized Digital Games. Black ‘c’ and blue ‘d’ lines show Amusement Emphasized Digital Games. Red ‘b’ and black ‘c’ lines are drawn with a bold style means typical samples that demonstrate the clear difference between two groups. Educationally Emphasized Digital Games consists of three steps, namely Powerful Level up Area, Adjustment Level up Area, and Level up Area, that are the same as the fitting results from Figure 2. Amusement Emphasized Digital Games is designed with short terms in sections or without sections and at the same time, it is designed to go upward in order to spend more term. The enlarged graphs of small box, as shown in Figure 6, demonstrate the clear difference between ‘b’ and ‘c’ lines.

Label A in Figure 6 indicates Will threshold entering into a step for learners, who are able to change themselves very actively after they’ve experienced the first step, Powerful Level up Area. Label B in Figure 6 means Action threshold entering into a step for learners, who experienced Will threshold so that they could accomplish actively the learning steps and sources in the long term. The functional formula in Table 5, induced by a trend line in Figure 5, shows the verification that the flexibility between two groups, Educationally Emphasized Digital Games and Amusement Emphasized Digital Games would be determined by a constant K . Depending on values of K , it can be different from each other.

The constant W determines the width in motivation at the section of Powerful Level up Area. It also has many differences in between two groups. The result of evaluation in Figure 6 does not only verify the possibility of adjustment from entertaining materials to an educational one with the computer–assisted learning model framework based on domains in digital games, but also the possibility of designing the structure of educational methods that bring about accomplishments in each learning steps through a step by step process according to the different levels of learners.

Functional Formula

As the above mentioned, the based on digital games can be made within its formation of a functional formula in relation to an educational model wherein a schema can be defined as a log-function, and in the case of applying a functional formula derived from Figure 5 and Table 5 to it. The functional formula can be derived from Table 5. If it means $Level \approx$ Learning Level, and $Exp \approx Schema$, it would be turned into:

$$L = k \log_e Schema \pm w$$

L = the accumulated learning level; k = a constant: the degree of difficulty in the computer–assisted learning model: the amusement, learning usability level; e = educational exponential; w = a constant: learning motivation elements, $Schema$ = the accumulated learning skill.

It is possible to design the various educational models appropriate to learning capacities and ages through a process of its adjustment in the constants of k and w . k And w consist of certain factors. These factors possess several particularities. However, they mean that each factor in Figure 3 functioning in the area of the third step in Figure 6, are examined on the basis of Table 5 and Figure 6.

The functional formula of the constant k includes many parts: Rules, Competition, Compensation, Degree of Freedom, and Community (Colby & Colby, 2008). w Includes motivation. The value of an alternate with some expressing personal capacities of players, such as competent abilities of computer and the learning attitudes might improve the educational effects. According to this research, it is possible to establish the boundary area in digital games divided into two parts, digital games for the educational purpose and digital games for the entertaining purpose, depending on the numerical values of k and w .

The computer–assisted learning model can be made up of an effective model when it has come to establish certain areas with divided steps so that certain factors involved in game-play could function well through several processes. However, it is true that the learner’s effort does not always come into fruition. Suppose that a Powerful Level up Area wouldn't function distinctively or irregular event would happen to these processes without any relation to educational purpose. Then, as shown from the previous experiment, that it is very difficult to accomplish the primary educational goal for learners in this system given the above circumstances.

DISCUSSION

When the main characteristics that resulted from the analysis in this experiment are put together with the points of view on the theory of educational models (Davidovitch et al., 2008), the computer–assisted learning model can be complete, which is similar to an instructive model in education with the purpose of acquiring the situated learning effect step by step in a constructive educational theory based on digital games. When it comes to the analysis of Educationally Emphasized Digital Games group from the theoretical aspects in association with the educational principles in constructivism, various forms of active models in education can be designed with relation to experiential learning effects that help learners to choose voluntarily what they want by means of amusement. It can be easily seen from an example of Powerful Level up Area in Figure 7.

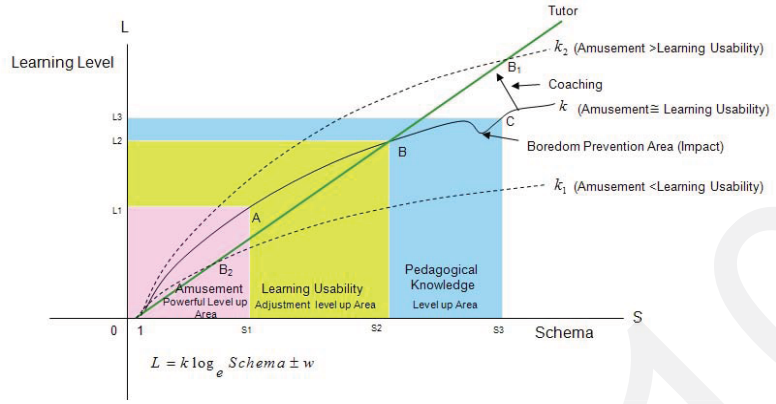

Figure 7. proposed the effective the computer–assisted learning model

Adjustment Level up Area causes learners to concentrate on the learning process with self-examination and cooperation. Learners in Adjustment Level up Area commit themselves to make up their systematic thoughts for achieving their goals in solving their problems so that they could examine their own knowledge and capacities with interaction to fellow learners.

Level up Area helps learners to accomplish pedagogical knowledge. This area completes creative materials in the affective and cognitive aspects by tutoring to bring about the circumstances of situated learning and cognitive apprenticeship (Seufert, 2003). Level up Area is considered to be important in terms of the function of a tutor, preventing the learner from getting into the state of Boredom so as to enhance creative activities.

The slope of schema increase curve in Figure 7 would be determined with the values of k at logarithm function. Schema of x-axis in the modeling function consists of Amusement, Learning Usability, and Pedagogical Knowledge. According to the research result in Figure 6, k line is one of the most ideal types.

If there is k_2 in Figure 7 with a point B_1 crossing with Tutor line, it would mean the condition of being Amusement bigger than Learning Usability so that it could come to a similar model to Amusement Emphasized Digital Games placing a great deal of weight on amusement rather than education. k_1 With a point B_2 crossing two lines relatively indicates little importance of Amusement in that Learning Usability is bigger than Amusement. Therefore, learners cannot find learning interesting without amusement. Therefore, the most ideal model in the computer–assisted learning model could be theoretically achieved under the condition of a state in Amusement ≅ Learning Usability, and the k line presented above for example.

A section of A (S_1 , L_1) on k line indicates Amusement and a section of B (S_2 , L_2) shows a process of Learning Usability. The section of C (S_3 , L_3) is the step entering into Pedagogical Knowledge. Learners entering into Pedagogical Knowledge proceed a real step for learning something very actively because they have been already accumulated lots of knowledge and schema as shown in the section of C (S , L).

An area drawn irregularly on the k line indicates Boredom prevention, derived from the event effects used in the Reward System of (b) and (c) in Figure 2. The framework of the Reward System of (b) and (c) in Figure 2 provides players with various events that play an important role in helping and encouraging them to commit consistently games that are fun. This fact makes it possible to design effectively many diverse model related to the impact learning (Papastergiou, 2009), for the purpose of preventing users going to a state of Boredom. From the viewpoint of cognitive apprenticeship, the area of coaching is the space that provides learners with outer assistance such as hints and feedbacks in various ways by experts and tutors observing learners' activities during commitment to their tasks (Gee, 2003; Hayes et al., 2008; Zeichner, 2007; Zwart, 2008).

SUMMARY AND CONCLUSIONS

It may not be asserted that this demonstrated structure of digital games Reward System presented in this research is necessarily supposed to be one of the most adequate models to be effective digital pedagogy. Through this research, however, we were able to locate the distinction between educational digital games and recreational digital games. It is assumed that this result will practically applicable not only on computer-assist learning models, but as well as balanced design of educational digital games.

This research rests on a firm basis of the comparative studies on Reward System in each groups of both Educationally Emphasized Digital Games and Amusement Emphasized Digital Games, as well as certain ideas and theories proposed by some constructivists. Under these conditions, the computer–assisted learning model has met the requirements of a certain modeling functional formula which has been validated by an education model. The functional formula derived from this research is essentially applicable as a standard that makes it possible to construct course works of learning adequate for different learning levels of learners, within the framework of the computer–assisted learning model.

The functional formula, can be derived from the analysis of the Reward System in digital games. It is possible for this formula to lead to various models for educational purposes which consider factors like ages, grades, and levels as values for the constant k . It is expected to appropriately control the necessary quantities of motivation for learners through different values of the constant w .

Applying this result to some educational algorithms associated with the field of artificial intelligence, emergent learning and motivated learning, it is possible to form a model for computer-assisted learning adequate for each level of learners. Furthermore, results from this research can be applied as models for the organization of diverse knowledge from the viewpoint of constructivism and the principles associated with education and environments focused on learner's motivation.

Recent researches have shown a tendency to focus only on the theoretical concepts in the establishment of pedagogical models while applying many elements in digital games to them. However, this research attempts to construct a concrete and progressive model based on functional formulas derived from some elements in digital games.

In as much as functional formulas can be derived from elements in digital games, a pedagogical model meets the objectivity and validity in order to influence other researches about pedagogical models in many ways. Furthermore, the method described in this paper helps other researchers to find an effective way of constructing digital pedagogy models classifying their subjects for education. Results from this research paves the way for various forms of pilot models that could be the subject of future work and experiment.

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A CRITICAL REVIEW OF TECHNOLOGY USE IN ENGLISH AS FOREIGN LANGUAGE LEARNING AND TEACHING: THE TOJET SAMPLE

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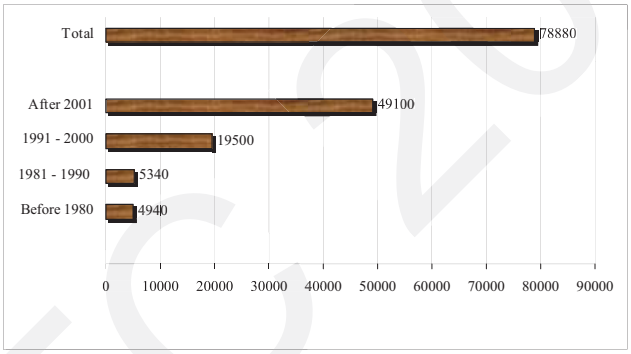
Abstract
The relationship between technology and English as a foreign language (EFL) learning and teaching is one of the significant research areas, and the Turkish Online Journal of Educational Technology (TOJET) publishes research papers on educational technologies addressing various topics related to education. This article aims to review 17 studies appearing in TOJET on the interrelation between technology and English as a foreign language (EFL) learning and teaching. It focuses on the research that investigates the relationship between technology and EFL learning and teaching in terms of the topics, participants, research design, and conclusions of the articles. Finally, implications for pedagogy and research are discussed.
Keywords: English as a foreign language learning, technology, TOJET

INTRODUCTION

The use of technology in English as a foreign language (EFL) learning and teaching included films, radios, televisions, language laboratories, videos, and computers after the 1980s (Cunningham, 1998). As advancing technology has become accessible for EFL learners and teachers and has been integrated into EFL learning and teaching, researchers' interest in the relationship between technology and foreign language has grown stronger since the 1990s and 2000s. Thus, a simple search on Google Scholar using the keywords *technology, "foreign language"* and *English* indicated that 78,880 results were listed as shown in the following figure. On the other hand, when the studies published in Turkey are considered, the search using the keywords *technology*, *"foreign language"* and *abstract* demonstrated that 1,730 items were listed on the pages from Turkey, while 463 papers written in Turkish were found on a Google Scholar search using the keywords *teknoloji,* "*yabancı dil*" and *özet.* In conclusion, it could be argued that there exists quantitatively a serious lack of research on the field of technology with regard to foreign language learning and teaching.

Figure 1. Search results on FL-related studies indexed in Google Scholar.



The Turkish Online Journal of Educational Technology (TOJET) is a quarterly and peer-reviewed international electronic journal that publishes papers on all of the fields of educational technology. Indexed by Social Science Citation Index since 2008, the TOJET has readers from 85 countries and occupies a significant place as a journal dealing with educational issues related to technology, as emphasized in its website (www.tojet.net). From its first to final issue, 358 articles have appeared in the TOJET, of which only 17 being on technology-related foreign language studies, as seen in the table given below. Namely, the percentage of the papers on the subject is only 4.7 although there is a strong interest in the technology-related foreign language studies in the world (Liu, Moore, Graham, & Lee, 2002). Briefly, it could be underlined that such a low rate can be seen as a reflection of the limited number of studies on the subject in Turkey.

Table 1. The Number of papers on technology and EFL studies appearing in the TOJET.

Years	Number of Issues	All of the Fields	Technology and EFL Studies
2002	1	11	1
2003	4	57	0
2004	4	80	3
2005	4	76	3
2006	4	46	5
2007	4	35	2
2008	4	32	2
2009	2	21	1
Total	27	358	17

Given the strong and increasing interest in technology for foreign language learning and teaching, it seemed important to review both quantitatively and qualitatively the articles published in the TOJET, a journal with a leading role in the field. In other words, two reasons guided the present study: Firstly, while there exist thousands of studies in a global scale, the number of studies in Turkey seemed fairly limited. Secondly, the limited studies conducted in Turkey should also be evaluated qualitatively in order to present their research and pedagogical implications. As a result, the study aimed to find answers to the following questions:

1. What do the articles focus on with regard to the relationship between technology and foreign language learning and teaching?
2. Who are used as sample groups in the researches?
3. What kind of research designs was preferred in the articles?

4. What are the conclusions of the researches?

METHOD

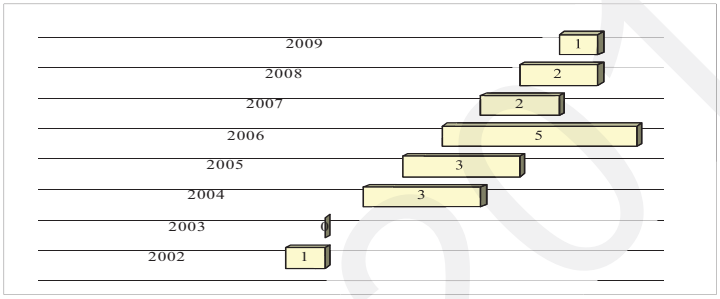
As the purpose of this paper is to review and discuss the articles on technology and English as a foreign language learning and teaching published in the TOJET, the primary data source was the website of the journal. After examining the titles and abstracts, a list of articles was prepared. Furthermore, using the key words *TOJET, technology* and "*foreign language",* the search results were examined and compared to the list prepared previously. Subsequently, after downloading and storing the articles, a detailed table was prepared that included the names of the authors, years of the publications, languages of the articles, and the information on the topics, participants of the researches, research designs, and conclusions. Finally, 17 articles were reviewed in terms of their focuses, sample groups, research designs and conclusions.

RESULTS

The articles listed were examined in accordance with four criteria (Appendix). Firstly, after specifying the names of the authors, the years, and the languages preferred, the topics of the researches were listed. Secondly, the sample groups of the studies were introduced. Then, research designs used in the studies were given. Finally, the conclusions obtained from the articles were presented.

As stated above, the articles were categorized in accordance with the names of the authors, publication years, and the preferred language. 17 articles (Adıyaman, 2002; Akbulut, 2007, Akbulut, 2008; Altun, 2005; Aydın, 2006; Aydın, 2007; Çakır, 2006; Gömleksiz, 2004; Hatipoğlu Kavanoz, 2006; Kartal 2005a; Kartal, 2005b; Kocoğlu, 2008; Köksal, 2004; Özad, & Kutoğlu, 2004; Şen, & Neufeld, 2006; Ulusoy, 2006; Yüksel, & Tanrıverdi, 2009) on technology use in EFL learning and teaching appeared in the TOJET between 2002 and 2009, as shown by the following figure that represents the distribution of the articles in years and numbers. The language used in the articles was mainly English, except for the two written in Turkish (Adıyaman, 2002; Kartal, 2005). To conclude, authors mostly preferred writing their papers in English.

Figure 2. The number of papers in years.



The first criterion used was the topics of the papers, as stated above. Among 17 studies, three focused on the attitudes of EFL learners towards technology, computers, and the Internet (Akbulut, 2008; Aydın, 2007; Gömleksiz, 2004) in EFL learning and teaching, whereas two papers dealt with the EFL students' perceptions on the role of e-portfolios in professional development (Koçoğlu, 2008), and beliefs, assumptions and knowledge about learning-centeredness (Hatipoğlu and Kavanoz, 2006). The studies concerning the Internet aimed to investigate the hypermedia effect on reading skills and vocabulary acquisition (Akbulut, 2007), WEBQUESTs in English teaching methodology (Şen & Neufeld, 2006), and the relationship between the Internet and autonomy in EFL learning (Kartal, 2005). Additionally, the effect of computers was also examined in two studies, one of which focused on the effect of computers on the reliability of writing tests (Aydın, 2006), while the other one reviewed the effect of computers on writing process (Ulusoy, 2006). In the TOJET, two other studies were published on the integration of multimedia and Internet technologies into EFL teaching (Altun, 2005), and on using presentations in EFL learning. Three of the studies aimed to examine the effects of audio-visual materials such as videos, DVDs, and captioned clips (Çakır, 2006; Köksal, 2004; Yüksel & Tanrıverdi, 2009) in EFL learning. Finally, one study focused on EFL learning through distance education (Adıyaman, 2002), while another paper examined the relationship between communicational technologies and language teaching industry (Kartal, 2005). In conclusion, the papers mainly focused on EFL learners' attitudes, beliefs, and conceptions about technology and its components such as computers and the Internet, as well as on the effects of technology on reading and writing skills and vocabulary.

The second question raised by the present paper aimed to review the sample groups used in the researches. According to the numbers given in Table 2, the participants included three different target groups: Teachers of English as a foreign language (EFL), the students of the departments of English language teaching (ELT), and the learners of English for specific purposes (ESP). The values provided in the figure also indicate that sample groups of the studies mostly consisted of the students of ELT departments, while three studies included the teachers of ELF in their sample groups. Finally, two of the studies used ESP students as participants during their research process. As some of the researches were conducted quantitatively and there existed limited numbers of the papers that used ELT teachers and ESP students as sample groups, the means of the participants were not given. As a result, it can be stated that researchers mostly preferred ELT students as their sample groups while they rarely chose teachers of English and ESP learners.

Table 2. The number of participants.

Studies	ELT Teachers	ELT Students	ESP Learners
Akbulut (2008)		155	
Yüksel (2009)		120	
Aydın (2007)		115	
Akbulut (2007)		69	
Altun (2005)		53	
Aydın (2006)		40	
Koçoğlu (2008)		5	
Gömleksiz (2004)	150		
Hatipoğlu Kavanoz (2006)	13		
Şen & Neufeld (2006)	5		77
Özad & Kutoğlu (2004)			60

The third criterion is the research designs of the studies, six of which were the reviews of literature (Adıyaman, 2002; Çakır, 2006; Kartal, .2005a & 2005b; Köksal, 2004; Ulusoy, 2006). As indicated by the research designs given in Table 3, the researches were mostly conducted

quantitatively. Specifically, four of the quantitative studies were designed in accordance with descriptive methods (Akbulut, 2008; Aydın, 2007; Gömleksiz, 2004), whereas four researches were designed experimentally (Akbulut, 2007; Aydın, 2006; Şen, & Neufeld, 2006; Yüksel, & Tanrıverdi, 2009). Exceptionally, Altun (2005) used both descriptive and qualitative designs in his research. Finally, in three of the studies (Hatipoğlu Kavanoz, 2006; Kocoğlu, 2008; Özad, & Kutoğlu, 2004), qualitative research methods were used. To sum up, researches mainly preferred to review the related literature and quantitative research designs; however they rarely used qualitative research design.

Table 3. Research designs of the studies.

Reviews	Qualitative	Quantitative	
		Descriptive	Experimental
6	3	4	4

The last question of the present study focused on the conclusions obtained from the studies, as stated above. The first and main conclusion drawn from the reviewed studies, in a broader sense, is that technology and foreign language learning are interrelated. Secondly, with regard to the individual differences in EFL learning and teaching, and specifically speaking, the attitudes of EFL learners and teachers, the conclusions indicate that EFL learners and teachers have positive attitudes towards technology use (Gömleksiz, 2004), computer assisted language learning (Akbulut, 2008), asynchronous communication tools (Altun, 2005), the internet (Aydın, 2007), and WEBQUESTS (Şen, & Neufeld, 2006). On the other hand, it should also be noted that the results of the above-mentioned studies demonstrate that the attitudes towards technology use in EFL learning and teaching are affected by some significant factors such as school climate, technology instruction (Gömleksiz, 2004), experience about using computers, computer ownership, the duration of using computers (Akbulut, 2008), and teachers and students (Şen, & Neufeld, 2006). Thirdly, the results reveal that technology has some significant effects on EFL learning process. For instance, technology enriches presentations (Özad, & Kutoğlu, 2004); the Internet offers opportunities for autonomous language learning (Kartal 2005a); computer use in writing process has positive effects on reliability (Aydın, 2006) and develops writing skills (Ulusoy, 2006); hypermedia environment contributes to reading comprehension (Akbulut, 2007); and e-portfolios help pre-service teachers of English to keep current with digital innovations (Kocoğlu, 2008). Fourthly, the results show that using videos in EFL learning and teaching allow students to practice what they learned (Çakır, 2006), develops listening comprehension, and enhance intercultural competence (Köksal, 2004), whereas captioned movies improve vocabulary (Yüksel, & Tanrıverdi, 2009). Finally, the studies suggest that public school teachers have limited knowledge about the implementation of learner-centeredness while private school teachers do not (Hatipoğlu Kavanoz, 2006), and distance learning offers opportunities in EFL learning (Adıyaman, 2002). Conclusively, the results reveal that EFL learners and teachers mainly have positive attitudes towards technology, and that technology have positive effects on EFL learning and teaching processes.

CONCLUSIONS AND DISCUSSION

This paper aims to review the articles published in the TOJET on the relationship between technology and EFL learning and teaching since technology in EFL learning and teaching is one of significant fields while the TOJET is a specific journal that publishes papers on educational technology. After listing and downloading the papers using the websites of the TOJET and Google Scholar, the articles were classified and reviewed in terms of their focuses, sample groups, research designs, and conclusions.

Three main results were obtained from the study. Firstly, the 17 articles which appeared from 2002 to 2009 in the TOJET in English rather than Turkish mainly focused on EFL learners and teachers' perceptions, beliefs, assumptions, knowledge, and attitudes towards technological tools and environments such as computers, the Internet, learner-centeredness, e-portfolios, presentations. Additionally, the papers examined the effects of the above-mentioned tools and environments on autonomous learning and some of language skills and knowledge areas such as reading, writing and vocabulary while few studies appeared on distance learning and language industry. Secondly, the sample groups of the studies consisted of EFL teachers, the students of ELT departments, and ESP students. Thirdly, the papers mainly include reviews and quantitative studies while qualitative studies seem limited. Fourthly and finally, the conclusions of the studies indicate that EFL learners and teachers mainly have positive attitudes towards technology, and that technology have positive effects on EFL learning and teaching processes.

In the light of the findings, some implications for pedagogy and research can be presented. First of all, the number of studies needs to be increased quantitatively. That is, it is obvious that the research activities conducted in our country seem too limited quantitatively when compared to those carried out on a global scale. Thus, educational policymakers and researchers should investigate and analyze the reasons and sources of the lack of research in the mentioned field. Specifically speaking, some studies should be conducted to investigate the problems of researchers in the field and to present suggestions; and finally, educational policymakers should aim to solve problems and present practical solutions including financial and motivational dimensions in order to increase the research activities quantitatively. Secondly, researches should include a wide variety of topics, as implicated by Alper & Gülbahar, (2009). For instance, as found in the study, the studies reviewed mainly focused on the attitudes of target groups while there exist more individual differences such as cultural issues, personality types, reactions, motivation, stress, and anxiety that may influence EFL learning through technology. Additionally, as the present findings indicate, reading and writing skills, and vocabulary knowledge of EFL learners were investigated while no study was found on the effects of technology on listening and speaking skills and grammar knowledge. Speaking broadly, given that language is a means of communication and interaction, social, communicational and interactional aspects of technology and their relations to foreign language learners should not be ignored. Furthermore, the topics should include more technological environments such as e-mailing, computer books, correcting and revising systems, chatting, and electronic discussions. Thirdly, as the sample groups of the studies mostly consist of the students in ELT departments, the ESP students and EFL teachers should be used more frequently in samples with larger size. Moreover, the problem with forming sample groups is that ELT students are already experienced in language learning process and in technology as they graduated from EFL classes of Anatolian or super high schools that have better technological infrastructure. That is, it is fairly obvious that the results of the studies that reveal positive influences can be easily predicted. Another problem is that EFL students in the sample groups may change their responses positively or negatively as the researchers are their teachers at the same time. Namely, the role of the researcher as a teacher may be a factor that distorts participants' objectivity. Due to the mentioned problems, to integrate the infrastructure of communication and information technologies into EFL learning, sample groups should be consisted of various target groups such as foreign language learners and teachers at primary, secondary and high schools and language courses, and ESP learners and teachers of various undergraduate, graduate and post graduate programs at universities in addition to the students of ELT departments, considering that 34% of the population already have computers whereas 24.5% have internet connection at homes (Turkish Statistical Institute, 2008). In other words, it will possible to draw more realistic conclusions if the sample groups of the researches include various target groups at different language levels. Thus, it should not be overlooked that there only exist 11 million EFL learners in primary schools and above 3 million in secondary schools (National Education Statistics, 2008) at elementary, intermediate and upper intermediate levels of English. On the other hand, financial problems of researchers, the difficulties in obtaining formal permission from authorities, and logistical issues should be resolved to encourage the researches. Fourthly, given that qualitative research seems significant to examine the EFL learning and teaching phenomenon in a deeper and broader perspective and to base quantitative studies, there is a need for more qualitative studies, as well as a combination of

qualitative and quantitative studies. In other words, in addition to the replications and studies in which research tools are used in their original versions from different sources, qualitative studies will also help researchers develop scales which can draw more realistic results about the foreign language learning phenomenon in our country. Fourthly and finally, as the results of the studies reveal that EFL learners and teachers are mainly positive towards technology-related environments and tools, and that technology and its components have positive effects on EFL learning and teaching processes, it can be recommended that some other factors concerning technology should be also investigated. Affective states and demotivating factors are, for instance, two of the significant issues that need to be examined. Moreover, in addition to reading and writing skills and vocabulary acquisition, it is necessary to examine communicational skills and main language skills such as listening and speaking. On the other hand, it should also be noted that a wide variety of topics are directly related to the conclusion obtained from the studies.

As a final note on the limitations, the present paper reviews 17 studies that address EFL issues related to technology and appeared in the TOJET in terms of their topics, participants, research designs, and conclusions. Further reviews should focus on a larger number of articles in quantity and use other criteria. Finally, it could be recommended that comparative reviews will be beneficial to compare the studies from Turkey to those conducted on a global scale.

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Appendix: Studies related to technology use in EFL learning and teaching.

Authors, Years, Language and Topic	Participants	Research Design	Conclusion
Adıyaman, Z. 2002, Turkish Foreign language teaching through distance education		Literature review	Distance learning offers opportunities for foreign language learning.
Özad, B. E. & Kutoğlu, Ü. English, 2004 Technology use in presentations by EFL students	60 students at the Department of communication and media studies	One group comparison Qualitative	ESP students prefer using technology to enrich their presentations.
Gömleksiz, M. N., 2004, English Technology use in EFL classes	150 teachers of English at elementary schools	Two-group comparison Descriptive	EFL teachers have positive attitudes towards technology use in EFL classes while there is a lack of support in school climate and instruction.
Köksal, D. 2004, English Using videos and DVDs in EFL learning and teaching		Literature review	Videos can be used as a tool to improve students' listening comprehension and enhance their intercultural competence.
Kartal, E. 2005, English The internet and autonomous language learning		Literature review	The Internet offers opportunities for learning a foreign language in autonomy.
Kartal E. 2005, Turkish Communication technologies and the industry of language teaching		Literature review	Technology and language learning are interrelated.
Altun, A. 2005, English The integration of multimedia and internet technologies into language teaching	53 students at ELT departments Advanced level	One-group comparison Qualitative Descriptive	EFL learners have positive attitudes towards using asynchronous communication tools.
Hatipoğlu Kavanoz, S. 2006 English EFL teachers' beliefs, assumptions and knowledge about learner-centeredness.	13 EFL teachers in primary schools	Two-group comparison Qualitative	Public school EFL teachers have limited knowledge to implement learner-centeredness whereas private school teachers do not.
Çakır, İ. 2006, English The use of video as an audio-visual material in EFL classroom.		Literature review	Using videos enables students to practice what they have learned through various techniques.
Şen, A. & Neufeld, S. 2006 English WEBQUESTS in ELT methodology	77 students of EFL, 5 ESP teachers in the departments of journalism, radio, TV and film studies, and public relations and advertising	Two-group comparison Experimental	In WQ2, although teachers were more positive towards these issues, students partly disagreed to contribute to the preparation of the WebQuest tasks and were neutral in working together with teachers to design such tasks.
Aydın, S. 2006, English Computer effect on the test and inter-rater reliability of writing tests of ESL learners	40 students at ELT Department Advanced level	Two-group comparison Experimental	The test and inter-rater reliability of the writing samples of the computer group students is significantly higher than that of the pen-paper group participants.
Ulusoy, M. 2006, English Computers in writing process		Literature review	Teachers, peers, instructional strategies, and computer software all together play some important roles on developing students' writing abilities.
Akbulut, Y. 2007, English Foreign language reading comprehension and vocabulary acquisition in a linear hypermedia environment	69 students at ELT department Advanced level	Two-group comparison Experimental	Annotation type, reading ability and previous topical knowledge are significant factors contributing to vocabulary learning while reading ability and learning styles are important variables contributing to reading comprehension in a hypermedia environment.
Aydın, S. 2007, English The attitudes of EFL learners towards the Internet	115 students in ELT departments Advanced level	One-group comparison Descriptive	EFL learners have positive attitudes towards the Internet except for some items such as addiction, socialization and shopping.
Akbulut, Y. 2008, English The attitudes of foreign language students towards using computers	155 students in ELT departments at advanced level	One-group comparison Descriptive	EFL learners have positive attitudes towards CALL, and having a PC at home, PC experience and hours of Internet use are significant factors that affect the attitudes.
Kocoğlu, Z. 2008, English EFL student teachers' perceptions on the role of electronic portfolios in professional development	5 students in ELT department at advanced level	One-group comparison Qualitative	E-portfolios help students and teachers keep current with innovations in the digital world while EFL learners do not believe that e-portfolios are important for reflective thinking.
Yüksel, D. & Tanrıverdi, B. 2009, English Effects of watching captioned movie clips on vocabulary development of EFL learners	120 students in ELT department at advanced level	Two-group comparison Experimental	Captioned movie clips have significant gains on vocabulary knowledge.

A LABLOG SYSTEM FOR SUPPORTING LABORATORY SITUATION AWARENESS*

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Abstract

Lablog is a continuous collection of digital records of various entities (including students, instruments, facilities, etc.) about their existence states and activity experiences occurring in a laboratory of a science or engineering school from the past to the present. The lablog can be regarded as a special laboratory-oriented database whose data are captured automatically via various ubiquitous devices such as cameras, microphones, sensors, RFID tags, etc., which are distributed in a laboratory. A lablog system enables a professor to know who were/are in the laboratory, how long they were/are in there, what they did or are doing, which instruments/facilities were used or are in using, and so on. This paper presents our study on how to record various kinds of data using different sensors, keep a large amount of the sensed data into a lablog database, and make them easily accessible, so that a professor can be better aware of laboratory situations and thus manage students' laboratory work more effectively.

Keywords: log, spacelog, lablog, laboratory, sensor, RFID, database, situation

INTRODUCTION

Log is generally some kind of records about history or experience of a *single entity* in a certain period. When the entity is an online course web server, the *server-log* records all students' access history to the server, and enables a teacher/instructor to know where students were from, when they accessed the online course and what course contents were accessed so as to improve course quality for students' learning. Since year 2000, a new area called *lifelog* has emerged, and it is a sequence of data records about personal life experiences of a special entity, i.e., an individual person. The representative projects are LifeLog/ASSIST [1], MyLifeBits [2], LifePod [3], Ubiquitous Memories [4] as well as our LifeImages [5]. They try to automatically capture an individual's states and activities, and keep the captured data into a personal database of life experiences, which can be retrieved when necessary and used to improve the person's life quality.

Different from the above mentioned server-log and lifelog, we proposed the concept of *spacelog* in [6], which is generally for *multiple entities*, and their existence states and activity experiences are in a real space or physical environment such as a laboratory, a classroom, a library, a home, a clinic, a shop, a restaurant, a farmland, a construction field, etc. The entities in a space can be people, facilities, artifacts, and space-related states, e.g., temperature distribution, air quality, noise level, sound source, etc. This variety of possible entities in a space marks one essential difference of the spacelog from the server-log and the lifelog.

The term "space" is a spatial *class*. It can be substituted by a concrete physical space name, such as a classroom and a home corresponding to classroomlog and homelog [7]. If we substitute "space" with "lab", we have *lablog*. That is to say, a lablog is an *instance*, i.e., a concrete spacelog, where the physical spatial environment is a laboratory, in particular an information technology laboratory as in our case study environment where a group of students do research under supervisions by a professor who may often be in another office. Our study is focused on design and implementation of such a lablog system that enables a professor to know his/her lab's past and current situations and thus helps the professor to effectively manage the lab and supervise his/her students.

Lablog data is captured automatically via various ubiquitous devices such as cameras, microphones, sensors, RFID tags, etc., which are distributed in a physical spatial environment or carried by users/robots who are in this space. However, the logs acquired directly by the various sensing devices are raw data, and they are heterogeneous in types, massive in data amount, and illegible in meanings. Thus, the challenges in developing lablog systems and applications are how to effectively capture, store, manage and utilize the heterogeneous, massive and illegible raw log data.

In this paper, we present how the lablog system to collect, store and utilize the lablog data for lab awareness. The paper is organized a s follows. Section 2 gives an overview about the lablog system. Section 3 discusses sensor management and lablog data acquisition. Section 4 describes lablog processing and access. Finally, conclusions and future work are given in Section 5.

OVERVIEW OF THE LALOG SYSTEM

A lablog system is generally consisted of various devices such as cameras, microphones, sensors, RFID tags and readers, and possibly movable robots that should be put appropriate places in a laboratory. The left of Fig. 1 shows a conceptual lab room and sensing devices used. The robot with carrying necessary sensing devices is used to collect information while it is moving around in a room. The devices, a management server and lablog storage server are connected by wireless or wired networks. A whole lablog system can be developed based on a multi-layered general model, as shown in the right of Fig. 1.

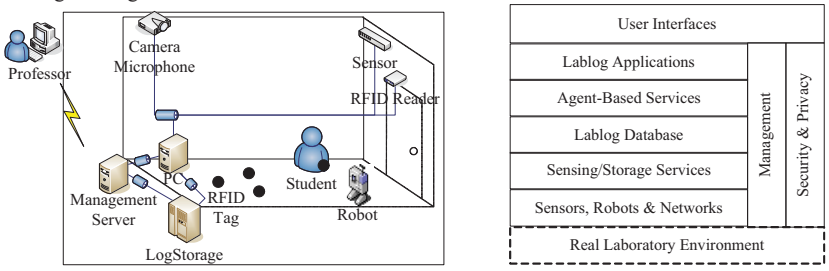

Figure 1. The lablog system concept (left) and layered model (right)

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The lowest layer is the real laboratory environment where various entities including students, instruments, facilities and other physical objects are placed or located. The second layer from the bottom covers all devices including various sensors, RFID tags/readers, robots, hard discs and their associated communication networks. With the great heterogeneity of the devices and networks, a middleware layer is necessary to provide unified programming abstractions and common services for lablog application developers to interact with these heterogeneous devices across different networks [8-10]. Above the middleware, is the lablog database layer, which keeps all the log data. Since the data on the lablog database are usually massive and illegible, and it is then necessary to have many effective tools to automatically retrieve, analyze, mine, and summarize the logs. All of these tools are placed at the lablog utilities layer on top of the lablog database. The application layer is about concrete lablog applications which provide corresponding services directly to users. The highest layer, i.e., the user interface, offers convenient interfaces between users and applications. Furthermore, the whole system should be manageable and scalable to enable convenient installations and controls. It must also be very reliable and secure to protect the importance and privacy of some lablog data.

SENSOR MANAGEMENT AND LABLOG ACQUITIONS

Various sensing devices are used in our lablog system, which are described as follows.

(1) RFID tag/reader: A tag is used to uniquely identify an object or a person. RFID readers are placed by the doors and some important places where a student is most often used, such as a desk, a chair, etc.

(2) Infrared/touch/pressure/vibration sensors: The infrared sensor can sense if a student is in some area in a laboratory, e.g. seating in front of the desk, and detect his/her motion by sensing body temperature. The touch/pressure/vibration sensors are attached to pens, books, chairs, and various physical objects inside the room. When a student touches, sits on or holds these objects equipped with sensors, corresponding events are captured, recognized and recorded.

(3) Camera & microphone: They are the most common devices used to capture environment visual/audio information. Particularly, it is also effective to use an Omni-directional camera to get a 360^0 information recording or an infrared tracking camera which can turn to a person all the time in a laboratory.

(4) Robot: Different from other devices, a robot can carry sensors and/or actuators. Therefore, a robot can move to a place to sense information or take an action in that place.

Due to the great heterogeneity of the various sensing devices and the sensed data, the management of all sensors and sensed data, the lablog system becomes very complex. Fig. 2 shows a GUI tool for managing all devices in a laboratory environment and data logs stored in a spacelog database. The GUI enables a user to know what sensors exist and where they are in the laboratory, and view the sensed logs from specified sensors in flexible visualized styles.

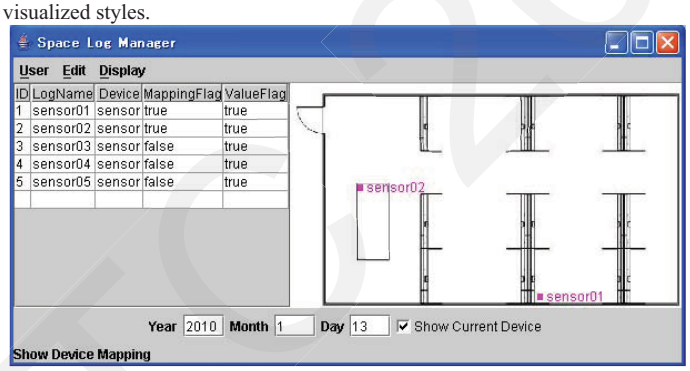

Figure 2. A snapshot of the lablog sensor management GUI

Besides the sensing devices, there are other machines used in the lablog system, such as a lablog database (LDB) to keep the acquired data, a lablog server (LLS) to manage devices and logs, and a PC/PDA or a cell phone for a professor to get information about his/her laboratory. So far, the lablog prototype shown on the left of Fig. 3 has been implemented using Java programming language. The LLS can run on an ordinary PC installed with a Java VM using JSE 1.60_07 on Windows OS environment. The SunSPOT (Sun Small Programmable Object Technology), a wireless device developed by Sun Microsystems [11], has been embedded with an acceleration sensor, a light sensor, a temperature sensor and several three colored LED actuators. It can also function as a gateway, called smart space gateway (SSG), to connect with other sensors as shown in the right of Fig. 3. To collect desired information from some sensors in an SSG, a lablog application (LLA) can send a sensing request to activate these sensors (using their corresponding SSG port numbers). The sensed data can be sent to either the LLA or a lablog database (LDB) in a lab according to the application's instruction. The sensors will continuously capture data until receiving a stop sensing command from the LLA.

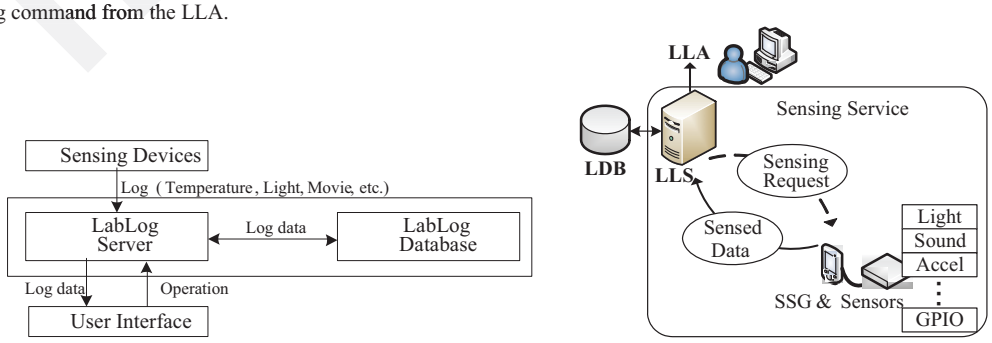

Figure 3. The lablog system modules (left) and sensed log acquisition (right)

LABLOG DATA PROCESSING AND ACCESS

Figure 4 gives an outline of the lablog prototype workflow from data acquisition to a sequence of log data processing. The lablog service-ware includes pre-processing services, post-processing services, and access services.

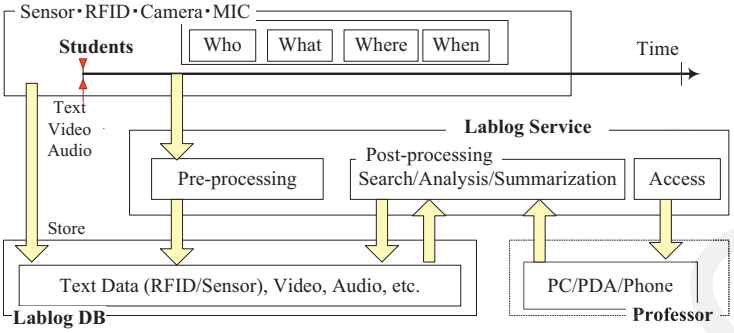

Figure 4. The workflow from data acquisition to lablog data processing

The pre-processing is to turn incoming raw sensed data into information for storing in a lablog database, further processing is the post-processing, or the direct use of a lablog application. For example, the collected camera sensor data can be filtered into different types of attribute-oriented information and stored in a lablog database for later use in applications.

The post-processing is to search, analyze, and summarize information from the lablog data into meaningful contexts for supporting lablog applications. This research takes an agent based post-processing approach in which multiple agents play their own roles and provide corresponding services in the process of turning information into meaningful contexts in applications.

To test the whole system of lablog prototype, an experiment environment has been set up with a set of SSGs distributed in our laboratory for making a lablog application to record the sensed data in the laboratory as shown in Fig. 5.

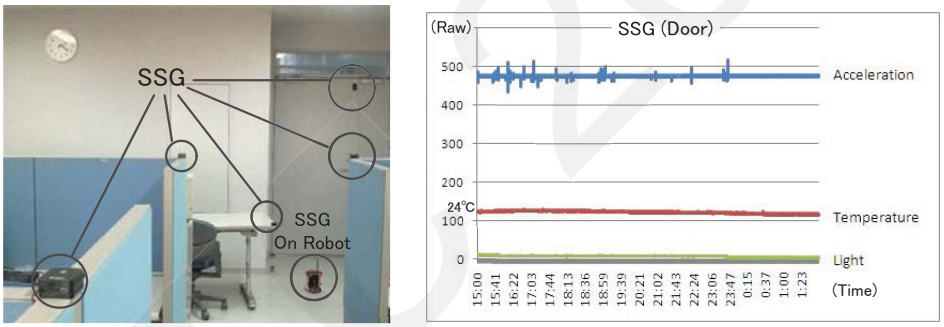

Figure 5. The snapshots of sensor-embedded SSGs (left) and retrieved log data (right)

As shown in Fig. 5, SSGs (three of them) are placed on the door, on the robot and table, and others on the partition boards in the room. The experiment was done in 24 hours (15:00, Jan. 7, 2009 – 15:00, Jan. 8, 2009). The right of Fig. 5 shows the sensed raw data of acceleration, temperature and light from the sensors embedded into SSGs that were put on the door. The sensed acceleration data on the door showed how often people have entered/left the laboratory in a day.

By analyzing and combining the sensed log data from various sensors, it is also able to make an activity summarization to show when students were in a lab and what they did as shown by an example given in Fig. 6. The summarization agent makes a set of data with their relations meaningful to a specific objective by heuristic approach. The main points of the heuristic based summarization are to model regular daily activities, create the corresponding heuristic graph examples, loosely match one of heuristic graph to a part of the created graph, and output the matched activities.

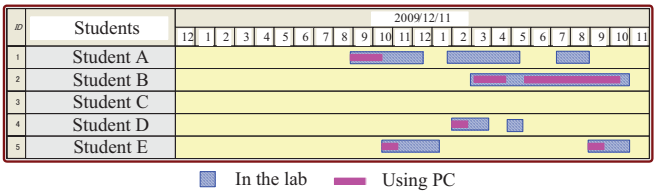

Figure 6. An example of student activity sumarization

CONCLUSIONS AND FUTURE WORK

Spacelog is a novel concept which we proposed in [6], and it can be regarded as a memory organ of a computerized intelligent real spatial site or environment, such as a laboratory and a home. This paper describes a lablog system that can automatically acquire data from our physical laboratory environment by various sensing devices, pre-process the acquired data, storing the data in a lablog database, and provides lab-related information and agents-based summarization services to a professor. The search agent, analysis agent, and summarization agent are working in a pipeline.

Spacelog including lablog is still new and lots of research issues remain in its systematic study covering modeling, techniques, systems and applications. The spacelog shares some common issues in other areas such as database, multimedia, sensor networks, pattern/activity recognition, AI, agent, data mining, etc. However, the question is that many issues in spacelog cannot be all solved by simply applying available techniques in these areas, and thus new approaches and techniques must be put forward to deal with the new features and solve the new problems existing specifically in the spacelog as well as related systems and applications.

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A LEARNING INNOVATION: MLARG-MOBILE LEARNING FOR THE YOUNG PEOPLE AT RISK GROUPS

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Abstract
This paper reports the initial study of "MLARG: Mobile learning for the young people at risk groups", a Leonardo da Vinci Transfer of Innovation project created and coordinated by Foreign Language Education Department of Boğaziçi University. The aim of the project is to use the mobile technologies to help tourism vocational high school students who normally do not have many opportunities to practice the foreign language. International partners from Czech Republic, Slovakia and Italy help the coordinating institution construct the technological infrastructure while Boğaziçi University team is working on developing the language content, which subsequently will be built into the mobile phones allowing students to practice the language by themselves whenever they like. The significance of the project is that it is one of the first and foremost mobile language learning projects ever designed in Turkey and it will pave the way for the mobile technologies sector to focus more on education and cooperate with the language teaching professionals. It will also allow young people to fulfill their potential by helping them to develop their language skills.

Anahtar Kelimeler: *m-learning, mobile learning, technology and education, tourism vocational high schools, youngsters at risk groups, language learning*

A LOGISTIC REGRESSION ANALYSIS ON THE EFFECTS OF MATHEMATICS ACHIEVEMENT OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) USAGE: FINDINGS FROM PISA 2006

İLETİŞİM VE BİLGİ TEKNOLOJİLERİ KULLANIMININ MATEMATİK BAŞARISINA ETKİSİ ÜZERİNE BİR LOJİSTİK REGRESYON ANALİZİ: PISA 2006 BULGULARI

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Abstract: This study presents an application of the binary logit model to educational data to reveal the most significant factors that affect the severity of mathematics achievement. Data were collected by Program for International Student Assessment (PISA), administered once every three years to 15 year-old students. The data for this study are included 4355 Turkish students. The dependent variable was determined as the severity of mathematics achievement and was classified according to two levels: students who get the score which was over the Turkey's mathematics average score (423) and students who get the score which was under the Turkey's mathematics average score. In the view of the dependent variable, the use of the binary logit model was preferred. Factors that affect on the students' performance in mathematics, such as gender, internet use, possession desk, computer, socio-economic and cultural status of the family and the region of school have been examined using PISA 2006 Turkish dataset. Results indicated that male students were more successful than female students and students who had higher socioeconomic and cultural status get higher scores in mathematics. Also, students who live in Eastern Anatolia and Southeastern Anatolia Region were shown to perform poorly in mathematics compared to students who live other regions in Turkey. On the other hand, it was revealed that although computer possession was one of the major factors affecting mathematics achievement, the aims of the computer use had important role on mathematics achievement.
Keywords: PISA, Mathematics achievement, Information and Communication Technology (ICT) usage, Binary logit models.

ÖZET: Bu çalışma matematik başarısının önem derecesini etkileyen en önemli faktörleri ortaya koymak için eğitim verisinde lojistik regresyon modelinin bir uygulamasıdır. Veri 15 yaş grubu öğrencilerine her üç yılda bir yapılan Uluslararası Öğrenci Değerlendirme Programı (PISA) tarafından toplanmıştır. Bu çalışmaya 4355 Türk öğrenci katılmıştır. Bağımlı değişken matematik başarısının önem derecesi olarak belirlendi ve bu değer Türkiye ortalamasının (423) üzerinde puan alan öğrenciler, Türkiye ortalamasının altında puan alan öğrenciler şekilde iki kategori olarak sınıflandırıldı. Bağımlı değişkenin yapısı gereği iki değerli logit model tercih edilmiştir. PISA 2006 Türkiye verileri kullanılarak cinsiyet, internet kullanımı, sıra ve bilgisayar sahipliği, ailenin sosyo-ekonomik statüsü ve okulun bulunduğu bölge gibi öğrencinin matematik performansını etkileyen faktörler araştırılmıştır. Sonuçlar erkek öğrencilerin kız öğrencilerden daha başarılı olduğunu ve sosyo-ekonomik statüsü yüksek olan öğrencilerin matematik puanının yüksek olduğunu göstermiştir. Ayrıca Doğu Anadolu ve Güneydoğu Anadolu bölgelerinde yaşayan öğrenciler, Türkiye'de diğer bölgelerde yaşayan öğrencilerle karşılaştırıldığında matematikte daha zayıf performans göstermektedirler. Diğer taraftan, bilgisayar sahipliği matematik başarısını etkileyen en önemli faktörlerden biri olmasına rağmen, matematik başarısında bilgisayar kullanımının amacının önemli bir role sahip olduğu ortaya çıkmıştır.
Anahtar Kelimeler: PISA, Matematik başarısı, İletişim ve Bilgi Teknolojisi kullanımı, Binary logit model.

INTRODUCTION

Turkish educational system has modern, secular, democratic and coeducation characteristics and educational reforms in Turkey have been developing slowly. These reforms are included changes in structural and curriculum program. After having negotiations with European Union in 2004, Turkey has applied various reforms in curriculum program for accomplishing educational targets of European Union. Turkey has aimed to liberalize educational system in structural program. So, Turkey should develop some strategic plans to increase the performance of education system and these plans should contain not only national but also international strategies. Besides national assessment studies were done in educational field, it was need of educational indicators to locate at the international level. According to particular reference points, level at which the field of education in our country and the lack of identification of the measures to be taken, thus it was aimed to raise educational level. Turkey was involved in some projects like Programme for International Student Assessment (PISA), Trends in International Mathematics and Science Study (TIMSS) and Progress in International Reading Literacy Study (PIRLS).

When previous studies were examined, it was seen that lots of techniques were used to measure mathematics achievement and one of these techniques was binary response model. The use of binary response models was becoming widespread in a variety of research fields. Especially in educational researches, a large of number of binary and ordered response variables was involved in survey. For regression analysis, if the dependent variable was categorical, the relationship between the explanatory variables and the expected value of the dependent variable may not be linear in most cases. This relationship was expressed by an S- shaped curve. The expected value of dependent variable may be smaller than zero or exceed 1, because of that some transformations have been applied to the expected dependent variable. A logistic regression model is obtained under the assumption that the distribution of error terms was logistic, whereas probit model is obtained when the normal distribution was assumed for the error terms (Uçar and Tatlıdil, 2005).

As a sophisticated example, Gürler et al. (2007) investigated to model which factors are effective about the education demands of individuals whose ages are 15-23. In their study, effects of the factors as education level and job of parents, rural or urban living style and income of household were conducted on logistic regression. Total annual income of household, education level of parents and urban life variables on enrolled to school was determined positive relationship. However, male students were more successful than the others, the expected value of education level increased on male students.

Aşkar et al. (2006) profoundly examined to identify of membership of users and non users information and communication technology (ICT) and the binary logistic regression model was used. The participants of this study were 416 teachers from 8 secondary schools in Ankara. Results indicated that complexity and relative advantage comes forth in preparation for lesson activities, being predictor in preparation of lesson plans and presentation during lesson.

In Braak's study (2001b), it was used logistic regression model for explaining the computer use in the classroom. Teaching a technology-related subject, computer experience and technological innovativeness were more important than gender, age and computer attitude. However, Aşkar and Yalçınalp (2003) investigated to some student's characteristics of internet usage formats as searching information and communication environment. According to this study, it was found the relationship between information strategies and styles. When students are provided internet access at specific conditions, they prefer to use internet instead of library and other resources.

As a final one, we have reviewed Barkatsas, Kasimatis and Gialamas study (2008) which is on learning mathematics and technology. Actually, they examined the relationship between students' mathematics confidence, confidence with technology, attitude to learning mathematics with technology gender and year level. The sample was composed of secondary students from state co-educational schools in Metropolitan Athens, Greece. Gender differences and differences between year levels and resulting clusters of students were analyzed using MANOVA. It was found that boys expressed more positive views towards mathematics and more positive views towards the use of technology in mathematics than girls. A high level of mathematics achievement was associated with high confidence in using technology and strongly positive attitude to learning mathematics with technology.

The main objective of this study was to determine the factors affecting mathematics achievement using data of the Turkish students who attended the Program for International Student Assessment in 2006. The other purpose was to resolve the lack and the results conduct in Turkey together with the results of foreign countries were subjected to comparative analysis.

METHODOLOGY

Data Set

PISA surveys, which take place every three years, have been designed to collect information about 15-year-old students in participating countries and economies. The database includes not only information on student performance in the three main areas of assessment – reading, mathematics and science – but also their responses to the student questionnaire that they completed as part of the assessment. In 2000 the major domain was reading; in 2003 it was mathematics and in 2006 it was science (OECD, 2009).

The PISA 2006 survey was participated in 57 countries (including 30 OECD countries). Nearly 400.000 students, representing almost 20 million 15-year-olds enrolled in the schools of participating countries, completing the assessment for two hours in PISA 2006.

Measures and Variables

This study used PISA 2006 data from Ministry of Education in Turkey. The data for this study describe 4942 students in 160 schools during the 2005-2006 academic years, but all students did not answer all questions. Therefore, it includes 4355 students. In this study, dependent variable is mathematics achievement (Y=1 if the score is over the Turkey's mathematics average score (423); Y=0 if not). Variables of the study were gender, the index of economic, social and cultural status, possession of desk, computer and internet, how much time the students use computer, index of ICT Internet/entertainment use and regions. After selecting these variables, the data were analyzed with binary logit analyses using SPSS package program.

Variables

Mathematics Achievement (Y_i): Mathematics performance of a student has measured four subjects: Geometry, Algebra, Arithmetic and Probability. The dependent variable $Y_i = 1$ if the score is over the Turkey's mathematics average score (46.5%); $Y_i = 0$ if not (53.5%).

Gender (G): Student gender is recoded as 1 = male and 0 = female. 44.8% of the total sample was female and 55.2% male.

Economic, social and cultural status (ESCS): The index of ESCS was used in the PISA 2006 analysis and that time was derived from three indices: home possessions, higher parental occupation (HISEI) and higher parental education expressed as years of schooling.

Possession of desk, computer and internet: These factors were questioned using yes-no question and percentage of students who have computer, internet and desk were 42.4%, 26.8% and 86.8% respectively.

How much time the students use computer: All students responded this question and "less than 1 year", "1 to 3 years", "3 to 5 years" and "5 years or more" were 20,7%, 27,8%, 23,7% and 27,9% respectively.

Index of ICT Internet/entertainment use: The PISA 2006 index of ICT internet/entertainment use was derived from students' responses to the six items measuring the frequency of different types ICT use. A five point scale with the response categories recoded as "almost every day" (=0), "a few times each week" (=1), "between once a week and once a month" (=2), "less than once a month" (=3) and "never" (=4) is used. All items are inverted for IRT scaling and positive values on this index indicate high frequencies of ICT internet/entertainment use (OECD, 2009).

Regions: There were seven regions in Turkey; Marmara Region, Central Anatolia Region, Aegean Region, Mediterranean Region, Black Sea Region, Eastern Anatolia Region and Southeastern Anatolia Region. In this study, 29.7% of the total sample was located in Marmara Region and Central Anatolia Region, Aegean Region, Mediterranean Region, Black Sea Region, Eastern Anatolia Region and Southeastern Anatolia Region were 17.7%, 13.5%, 14.6%, 12.4%, 6.2% and 5.8% respectively.

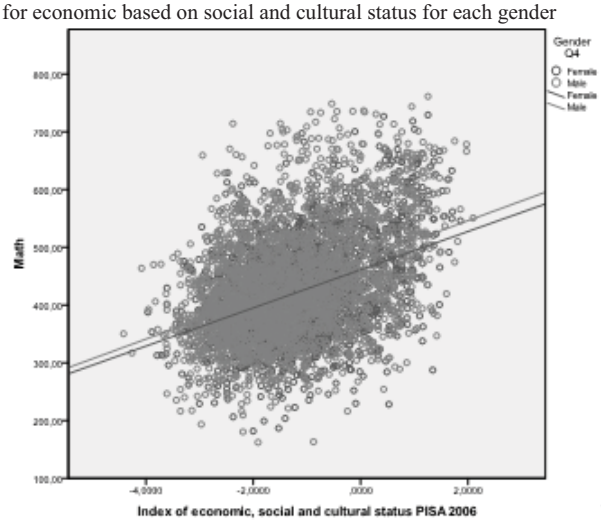
FINDINGS AND RESULTS

Table 1 show the descriptive statistics for continuous variables for all models which we used.

Table 1: Descriptive statistics of the continuous predictors of students' performance

	Index of ICT Internet/entertainment use	Economic, social and cultural status
Minimum	-3,04	-4,42
Maximum	3,18	2,10
Mean	-0,04	-1,24
Std. Deviation	1,12	1,08

Figure 1 showed mathematics score based on economic, social and cultural status for each gender.
Figure 1. Mathematics score for economic based on social and cultural status for each gender



As is seen in Figure 1, it could be said that male students who has higher economic, social and cultural status get higher ranks in mathematics. Also it could be shown in our statistical model which was called multivariate binary model.

Table 2: Logit model output

		B	S.E.	Sig.	Exp(B)
	Constant	-,160	,159	,316	,852
	Gender	,427	,073	,000	1,532
	Possession desk	,301	,111	,007	1,351
	Possession computer	,598	,089	,000	1,818
	Index of ICT Internet/entertainment use	-,401	,036	,000	,669
	Economic, social and cultural status	,526	,042	,000	1,692
How long used computer	5 years or more			,000	
	Less than 1 year	-,594	,111	,000	,552
	1 to 3 years	-,283	,096	,003	,753
	3 to 5 years	-,234	,095	,014	,791
Regions	Marmara Region			,000	
	Central Anatolia Region	,427	,100	,000	1,532
	Aegean Region	,558	,109	,000	1,748
	Mediterranean Region	,662	,108	,000	1,939
	Black Sea Region	,337	,112	,003	1,400
	Eastern Anatolia Region	-,476	,159	,003	,621
	Southeastern Anatolia Region	-,500	,163	,002	,607

According to Table 2, all factors, except possession of internet, had statistically significant effect on mathematics achievement. So, the factor called possession of internet was excluded to our model. In this study, true classification rate of the final model was 70%.
After examining previous studies, it was realized that there were many factors such as gender and socio economic and cultural status etc. effecting students' mathematics achievement (Martin et al., 2008; Kivilu & Rogers, 1998). Therefore, factors which were about students' characteristics and wealth added to the current model which was called binary logit model. It was showed that male students were more successful than female students and students who had higher socioeconomic and cultural status get higher scores in mathematics in this model.
In Turkey, especially Eastern Anatolia and Southeastern Anatolia Region, some factors such as schooling ratio, number of students per teacher and teachers experience period were lower than other regions (Worldbank, 2005). Also it was showed that students who live in these regions were performing poorly in mathematics compared to students who live other regions in Turkey (Worldbank, 2005). Because of these reasons, mathematics achievement had different characteristics in each region. For example, Mediterranean Region was the most successful region, if the Marmara Region would be the reference category.
Students who have a desk and computer were more successful than other students who did not have them. In this study, it was revealed that possession of desk or computer were the major factors that affect mathematics performance. Furthermore, it was showed that student who use computer for 5 years or more outperform other students on mathematics. On the other hand, it was revealed that although computer possession was one of the major factors affecting mathematics achievement, the aims of the computer use had important role on mathematics achievement. Therefore, students who use computer for internet and entertainment got lower score than others.

CONCLUSIONS AND DISCUSSION

In this study, it was examined that factors affecting mathematics achievement using data set of the Turkish students who attended the Program for International Student Assessment in 2006. The dataset includes 4355 students. Multivariate statistical techniques were used to

investigate the relationships between mathematics achievement and gender, the index of economic, social and cultural status, possession of desk, computer and internet, how much time the students use computer, index of ICT Internet/entertainment use and regions. In this model, mathematics score was coded 1 if students' mathematics achievement score was over the mean score of the country, otherwise it was coded 0. Thus, current model was analyzed using multivariate logit model in SPSS package program.

In Turkey, just like other countries which attended PISA Project, there was a huge gap between male and female students' mathematics achievement. Also, in Turkey, especially Eastern Anatolia Region, school enrollment of girls was lower than boys (Worlbank, 2005). So, it was one of the reasons of the achievement difference. In this study, like other studies which were examined before (Chiu and Xihua, 2008; Chow et al., 2007), male students outperformed female students on mathematics achievement and similar results could be found in the studies of Zaccarin and Donati (2008) and Martin et al. (2008). Furthermore, the importance of this gap was revealed in Worldbank Report in 2005. So, gap between boys and girls in mathematics achievement must be taken into prior consideration to reduce the achievement difference between genders.

It was revealed that socio economic and cultural status of people in Turkey varies in not only regions but also provinces (Worlbank, 2005). Resources of education could not be delivered equally to each region and it was the main reason for socio economic and cultural variability. So it was the main reason for the variability of socioeconomic cultural status in each region and its effects on mathematics achievement could not be ignored. Therefore, government should consider these areas to have top priority for high quality education in Turkey. Also, other problems of these areas were determined in the report of the World Bank in 2005. According to the World Bank report in 2005, sustainability of the education, student-teacher ratio, the number of classified teacher and problems of delivering resources were the most common problems in Turkey. Government should solve these problems to increase not only secondary school performance but also the performance of education. Also we thought that increasing the number of teachers and establishing new schools could solve these problems. Besides, increasing the number of certificated teachers, arranging competitive examinations of mathematics and science or arranging some seminars explaining usage of mathematics and science in daily life could improve the level of Turkish education.

Possession of desk and computer were factors effecting student achievement positively. It means that students, who had his/her own desk and computer, were more successful than others (Ismail & Awang, 2008). Thus, the importance of the possession of desk and computer on mathematics achievement was emphasized once again (Demir, Depren & Kılıç, 2009). In Turkey, it was the fact that all family could not afford to buy a computer and desk or they did not have any space to locate them in their house (Worldbank, 2005). So, government should provide computers and study places for each school to increase educational performance. Besides all this, it was not finished by providing computers for students. Aim of the usage computer was the most important thing for success. In this study, it was emphasized that if students use their computers for internet and entertaining rather than researches and homework, mathematics achievement would decrease. Similar results were seen in Jackson et. al. (2007). These results showed us that computer possession was not the only factor to increase mathematics performance. But if it is used for researches, homework, grouping study activities etc., mathematics achievement will increase.

As a result of this study, some factors effecting students' achievement were determined, and results of this study compared to results of the previous studies. Finally, it was revealed that there were similar problems about regional differences in mathematics achievement, internet and computer use, socio economic and cultural status etc. in Turkey. Also it was showed that similar factors affected students' achievement, so Turkey should create better strategies which were used to increase the performance of education system. We thought that this study could be a resource for further national and international researches.

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A MODEL FOR BUILDING E-CONTENT SESSIONS

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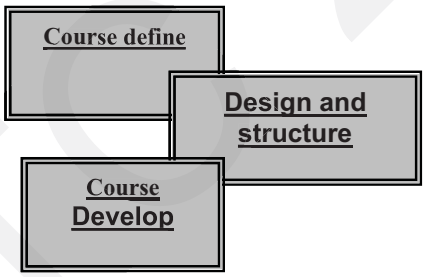
***Abstract*—** with the quick growth of Internet technologies and web based environments, e-learning has become a major trend in the education area. Most of the e-learning contents are still developed in same traditional educational ways; in the ICTE program in Jordan University we follow a different way.
In this paper we present the general principles of a proposed approach for building e-content for e-learning and m-learning based on mix recommendations, we will on three phases in building the e-content.
The first phase is the analysis phase of the content which done by experiences person in the field, the output of this phase is the input for the second phase which is design phase, finally the implementation phase which need a special knowledge in technology application and experience in the material itself.
***Index Terms*—** *elearning, content, Econtent, course, development.*

INTRODUCTION

Any content that is created for use online has to bring added value to the learner and support teachers in helping students to understand concepts. Too little consideration is given as to whether there are advantages in digitisation and what they are. In face to face settings econtent should be seen as a tool to improve the understanding, engagement and motivation of learners; to provide a safe environment for them to experiment and explore their conjectures; and to test their understanding using novel assessment methodologies based on trial and improvement; simulations and manipulation of models.

Developing e-content need attentive planning and thought into the creation of any e-learning resource is essential. The term 'Develop' refers to more than just the technical process of building the resource. The resource should seek to solve some educational problem, i.e. have some educational value and purpose, and also apply an appropriate learning design.
Planning the user experience then follows, and will include storyboarding, design of the structure, layout and navigation. Ensure that work in this area has been well-considered. This will result in minimal interruption to the technical development phase to 'last-minute' changes or corrections to the final resource design[1].
From experience of teaching in the ICTE (Information and Communication Technology in Education) which is a high diploma program in the University of Jordan, where most of the students are teacher or involved in the ministry of
education in Jordan and other Arab Country. The best way to develop e-content is to follow three phases which are:

1. Define (Analysis and preparation).
2. Design and structure.
3. Implementation and testing.



DEFINE (ANALYSIS AND PREPARATION)

Covering your content ensures it will be portable and can be used by software such as LMSs, or directly in a browser without further modifications by the user. Technically, a 'content package' is a zip file3 which contains the actual content as well as a file containing machine readable information describing the structure, navigation and presentation of this content. The process of creating a content package can be a simple process Figure

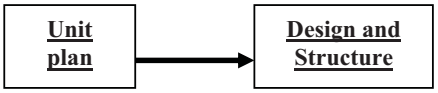
Preparing concepts
It is a requirement that all content developed is packaged using the IMS Content Packaging specification or directly in a browser. Technical knowledge of this specification is not required[2]; however we should be familiar with these concepts when we packaging our content (preparing it):

1. determine the content (course/unit).
2. determine your target (student, employee……).
3. Item – a reference to a file containing content.
4. Aims of the content (general aims).
5. Questions in the topics (i.e. unit) (main question and general questions) the questions covers the aims of the topics.
6. Specify the lessons: each lesson time between (45-60 minutes).
7. Aims of the lessons (each lesson have it is own aims (less than or equal three).
8. Questions in the lessons (main question and general questions): the questions cover the aims of the lesson itself.
9. Develop story boarding for each lesson.
10. Include all the above steps in unit plane.

Not that all of the above point must be done by experiences people (teachers) or any people related to the topic, we mean that they have a practical expenses in the topic with student and classroom (teach the topic) in real environment.

DESIGN AND STRUCTURE.

In this phase the whole work is in the design and structure of the work and it is depend in the result of the first phase where we construct the final unit plan.



In this phase the processes are often concurrent and iterative. Processes and steps might differ between organisations and for different projects and for different subject, but generally the steps include:
If your resource contains HTML, multimedia, images and documents and has a learning objective then it's perfect for to convert to econtent . Take a look at your proposed resource and think about how the files and folders might be structured (main directories and subdirectories).
Before you start developing content, you should set up and use standard directories such as 'images', 'scripts', 'documents' and 'css' (cascading style sheets),etc… for commonly used files. This will help with the structuring and future maintenance of the e-learning resource.
If you can anticipate that the final resource will be large (over 10MB) you should separate it into smaller pieces before group it. This may be necessary if the content contains large files such as video. Content grouping should be limited to 10MB each. You can plan for this by keeping each task or unit in its own folder and avoiding links between the folders so they can be packaged separately[3].
A typical object may contain an:

- Introduction.
- aims
- Learning content, preferred all type of data, depend on the target people.
- Questions (quiz).
- Reference material.
- One or more tasks.

Although not mandatory, it is good to offer a distinction between learning content, tasks and reference materials.
An introduction page should be created separately from the other sections and should introduce the learning object and give an overview of the content[4].

CONTENT FORMATS

These are some recommended for content and formats will allow greater portability of content:

1. All web content (HTML) should be written in valid XHTML 1.0 and it is recommended that the file size for HTML files is kept less than 65Kb.
2. Cascading style sheets (CSS) should be used for presentation and stored in external files for easy customisation.
3. All still graphics must be provided in PNG, GIF or JPEG format.
4. All video is provided in MOV, MPEG2 or MPEG4, AVI, SWF or FLV.
5. All audio is provided in MP3 or AU,….etc.
6. Design in general (colors, font image).
7. all files names preferred to not be in Arabic language (may it caused some technical problem).
8. Text alternatives for images, graphs, video and multimedia should be planned and implemented during the production process.
9. Content with high bandwidth requirements (such as video) should also be provided in a low bandwidth alternative (eg still images and text).
10. Access to all content should be possible without the use of scripts (eg Javascript).
11. follow the structure and unit plan that specfied in the pevious section.

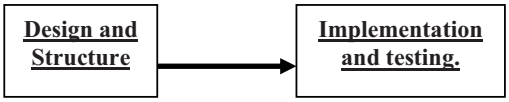
DESIGN

In general This phase is in the midle of whole the work (development of econtent), so the developer can go back to the brevios phase with any any problem m but any maintaining in the unit plane or any part of the work must be considered in this phase[5].
The output of this phase is the main page and a link for the one of the learning object that work completely with all support. Tha main bage must contain the following for the whole content:

1. Introduction.
2. aims of the course.
3. Learning content (lessons), preferred all type of data, depend on the target people.
4. Questions (main exame/questions).
5. One or more tasks.
6. Reference material.
7. contact details

all of the above points are used in the main page of software developed by the student of the ICTE programe in the course of (project1,project2 and project3).
As it is known the most important persons who use the development content is the teachers and the students, so it is so important to show them (teachers and students) the work at this phase to share with them their opinion or to get feedback from them about the work as an experts people and related to the product.
The work here is the main page with it is main content and one of the lessons work completley , with all resources for this lesson(text, voice, image,digrame,animation,video,……etc)
After completing all this steps and the first draft of the work is produced, then we are ready to start the final phase of producing the content as Econtent[6].

DEVELOP IMPLEMENTATION AND TESTING.



As the last phase of the econtent development the input of this stage is the output of the design and structure phase. The work here is to complete building the lessons and integrate them togother with the main page as a hole unit.
During the final development stage you must be aware for all many aspects for the final product, some of these aspects are:

1. Storyboard development (templates, design tool, Microsoft Office).

2. Content authering tool (Macromedia tool,flash,HTML,XML……etc).
3. Graphic Design production tools (Macromedia too, Photoshop,flash….etc).
4. video and audio production tools (movie maker, adobe premire).
5. programing and scripting.
6. use the service of subject matter experts to develop the content.
7. applying systematic instructional development process and systems development-analyze, design, build and evaluate.
8. use text book.
9. development of content and instructional design using structured storyboard and scripts.
10. prodution of multimedia content elements text, graphics and animation, audio and video.
11. authoring/ programming of content elements and logic into complete courseware application.
12. testing of complete application integration.
13. user acceptence.

KEY SUCCESS FACTORS.

While there are many factors involved in successful development of online content, the following have consistently been found to be of particular importance and key to the success of works:

- Creating a balanced project team (i.e. not dominated by technical people but a good mix of skills and importantly project management and educational design skills).
- Effective planning.
- Good communication within the project team.
- Key features of good online resources, from a student's perspective, include: accessibility (fast to download, easy to read, easy to navigate), use of appropriate online features and good content design, i.e.
- The learning content is enhanced by careful selection of appropriate and current learning resources.
- Is motivational and engaging.
- The learning material is clearly presented and accurate, and appropriate level of instruction given.
- The content is written in appropriate style and format for online, and is complemented with downloadable.
- From a design perspective good learning design involves effective interrelation between learning resources, learning tasks, and learning supports.
- Planning the communication activities to take place between learners, and between learners and teachers.
- Effective educational design is extremely important, but can be cancelled if product design (interface, navigation, and technical aspects) is not effective.
- The development of a prototype as a key review and 'sign-off' point prior to detailed development of the whole resource.
- Final testing to ensure that the product meets the technical requirements specified, and can be effectively accessed and used by the intended learner group[9].
- Development of good documentation so that teachers and learners know how to install, access, use, navigate and adapt the resources developed.

GETTING YOUR STUDENTS ON-LINE

Many students are worried of the online learning environment and may need encouragement and specific help in how to engage with your online course[7].
This is some pints to encourage them to use online learning.

1. Arrange meeting that deal specifically with using the online learning environment – even when the delivery of the course is entirely online.
2. Log the students on to the system; explain how the course works and how to use the site.
3. Make sure you let the students know that they are not alone but you are available through alternative or even more means via the discussion board and email.
4. Discuss with your students.
5. Allow students too meet one another, get contact details and from groups if needed.
6. Give the students an initial activity where they practice using online told that are part of your course (such as the discussion board). This gives them chances too ask you questions and allay fears about the technology.
7. Check all students can send and receive information in a useable format (at least by e-mail (there own e-mail).
8. Email students around week two to check that they have been able to do everything they have been asked to do online. If there are any problems, try too collating the problems and deal with them in bulk. Use the message board for example[8].

SUMMARY AND CONCLUSION

Figure(1), bellow summarise all the main points in building an econtent, with it is main activites and needed resources.
The model is tested by the student of the ICTE programe, they work in three phases of the model and we found that it is:

1. easy to follow.
2. easy to maintain any point of work.
3. every pahse have it is own output.
4. we can share the work(product) with experts people (students, other teachers …etc).
5. most of the software our students work in it is (Macromedia Dreamweaver, photoshop, Autherware, flash and MSoffice ….etc).

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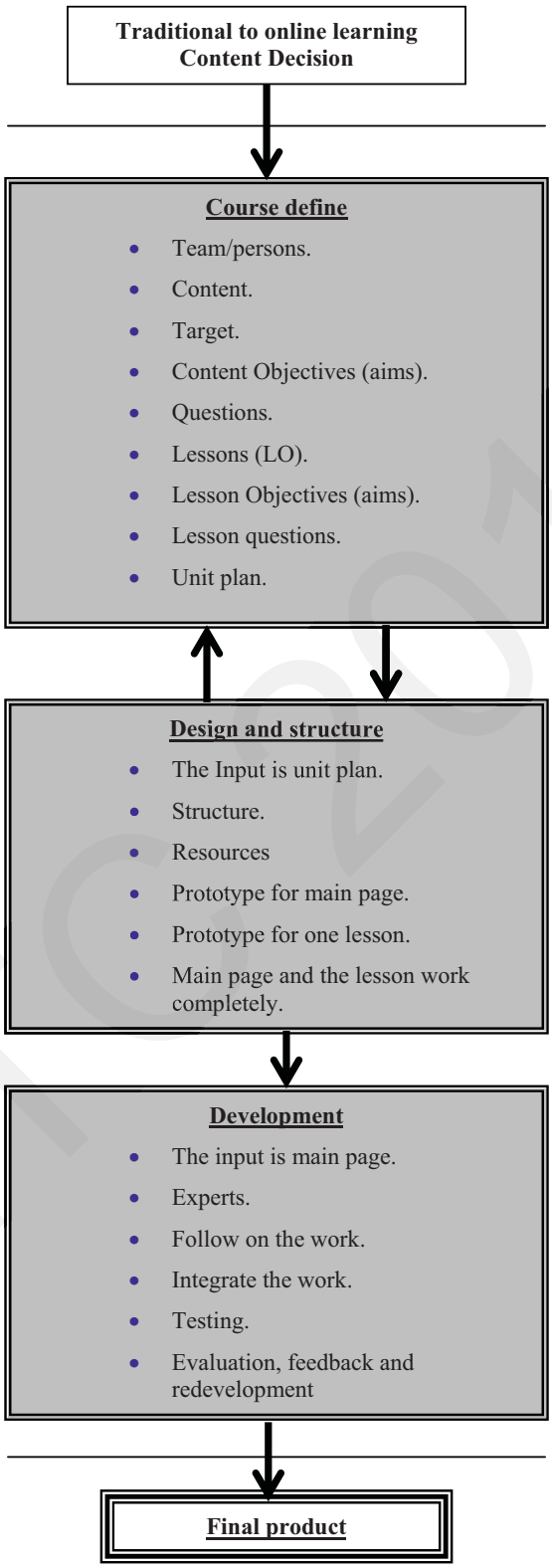

Figure(1): proposed model

A QUALITATIVE STUDY AT DISTANCE ENGLISH TEACHER TRAINING PROGRAM: WHAT ARE THE PROBLEMS OF STUDENT TEACHERS DURING DISTANCE FIELD EXPERIENCE?

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Abstract
The study aims to investigate the problems of student teachers at the B.A Distance English Teacher Training Program at Anadolu University Open Education Faculty during field experience. The participants are 21 student teachers having field experience in different regions of Turkey. Data are collected by open-ended interview questions. The recorded interviews were transcribed and analyzed. The general themes emerged are related to the assessment system, computer mediated communication, mentor and feeling of isolation of student teachers. The student teachers reported that the assessment system was very strict and was their most serious problem. Untrained and unqualified cooperating teachers, non equivalency in distance learning opportunities, and non existence of a supervisor were the other problems reported by the student teachers. The study is important in providing an opportunity to the student teachers for voicing their problems and feedback to the course organizers for the implementation of the program.

INTRODUCTION

Anadolu University Open Education Faculty (AUOEF) offers the only distance B.A Program in English Teacher Training (DETTP) in Turkey. The program aims to train qualified English teachers and to meet the growing demands of Turkey for English teachers. The program is in blended format. That is, during the first two years education is partly face-to face. The first and second year students have to accommodate in one of the eight cities (Adana, Ankara, Balıkesir, Edirne, Erzurum, Eskişehir, İzmir ve Konya) in order to get on-campus education. During the 3rd and 4th years, the student teachers are educated by distance learning. Since winter 2004, the 3rd and 4th year student teachers have been provided with an on-line support, in which the student teachers have access to the online information of each unit of the course book for each module prepared by the course instructors to make the written materials more comprehensible and helpful for the student teachers. This online information consists of pre-during and post activities for each chapter of the course books with a post test which enables the student teachers to evaluate their learning. What is more, an instructor is allocated for each course to give support and guidance to the student teachers. The courses are taken annually. For most of the courses the student teachers take 3 tests at intervals (December, February, April) and a final test at the end of the year. For student teachers to pass a particular course, the cumulative average score on all the three tests should be 70. If the student teacher receives a grade below 70, it would then be necessary for the student teacher to repeat the course. Throughout Turkey, there are 13 test centers. These cities are Adana, Ankara, Balıkesir, Bursa, Edirne, Erzurum, Eskişehir, Gaziantep, İstanbul, İzmir, Konya, Samsun, and Trabzon. All of the student teachers have to take their tests in one of those cities.

One of the courses the 4th year student teachers have to take is 'teaching practice', in which each student teacher is assigned to a school in the city of accommodation. Each student teacher is allocated an English teacher in that school, who is referred as 'cooperating teacher', to supervise the student teacher throughout the field experience. This course requires the student teacher to go to the school at scheduled times each week; observe the cooperating teacher, make lesson plans and practice teaching. Similarly, the cooperating teacher is responsible for the professional development of the student teacher. The responsibilities of a cooperating teacher is to observe the student teacher and take notes, provide assistance with the lesson plans, and give feedback about the student teacher's work. The evaluation of the student teacher for this course is a shared responsibility of the cooperating teacher and the course evaluation team at AUOEF. Prior the academic year, the AUOEF organizes a seminar for the cooperating teachers. However, not all the cooperating teachers in the cohort take advantage of this opportunity. Only the representatives of English teachers from each school are invited. The main idea is that these representatives share information about the supervision process with the other cooperating teachers at their schools. The cooperating teachers are also provided with a handbook developed by the AUOEF faculty as a resource to guide them during the teaching practice course. These sources include various procedures about the teaching practice progress. The AUOEF also offers the student teachers asynchronous environments, in which an instructor is allocated for the course and the student teachers are free any time to ask about any problems related to the field experience period by means of e-mail. Apart from e-mail, the student teachers have also the chance to communicate the course organizers by telephone and post. In addition to this also there is on-line discussion group promoted to provide dialogue and support for field experience and other modules.

Theoretical framework

There are two theories framing the present study. The first one is the 'Equivalency Theory' which frames a theoretical base for learning by distance. The key to theory is the concept of 'equivalency' which claims that although the on campus and distant learners have fundamentally different environments, the distance institution is responsible for providing the all students equivalent learning instructional experiences (Simonson, 1999; Scholosser & Simonson, 1996). Another key to equivalency theory is the use of telecommunication technology such as synchronous audio, video and computer Networks in order to promote communication at a distance (Simonson, 1999). Synchronous interaction need not be mandatory, however. Various communications systems, including asynchronous ones, can and should be used for distance education, as long as the goal of equivalency of experiences is met.

The second theory is the 'social-constructivism' which constitutes a framework for 'field experience in teacher education'. Within this theory, pre-service teacher training is a social experience. The cooperating teacher and the university supervisor provide the student teachers with many opportunities to interact with them and each other as well, which grants the student teachers to construct information necessary for learning teaching. Because learning occurs in a social context and with the assistance of more able others, these experiences offer the student teachers multiple opportunities for learning (Vygotsky, 1978)

Scope of the study

Field experience is considered to be the most important part in a teacher education program (Darling-Hammond& Youngs, 2002; Guyton & McIntyre, 1990). Quality in teacher preparation largely depends on the quality of field based experiences (O'Shea, Hammite, Mainzer& Crutchfield, 2000). Despite the importance of field experience, there is relatively little research on field experience in distance education programs (Conderman et all, 2005). Practicum is described as the most challenging part of the DETTP (Savaş, 2006). In the same study, it was identified by the course instructors that monitoring the performance of the student teachers at DETTP is very challenging due to the limited supervision opportunities when compared with face to face teacher education (Savaş, 2006). Therefore a study focusing on the student teachers' problems during field experience could provide a holistic view and feedback to the program organizers in monitoring the

supervisory process. Based on these queries the research question of the present study is: What problems do the student teachers at the DETTP have during field experience?

METHODS

Participants

Participants of the study are 21 4th year student teachers and doing their field experience in four different regions of Turkey (Marmara, Agean, Central Anatolia,East Anatolia). To obtain as diverse a sample as possible, participants were purposefully selected to represent the big amount of teachers spread over 7 regions of Turkey. 5 of the participants were male and 16 were female. 5 of the student teachers were having their field experience in Bursa, 3 in Malatya, 4 in İzmir, and 10 in Eskişehir

Data collection procedures

The semi-structured interviews were used to gather data. The interviews took place at the schools of the student teachers during the school day. By the time the study took place, the student teachers had experienced field teaching for at least 6 weeks. The data collection procedure took about 4 weeks. The student teachers were assured that their thoughts would be carefully examined and would be held in severe confidence.

Data analysis

All interviews were tape recorded and transcribed for analysis. Qualitative analysis was conducted in the form of open coding and categorization development (Marshall & Rossman, 1996; Walker, 2002). First, all units of student teacher quotations were analyses and categorized according its content. At the end of the analysis general themes emerged. Then, each categorized quotations were again reanalyzed and some themes, which turned out to be subsumable under others, were identified as sub-issues. Reliability of the study is achieved by selecting student teachers who represent a large are of Turkey, conducting interviews within the same time frame for participants, and piloting the interview questions prior to data collection. Being consistent in the interview questions for all the participants also enhanced the internal validity of the study. The researcher's being a teacher trainer allowed her to understand the teaching experiences of the student teachers, which promoted credibility, an issue of internal validity, as well.

RESULTS

Four general themes emerged after the analysis of the interviews: 1) assessment system, 2) computer mediated communication (CMC), 3) mentor, and 4) feeling of isolation. A further analysis of these themes resulted with sub–issues. The problems aroused in these areas were: the strict assessment system, memory-based testing, distant test centers, unequal distance learning opportunities, unprepared and unqualified cooperating teachers, nonexistence of a regular university supervisor, and time lapse in communication. Themes and issues recognized within these themes are supported with the student teacher quotations in the following section.

Assessment system

Regarding the assessment system at DETTP, the identified problems were that the assessment system is very strict and memory-based. Test centers were also a second problematic area.

The student teachers identified that the assessment system's being very strict as their most serious concern. The student teachers at the DETTP are required to get '70' to pass a course, which most of the student teacher find very hard to achieve. Therefore, they regard the assessment system 'very strict' and identify it as the result of low degree of graduates. One of the student teachers comment on this as follows:

"To pass a course you must get 70. If you get a cumulative average of 69, you fail. Because of just 1 mark you have to take the course again, which means to repeat the class. I have a lot of friends who repeated their classes once or more. Only two of the 52 student teachers achieved to graduate in four years. The 50 student teachers had to repeat their classes due to this strict assessment system. That is the reason for why the first graduates of the DETTP were very few"

Student teachers also think that such a strict assessment system negatively affects their psychology and is their most important source of their stress. One of the student teachers report his feelings as follows:

"What tires us is not the field experience, but this grim assessment system. The institute has to find a solution to this. I understand that quality is important. But quality can not be achieved by putting all the student teachers under such a great pressure"

Another problem identified related to the assessment system was that it was memory-based. The student teachers report that they have to memorize the book in order to pass, which is not an appreciated method of learning. A student teacher remarks his disagreement to the assessment system as follows:

"…the passing grade for the courses is 70. The assessment system is different and more genial at the other universities. Opposite to the on campus student teachers, in order to pass a course we have to memorize every word of the books, which I believe is a very awry system. "

Student teachers also highlighted a problem regarding the test centers. They mentioned that to take a test in a different city from the one they are currently accommodating is very stressful and exhausting. Even such stress cause serious illnesses. What is more, the test duration is very long. Below, one of the student teachers who have to go to another city to take an exam tells about his horrific experience:

"To take my tests I went to Samsun from Malatya and it took about 9 hours. I was very sleepy, but I had to take the tests. What is more, I had gastric spasm during the final test because of the stress. It was not only me, but there are others suffering from stress. There were even ones who fainted. We take tests of all courses at a time, which takes about 4 hours, which I do not think fair. The assessment system is not the same as at the traditional English teacher faculties of education. There, the tests of the courses are spread over a time schedule like a week or two. Why should I experience such a torture? Why can't I take my tests in Malatya. We are about 20 student teachers in here. So, the institute somehow could arrange a test center for those. This is really very stressful. All these beat up us"

Computer Mediated Communication (CMC)

Course books are the main sources for the distance student teachers at the DETTP. Besides, CMC is useful in providing them academic support and communication. However, in the present study it was identified that not all the student teachers may have access to the internet and computer which jeopardize the equivalency in distance learning. One of the student teachers states her concern in the following quotation:

"I often used CMC, since I have a computer and internet at home. Therefore, I was successful at the courses and passed the 4th class. But I had friends who did not have a personal computer and internet access, which means a big shortcoming. From that point of view I find myself lucky. But what about the others who do not have the same opportunity as I have? They are likely to fail and prolong the graduation."

Similarly, in the following, another student teacher mentions about his afford for the access to the internet and computer:

"I went to the internet café for CMC and work for hours. I do not have extra expenses such as cigarettes. So, I can afford it."

Another problem related to the use CMC was the time lapse of feedback. A student teacher comments on this:

"For the 4th year students having their field experience, there is a discussion board on the web site. If there is something we do not understand about the course, we e-mail it. However, the feedback is always late. Even I waited for months for answer. "

Mentor

In relation to this category, it was identified that mentor's being unprepared for the field experience were one of the basic problems faced by the student teachers. Related to this issue, one of the student teachers quotations is stated in the following in conclusion:

"My cooperating teacher first experienced supervision of student teachers last year. Therefore, he is not donated with adequate information about field experience. With the cooperating teacher, together we tried hard to understand the process for a month. I suggest that a committee should be sent to each school by the institution at the beginning in order to give information to the school and the cooperating teachers about the field experience process. This is very necessary. "

In addition to the 'unprepared cooperating teachers', 'cooperating teachers being not qualified in the subject area' was the other problem for the student teachers. One of the student teachers reports his preference for a cooperating teacher who is a graduate of ELT as in the following quotation:

"I have a good relationship with my cooperating teacher. He helped me a lot. He is not a graduate of ELT, but chemistry. Therefore, I wished to have been supervised by a cooperating teacher who is a graduate of ELT. He was very weak from the pedagogical sight. For example, when I said that I was going to do a reading lesson in the class, he would not understand what I meant and asked what that was? . My cooperating teacher really tried to do his best; however, if he was a graduate of ELT he could supervise more efficiently."

Nonexistence of a regular university supervisor was another problem identified by the student teachers. One of the student teachers utters his longing for a university supervisor support below:

"I wish I had a supervisor from the university to consult any issue about teaching. I come to the school on Tuesdays only. Therefore, if I have a problem I have to wait till Tuesday to get help from my cooperating teacher. Apart from field experience, I face with problems related to other courses. Therefore, if there was a university supervisor, I would not only ask assistance for the field experience, but also for other courses. What is more, a second sight on my work would help me a lot.

Similarly another student teacher quotes: *"The supervision of only a cooperating teacher is not sufficient. It would be superb to have a university supervisor with a M.A in the field. Also I wish to have had a university supervisor who is an assistant professor or an associate professor."*

Feeling of Isolation

Feeling of isolation was another categorized problem. Many of the student teachers reported that they would like to meet the instructors at AUOEF. One of the student teachers states his desire as follows:

"I did not have a chance to meet Mrs X and Mrs Y who were the course instructors of the language acquisition course. I could just look at their photos on the web. However, I wished to have met them. The institute could have invited the student teachers, at least the 4th year student teachers, to the campus and provided us an opportunity in seeing the university from which we will graduate."

Another one similarly mentions how she feels isolated:

"The institute could organize orientation meetings for the student teachers which offered the opportunity to meet all the course instructors whom we know only from the distance. If we met the course instructors, this could encourage us to begin the university willingly. We only meet the Open faculty office administrator in the city of where the student teacher accommodates and the instructors of the courses during the face to face training. It is interesting that I do not know my university. My friend asks me about the university and Eskişehir. But, I cannot tell anything since I know nothing about it. "

DISCUSSIONS

From the analysis of the interview sections four main themes emerged: 1) assessment system 2) CMC, 3) Mentor and 4) isolation of student teachers.

Regarding assessment system, the student teachers reported that the grading system was very strict. The distance student teachers also mentioned the 'inequivalency' side of the assessment system. This result conflicts with the 'equivalency theory' which props that the 'the more equivalent the learning experiences of distance students are to that local students, the more equivalent will be the outcomes of the learning experiences '(Simonson, 1999). The student teachers also reported that the assessment system encouraged memorization. This is in line with the results of a study by Sampong (2007), in which nearly a half (48.8%) of the distance student teachers agreed that the test questions contained memorization.

The use of Computer Mediated Communication (CMC) comprises a vital part of distance English teacher training program. CMC not only helps the student teachers enhance their understanding of the course content, but also helps them to establish rapport with their peers and course instructors. Such communication and interaction reduce student teachers' feeling of isolation and make them believe that they belong to a part of a social community (Bloomfield, 2000). However, the student teachers in the present study reported that not all the student may have the opportunity to use CMT, which can be regarded as a threat to having equal learning opportunities and this conflicts with the framework of distance learning emphasizing that 'the distance education system should endeavor equal learning experiences of all students' (Schlosser& Simonson, 1995). Similarly, Simonson (1999) states that various communications systems, including asynchronous ones, can and should be used for distance education, as long as the goal of equivalency of experiences is met (p.7). Another problem related to CMC stated by the student teachers was the time of lapse for feedback from the course instructor. Savaş (2006) found that in asynchronous communication there is a time lapse between 'sent' and 'received' messages.

The student teachers reported that there are cooperating teachers who were not sufficiently acknowledged about the field experience period. This could be due to the cooperating teachers' association with the DETTP for the first time. Bhatnagar (2008) similarly reported in an initial study that the cooperating teachers felt unprepared and lacked confidence, but as time passed, they gained a better understanding of the supervision process. Cooperating teachers' in adequate self-preparation for their supervisor roles may be a second explanation. AUOEF provides all the cooperating teachers a guide handbook. Therefore, all the cooperating teachers are expected to read this handbook and donate themselves with necessary information needed for an effective mentorship. Cooperating teachers' not having sufficient information about the distance field experience process could be related to their not having read the handbook or not being acknowledged by the representative who has participated in the seminar.

Another noteworthy finding of the study was that the student teachers reported that they do not appreciate to be supervised by cooperating teachers who are not graduates of English language teaching (ELT) department. Similarly, in a study by Conderman, Morin and Stephens (2005), selecting and retaining qualified cooperating teachers were reported to be the second most significant field experience challenge by the student teachers. The results of the present study are supported by an initial study (Koç, 2008) which reported that 10.3 % of the cooperating teachers supervising the distance student teachers were the graduates of other departments such as chemistry, physics, etc. and only 69.2 % of the cooperating teachers were the graduates of ELT department. It is really a difficult job to organize school placement of the

student teachers in a big number. Therefore, it is possible that the AUOEF may have difficulty in assigning qualified cooperating schools. In line, Bozella (2008) states that the need for large numbers of cooperating teachers to provide student teacher placement precludes the selection of high-quality cooperating teachers. Robinson (1997) outlined the problem and stated that stability of quality in practicum is very demanding for widely geographically spread students and it is challenging to understand cooperating school conditions and be receptive from a centralized point of control.

Non existence of a regular university teacher in the supervisory process was another problem stated by the student teachers. Distance student teachers' supervised by only a cooperating teacher shows divergence with social constructivism, which promotes frequent opportunities for interaction among practicum members. Also Cochron –Smith (1991) mentions that placement with a single cooperating teacher fails to prepare the student teachers for the scope of a teacher's role as it limits them to learning from just one mentor.

CONCLUSIONS

The present study investigated the problems the student teachers at the DETTP experience during field experience. One of the problems stated by the student teachers was that some of the student teachers were supervised by cooperating teachers who were graduates of other departments such as chemistry. Since the value of teaching practice experience in cooperating schools seems to depend upon the quality of the cooperating teachers AUOEF should pay more attention to the selection of the cooperating teachers. Similarly, Sampong (2007) claim that distance pre-service teacher education is executed efficiently in provision that the practicum component is planned properly and is well supervised by qualified master teachers. Therefore, cooperating teachers should be selected according to specific criteria. If the selection of cooperating teachers focus on known effective traits, it is likely to increase the quality of the cooperating school placements and as a result the quality of field experience. Isolation was another problem identified by the student teachers. Kirkup and Jones (1996) mention that isolation and individualization of the student is one of the most significant weaknesses of distance education. In order to 'reduce' the feeling of isolation and help the student teachers feel they are a part of the student community of AU, AUOEF could organize orientation meetings for the student teachers on the campus in order to meet the course coordinators and coursed instructors.

The present study also suggests a further research in regard to 'distance learning opportunities of the student teachers. Since CMC is important in the distance student teacher education, access opportunities of the students to the internet and computer should be investigated. Related to the use of CMC, the student teachers also reported that they may have problems such as time lapse in feedback turn. Therefore, a second suggestion for further research is a study which focuses on the student teachers' and cooperating teachers' evaluations of the CMC system offered at the DETTP by AUOEF.

The present study is important in that it has provided the student teachers a chance to voice their problems. Though the number of the subjects is limited, the findings throw light on the understanding of what kind of problems the student teachers experience during their field experience and therefore, the study will be significance to the DETTP, as well as other distance teacher education programs in other countries. DETTP has provided a great solution for the shortage of English teachers. Successful program development occurs with evaluation. Therefore, the identified problems stated in the present study should be regarded as 'constructive feedback' by the course organizers to be used for the implementation of the DETTP.

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A RECIPE FOR FINDING A BALANCE IN BLENDED COURSES OF PROGRAMMING: BETWEEN LESSONS IN CLASSROOM AND LESSONS VIA THE INTERNET

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Abstract – Since the beginning of this century, in universities and companies worlwide, that continuosly follow the development of advanced computer technologies, there has been constant development and application of modern blended learning programmes. In present conditions, blended learning programmes imply combining advanced flexible components for learning –via the Internet, with, socially speaking, the very importnant traditional components for learning – in classroom. Depending on the study area, the kind of programme and audience, one of the two components dominates, and their combining is performed in a suitable way. At The Advanced school of Electrical and Computer Engineering in Belgrade, due to the rather favourable conditions for the development and use of modern learning environment via the Internet, two blended courses (The Programming Fundamentals 1 and The Programming Fundamentals 2) have been developed so far, and each of them had its implementation during two school years. One of the key questions within the two programmes was: how to combine lessons via the Internet and classroom lessons, so as to provide higher learning efficiency. This paper describes one solution that was reached in the above-mentioned courses, the solution that addresses the ratio and the way of combining the two kinds of lessons.
Key words - blended learning, high education, lessons via the Internet, programming.

INTRODUCTION

In the last ten years, blended learning programmes, which combine learning via the Internet and classroom learning, have had increasing application. A number of learning programmes, previously realized only in classroom or via the Internet, are becoming blended now. Thus, advanced information technologies are increasingly becoming part of the learning process, but the usually present requirements for immediate communication during learning are also met. The course attendants have their classes organized via the Internet, with the lessons, exercises, regular progress checks ..., and a number of classes and major progress checks are still performed in classroom. Blended learning programmes are becoming increasingly dominant over other learning programmes, owing to many observed advantages:

- The knowledge bases have increasing complexity and more extensive miltimedia content,
- In this way student motivation for learning in modern conditions is stimulated,
- Learning ndividuality becomes more evident,
- The very important live communication retains its importance,
- The cost of the course is reduced...

Experience shows (Bonk and Graham, 2006; Garrison and Vaughan, 2008) that one of the key issues of such programmes is: how to deal with the ratio and way of combining Internet and classroom lessons. We need solution frameworks in each study area, and specific solutions for each blended learning programme in question. Blended learning programmes are being developed and introduced both in leading world companies in IT area and in high schools. Some of them develop their own blended learning programmes, while others apply ready-to-use blended learning courses. Each of the developed blended learning courses has its special features: the area in which it was developed, basic elements, experience and recommendations for the development of similar programmes... One of the notable characteristics of each developed blended learning programme (Bruce, Fallon and Horton 2001; Dooley and Lindner, 2005) is the goal to establish a balance between lessons via the Internet and classroom lessons: finding the suitable ratio between the two kinds of lessons, and the adequate way of their combining in concrete conditions.
In the coming sections of this paper, one solution which might be used as a recipe, for combining Internet lessons and those in the classroom, in the area of programme learning, will be presented, which resulted from the development and implementation of blended courses in this area, at the Advanced School of Electrical and Computer Engineering in Belgrade.

AVAILABLE EXPERIENCE OF THE EXISTING BLENDED LEARNING PROGRAMMES

Leading IT companies of the world were among the first to develop and apply advanced blended learning programmes, and today they are the most dynamic. In order to provide minimum cost and maximum efficiency of learning programmes in their training centres, these companies have developed and already widely apply different kinds of blended programmes in the area of development and use of the equipment and programmes. The percentage of classroom lessons within the total number of lessons planned, varies from programme to programme, but it is mandatory and conditioned by the programme type. The scenario of blended learning programmes used in companies usually prescribes a smaller percentage of classroom learning lessons and a bigger percentage of Internet lessons. However, in practice we can find examples where these two components are present in various ratios, from one extreme to another: from 10%:90% (minimum Internet learning), to 90%:10% ratio (Internet learning is prevalent).
Blended learning programmes in basic, master and doctoral studies in worldwide, are becoming increasingly flexible (they are being constantly adjusted to their attendants, their learning conditions and styles). The ratio between Internet learning lessons and immediate learning lessons in classrooms depends on the study area and the kind of programme. The prescribed number of Internet lessons within the first developed programmes of this kind was from 10% to 20% and afterwards, in some areas, it increased to about 40% to 50%, whereas today in some cases it goes to 70% of the total number of lessons.

In available literature (Bersin, 2004; Picciano and Dziuban, 2007) we can find the results of some of the research that was carried out in order to analyse the combination of advantages of Internet learning, with learning in the traditional environment (in classroom, laboratory...). The development of blended learning programmes differs from one area of expertise to another. Time will show in which way, in specific areas, blended learning programmes are acceptable. Due to this, such learning programmes usually do not substitute traditional learning programmes right away, but are introduced as alternative. There are no rules when it comes to determining the number of classroom and Internet lessons in blended learning programmes. If a blended learning programme is introduced for the first time, in the beginning, the recommended number of classroom learning is either higher, or at least equivalent to the number of Internet lessons. In technical studies for example (Cartelli, 2006; Petrina, 2007), it is not advisable to have much more Internet lessons than those in classroom, but the ratio between the two kinds of lessons always depends on the programme type, specific development conditions and the audience.

ONE OF THE SOLUTIONS FOR BLENDED PROGRAMMES IN THE AREA OF PROGRAMMING

In the last few years, the complete knowledge base of beginner programming courses at the Advanced School of Electrical and Computer Engineering in Belgrade, has been updated by multimedia content and interactive simulations (Mayer, 2003, 2005; Cole and Foster, 2007). A specialized Internet platform has been installed and created conditions to replace a part of classroom lessons by those via the Internet.

On the basis of available recommendations of the existing blended courses in various areas, we developed, and in the last two school years realized the first blended courses in this school. Those are Programming Fundamentals 1 and Programming Fundamentals 2, in the first and the second year of studies. The teaching material of the first subject comprises learning structural programme design and programming fundamentals in "C" language (data types, operators, commands, direct and indirect addressing of the memory, and sub-programmes).The teaching material of the latter subject comprises learning of advanced programming techniques in "C" and fundamentals in "C++" language (dynamic allocation of the memory, work with: data structures, command line data, data bases and modules), and the basics of object-oriented programme design in language "C+++" (the use of standard input-output classes, creating standard class objects, new operators and function features relative to language "C"). Students of this school can choose between the two kinds of learning programming fundamentals: learning in classroom and computer laboratory or blended learning (regularly in classes via the Internet and occasionally in classroom or computer laboratory).

A Developed Knowledge Base

If the knowledge base in programming courses is intended to provide all the necessary levels of knowledge in that field, it is to contain a broad range of textbooks. In order to improve the quality of the knowledge base, apart from the so-far used academic textbooks which are widely accepted in this area (Kraus, 2001, 2004), and the previously developed printed and CD editions of programming tasks collections (Djenic, Mitic and Strbac, 2007, 2008), for blended courses we also developed http://e-learn.viser.edu.rs/moodle/:

- Rather flexible dynamic interactive multimedia textbooks,
- The accompanying progress checks in the electronic form (tasks, tests, questionnaires ...).

For distributing of the thus developed knowledge base via the Internet, we selected the programme platform Moodle (Modular Object Oriented Dynamic Learning Environment), which is usually used in high education (the installation is available on the Internet, whereas the use is very simple and flexible).

The Designed Structure

In blended environment, which was developed for the purposes of the above-mentioned courses, two basic categories of components stand out:

1. A part of components is intended for lessons via the Internet:
   - Learning the theory of programming languages, with an abundance of interactive animations,
   - Exercises with interactive simulations of programming examples,
   - Regular progress checks (using: tests, homework...),
   - Regular discussions through forums, between students and lecturers...
2. The second part of components is intended for lessons performed in classrooms and computer laboratories, so as to provide to the students:
   - Help in reviewing of the covered lessons and emphasizing the most important places in them,
   - Help in practical work on programming tasks in a suitable development environment,
   - Progress checks in computer laboratory,
   - Indispensable live discussion on the teaching material with the purpose of enhancing student learning motivation..

The Planned Scenario Of Development And Implementation

In each of the developed blended courses, special attention was paid to designing the scenario. The scenario of course development and implementation was created on the basis of the available experience with similar programmes (Watkins, 2005; Levine, 2005; Schlosser and Simonson, 2006), bearing in mind the specific conditions, Figure 1.

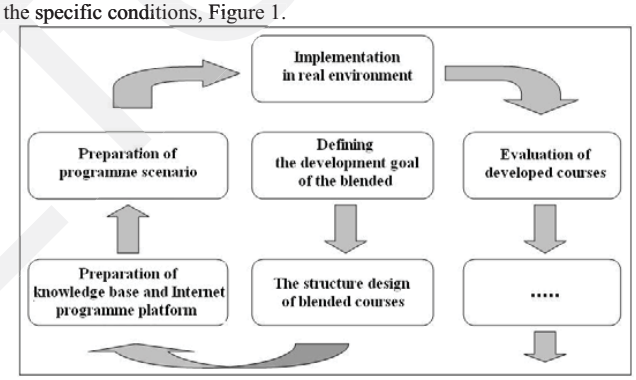

Figure 1. The scenario of blended learning programme development

The coming section of this paper contains more details on the way certain blended course activities were actually realized, according to a planned scenario.

THE RATIO AND MANNER OF COMBINING CLASSROOM AND INTERNET LESSONS

The specific blended learning programme prescribes regular lessons via the Internet (lectures, exercises and consultations) and occasional classroom lessons (lectures, exercises and consultations). The developed blended courses of programming fundamentals recommend a specific ratio between classroom and Internet lessons, which is ≈50%:50% (with possible deviation for students who are employed or are otherwise unable to attend all classroom lessons), Figure 2.

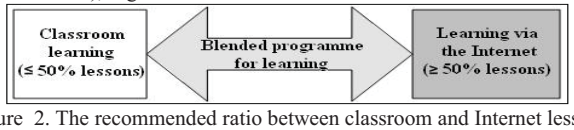

Figure 2. The recommended ratio between classroom and Internet lessons

For all course attendants the following lessons in classroom are mandatory: the first meeting of course attendants, first lectures, colloquiums, final exam and the final meeting (30% of the total number of lessons). Lessons intended for reviewing the covered material, which are organized immediately before every colloquium are also recommended (+10% of the total number of lessons). Other classroom lessons are organized after every covered unit of the teaching material (+10% of the total number of lessons).

Apart from defining the ratio between classroom and Internet lessons, in developing the blended learning programme, a big challenge was to find a way of combining the two kinds of lessons. On the basis of the experience with developed blended learning programmes and long-term personal experience in working with students in a specific area, the following strategy was chosen:

1. At the beginning of the course – group meeting in the classroom, for better introduction of all course attendants and their getting familiar with the rules, and starting work on lessons.
2. Regularly, during the course – learning outside the classroom, via the Internet, through: theory and practical lessons, self-check and progress check, discussion via available forums. Regular studying without Internet access: individual learning from printed and CD editions of textbooks.
3. Occasionally, during the course, after each covered unit of the teaching material – complete review of the covered material and adequate knowledge checks in classroom and computer laboratories.
4. At the end of the course – final group meeting in the classroom, for assessment and the evaluation.

It was a big challenge to find the proper way for maintaining discussion on the teaching material via the Internet, since these discussions represent a rather important component in the learning process (Shih and Hung, 2007). One topic of discussion is to be started in the beginning of each week, which should be related to a specific week/exercise/ planned self-check of knowledge. Apart from live discussions which are present in occasional classroom lessons, these courses prescribe two other kinds of discussions:

- Delayed discussion via the forum – involving asking questions and making comments during each work day. The answers can be expected within 48 hours at the latest,
- On-line discussion via the forum – involving asking questions and making comments in one day of the week only, and answers and further comments are expected right away.

Discussions via the Internet can be initiated for 24 hours, 7 days in the week during the course, unlike classroom discussions which occur at specific times within a week.. In the beginning of each course, discussions to do with the teaching material were mostly initiated and maintained by the lecturer. However, this changed in time and students increasingly assumed the initiative for starting discussions.

EVALUATION RESULTS

The make the research that followed the development of blended courses more complete, evaluation procedure was carried out. This procedure was included to provide the assessment of the developed courses quality in real environment, through the control of students` results and student feedback. During two school years, the blended course Programming fundamentals 1 was chosen by approximately the same percentage of students (18% / 19%). The blended course Programming fundamentals 2 was the choice of a significantly higher percentage of students (37% / 43%). The blended courses were the choice of: all students who are employed or have family commitments, most students who live away from the place of studying and all students who have constantly good Internet access. In the first pilot blended courses, the frequency of access to lessons and the discussions via the Internet was relatively low, and the lecturers noticed the necessity for their additional engagement, unless there was adequate response from students. In each of the coming blended courses there were more activities on both sides, and more harmony between them, Figures 3. and 4.

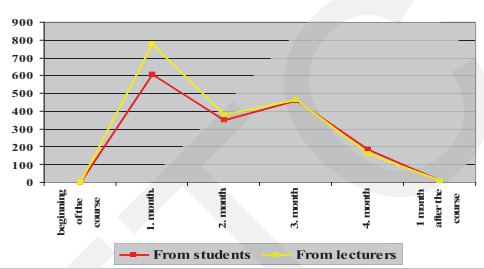

Figure 3. Average access to Internet lessons in the first pilot courses

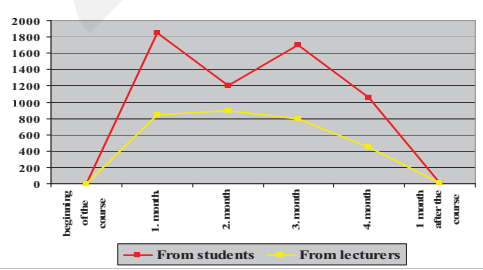

Figure 4. Average access to Internet lessons in repeated courses

In blended courses that have been realized so far, we have had satisfactory results from students. The percentage of students taking the exam in the first exam period was somewhat higher in blended than in traditional courses (the difference was ≈4%). In each of the coming exam periods, the difference was increasing (after the first three periods it was ≈6%). The average mark was approximately the same for both types of the course. Only in the first course that was organized in the first year, this mark was slightly lower than in the traditional course (≈0.2 difference). In all the other blended courses the average mark was better (≈0.4). The basic characteristics of blended courses had better ratings relative to the same characteristics of the traditional ones. In these courses, students rated as best the following: making the right choice, easy communication with lecturers and studying at the most convenient time for them.

EXPERIENCE AND RECOMMENDATIONS

The implementation of blended programming courses in two school years (2007/8. and 2008/9.) provided the following experience:

- In the first courses, the focus is usually more on designing new forms of activities, whereas in the repeated courses of the same kind, the main focus should be on perfecting the scenarios.
- In realized courses, classroom lessons were organized: in the beginning, at the end of each covered unit, before exams and at the end of the course. Exams were organized in classroom.
- A quality communication between students and lecturers in lessons via the Internet was crucial.
- It was very important to find a balance between classroom and Internet lessons. In the mentioned courses, this ratio was set to the recommended 50%:50%. Practical experience showed frequent deviations from this ratio (in this case it was 40%:60%, and with working students 30%:70%). For this reason, scenario of each future blended course should be adaptable to attendants` needs.

Recommendations for the preparation and development of similar blended courses, Figure 5:

- The preparation of blended learning programme should be started, if possible, at least 6-12 months before the beginning of the first course planned.
- It is important to plan Internet lessons as the major part of the course (make a timetable for lectures/practice/consultations) and occasional classroom lessons (not in oversized groups).
- The ratio between classroom and Internet lessons should be adjusted to the study area and the course auditorium...

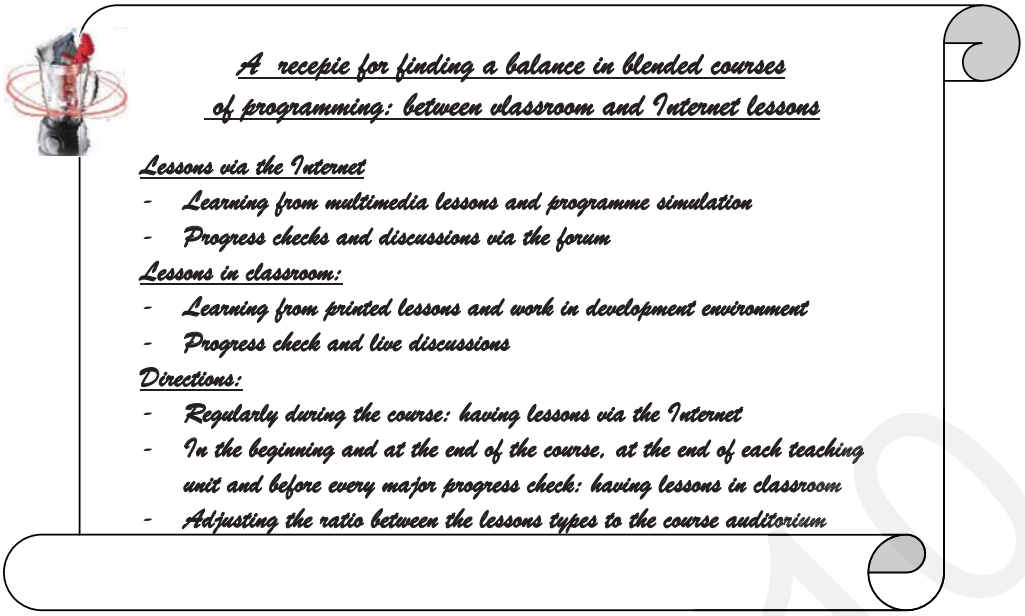

Figure 5. A recipe for combining lessons via the Internet and in classroom

Despite relying on the existing experience and recommendations, lecturers who introduce blended courses for the first time are facing a difficult task, since advanced blended learning programmes demand increasing engagement on their part (Bjekic, Krneta and Milosevic, 2010). However, results obtained from students in these courses, together with their comments that these very courses are "satisfactory for all modern generation students", encourage and inspire the development of similar courses.

CONCLUSION

Students who opt for learning programming in modern environment require the following: repeating lessons as necessary (because of the different level of pre-knowledge), as much practical work as possible on programming examples, regular progress checks (useful for making connections between different concepts in this area), as well as continuous discussions with lecturers (always welcome in this area).

At the Advanced School of Electrical and Computer Engineering in Belgrade, beginner courses in the area of programming, Programming Fundamentals 1 and Programming Fundamentals 2 are regularly changing and improving. To change for the better the learning conditions in the given area, and make them suitable for the needs of modern generation of students, in the last school years blended courses were developed and applied. A part of classroom lessons was turned into lessons via the Internet, while the number and manner of organizing lessons in classroom is adjusted to the needs of each specific course. Bearing in mind that there is no area, this one included, that has a referent model of blended learning programme, the available experience of similar courses was used with making the programme initial structure. The ratio between classroom and Internet lessons in the above mentioned blended courses was planned in the beginning on the basis of the existing experience (50%:50%), but it was adjusted to the needs of the course attendants during its implementation, whether they were employed or not. The following ratio between classroom and Internet lessons was achieved in these courses: from ≈50%:50% (recommended), through ≈40%:60% (realized for unemployed students), to ≈30%:70% (realized for students who were employed).

The developed blended courses enabled to the students to master programming fundamentals and show satisfactory results in progress checks. From the poll on the quality of these courses, rather favourable assessment was obtained from attending students. The majority of students were of the opinion that they made an excellent choice and that the course was rather efficient in their case.

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A RELATIVE INVESTIGATION ON PURPOSES OF COMPUTER AND INTERNET USING OF PROSPECTIVE GEOGRAPHY TEACHERS' IN TURKEY AND CHINA

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Abstract
This study investigated the levels and frequencies of Chinese and Turkish prospective geography teachers' use of computer and internet applications as indispensable instruments in and out of education nowadays. 292 prospective geography teachers' students from Shanghai, China and Izmir, Turkey participated in this study.
The purpose of this study was to further examine among prospective teachers' aims about using of computer and internet in Turkey and China, hereby the study aimed to propound disparities and similarities between Turkish and Chinese geography education students' in computer and internet using.
A questionnaire for this study was developed and applied to 292 students in Nine September University, Turkey and East China Normal University, China. The data was analyzed with SPSS. The results were propounded by using descriptive statistics and t test.
The results of research showed that there are meaningful differences between Prospective Geography Teachers' in Turkey and China in term of purposes of computer and internet usage.
Key Words: relative investigation, computer and internet using, prospective geography teacher.

Introduction

Review of the Literature

With approximate 1.3 billion citizens, China is the world's most densely populated country and the third largest country in the world in terms of territory. China has undergone rapid, profound economic and social change and development in recently. Naturally these development and changes have reverberated to education. Especially, with the developments of computer technology together computer assisted instructions have started to become widespread in China such as over the entire World. Moreover, geography information systems have increased in more and more importance of computers in geography lessons. On the other hand, computers are used not only in education they are used but also in everyday of life for variety activities in china (Turan, 2010). There is a long history of the research on basic theory and application technology of computer information network in China. The policy of reform and open door brings forward a good developing oppportunity for the construction of information infrastructure such as telephone, capled television, fiber television system, etc. (Wu 2006). The development of the internet infrastructure in China commenced in academic and scientific circles, as in most other countries. The first computer network was the China Academic Network (CANET). It was set up in 1987 to provide support for academic and scientific research in computer science (Tsui L. 2001). It established the first TCP/IP-capable academic network, the National Computing and Networking Facility of China (NCFC), in April 1994 and opened the first public Internet service, ChinaNet, in January 1995 (Qiu, 2003).
The first efforts for the use of computers in Turkish school system started at the beginning of 80's though the introduction of computers to universities started after 60's and computer assisted education became a national education policy after acceptance of 6th Five Year Development Plan. From the 80's to present day many schools have been equipped with computers and computer assisted education has ever since branched into all levels of education (DPT, 1990 &. Deniz, 2007). The first computer network connection in Turkey was established on 12th April 1993. During the first six years several universities were the dominant users of this tool. However, since 1996, the Internet in Turkey has touched almost all sectors, including banking, education, and health (Uzun, 2003).
Currently, of the netizens in Turkey, the female (34%) is lower than the male (66%) (Google Fun, 2008). These rates in China are difference from those of in Turkey (the female 42.8%, the male (57.2%). Nevertheless the internet usage of female is also lower that of male (CINIC 2008). About 83% of the students in university in China has surfed the Internet (Asia times, 2010). This rate in Turkey is 87.2 %. (Bilişim '08, 2008). Some statistical knowledge for two countries concerned internet are given in Table 1.

Table 1: Top 20 Countries With The Highest Number Of Internet Users (IWS, 2009).

Country		User Latest Data	% Population (Penetration)	% of World Users
1	**China**	**360.000.000**	**26.9**	**20.8**
2	United states	227.719.000	74.1	13.1
3	Japan	95..979.000	75.5	5.5
4	India	81.000.000	7.0	4.7
5	Brasil	67.510400	39.0	3.9
6	Germany	54.229.325	65.9	3.1
7	United Kingdom	46.683.900	33.3	2.6
8	Russia	45.250.000	32.3	2.6
9	France	43.100.134	69.3	2.5
10	Korea South	37.475.800	77.3	2.2
11	Iran	32.200.000	48.5	1.9
12	Italy	30.026.400	51.7	1.7
13	Indonesia	30.000.000	12.5	1.7
14	Spain	29.093.984	71,8	1.7
15	Mexico	27.600.000	24.8	1.6
16	**Turkey**	**26.500.000**	**34.5**	**1.5**
17	Canada	25.086.000	74.9	1.4
18	Philippines	24.000.000	24.5	1.4
19	Vietnem	21.963.117	24.8	1.3
20	Poland	20.020.362	52.0	1.2
Top 20 Countries		1.325.437.422	30.3	76.4
Rest of World		2.480.556.319	17.1	23.6
Total World-Users		1.733.993.741	25.6	100.0

Computers can make a real contribution to almost every type of teaching method and most subject areas of geography in higher education. As technology advances, its impacts on people's lives have become more visible. Therefore the dependency on technology has increased in time. Computers are of the most outstanding ones of the technological devices which become part of daily routines. To be able to make use of such a facility, recognizing the potential role of computers and being technologically literate are essential (Güçlü 2010).

According to İES Statistical Analysis Report (2006) Students' computer and Internet activities and rates of use are of interest for several reasons. Use of computers and the Internet has been associated with improvements in people's education, labor market prospects, and everyday lives. Since these technologies have the potential to improve access to information, to help get tasks done better or more quickly, and to facilitate communication according to National Research Council, computer and Internet use rates are indicators of the standard of living. Since the use of computers helps students gain computer literacy, use rates may indicate how well prepared the current generation of students will be to enter a workforce where computer literacy is in demand.

National cultures have an effect on people's attitudes and usage in terms of ICTs. Li, et. al (2007) explained on their article called "*Gender and cultural differences in Internet use: A study of China and the UK"* that Chinese and British students would have different experiences of the Internet, hold different attitudes toward the Internet, have different opinions on how the Internet will affect society and their own lives, and use it themselves differently. The students in these two countries have been educated in different educational systems, live in different political systems, speak different languages, and have different views on the value of ICTs. But how national cultures influence students' use of the Internet needs to be explained theoretically and investigated systematically. It can also be argued that there are two global cultures with respect to the Internet and these are organised by gender. The question remains whether these two cultures exist across all national cultures, or whether there is a different interplay of gender and the Internet in different national contexts. The other reseach is about "*Conceptions of computers among students in China and Sweden".* Allwood and his friend (1990) stated on this article the Chinese students were somewhat more optimistic about the effect of computers on society than were the Swedish students. However, this result was not consistent for all relevant items in the questionnaire. Other results show that humans and computers appeared more similar for the Chinese students than for the Swedish students (1990).

When we compare with the other developed countries, the educational uses of the Internet in Turkey are still in the infancy period. The mandatory primary education in Turkey has been extended from five years to eight years. The some problems encountered in the process are expansion, school, hardware and manpower. Distance education and the Internet as a supporting tool and technology are very important alternatives to solve these problems (Usun, 2003). This circumstance necessitated enlargement of internet in education environment of Turkey.

The Internet and computer in geography education have improved students' thinking and decision making skills and geographical knowledges. One of the priorities of the researchers in geography education is to develop a reseacher personality. Students are able to arrive a lot of more accurate visual and audiory examples and models documents to make research concerning geography.

Method

This study was designed to compare of purposes of computer and internet using of prospective Geography teachers' in Turkey and China. The study was conducted in the period 2008 to 2009 at Geography Education Section of Buca Education Faculty, Nine September University, Izmir and Geography Education Section for Teacher Candidates of Department of Geography, East China University, and Shanghai.

Cross-cultural comparisons are needed to give a better understanding of student's use of the Internet in different national cultural backgrounds (Li, et al 2007).With this aim, necessary literature was scanned by researcher. Afterwards a questionary which had been developed by researcher together with Chinese geography education academians was applied to geography students in Turkey and China.

Sample

Sample selected by the method of random sampling as two hundred ninety two students registered in courses during 2008-2009 school year at section of geography education student at Nine September University, İzmir, Turkey and East China Normal University, Shanghai, China who are undergraduate students.

Instrument

The research instrument in this study was a questionnaire divided into two sections. The first section of the questionnaire collected the students' demographic variables namely gender, grade, students' educations of father and mother and students'having computer ownership at home.

The second section of questionnaire was consisted of the Computer and Internet Using. Questionnaire using the Likert scale that comprised five points ranging from''strongly disagree'' (1) to ''strongly agree'' (5). There were 17 items at this instrument.

Administration of the questionnaire

The questionnaire was written as English. The questionnaires were handed out to Chinese subjects by himself of the researcher in Shanghai, China. When Chinese students didn't understand English questions were translated into Chinese by teachers knowing english in period of application of questionnares. Turkish students were given the questionnaire during regular class time by the researcher's Turkish colleagues in Turkey and returned from İzmir by post.

Data Analysis

Geography education undergraduate students' computer and internet use in Turkey and China were analyzed through the prepared questionnaire. Responses to the questionnaire were coded and analysed through the use of the SPSS 17.0. Test were carried out along with frequency and percentage techniques to determine the discrepancy between the opinions of the subjects according to gender, grade, education level of their mothers, education level of their fathers, and having computers at their homes and statistical operations was applied t Test.

The scale`s coefficient of Cronbach`s alpha is 0.85 in term of reliability.

Participants

The participants for this questionnaire survey consisted of a total of 292 Turkish and Chinese students (121Turkish and 171 Chinese aged between 19 and 23). The demographic characteristics of geography students are presented in Table 2. Chinese participants were 171 volunteer students enrolled at Geography Education, Geography Departure, East China University, in Shanghai, China. They consisted of 29.8% (51) male and 70.2 % (121) female. Turkish participants were 121 volunteer students from Geography Section, Education Faculty, Nine September University, İzmir. Of the 121 Turkish participants in the study, 54 (44,6%) were women and 67 (55,4%) were men.

Table 2: Frequencies and Percentages of participants

		Turkey		China	
A.	**Gender**	***f***	**%**	***f***	**%**
1.	Male	67	55.4	51	29.8
2.	Female	54	44.6	120	70.2
TOTAL		121	100	171	100
B.	**Grade**				
1.	Freshmen				
2.	Sophomore	35	28.9		
3.	Junior	28	23.1	58	33.9
4.	Senior	32	26.4	113	66.1
5.	Upper Senior	26	21.6		
TOTAL		121	100	171	100
C.	**Education level of students' father**				
1.	Primary school	71	58.7	8	4.7
2.	Secondary school	18	14.9	31	18.1
3.	High school	24	19.8	62	36.3
4.	Undergrade level	8	6.6	55	32.2
5.	Postgrade level	-	-	15	8.8
TOTAL		121	100	171	100
D.	**Education level of students' mother**				
1.	Primary school	92	76.0	16	9.4
2.	Secondary school	7	5.8	62	36.3
3.	High school	17	14.0	48	28.1
4.	Undergrade level	4	3.3	39	22.8
5.	Postgrade level	1	0.8	6	3.5
TOTAL		121	100	171	100
E. The having computer at home or dormitory					
1.	Not Having a computer	17	14.0	36	21.1
2.	Having a computer or being able to arrive a computer	104	86.0	135	78.9
TOTAL		121	100	171	100
F. The interest to geography Course					
1.	Never	3	2.5	8	4.7
2.	Lower	6	5.0	32	18.7
3.	Medium	28	23.1	84	49.1
4.	Higher	40	33.1	38	22.2
5.	Excellent	44	36.4	9	5.3
TOTAL		121	100	171	100
G. The interest to geographical software					
1.	Never	23	19.0	9	5.3
2.	Lower	30	24.8	46	26.9
3.	Medium	51	42.1	67	39.2
4.	.Higher	13	10.7	39	22.8
5.	Excellent	4	3.3	10	5.8
TOTAL		121	100	171	100
H. Frequences of computer use a week					
1.	Never	-	-	2	1.2
2.	Lower	17	14.0	9	5.3
3.	Middle	50	41.3	38	22.2
4..	Higher	23	19.0	42	24.6
5.	Very higher	31	25.6	80	46.8
TOTAL		121	100	171	100

Frequencies of Individual Items

The frequencies of all the items are shown in table 3. According to the single item indicating overall strongly disagree to strongly agree with computer attitudes. The frequencies of the items are shown in table 2. As can be seen from various items in the Table 2, Chinese geography education students have used much more than those of Turkish for various purposes. Almost All Items have put clearly forward this result.

Table 3: Frequencies and Percentages of Individual Items

A. Only Computer Use												
1. Word processing	Turkey	15	12,4	41	33.9	35	28.9	24	19.8	6	5.0	121
	China	8	4.7	21	12.3	50	29.2	41	24.0	51	29.8	171
2. Spreadsheets	Turkey	26	21.5	47	38.8	28	23.1	15	12.4	5	4.1	121
	China	7	4.1	41	21.0	73	42.7	35	20.5	15	8.8	171
3. Database programmes	Turkey	61	50.4	31	25.6	21	17.4	5	4.1	3	2.5	121
	China	33	19.3	76	44.4	43	25.1	13	7.6	6	3.5	171
4. Graphic and drawing programs	Turkey	50	41.3	28	23.1	28	23.1	9	7.4	6	5.0	121
	China	23	13.5	52	30.4	45	26.3	44	25.7	7	4.1	171
5. Desktop publishing	Turkey	35	28.9	31	25.6	25	20.7	22	18.2	8	6.6	121
	China	28	16.4	50	29.2	48	28.1	40	23.4	5	2.9	171
6. Present programs such as Powerpoint	Turkey	12	9.9	25	20.7	21	17.4	24	28.1	29	24.0	121
	China	6	3.5	25	14.6	41	24.0	69	40.4	30	17.5	171
Only internet use												
7. Internet research for education	Turkey	6	5.0	20	16.5	40	33.1	39	33.2	16	13.2	121
	China	1	.6	45	26.3	50	29.2	54	31.6	21	12.3	171

8. E-mail	Turkey	7	5.8	19	15.7	36	29.8	34	28.1	35	20.7	121
	China	2	1.2	14	8.2	37	21.6	60	35.1	58	33.9	171
9. Chatting	Turkey	11	9.1	30	24.8	34	28.1	22	18.2	24	19.8	121
	China	3	1.8	14	8.2	31	18.1	55	32.2	68.	39.8	171
10. Making download	Turkey	6	5.0	25	27.8	30	24.8	28	23.1	32	26.4	121
	China	4	2.3	17	9.9	21	12.3	52	30.4	77	45.0	171
11. Online shopping	Turkey	67	55.4	23	19.0	17	14.0	4	3.3	10	8.3	121
	China	20	11.7	35	20.5	54	31.6	39	22.8	23	13.5	171
12. Looking up news and magazines	Turkey	14	11.6	37	30.6	31	25.6	28	23.1	11	9.1	121
	China	3	1.8	22	12.9	41	24.0	57	33.3	48	28.1	171
Both Computer and internet Usage												
13. Game	Turkey	37	30.6	27	22.3	25	20.7	18	14.9	14	11.6	121
	China	16	9.4	46	26.9	42	24.6	29	17.0	38	22.2	171
14.Homework	Turkey	4	3.3	9	7.4	27	22.3	50	41.3	31	25.6	121
	China	2	1.2	18	10.5	40	23.4	61	35.7	50	29.2	171
15. Music listening	Turkey	2	1.7	11	9.1	29	24.0	27	22.3	52	43.0	121
	China	2	1.2	15	8.8	30	17.5	52	30.4	72	42.1	171
16. Film and photo w atching	Turkey	4	3.3	18	14.9	29	24.0	25	20.7	45	37.2	121
	China	1	.6	12	7.0	28	16.4	54	31.6	76	44.4	171
17. Others	Turkey	17	14.0	40	33.1	37	30.6	11	9.1	16	13.2	121
	China	23	13.5	23	13.5	86	50.3	25	14.6	14	8.2	171

t-test of Individual Items

According to Independent Samples Test results at done for country there are significant differences between the mean levels of Turkish and Chinese students on İtem 1 (Word processing), 2 (Spreadsheets), 3 (Database programmes), 4 (Graphic and drawing programs), 8 (E-mail), 9 (Chatting), 10 (Making download), 11 (Online shopping 12 (Looking up news and magazines) 13 (Game) and 16 (Film and photo watching). The rates of computer and internet use of Chinese students on these items are higher than those of Turkish students Nevertheless, There are not meaningful differences on İtem 5 (Desktop publishing), 6 (Present programs such as powerpoint), 7 (Internet research for education), 14 (Homework), 15 (Music listening), 17 (Others) (Table 4).

Table 4: The significiant Differences observed between Turkish and Chinese Prospective Geography Teacher in term of computer and internet usage

	Country	N	Mean	SD	t	df	Sig.
1. Word processing	Turkey	121	2.7107	1.07578	6.765	290	.000
	China	171	3.6199	1.16894			
2. Spreadsheets	Turkey	121	2.3884	1.08299	5.508	290	.000
	China	171	3.0508	098044			
3. Database programmes	Turkey	121	1.8264	1.02207	4.117	290	.000
	China	171	2.3158	.98503			
4. Graphic and drawing programs	Turkey	121	2.1157	1.17750	4.827	290	.000
	China	171	2.7661	1.10252			
5. Desktop publishing	Turkey	121	2.4793	1.26556	1.392	290	.165
	China	171	2.6725	1.09453			
6. Present programs such as Powerpoint	Turkey	121	3.3554	1.31567	1.315	290	.189
	China	171	3.5380	1.05302			
7. Internet research for education	Turkey	121	3.3223	1.05842	-292	290	.770
	China	171	3.2865	1.00867			
8. E-mail	Turkey	121	3.4215	1.15291	3.980	290	.000
	China	171	3.9240	.99414			
9. Chatting	Turkey	121	3.1488	1.26606	6.332	290	.000
	China	171	4.0000	1.03469			
10. Making download	Turkey	121	3.4545	1.22474	4.433	290	.000
	China	171	4.0585	1.08848			
11. Online shopping	Turkey	121	1.9008	1.25436	7.964	290	.000
	China	171	3.0885	1.20151			
12. Looking up news and magazines	Turkey	121	2.8760	1.16598	6. 507	290	.000
	China	171	3.7310	1.06170			
13. Game	Turkey	121	2.5455	1.36626	3.885	290	.000
	China	171	3.1579	1.29873			
14.Homework	Turkey	121	3.7851	1.01822	.230	290	.818
	China	171	3.8129	1.01173			
15. Music listening	Turkey	121	3.9587	1.09085	.610	290	.542
	China	171	4.0351	1.02839			
16. Film and photo watching	Turkey	121	4.1228	.96534	3.047	290	.003
	China	171	3.7355	1.20256			
17. Others	Turkey	121	2.7438	1.20781	1.213	290	.226

	China	171	2.9064	1.06964			

P<0.05

The significant differences between students of two countries have also clearly been shown on gender in term of computer and internet use. It is apperared from t-test analysis that there are meaningful differences in favour of Chinese students on İtem 1 (Word processing), 2 (Spreadsheets), 3 (Database programmes), 4 (Graphic and drawing programs), 8 (E-mail), 9 (Chatting), 10 (Making download), 11 (Online shopping) and 12 (Looking up news and magazines) between turkish and chinese male students. On the other hand there are also meaningful differences in favour Chinese female students on item 1 (Word processing), 2 (Spreadsheets), 3 (Database programmes), 4 (Graphic and drawing programs), 8 (E-mail), 9 (Chatting), 10 (Making download), 11 (Online shopping, 12 (Looking up news and magazines) 13 (Game) and 16 (Film and photo watching). Two examples of Ti-test results on gender are given below (Table 5).

Table 5: The significiant Differences observed between Turkish and Chinese Prospective Geography Teacher in term of Gender

	GENDER	N	Mean	SD	T	df	Sig.
1.Graphic and drawing programs	Turkish male Students	67	2.2239	1.19114	2.868	116	.000
	Chinese male Students	51	3.0392	1.05756			
2. Graphic and drawing programs	Turkish Female Students	54	1.9815	1.16598	3.638	172	.000
	Chinese Female Students	120	2.6500	1.06170			

P<0.05

Discussion and Conclusion

The Internet may be a global technology but students work in local/national contexts, and have differences in other aspects of their identities. Today, one of the most important communication technologies is internet. In addition to using in daily life, internet is getting more important to use in education activities and academic environments. At the same time, teacher candidates need internet to realize instructional activities, personnel knowledge system, and keeping abreast of global world developments etc. (İşman et. al 2008).

When students' computer usage was analyzed we concluded that students' computer usage is not satisfactory. While educators tend to integrate and implement computer games having educational characteristics within educational settings, approximately half of the female students in this study stated that they do not have any chance in order to use computers in Turkey. Cultural aspects and norms should be considered while the technological perspectives of the peoples are examined. Every culture has its own beliefs and norms, and people living and having their cultures behave according to the culture's truths (İnal et al, 2006).

According to finding in the research Chinese students have spend more time than Turkish ones in Computer and internet. The use of computers and internet to improve teaching and learning in geography course is obligatory. Their use as education resources have remained at a low level. For these reason geography education students in Turkey should be encouraged for computer and internet usage.

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A REVIEW OF BLENDED LEARNING THEORY

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Abstract
Blended learning is a new approach intending to combine classroom and web-based learning environments in the teaching/learning processes. Although it has been more than a decade that blended learning is at the center of attention, it gained a considerable popularity within the previous five years. Such an increasing attention given to blended learning, different sorts of and/or variations of its application in teaching and learning situations, rapid change and some definitional concerns highlight the necessity of reviewing previous studies. This paper aims to review different variations of blended learning applications with respect to studies conducted within the last 10 years and conduct an evaluation of the use of the blended learning in different educational settings.

INTRODUCTION

Every century has been characterized with a reality which affects all the people in a daily life. It is sure that information technology is the dominating characteristic of this century. People's need to manage the information started long time ago but today information technology is surrounding us at everywhere in the pockets of each individuals. One of the most important children of the information technology is the Internet. Although classroom learning environment (CLE) is still used with a dominant role in the education, introduction of the Internet has inspired educators to use it as an alternative learning environment to CLE which is also called as online learning environment (OLE). In CLE face-to-face interaction between students and teacher plays the main role in the teaching/learning process. On the other hand, in the OLE, face-to-face contact is not existing and teacher and students are at different places. Transformation of the Internet into education created a debate between educators whether CLE is best to implement in the teaching/learning process or the OLE should be favored.
Blended learning plays such an important role in between these two learning approaches. It advocates benefiting the advantages of both systems by combining face-to-face learning environment with the online learning environment.It is indicated by most of the scholars that popularity of blended learning is increasing and it will dominate the higher education and will be favored by academic, corporate and government organizations as the future learning environment (Singh, 2003; Garrison & Kanuka, 2004; Oliver & Trigwell,2005). In addition to popularity increase, it is also found in different studies by different scholars that blended learning provides a more learner-centered environment with increasing student engagement and enrollment, encouraging active learning and facilitating higher level of learning experience (Garrison & Kanuka, 2004; Rovai & Jordan, 2004; Boyle et. al., 2003; Riffell & Sibley, 2005).
Popularity increase of blended learning has brought some questions with it. Blended learning is regarded as ill-defined, inconsistently used and doesn't have accepted standards on it (Oliver & Trigwell,2005; Deliagaoglu & Yildirim, 2007). Although blended learning is a useful, learner-centered and popular future learning approach, there are some questions and points that are not clear in practice. This paper aims to review blended learning theory with respect to three dimensions. In the first dimension, definitions regarding to blended learning theory will be reviewed. Secondly, blended learning will be reviewed with respect to statistical analysis on studies conducted. Lastly, blended learning will be reviewed with respect to findings on the studies. At the final part of the paper, you will find some suggestions on blended learning.

DEFINITIONS

Blended learning approach has gained popularity within the last five years. In order to understand the importance of blended learning, firstly it is needed to understand the idea behind blended learning with respect to its definitions. Singh (2003) underlined the problems in the use of e-learning. He explained that first generation e-learning focused on presenting classroom-based instruction over the Internet (Singh, 2003). The feedback gained from first generation e-learning environment provided us the result that single mode of delivery is not sufficient enough with respect to social contact, engagement, relevance and the context that is needed to facilitate successful learning. Macdonald and Mcateer (2003) indicated that although online networking has made a complex and important contribution to learning support in the universities, use of online media for learner support doesn't work as effectively as it was expected (Macdonald & Mcateer, 2003). The main characteristic of the e-learning environment is about using the technology as the teaching occurs in a classroom like environment. All the planning and design has been made according to traditional classroom settings and e-learning environment was used to support these method but results revealed that this single mode of delivery is not sufficient enough for researchers (Singh, 2003; Macdonald & Mcateer, 2003).
Furthermore, Graham (2004) underlined the shift from single mode delivery to multimode future blended learning environments. He indicated that widespread accessibility of digital learning technologies, increased the levels of interaction between face-to-face learning and blendedlearning (Graham, 2004). In figure 1, which is adapted from Graham (2004), technological shift from traditional face-to-face learning environment into blended learning systems have been indicated.

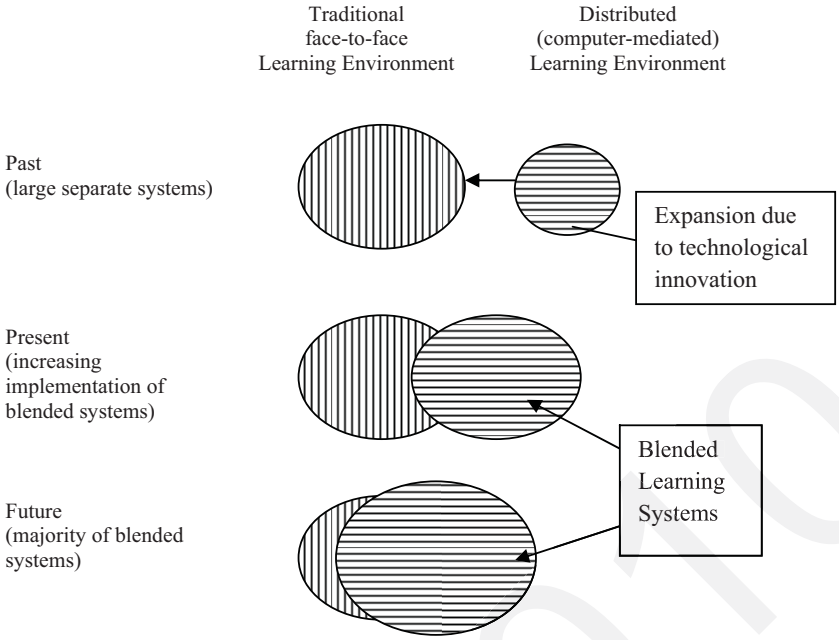

Figure 1. Development of blended learning systems
adapted from Graham (2004)

"Blended learning" and "hybrid learning" is used interchangeably to indicate the same learning approach. This learning approach is commonly defined as combination of face-to-face classroom learning environment with online learning environment by considerable number of scholars (Garrison & Kanuka, 2004;Deliagaoglu & Yildirim, 2007; Alonso et. al., 2005).Singh (2003) provided a more general definition to blended learning. He indicated that "Blended learning combines multiple delivery media that are designed to complement each other and promote learning and application-learned behavior" (Singh, 2003). Although this definition is more general to commonly usage of blended learning, it brought another argument to be discussed by the scholars. Oliver and Trigwell (2005) indicated that although blended learning gained so much popularity, it is still ill-defined.
They summarized the most common definitions for blended learning approach;

- First definition emphasizes that it is the combination of traditional face-to-face learning with online learning.
- Second definition underlines that it is combination of media and tools used in an e-learning environment.
- Third definition states that it is the combination of pedagogic approaches without looking to the learning technology used.

Kernes and De Witt (2003, as cited in Oliver and Trigwell, 2005) defined blended learning as the mix of different didactic methods and delivery formats. Driscoll (2002, as cited in Oliver and Trigwell, 2005) provided four (4) different concepts for the definition of blended learning. These concepts are;

- Combination of web-based technological tools to accomplish an educational goal.
- Combination of pedagogical approaches to produce optimal learning outcome.
- Combination of any form of instructional technology with face-to-face instructor-led training.
- Combination of instructional technology with actual job tasks.

Another scholar Valiathan (2002, as cited in Oliver and Trigwell, 2005) provided different approach to definition of blended learning with respect to learning approaches. He indicated three types of learning approach which is named as skill-driven learning, attitude-driven learning and competency-driven learning. Skill-driven learning highlights the importance of self-paced learning like e-learning. Attitude-driven learning mixes various events and delivery media which in a way that enhances learning with technology. On the other hand, competency-driven learning blends performance support tools with knowledge management resources which in a way integrate blends two different approaches with support tools. All these different definitions aimed to indicate that there wasdifferent type of experiments and different type of conceptions on blended learning but today the most commonly usage of blended learning is in the way of blending face-to-face learning environment with online learning environment.
All this definitions lead us to make a conclusion that blended learning theory is an approach that supports the use of more than one learning/teaching component in the learning process. This blending can include such components; learning environment, instructional technology, pedagogical approaches and any other educational tools.

STATISTICAL ANALYSIS

Another important point is to look at the blended learning theory with respect to some statistical analysis. Blended learning theory has more interest and popularity within the recent years. Following is a graph showing the number of publications that has "blended learning" keyword in the title. Following graph is generated from the database ofGoogle Scholar. In google scholar, "blended learning" keyword is searched at the title of the scholarly articles from 1990 untill 2010 April. The results revealed that blended learning has an increasing trend as it is seen in the graph below.

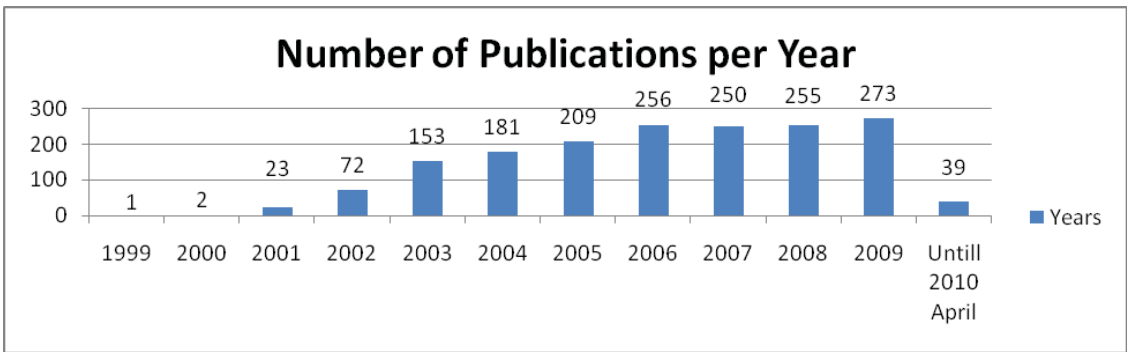

Figure 2. Number of publications on "Blended Learning" per year

FINDINGS IN THE LITERATURE

There are different types of studies on blended learning approach. In this part, I will review the findings in some of the popular scholarly articles in the literature. Denis (2003) proposed a conceptual framework for self-directed learning in a blended learning. Their conceptual framework depends on the seven principles which support the use of project oriented learning/teaching process. The principles of their framework are project oriented pedagogy, induction mechanism, new roles for trainers, open training resources environment, triple level of follow-up for learners and alternating pace for activities. Although they have not projected any student preferences, their results indicated that using personal projects for each student, learner-centered activities, follow-up activities and personal log books are useful for a constructivist approach on blended learning. Their face-to-face and online education blending ratio is 50-50.

Another study is a pilot study conducted in 2003 by Open University in Scotland and Scottish Centre for Research into On-Line Learning and Assessment that is named as SOLACE project (Macdonald & Mcateer, 2003). This study aims to explore learner support strategies and potential of available and developing technologies as a solution to learner support problems. In this study, they have introduced a web-based conference system to support learners and collected qualitative and quantitative data from tutors. Their comparisons between face-to-face, computer conferencing and letter to group approaches revealed that each approach has different tools for learner support but computer conferencing tutorials removes the time boundaries in face-to-face tutorials and provides increasing demand on supporting of learners.

O'Toole and Absalom (2003) studied the use of the more than one environment for provision of course materials on the university Intranet. They compared the mean on quiz between students with respect to ones that who accessed the materials over ICT, participated only in lectures and the ones who used both. Although, there is not a significant difference, their results revealed that the students who use both ICT and lectures scored slightly higher on the quiz. They concluded that the materials on the ICT had an advance organizer role for students.

Garrison and Kanuka (2004) pointed their positions on applicability of blended learning in higher education which is one of the most cited studies on blended learning. They stated that asynchronous computer-mediated conferencing tools support reflection, interpersonal and teamwork skill development. Another important conclusion is about the requirement of rethinking and redesigning teaching/learning with respect to blended learning. It is not just about the integrating technology ordinarily to teaching/learning process. Furthermore they have extended their ideas that blended learning is about planned integration of face-to-face learning with online learning. Blended learning is not viewed as a layer on top of face-to-face learning. Finally they have defined six criteria in administration and development of a blended learning approach. These blended learning administration criteria are policy, planning, resources, scheduling and support. Theyreflected that campus-based higher education institutions will adopt blended learning approach in the future significantly. Today, our analysis on publications related to blended learning approves their foresight.

The study of Riffel l, S., and Sibley, D. (2004) attempted to test the hypothesis that students learn better when they are enrolled in a hybrid course format in comparison to those who are enrolled in traditional face to face lecture format. In order to test this theory, a hybrid course including biweekly online tasks and weekly face to face meetings designed to teach the content. To test the effectiveness of the hybrid course, the same content was planned to be taught in a traditional way, which mainly included passive lectures. Studied groups, the pots-course assessment test results revealed out that hybrid course was found at least equivalent but online assignments were more successful than passive lectures. It is concluded that hybrid courses work better with upperclassman in comparison to freshman students. Hybrid course format providing students with opportunities to experience interactive learning environment and leading them tom demonstrate individualized performance on specific tasks enable students actively enroll in their own learning and share the experiences of their classmates online.

Roisin Donnelly (2006) from Ireland conducted a case study in order to discover how blended problem-based learning with e-learning improves the knowledge and skills of academic staff in a professional development module. Donnelly (2006) used blended learning approach in a postgraduate module called "Online Learning" which is accredited professional development program for academic staff. Problem-based learning (PBL) is chosen as pedagogic approach. Furthermore, shedefined module structure precisely for blended learning approach. She blended PBL(B-PBL) module consists from pre-induction activity, face-to-face induction, online induction, problem part one and problem part two. Her activities in the B-PBL approach are summarized in the table below.

Table 1. Donnelly's Activities which blends online activities with face-to-face PBL (Donnely, 2006)

Activity-1: Critiquing of web-resources, and relating these skills to those of the problem.
Activity-2: Online debate and role play
Activity-3: Participant's conceptions of the problem are accessible to one another through online and face-to-face discussion & feedback.
Activity-4: Participants develop skills in different levels of reflective writing.

She has categorized these four activities as adaptive, interactive, discursive and reflective. One of the findings they have gathered is about the stimulating social communication role of online learning. Students' perceptions revealed that they have started to communicate much more

with the use of the online learning tool. Furthermore, she emphasized that the tutor should value cohesive, supportive and productive approach on blended PBL approach. She also provides the conclusion on the forms of interaction. During her case, firstly she assigned individual activities and then she assigned pair and group activities to students. Besides, students reflected that use of communication and reflections in a blended learning group discussion tool advanced their knowledge and ideas. Donnelly's last finding is about the individual learner in a blended PBL group. She reflected that in addition to group activities, she supported the individual learners with individual activities and individual participation in the group discussion environments on the online learning module of blended PBL approach. Her study specifically enlightened the use of PBL by a blended learning approach.

A very well known fact is that professional development has important contributions to individual himself and to the organization itself. For that matter supporting lifelong professional development has become an important matter of research studies. For instance, Wall and Ahmed (2008) investigated the opportunities and challenges faced when lifelong professional development of individuals has been supported by a blended lifelong learning which is embedded with a simulation game. One important result derived from this study was that the inclusion of simulation games play effective role in the delivery of lifelong learning opportunities. However, there are important challenges such as establishing key milestone dates or encouraging online collaboration. It is asserted that getting all prerequisite sources prepared requires a careful pre-planning and planning stages where all the possible obstacles are reviewed and eliminated. However, integrating a simulation game program "MERIT" into the blended learning design included several challenges that could not be predefined. Therefore, suggestions of this research is valuable regarding the fact that the intention of providing lifelong learning opportunities can be supported via more than one technologic channel but must be careful of later consequences in terms of ICT, software, and hardware difficulties.

Another study is from Turkey by Delialioglu and Yildirim (2007) which explores students' perceptions of interactive learning in a blended learning environment, is a good example of those that mention the effect of technology in education. Different views and dimensions surrounding the issue of including technology in education have been discussed. A model, which dominates an instructional setting have been reviewed and evaluated by the students who are enrolled in the program. This program, which is called hybrid, includes pedagogy dimension as well as technology. This is where it begins to have difficulties, say Delialioglu and Yildirim (2007). Their study corresponding several interactive technological facets applied where all interactive features were accessible by students. When students' perceptions were analyzed, it is concluded that when several instructivist and constructivist elements were blended students increase students learning in hybrid course.

CONCLUSION

In conclusion, blended learning is a popular approach nowadays which advocates benefiting the advantages of both systems by combining face-to-face learning environment with the online learning environment. Although combining online learning environment and face-to-face learning environment is the most common definition of blended learning approach, there are different definitions stated by different scholars. Blended learning approach provides a more learner-centered environment with increasing student engagement and enrollment, encouraging active learning and facilitating higher level of learning experience (Garrison & Kanuka, 2004; Rovai & Jordan, 2004; Boyle et. al., 2003; Riffell & Sibley, 2005).

"Blended learning" and "hybrid learning" is used interchangeably to indicate the same learning approach. This learning approach is commonly defined as combination of face-to-face classroom learning environment with online learning environment by great number of scholars (Garrison & Kanuka, 2004;Deliagaoglu & Yildirim, 2007; Alonso et. al., 2005). Furthermore, there are different definitions by different scholars on blended learning (Singh, 2003; Oliver & Trigwell, 2005; Kernes and De Witt, 2003, as cited in Oliver and Trigwell, 2005; Valiathan, 2002, as cited in Oliver and Trigwell, 2005). All these definitions lead us to make a conclusive definition that blended learning theory is an approach that supports the use of more than one learning/teaching component in the learning process. This blending can include such components; learning environment, instructional technology, pedagogical approaches and any other educational tools. There are lots of studies on blended learning but some of the most cited studies were indicating the importance of defining a conceptual framework for blended learning, underlining the benefits of using online environment of blended learning approach in learner support, which eliminates the time boundaries in comparison to face-to-face learner support (Denis, 2003;Macdonald & Mcateer, 2003). Besides, Garrison and Kanuka (2004) emphasized that blended learning approach is not an ordinary approach so should not beviewed as a layer on top of face-to-face learning. Teaching/learning activities should be redesigned for blended learning on any course that will be implemented.

All these studies and differences in the definitions show us that there are some variations in people's perception of blended learning. In order to strengthen the base of the blended learning theory, it is needed to define standards and models for teaching/learning planning and designing progress of the blended learning approach.

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A STUDY INTO THE TEACHING MATERIALS USED DURING SOCIAL STUDIES LESSONS ON THE BASIS OF CERTAIN VARIABLES

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Abstract
The purpose of this study is to analyze the teaching materials employed during social studies teaching on the basis of certain variables. The present paper conducts a study into whether gender, length of service, owning or not owning a personal computer, having received or not having received an in-service training regarding the use of teaching materials, liking or disliking using technological devices and schools having or not having an adequate number of equipment have an influence on written-published materials, audiovisual materials or experience-giving methods in social studies lessons. For that purpose, a scale was conducted on 160 classrooms and social studies teachers – 87 of them being female and 73 of them being male- who were working in Istanbul and Sakarya during the second term of the educational year 2008-2009. The study concluded that there was a meaningful difference in using published materials and experience-giving methods in favor of female teachers and those teachers who have received an in-service teaching. A meaningful difference in published materials, experience-giving methods and in total was found in favor of the teachers who had a 16-years or more length of service. Furthermore, it was observed that teachers made use of audiovisual materials and experience-giving methods to the extent which they liked technology. In addition, a positive correlation was found between the equipment in their schools and the educational materials they used during their lessons. A similar correlation was found between teachers' length of service and the extent to which they used audiovisual materials and between their having or not having a personal computer and the extent to which they made use of educational materials.
Keywords: Social studies, instructional technology, multimedia, educational technology, teaching material

INTRODUCTION

The task of developing a democratic society through formal educational institutions in Turkey has been mainly burdened on Social Studies educational programs. Therefore, Social Studies teaching has been a factor in determining whether a society will have democratic attitudes and values, problem-solving and decision-making skills and whether it will be consisted of productive and participatory individuals (Ozturk and Otluoglu, 2002:1). In social studies teaching which is burdened with such an important mission, it is possible to make the learning process easy, enduring and meaningful through the use of educational materials.

Education methods are one of the fundamental components in learning-teaching process. All the materials and sources used for developing the desired knowledge, skills, attitudes and values in students are regarded within the scope of educational materials (Paykoc, 1991: 93; Simsek, 2003: 144). Educational materials play an important role in making learning-teaching process in social studies efficient, in presenting signs and explanations to students and making students comprehend these signs and explanations. They provide a great deal of convenience in teacher's ability to convey a message to students in an accurate, proper, clear and understandable manner; in making abstract knowledge concrete and in enabling students to comprehend complex ideas through simplification. Written, published, audiovisual materials and experience-giving methods, included among educational materials, help to make learning easy and enduring.

Whether students can retrieve what they have learned in an easier way depends on the multimedia learning-teaching process in a classroom. It is thought that students' motivation level will get increased when audiovisual materials are employed in a classroom (Demirel, 1999:49; Isman, 2003; 203). Multimedia approach is generally more effective than traditional teaching (Michaelis and Garcia, 1996: 83). The learning-teaching process is greatly assisted by multimedia, in which more than one material can be used through modern technology. Through a multimedia-assisted teaching, it is easier for students to gain the desired educational attainments. The multimedia-assisted education makes learning more interesting, meaningful and enduring. Studies concluded that the number of sense organs addressed by the teaching materials used in learning-teaching process is directly proportional to an easy and enduring learning process. In other words, the higher the number of sense organs is addressed by the teaching materials employed in learning-teaching process, the better and more enduring the learning process is. Correspondingly, forgetting is delayed (Yasar and Gultekin, 2009: 310). Teachers also are burdened with important roles in order to make social studies lessons efficient. While preparing their lesson/daily plans, teachers also need to plan audiovisual materials related to a particular lesson; to plan where and how to use these materials in a proper way; and to make their arrangements accordingly (Demirel, 1999: 49).

One of the most important tasks of social studies teachers regarding teaching materials is to present those experiences that will enable students to gain the educational attainments related to a particular subject. For that purpose, teachers should carry out the learning-teaching process, which has been prepared beforehand, by using the required materials and methods. The crucial part of this operation is that the teacher should be able to acquire and employ teaching materials and methods suitable for student characteristics and attainments and subject of a particular lesson (Cilenti, 1988: 124). It is thought that it is important to determine the state of the use of materials which are an important factor in making learning easy and enduring, in making abstract information concrete, in increasing motivation and in presenting complex information through simplification during social studies lessons. Thus, the study of teaching materials employed throughout social studies lessons has been determined as the main problem of the present study. On the basis of this problem, an attempt has been made to seek an answer to the following questions:

1. Do the teaching materials used in social studies lessons differ depending on the gender of classroom teachers and social studies teachers?
2. Do the teaching materials used in social studies lessons differ depending on the length of service of classroom teachers and social studies teachers?
3. Do the teaching materials used in social studies lessons differ depending on whether classroom teachers and social studies teachers have a personal computer at home or not?
4. Do the teaching materials used in social studies lessons differ depending on whether classroom teachers and social studies teachers have received an in-service training concerning teaching materials or not?
5. Do the teaching materials used in social studies lessons differ depending on whether classroom teachers and social studies teachers like technological devices or not?
6. Do the teaching materials used in social studies lessons differ depending on whether classroom teachers and social studies teachers have an adequate number of teaching materials in their schools?

METHODOLOGY

This study, whose purpose is to analyze the teaching materials used during social studies lessons on the basis of certain variables, is a descriptive one.

Population and Sample

The population of the study is comprised of the classroom teachers and social studies teachers who work for Kupluce Primary School, Fatih Primary School, Kirazlitepe Primary School, Burhaniye Primary School, Gazi Mustafa Altintas Primary School and Bilfen College in Istanbul, and Zubeyde Hanim Primary School, Mithatpasa Primary School, Dr. Nuri Bayar Primary School, Kupcular Primary School, Mehmet Zorlu Primary School and Sakarya University Foundation College in Sakarya.

The sample of the study consists of 160 classroom teachers and social studies teachers – 87 of them being female and 73 of them being male- who have been randomly chosen and thought to represent the population.

Development and Application of Data Collection Instrument

The study used "The Scale for Teaching Materials Used during Social Studies Lessons" developed by the researcher. During the process of developing the scale, a review of literature was carried out by the researcher and an 18-item scale was devised through interviews with teachers. Opinions from specialists in social studies teaching, research methods and statistics were received in order to achieve face and content validity of the scale. The scale was shaped in accordance with learned opinion and was performed on 160 teachers so as to ensure construct validity and reliability. In accordance with the data obtained, exploratory factor analysis was employed regarding construct validity. The exploratory factor analysis concluded that the items 7 and 9 distorted the structure; thus, they were excluded. Consisting of the remaining 16-items, the scale was exposed to factor analysis again. The values obtained from the KMO and Barlett test were studied prior to the factor analysis. Since the KMO test indicated a variation of .86 and Barlett a meaningful variation, it was decided that it would be appropriate to conduct factor analysis on the scale (Buyukozturk, 2007). The factor analysis concluded that the scale had a three-dimensional structure consisting of 16 items. The first dimension includes 8 items and factor coefficients varied between .35 and .81. This dimension was named as "Written and Published Materials". Accounting for 38.4% of Audiovisual Materials", the second dimension consists of 5 items and their factor coefficients ranged from .74 and .87. Accounting for 13.3% of the total variance, this dimension had an internal consistency coefficient of .89. Titled as "Experience-giving Methods", the third dimension consists of 3 items and their factor coefficients ranged from .50 and .62. Accounting for 7.7% of the total variance, this dimension had an internal consistency coefficient of .76. When regarded as a whole, the 16-item scale accounted for 59.4 percent of the total variance and had an internal consistency coefficient of .89.

Data Analysis

Before the data was analyzed, data collection instruments were analyzed individually. Two of the data collection instruments which had missing parts were considered "invalid" and excluded from the analysis process. The analysis was conducted on 160 data collection instruments. In order to numerically calculate the scores of the answers provided by the classroom and social studies teachers, the items in the scale was assigned the following numbers: 4, 3, 2 and 1, which meant "always", "often", "occasionally", and "never" respectively. The data was analyzed through SPSS. T test, Anova, Kruskal-Wallis H Tests were conducted in order to statistically analyze the data obtained.

FINDINGS AND DISCUSSION

The findings and discussion are presented below by their sub-problems.

Table 1: The distribution of the teachers by gender, length of service, having or not having a personal computer, and having received or not having received an in-service training

		f	%
Gender	Female	87	54.4
	Male	73	45.6
Length of Service	1-5 Years	28	17.5
	6-10 Years	41	25.6
	11-15 Years	35	21.9
	16 years and more	56	35.0
Personal Computer	Yes	137	85.6
	No	23	14.4
In-service training	Received	103	64.4
	Not received	57	35.6

Table 1 presents the distribution of the teachers by gender, length of service, having or not having a personal computer, and having received or not having received an in-service training. It can be concluded from the table that 54.4% of the classroom teachers and social studies teachers participating in the study were female and the remaining 45.6% were male. When analyzed on the basis of their length of service, it is clear that 17.5% of them had been serving for one to five years, that 25.6% for six to ten years, 21.9% for eleven to fifteen years and that 35.0% for sixteen years or more. It can also be observed that 85.6% of the teachers had a personal computer whereas a small percentage (14.4%) did not. An analysis on the basis of having received or not having received an in-service training indicates that the majority of the teachers (64.4%) received an in-service training. The remaining 35.6% did not undergo such training.

Table 2: The results of the T Test on the teaching materials used by teachers during social studies lessons depending on their gender

Dimensions	Gender	N	$\bar{x}$	S	Sd	T	p
Written and Published Materials	Female	87	24,09	3,94	158	2,42	,017
	Male	73	22,60	3,80			**
Audiovisual Materials	Female	87	13,26	4,39	158	,28	,780
	Male	73	13,08	3,70			
Experience-giving Methods	Female	87	6,08	2,14	158	2,14	,034
	Male	73	5,38	1,94			**
Total	Female	87	43,43	8,55	158	1,83	,070
	Male	73	41,06	7,69			

Table 2 indicates that there is a meaningful difference ($p<.05$) between the two genders in the use of Written and Published Materials ($t=2.42$) and Experience-Giving Methods ($t=2.14$). On the other hand, the scores obtained from the dimension "Audiovisual Materials" ($t=0.28$) and the total scale (1.83) did not display a meaningful difference ($p<.05$) between the two genders. It was discovered that female teachers ($\bar{x}$ = 24.09) used written and published materials more when compared to male ones ($\bar{x}$ = 22.60) and that the former group ($\bar{x}$ =6.08) made use of experience-giving methods more than the latter group ($\bar{x}$ = 5.38). This suggests a meaningful variation in favor of female teachers in the use of not only written and published materials but also experience-giving materials.

Table 3: The results of the Anova test on the teaching materials used by teachers during social studies lessons depending on their length of service

Dimensions	Length of Service	N	$\bar{x}$	SS		Sum of Squares	sd	Mean Squares	F	P	Difference
Written and Published Materials	1-5 Years	28	22,07	3,54	Inter-group	256,15	3	85,38	6,02	,001	1-4
	6-10 Years	41	23,31	4,49							3-4
	11-15 Years	35	22,05	3,13	Intra-group	2210,62	156	14,17			
	16 Years and more	56	25,00	3,64							
	Total	160	23,41	3,93	Total	2466,77	159				
Audiovisual Materials	1-5 Years	28	13,96	3,77	Inter-group	107,35	3	35,78	2,19	,091	
	6-10 Years	41	13,19	4,06							
	11-15 Years	35	11,71	4,26	Intra-group	2546,38	156	16,32			
	16 Years and more	56	13,69	4,00							
	Total	160	13,18	4,08	Total	2653,74	159				
Experience-Giving Methods	1-5 Years	28	5,71	1,99	Inter-group	36,43	3	12,14	2,91	,036	2-4
	6-10 Years	41	5,43	2,14							3-4
	11-15 Years	35	5,20	2,19	Intra-group	650,53	156	4,17			
	16 Years and more	56	6,37	1,88							
	Total	160	5,76	2,07	Total	686,97	159				
Total	1-5 Years	28	41,75	7,23	Inter-group	830,85	3	276,95	4,35	,006	3-4
	6-10 Years	41	41,95	8,57							
	11-15 Years	35	38,97	7,70	Intra-group	9943,83	156	63,74			
	16 Years and more	56	45,07	8,05							
	Total	160	42,35	8,23	Total	10774,69	159				

A review of Table 3 suggests that there is a meaningful difference (p<.05) in the use of Written and Published Materials ($F_{(3-156)}$=6.02), Experience-Giving Methods ($F_{(3-156)}$=2.91) and in the whole scale ($F_{(3-156)}$=4.35) depending on the length of service. On the other hand, the scores obtained from the dimension "Visual and Audio Materials" ($F_{(3-156)}$=2.19) did not display any meaningful difference (p>.05) on the basis of the length of service. Table 3 shows that the teachers who had been serving for 16 years or more ($\bar{x}$ = 25.00) used written and published materials more when compared to those teachers with a length of service of 1 to 5 years ($\bar{x}$ = 22.07) or 11 to 15 years ($\bar{x}$ = 22.05). It also indicates that the teachers who had been serving for 16 years or more ($\bar{x}$ = 6.37) used experience-giving methods more when compared to those teachers with a length of service of 6 to 10 years ($\bar{x}$ = 5.43) or 11 to 15 years ($\bar{x}$ = 5.20). According to the scores obtained from the whole scale, it was found that the teachers who had been serving for 16 years or more ($\bar{x}$ = 45.07) made use of materials during social studies lessons more when compared to those teachers with a length of service of 11 to 15years ($\bar{x}$ = 38.97). It is interesting that the meaningful difference in the dimensions "written and published materials" and "experience-giving methods" and in total was in favor of the teachers who had been serving for 16 years ore more. No meaningful correlation was found between length of service and use of audiovisual materials. In her study, Pala (2006) found that there was not a meaningful correlation between teachers' attitudes towards educational technologies and their length of service.

Table 4: The results of the T test on the teaching materials used by teachers during social studies lessons depending on whether they had a personal computer at home or not

Dimensions	**Computer**	**N**	$\bar{x}$	**S**	**sd**	**t**	**P**
Written and Published Materials	Yes	137	23,43	3,97	158	,20	,84
	No	23	23,26	3,81			
Audiovisual Materials	Yes	137	13,29	4,14	158	,89	,37
	No	23	12,47	3,71			
Experience-giving Methods	Yes	137	5,84	2,06	158	1,25	,21
	No	23	5,26	2,15			
Total	Yes	137	42,58	8,27	158	,85	,40
	No	23	41,00	8,01			

It can be concluded from Table 4 that there was not a meaningful difference in the use of Written and Published Materials (t=0.20), Audiovisual Materials (t=0.89) and Experience-Giving Methods (t=1.25) depending on whether teachers had a personal computer. In addition, it has been observed that no meaningful difference (p>.05) existed between having or not having a personal computer and the use of materials during social studies lessons in general (t=0.85). An interesting finding of Table 4 is that the great majority of the teachers (85.6%) had their own personal computers. This can be interpreted as teachers' being open to advances and willing to acquire and use technology.

Table 5: The results of the T test on the teaching materials used by teachers during social studies lessons depending on whether they had received an in-service training

Dimensions	**In-service training**	**N**	$\bar{x}$	**S**	**sd**	**T**	**P**
Written and Published Materials	Received	103	24,08	4,00	158	2,99	,003
	Not received	57	22,19	3,52			**
Audiovisual Materials	Received	103	13,48	4,02	158	1,27	,206
	Not received	57	12,63	4,17			
Experience-giving Methods	Received	103	6,08	2,07	158	2,71	,007
	Not received	57	5,17	1,96			**
Total	Received	103	43,66	8,29	158	2,74	,007
	Not received	57	40,00	7,63			**

Table 5 suggests a meaningful difference in the use of Written and Published Materials (t=2.99), Experience-Giving Methods (t=2.71) and the total score obtained from the scale (t=2.74) between teachers who had an in-service training and those who did not. A review of the scores obtained from the dimension "Audiovisual Materials" (t=1.27) indicates no meaningful difference (p>.05) between the teachers who had an in-service training and those who did not. It was discovered that the teachers who had an in-service training ($\overline{x}$ = 24.08) employed written and published materials more when compared to those who did not ($\overline{x}$ = 22.19). Another finding implied in Table 5 is that the teachers who had an in-service training ($\overline{x}$ =2.07) benefited from experience-giving methods more than those who did not ($\overline{x}$ = 1.96). Total scores obtained from the scale indicate that the teachers who had an in-service training ($\overline{x}$ =43.66) made use of materials during social studies lessons more than those who did not ($\overline{x}$ = 40.00). It is important that there was a meaningful difference in the use of written and published materials and experience-giving methods in favor of the teachers who had an in-service training. This indicates that teachers are likely to employ teaching materials and experience-giving methods in order to increase the efficiency of social studies lessons once they have received an in-service training. In their studies, Altinisik and Orhan (2002) point out that teachers should undergo an in-service training so as to be able to ensure more efficient learning experiences.

Table 6: The results of the Anova test on the teaching materials used by teachers during social studies lessons depending on whether they liked technological devices

Dimensions	Like technology?	N	$\overline{x}$	SS		Sum of Squares	sd	Mean Squares	F	p	Difference
Written and Published Materials	A little	44	22,86	3,19	Inter-group	34,21	2	17,10	1,10	,334	
	Quite	75	23,34	4,04							
	Very much	41	24,12	4,42	Intra-group	2432,55	157	15,49			
	Total	160	23,41	3,93	Total	2466,77	159				
Audiovisual Materials	A little	44	11,02	3,91	Inter-group	423,13	2	211,56	14,89	,000	1,2
	Quite	75	13,18	3,63							1,3
	Very much	41	15,48	3,86	Intra-group	2230,60	157	14,20			2,3
	Total	160	13,18	4,08	Total	2653,74	159				
Experience-Giving Methods	A little	44	5,11	1,75	Inter-group	30,66	2	15,33	3,66	,028	1,3
	Quite	75	5,85	2,06							
	Very much	41	6,29	2,28	Intra-group	656,30	157	4,18			
	Total	160	5,76	2,07	Total	686,97	159				
Total	A little	44	39,00	7,19	Inter-group	1011,29	2	505,64	8,13	,000	1,3
	Quite	75	42,38	7,97							
	Very much	41	45,90	8,41	Intra-group	9763,39	157	62,18			
	Total	160	42,35	8,23	Total	10774,69	159				

It was found that there was a meaningful difference (p<.05) in the use of Audiovisual Materials ($F_{(2-157)}$=14.89), Experience-Giving Materials ($F_{(2-157)}$= 3.66) and in the whole scale ($F_{(2-157)}$=8.13) depending on the level at which teachers participating in the study liked technology. A review of the scores obtained from the dimension "Written and Published Materials" ($F_{(2-157)}$=1.10) indicates that there was not a meaningful difference (p>.05) between the level at which teachers liked technology and the use of written and published materials. It was also discovered that the teachers who liked technology very much ($\overline{x}$ = 15.48) and the teachers who quite liked technology ($\overline{x}$ = 13.18) used visual and audio materials more when compared to the teachers who liked technology a little ($\overline{x}$ = 11.02). Moreover, the teachers who quite liked technology ($\overline{x}$ =13.18) were found to use audiovisual materials more when compared to the teachers who liked technology a little ($\overline{x}$ =11.02). When the dimension "Experience-giving Methods" is analyzed, it can be observed that the teachers who liked technology very much ($\overline{x}$ = 5.85) employed these methods more than the teachers who liked technology a little ($\overline{x}$ = 5.11). The total score obtained from the scale demonstrated that the teachers who liked technology very much ($\overline{x}$ =45.90) made use of teaching materials during social studies lessons more when compared to those who liked it very little ($\overline{x}$ =42.38). It is an important finding that there was a positive correlation between the level at which teachers like technology and their using visual and audio materials and experience-giving methods. This means that teachers employ teaching materials throughout social studies lessons to the extent that they like technology. Teaching materials will make social studies teaching more enjoyable. In their studies, Woodrow, Mayersmith and Pedretti (2000) stated that teaching with multimedia, when compared to the one in a traditional setting, led to a positive change in students' attitudes towards lessons. In her study, Fidan (2008) found that teaching materials made lessons more enjoyable and they ensured increased motivation and enduring learning process on the part of students.

Table 7: The results of the Kruskal Wallis H Test on the teaching materials used by teachers during social studies teachers depending on whether their schools had an adequate number of teaching materials

Dimensions	Equipment is adequate	N	Mean Rank (SO)	Sd	χ^2	p	Difference
Written and Published Materials	Totally disagree	20	58,90	3	22.04	.000	1-3;1-4 2-3;2-4 3-4
	Agree a little	75	70,27				
	Quite agree	51	93,25				
	Totally agree	14	119,68				
Audiovisual Materials	Totally disagree	20	62,10	3	29.47	.000	1-3;1-4 2-3;2-4 3-4
	Agree a little	75	68,34				
	Quite agree	51	91,06				
	Totally agree	14	133,46				

Experience-giving Methods	Totally disagree	20	60,38	3	22.00	.000	1-3;1-4 2-3;2-4 3-4
	Agree a little	75	70,09				
	Quite agree	51	92,84				
	Totally agree	14	120,07				
Total	Totally disagree	20	57,15	3	34.32	.000	1-3;1-4 2-3;2-4 3-4
	Agree a little	75	67,39				
	Quite agree	51	94,24				
	Totally agree	14	134,04				

It was determined that there was a meaningful difference ($p<.05$) in the use of Written and Published Materials ($\chi^2=22.04$), Audivisual Materials ($\chi^2=29.47$), Experience-Giving Methods ($\chi^2=22.00$) and in the total score obtained from the scale ($\chi^2=34.32$) depending on the level at which teachers agreed or disagreed with the fact that there was an adequate number of equipment in their schools. A review of the dimension "Written and Published Materials" indicates that the teachers who "totally agreed" (SO = 119.68) that there was an adequate number of equipment in their schools used written and published materials more when compared to the teachers who "quite agreed" (SO = 93.25) and "agreed a little" (SO = 70.27) or "totally disagreed" (SO = 58.90). A review of the dimension "Audiovisual Materials" indicates that the teachers who "totally agreed" (SO = 133.46) that there was an adequate number of equipment in their schools used visual and audio materials more when compared to the teachers who "quite agreed" (SO = 91.06) and "agreed a little" (SO = 68.34) or "totally disagreed" (SO = 62.10). A review of the dimension "Experience-Giving Methods" indicates that the teachers who "totally agreed" (SO = 120.07) that there was an adequate number of equipment in their schools used experience-giving methods more when compared to the teachers who "quite agreed" (SO = 92.84) and "agreed a little" (SO = 70.09) or "totally disagreed" (SO = 60.38). The total scores obtained from the scale indicated that the teachers who "totally agreed" (SO = 134.04) that there was an adequate number of equipment in their schools made use of teaching materials during social studies lessons more when compared to the teachers who "quite agreed" (SO = 94.24), and "agreed a little" (SO = 67.39) or "totally disagreed" (SO = 57.15). These findings can be interpreted as the fact that the more the equipment in a school is, the more social studies teachers use materials in social studies lessons.

CONCLUSION AND RECOMMENDATIONS

The results of the present paper which aimed to study the teaching materials used during social studies lessons are as the following:

1. There is a meaningful difference in the use of both written and published materials and experience-giving methods in favor of female teachers.
2. The difference in written and published materials, experience-giving methods and in total was found to be in favor of the teachers who had been serving for 16 years or more. No significant correlation was found between the length of service and the use of audiovisual materials.
3. No meaningful difference was found in the use of Written and Published Materials, Audiovisual Materials and Experience-Giving Methods between teachers who had a personal computer and those who did not. 85.6% of the teachers were discovered to have a personal computer.
4. There was a meaningful difference in the use of written and published materials and experience-giving methods in favor of the teachers who had received an in-service training.
5. There was positive correlation between teachers' liking technology and their use of audiovisual materials and experience-giving methods. This means that teachers employ teaching materials during social studies lessons to the extent that they like technology.
6. It was determined that the teachers who "totally agreed" that there was an adequate number of equipment in their schools made use of teaching materials during social studies lessons more when compared to the teachers who "quite agreed" and "agreed a little" or "totally disagreed". It has been observed that the more the equipment in a school is, the more social studies teachers use materials in social studies lessons.

In the light of the results of the study, the following recommendations can be made:

1. Classroom teachers and social studies teachers should be made to undergo an in-service training in order to enable them to make use of teaching materials during social studies lessons in a more efficient manner.
2. Necessary precautions should be taken so as to increase the level at which teachers like technology.
3. The problems with teaching materials in schools should be immediately overcome and schools should include an adequate quality and quantity of teaching materials to be employed during social studies lessons.

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A STUDY OF COMMUNICATION SKILLS AND LONELINESS LEVELS OF UNIVERSITY STUDENTS IN TERMS OF THEIR INTERNET HABITS

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ABSTRACT

The aim of this research is to examine the communication skills and loneliness levels of university students in terms of their internet use habits.

The population of the study consists of the students at the university in Cyprus. The sample consists of 235 students at Cyprus International University selected according to purposeful sampling.

Data collection instruments are "Communication Skills Inventory" developed by Ersanlı and Balcı (1998) with the reliability of .72 and "Loneliness Scale" adapted by Demir (1989) with the reliability of .96.

In the analysis of data, t-test, ANOVA and correlation analysis techniques are used. The significance level is .05. As a result of research, it has been found that there are significant relationships between the communication skills loneliness levels of university students and their internet use habits.

Key words: Internet use, communication skills, loneliness level, university students

INTRODUCTION

Although internet usage has a very short history, it reached a privileged position by gaining a wide usage area on Earth. Internet is widely used in trading, communication, amusement sectors; education and even administrative applications as well as for chatting, listening to music and research purposes. As this communication tool's usage area expands day by day, new expressions, loss of verbalism, symbols, handy usages are introduced to our lives.

As internet became an indispensable part of our homes, businesses, briefly our lives in a short time; it started to take away some important things as it brings big convenience. It has become a new research topic that internet pushes people to laziness, decreases intercommunication between people and is making people asocial beings. The ideology of Communication-Information Revolution that is the third biggest technological revolution of human history is human rights, in other words democracy. In this period, cell phone via communication technology and computers via information technology entered in to people's lives and rapidly progressed. World is becoming a small village by computers, satellites and internet technologies. These technologies can transmit the latest information and developments instantly to every point in the world (Yalçın, 2010).

A couple of years ago, the internet was only known by press in Turkey, but today this technology is becoming wide-spread. The importance of computer in education and the most important property of computer, which differentiates it from other tools, is that it can be used as an output, education, control, presentation and communication tool. Education and teaching is also widespread on the internet by computers (Tezer & Arifoğlu, 2008). The number of researchers, which believes that internet usage deprive skills, ability and patients required for building social relations, is increasing every passing day (Kelleci, 2008). When we look at school children the inappropriate usage of computer and internet; games including violence, excess usage, visiting improper websites, inconvenient and unnecessary chats that brings tiredness, sleeplessness, corruption of attention and lesson failure attract our attention. Other evident facts can be listed as incuriosity about surroundings, break away from real life and economical difficulties (Cengizhan, 2010).

According to a research in America, every year, the internet usage is increasing by about 40 %. The students having a personal computer at home and spending the whole day in front of the screen are becoming asocial and problematic people that can not make friends easily in the course of time. Researches are showing that about 80 % of the internet users are formed by male students and this group especially spends a very long time in web-sites having pornographic contents. The legal regulations about this information bombardment that could lead to negative effects in their future spiritual lives have not yet done in any country (Yalçın, 2010). As the number of internet users over the world increases rapidly, fast changes in the demographic structure of the users is also observed. About 605 million people are reported of using internet on the world and some of these people are characterized as "internet addicts". According to the results of the Household Information Technology Usage Research 2007 by the Turkish Statistical Institute, 18.9 % of the households have access opportunity to internet. 16-74 years age group households' computer and internet usage ratios during the period of April-June 2007 are given respectively as 29.5% and 26.8% (Oğuz & Sakı, 2008).

Stimulus control defects and/or obsessive-compulsive defects symptoms have been identified on most of the individuals using computer or internet. A high correlation has been reported between psychological disorders and excessive computer usage. In other words, as excessive computer-internet usage can point out and report some psychological disorders; having some psychological disorders can also increase the risk of computer-internet addiction. It is such that, now in some academic papers, excessive and improper usage of computer and internet is characterized as psychological disorder or terms and concepts related with disorders such as "pathological internet usage", "internet addiction", "Computer/computer games addiction", "problematic internet usage" (Özcan & Buzlu, 2005; Kelleci, 2008; Kelleci, 2009; Yalçın, 2010; Cengizhan, 2010).

While internet is evaluated as a technological miracle that supports personal development for children and youths by reaching to information, doing research, solving problems, creativity, critical thinking, at the same time it is thought that it has negative effects on the development of personal skills by excessive, uncontrolled, improper and unconscious usage. In conventional community many people from almost every section are having problems in communication; even if they are together with others, they face loneliness perhaps not in physical but from psychological manner. Some individualised people could creep into their own skin and could enter into both physical and psychological loneliness (Dökmen, 1994). When people experience this type of loneliness and sidelining senses, this will increase the usage ratio of using internet that promises having nice time by virtual communication.

Relationships between the communication skills and loneliness levels of university students and their internet use habits will be investigated and how these factors affect each other will be evaluated and possible solving methods will be discussed with the help of the information gathered by this study.

This research aimed to be developed new perspective for academics, educational programmer, teachers, managers etc. to their own researches.

The Aim of the Research
The aim of this research is to examine the communication skills and loneliness levels of university students in terms of their internet use habits.

The Statement of the Problem
The problem statement of this study is "What are the meaningful relations (if any) between communication skills, loneliness levels and internet useage habits of university students?"
In the direction of this basic problem, answers to the following sub-problems were sought.
Communication skills and loneliness levels of university students;

a. is there statistically differnce whether being a member or not to facebook, msn, twitter, meeting, chatting, chat rooms etc.?
b. is there statistically differnce depending on the daily internet usage duration?
c. is there any statistically meaningful relationship between them?

RESEARCH METHODOLOGY

Research Design
This research is performed by descriptive type of associational model. Descriptive approach, which is widely used, aims to describe the interested cases. However, screening models are research approaches that aim to describe an existing case as it is (Karasar, 2009).

Universe and sample
University students studying in Cyprus forms the universe of this research. The sample of the research conducted among 235 students (40,9 % (n=96) male, 59,1% (n=139) female, who had been having education at Cyprus International University. These students were selected by criterion sampling, which is a purposive sampling method.

Instruments
"Communication Skill Inventory" which was developed by Ersanlı and Balcı (1998) with Cronbach's alpha reliability coefficient is .72 and "Loneliness Scale" adapted by Demir (1989) with Cronbach's alpha reliability coefficient is .96 applied as data collection instruments in this research.

Analysis of data
All analysis is performed by using the SPSS 15.0 for Windows. In this research percentage documentation average, t-test, one way analysis of variance (ANOVA) and Pearson Moment's Correlation Coefficient was figured out in the analysis of data. The significance level was accepted as .05 in this study.

RESULTS

The first sub-problem of the research is defined as "Do communication skills and loneliness levels of university students change whether being a member or not to facebook, msn, twitter, meeting, chatting, chat rooms etc.?" t-test was applied to determine whether there are statistically meaningful changes on the average loneliness level according to be a member or not to facebook, msn, twitter, meeting, chatting, chat rooms etc.

Table1. T-test Result on Communication Skills and Loneliness Levels According to be a Member or not to Facebook, Msn, Twitter, Meeting, Chatting, Chat Rooms etc.

Being a member or not		n	Mean	Std. Dev.	df	t	p
Communication	Yes	194	156,149	18,301	233	3,749	0,000*
	No	41	144,975	11,617			
Loneliness	Yes	194	49,139	7,134	233	0,160	0,873
	No	41	49,353	10,418			

* The mean difference is significant at the .05 level.

As a result of the t-test, it is determined that there is a meaningful change in the communication skills of university students depending on being a member or not to a web-site. As this can be seen from the Table 1, students that are members to facebook etc. show more positive levels of communication skills compared with those who are not members. Loneliness levels are independent of being member or not to a web-site, in other words, it is not affected.
The second sub-problem of this research is defined as "Do communication skills and loneliness levels of university students change depending on the daily internet usage duration?" F test (ANOVA) was applied to determine if there is a statistically meaningful difference in communication skills and loneliness level means depending on the daily internet usage duration.

Table 2: F-test Result for Communication Skills and Loneliness Levels Depending on Daily Internet Usage Duration.

Daily internet usage duration		n	Mean	Std. Dev.	df	F	p	Meaningful difference
Communication	None (a)	15	149,066	17,978	4	4,958	0,001*	d-b**
	1-3 hours (b)	44	164,068	16,912				
	3-5 hours (c)	67	154,298	19,866	230			e-b**
	5-8 hours (d)	69	150,797	15,460				
	8 hours + (e)	40	150,975	15,398	234			
	Total	235	154,200	17,815				
Loneliness	None	15	49,033	6,820	4	0,665	0,617	-
	1-3 hours	44	50,670	6,644				
	3-5 hours	67	49,216	7,770	230			
	5-8 hours	69	48,217	8,637				
	8 hours +	40	49,175	7,841	234			
	Total	235	49,176	7,780				

* The mean difference is significant at the .05 level.
** Difference on benefit.

According to the results obtained from one-way variance analysis, communication skills of university students are affected by the daily internet usage duration; however loneliness levels are not affected by the daily internet usage duration, in other words, it is independent.
The scheffe test was applied to the data to be able to determine the groups that causes statistically meaningful difference in the communication skills of university students. As a result of the scheffe test, it is determined that this meaningful difference arise from students

that express a daily internet usage duration of "1-3 hours" with "5-8 hours" and "8 hours and higher". This change is towards the benefit of group that expressed a daily internet usage of "1-3 hours".
The third sub-problem of this research is defined as "Is there any statistically meaningful relationship between communication skills and loneliness levels of university students?"

Table 3: Correlation Results between Communication and Loneliness Levels

		Loneliness Mean=49,176 Std. Dev.=7,780
Communication Mean=154,200 Std.Dev.=17,815	Pearson Correlation	-,211(**)
	Sig. (2-tailed)	,001
	n	235

** Correlation is significant at the 0.01 level (2-tailed)

When Table 3 is examined, it is determined that there is a low level negative and meaningful correlation between communication skills and loneliness levels of university students (r=0,211 p<0,05).
For this instance, it can be said that as the students' communication skills increase, their loneliness levels decrease.

DISCUSSION

Researches show that students mostly use internet purposely to search information and communication, chat, enjoy themselves and follow the news (Demir, 2001; Kozaklı, 2006; Oğuz *et. al.* 2008; Kelleci, 2008; Cengizhan, 2010). When literature is search thoroughly preliminary publications about problems connected with internet usage are done as of the first years of 1990's. Frequently coincident excessive Internet usage, especially at adolescents, causes defects in spiritual and physical developments, affects social relations negatively and brings academic performance down. In this context, previous research results support the results of this study. In a study, which investigated changes happening in families at the first two years of Iinternet usage, Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay and Scherlis 2002 determined that the communication in the family and local social environment decreases with more internet usage. Increase in the internet usage was also found out to be connected with increase in depression and loneliness in this research. When Morahan-Martin and Schumacher 2000 investigated university students about their internet usage, they partly verified the results of this study. Morahan-Martin and Schumacher pointed out that users, which neglect their responsibilities and be in difficulty of decreasing internet usage durations, face more levels of loneliness (Morahan-Martin & Schumacher 2000; Özcan & Buzlu, 2008). Oğuz et. al. (2008) carried a study on medicine students about their cognitive conditions on internet. They compared the students, which use internet for the purpose of playing games, chatting for many times, having video conversations, with students that do not do these activities. They found out that students that do stated activities showed statistically meaningful and higher points at social support, decreasing stimulus control and loneliness, depression scales.

CONCLUSION AND SUGGESTIONS

As a result of this study, independent variables, which are being a member or not to facebook, msn, twitter, meeting, chatting, chat rooms, etc. and daily internet usage durations, affect the communication skills of university students but they do not have an effect on students' loneliness levels. It is also found out that there is a low level but meaningful negative correlation between communication skills and loneliness levels; as communication skill level between individuals increases, the loneliness level decreases.
According to the results of this research, following suggestions are made. It should be ensured that students use computer and internet facilities properly, effectively and securely. Students should be acknowledged about how to profit form internet and they should be encouraged to use computer and internet for certain purposes such as researching and getting information. Students should also be encouraged to communicate with their friends without using the internet; they should be forced to join activities such as cinema, theatre, excursion and sportive activities. We should hold an opinion about the inclination of the students by getting information about which web-sites do the students visit on the internet. In this direction, the profits and dangers of the computer and internet should be discussed with the students. Students hobby development apart from computer and internet should be encouraged and the habit of reading books should be gained by following the families lead. Informative conversation groups should be formed to give information to students about the harms of excessive internet usage to the social life and arising physical disorders due to excessive usage.

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A STUDY OF THE ATTITUDES OF THE TEACHER EDUCATORS TOWARDS SECONDARY SCHOOL TEACHER EDUCATION PROGRAMME IN PAKISTAN

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Abstract
The success of any educational reform depends upon the quality of teachers and in turn the quality of teachers depends to a large extent on the quality of teacher education and quality of teacher education mainly depends upon the teacher training institutions. Education is a nation building activity and teachers are the pillars of the educational system. At present the education colleges and some departments of education of public sector universities are given the responsibility of providing Pre Service training, and with in the institutions teacher educators have to play an important and vital role. The study was aimed to know the attitude and perception of teacher educators towards secondary school teacher training programme in Pakistan. To get the desire end a questionnaire of 82 items was constructed. Questionnaire was divided into sub sectors i.e. Admission criterion. Objectives of teacher training, Facilities available, Content of the courses, Methodology used by the teacher educators, Teaching practice and Evaluation procedure adopted by the teacher educators. Data were collected from 325 teacher educators from 26 institutions through out the country and data were analyzed by using mean score t test and ANOVA by comparing different variables i.e. age, gender, residence, institution, province, academic qualification, professional qualification, teaching experience, administrative experience. The study revealed that there is significant difference among the attitude and perception of teacher educators on selected variables i.e. age, gender, residence, institution, province, academic qualification, professional qualification, teaching experience, administrative experience. Beside it very interesting finding were found.
Key words; objectives; facilities; content; methodology;evaluation; admission criterion

Introduction

The role of teacher and education in the reconstruction of society need no fresh emphasis. The trio, the teacher, the educational system and the society have seldom come to terms about their respective deal both independent and mutual. Nowhere, have the expectations been of a deeper and wider nature than in the case of an educator. Again, nowhere have they been so little explicit and undefined as in the case of teachers. Training colleges have conceived of or imagined a certain perspective in the functioning and behaviour of the teacher in a school. Teacher is building future citizens of the country. As he/ she molds the children the country will be molded. From this point of view, a lot of responsibilities lie with the teacher to execute in day-to-day activities. But the teachers must be equipped to deal with children. They should develop necessary knowledge, skills, abilities and attitude to perform their duties effectively. It is in this context that education of teachers becomes most important in any country. It is so worthwhile to raise some issues in this regard and think of their solution. If we talk to average parents they will say that there is practically no teaching in schools so the child should be provided with private tuitions. Probably the same reply will be expected from the head of the educational institutions. Even if some teachers teach, that is more or less mechanical. Ask students; a good number of them will tell that they do not like the school. All these situations reveal that a good number of teachers are not interested to teach. They do not love students. If you ask them they will further add that they have joined this profession, as there was no other alternative. If this is the state of affairs with teachers, what type of learning will we expect from children? (Sing& Nath, 2005, p. 111).Attitude serves as an index of how we think and feel about people, objects and issues in our environment. In addition, they can provide clues future behaviors, predicting how we will act when encounter the objects of our beliefs. While according to Bem (1970) & Karlinger (1984) as quoted by Hussain (2004) that attitudes are likes and dislikes. It is tendency to act towards or against some thing.
According to Bem (1974) as quoted by Hussain (2004) it is a psychological construct, or latent variable inferred from observable responses to stimuli, which is assumed to mediate consistency and covariance.Anastasi (1990) is also of the view that attitudes can not be directly observed but must be inferred from overt behavior both verbal and non verbal. Generally when it is said that we have a certain attitude towards something or some one, is like a short hand way of saying that we have feelings or thoughts of like or dislike (affect), trust or distrust (cognition), attraction or repulsion (behavior) towards some thing or some one (Wittrocks,1984) as quoted by Hussain (2004).
The teaching profession demands a clear set of goals, love of profession and obviously the more favorable attitude towards the profession. If teachers are well trained and highly motivated, learning will be enhanced (Govt of Pakistan, 1979). According to Govt of Pakistan (1998) Pakistan needs well trained and professionally sound teachers and a lot of responsibilities falls on teacher training institutions in this perspective. These institutions should take pain taking efforts to equip the prospective teachers.
According to Glaser (1989) as quoted by Hussain (2004) for effective teaching learning process, a sound professional education and training is inevitable. Rasul (1992) is also of the view that a sound programme of professional education of teachers is essential for qualitative improvement of education.Teaching is an art and many are to be trained in this art. Anybody can become a teacher but everybody cannot become an effective teacher. In olden days the requirements in terms of teacher education were limited but the present system requires only well trained teachers. A comprehensive teacher education programme may help in producing quality teachers. At present the education colleges and some departments of education of public sector universities are given the responsibility of providing Pre Service training. Hence, there is every need to look into the status of T T Is at secondary level from various angles and to study the situation on the basis of perceptions of teacher educators, who form a part and parcel of the total training programme at the T T Is level. So the present study will be an ardent effort in this direction.

Objectives of the study

1. To measure the opinion of teacher educators regarding secondary school teacher's training programme
2. To compare the opinion of teacher educators on different variables i.e. (gender, residence, age, province, teaching experience, academic qualification and professional qualification).

Research Methodology

The study was descriptive in nature.

Population.

All the teacher educators of teacher training institutions where B.Ed programme to secondary school teachers is offered are considered the population of the study. Which were 431 in number.

Sample

All the 431 teacher educators were taken in sample but only 325 (75.04%) responded.

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Research instrument

A 73 items questionnaire was constructed and divided into seven dimensions i.e. (admission criterion, objectives, facilities, content. Methodology, teaching practice and evaluation) was administered to the teacher educators and there opinion was got. Before the administration of questionnaire, it was pilot tested and its reliability was calculated, the reliability of the questionnaire was 0.937.

Data Analysis

After collecting data the data was fed into SPSS spread sheet and verified. Then data was analyzed by using mean, independent sample t-test and ANOVA at 0.05 significant level.

Findings

The findings of the study were as under:

Table: 1 Showing the mean difference between mean scores of male and female teacher educators on different parameters of teacher training

Dimensions	*Gender*	*N*	*Mean*	*Std. Deviation*	*Std. Error Mean*	*df*	*t-value*	*p-value*
Admission Criterion	Male	174	2.9387	.82281	.06238	323	1.526	0.128
	Female	151	3.0728	.75119	.06113			
Objectives	Male	174	3.3287	.66053	.05007	323	2.961	0.003
	Female	151	3.5408	.62466	.05083			
Facilities	Male	174	3.1448	.63288	.04798	323	3.176	0.002
	Female	151	3.3863	.73798	.06006			
Content	Male	174	3.1919	.70223	.05324	323	1.996	0.047
	Female	151	3.3383	.60869	.04953			
Methodology	Male	174	3.2083	.67734	.05135	323	1.784	0.075
	Female	151	3.3361	.60311	.04908			
Teaching Practice	Male	174	3.5322	.82350	.06243	323	2.235	0.026
	Female	151	3.7377	.83080	.06761			
Evaluation	Male	174	3.3741	.76049	.05765	323	3.630	0.000
	Female	151	3.6623	.65562	.05335			

It is evident from above table that there is significant difference between the mean scores of female teacher educators and male teacher educators on objectives of teacher training being achieved, facilities provided in the teacher training institutions, contents taught during training, teaching practice component of the training and evaluation process of the training. Female Teacher educators are more confident and more positive on objectives of teacher training being achieved, facilities provided in the teacher training institutions, contents taught during training, teaching practice component of the training and evaluation process of the training. While on the other parameters i.e. admission criterion of the institutions and methodology adopted by the teacher educators there is a difference but that difference is not significant statistically. So it can be concluded from the above table that female teacher educators are more positive and confident towards the teacher training of secondary school teachers.

Table: 2 Showing the mean difference between mean scores of urban and rural teacher educators on different parameters of teacher training

Dimensions	*Residence*	*N*	*Mean*	*Std. Deviation*	*Std. Error Mean*	*df*	*t-value*	*p-value*
Admission Criterion	Urban	286	2.9662	.77637	.04591	323	-2.159	.032
	Rural	39	3.2564	.86674	.13879			
Objectives	Urban	286	3.3681	.62812	.03714	323	4.569	.000
	Rural	39	3.8615	.66586	.10662			
Facilities	Urban	286	3.2632	.67210	.03974	323	0.432	0.666
	Rural	39	3.2120	.84090	.13465			
Content	Urban	286	3.2501	.63048	.03728	323	0.717	0.474
	Rural	39	3.3314	.87513	.14013			
Methodology	Urban	286	3.2255	.62203	.03678	323	3.232	0.001
	Rural	39	3.5769	.73880	.11830			
Teaching Practice	Urban	286	3.5958	.82589	.04884	323	1.878	0.061
	Rural	39	3.8615	.84996	.13610			
Evaluation	Urban	286	3.4979	.72125	.04265	323	0.577	0.499
	Rural	39	3.5821	.77353	.12386			

It is evident from above table that there is significant difference between the mean scores of teacher educators from urban and rural on admission criterion of the institutions, objectives of teacher training achieved and methodology adopted by the teacher educators during the training. Teacher educators from rural locality are more confident and more positive on admission criterion of the training institutions , objectives of training are being achieved as well the teacher educators adopt good methodology while their counter parts from urban locality are significantly less confident than them. While on all the other parameters there is a difference but that difference is not significant

statistically. So it can be concluded from the above table that teacher educators from rural locality are more positive and confident towards the teacher training of secondary school teachers.

Table: 3 Showing the ANOVA on all the parameters of teacher training regarding age of teacher educators.

Dimension	*Source of Variation*	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Admission Criterion	Between Groups	9.423	6	1.571	2.577	.019
	Within Groups	193.798	318	.609		
	Total	203.222	324			
Objectives	Between Groups	3.736	6	.623	1.479	.185
	Within Groups	133.911	318	.421		
	Total	137.647	324			
Facilities	Between Groups	2.285	6	.381	.790	.579
	Within Groups	153.413	318	.482		
	Total	155.699	324			
Content	Between Groups	2.313	6	.386	.874	.514
	Within Groups	140.305	318	.441		
	Total	142.618	324			
Methodology	Between Groups	7.027	6	1.171	2.905	.009
	Within Groups	128.225	318	.403		
	Total	135.252	324			
Teaching Practice	Between Groups	2.671	6	.445	.639	.699
	Within Groups	221.599	318	.697		
	Total	224.271	324			
Evaluation	Between Groups	4.259	6	.710	1.352	.234
	Within Groups	166.980	318	.525		
	Total	171.239	324			

It is evident from above table that there is a significant difference among the groups on the admission criterion of the training institutions and methodology adopted by the teacher educators during training according to the age of the teacher educators. While on the other parameters objectives of the teacher training, facilities provided during training, contents taught during training, teaching practice component of the training and evaluation process of the training, there is no significant difference among the groups age wise.

Table: 4 Showing the ANOVA on all the parameters of teacher training regarding provinces

Dimensions	*Source of Variation*	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Admission Criterion	Between Groups	23.721	3	7.907	14.140	.000
	Within Groups	179.501	321	.559		
	Total	203.222	324			
Objectives	Between Groups	6.185	3	2.062	5.034	.002
	Within Groups	131.462	321	.410		
	Total	137.647	324			
Facilities	Between Groups	3.778	3	1.259	2.661	.048
	Within Groups	151.920	321	.473		
	Total	155.699	324			
Content	Between Groups	3.047	3	1.016	2.336	.074
	Within Groups	139.571	321	.435		
	Total	142.618	324			
Methodology	Between Groups	5.905	3	1.968	4.884	.002
	Within Groups	129.348	321	.403		
	Total	135.252	324			
Teaching Practice	Between Groups	7.931	3	2.644	3.923	.009
	Within Groups	216.340	321	.674		
	Total	224.271	324			
Evaluation	Between Groups	10.966	3	3.655	7.321	.000
	Within Groups	160.273	321	.499		
	Total	171.239	324			

According to the above table there is a significant difference among the various groups on all the parameters of teacher training except contents taught during the training.

Table: 5 Showing the ANOVA on all the parameters of teacher training regarding teaching experience

Dimensions	*Source of Variation*	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Admission Criterion	Between Groups	13.935	6	2.322	3.902	.001
	Within Groups	189.287	318	.595		
	Total	203.222	324			
Objectives	Between Groups	4.680	6	.780	1.865	.086
	Within Groups	132.967	318	.418		
	Total	137.647	324			
Facilities	Between Groups	6.351	6	1.059	2.254	.038
	Within Groups	149.348	318	.470		
	Total	155.699	324			
Content	Between Groups	4.641	6	.773	1.783	.102
	Within Groups	137.977	318	.434		
	Total	142.618	324			
Methodology	Between Groups	10.872	6	1.812	4.632	.000
	Within Groups	124.381	318	.391		
	Total	135.252	324			
Teaching Practice	Between Groups	9.195	6	1.532	2.266	.037
	Within Groups	215.076	318	.676		
	Total	224.271	324			
Evaluation	Between Groups	6.862	6	1.144	2.212	.042
	Within Groups	164.378	318	.517		
	Total	171.239	324			

According to the above table there is a significant difference among the various groups on all the parameters of teacher training except objectives of the teacher training and contents taught during the training and objectives of the training.

Table: 6 Showing the ANOVA on all the parameters of teacher training regarding professional qualification of teacher educators

Dimensions	*Source of Variation*	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Admission Criterion	Between Groups	3.213	6	.536	.851	.532
	Within Groups	199.561	317	.630		
	Total	202.775	323			
Objectives	Between Groups	3.171	6	.529	1.249	.281
	Within Groups	134.147	317	.423		
	Total	137.318	323			
Facilities	Between Groups	4.120	6	.687	1.440	.199
	Within Groups	151.120	317	.477		
	Total	155.240	323			
Content	Between Groups	2.494	6	.416	.941	.466
	Within Groups	140.046	317	.442		
	Total	142.540	323			
Methodology	Between Groups	2.850	6	.475	1.140	.339
	Within Groups	132.082	317	.417		
	Total	134.931	323			
Teaching Practice	Between Groups	4.314	6	.719	1.037	.401
	Within Groups	219.817	317	.693		
	Total	224.132	323			
Evaluation	Between Groups	4.020	6	.670	1.271	.270
	Within Groups	167.134	317	.527		
	Total	171.154	323			

It is evident from the above table that there is no significant difference among the mean scores of teacher educators on all the parameters of teacher training i.e. admission criterion adopted by the training institutions, objectives of the teacher training, facilities provided in the training institutions, content taught during training, methodology adopted by the teacher educators, teaching practice component of the training and evaluation process of the training. So, it can be concluded from the above table that all the teacher educators are having the same opinion about the all parameters of the teacher training regarding professional qualification.

Table: 7 Showing the ANOVA on all the parameters of teacher training regarding academic qualification of teacher educators.

Dimensions	*Source of Variation*	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Admission Criterion	Between Groups	4.002	4	1.001	1.607	.172
	Within Groups	199.220	320	.623		
	Total	203.222	324			
Objectives	Between Groups	2.568	4	.642	1.521	.196
	Within Groups	135.079	320	.422		
	Total	137.647	324			
Facilities	Between Groups	1.053	4	.263	.545	.703
	Within Groups	154.646	320	.483		
	Total	155.699	324			
Content	Between Groups	1.548	4	.387	.878	.477
	Within Groups	141.070	320	.441		
	Total	142.618	324			
Methodology	Between Groups	1.868	4	.467	1.121	.347
	Within Groups	133.384	320	.417		
	Total	135.252	324			
Teaching Practice	Between Groups	1.929	4	.482	.694	.597
	Within Groups	222.342	320	.695		
	Total	224.271	324			
Evaluation	Between Groups	3.637	4	.909	1.736	.142
	Within Groups	167.602	320	.524		
	Total	171.239	324			

It is evident from the above table that there is no significant difference among the mean scores of teacher educators on all the parameters of teacher training i.e. admission criterion adopted by the training institutions, objectives of the teacher training, facilities provided in the training institutions, content taught during training, methodology adopted by the teacher educators, teaching practice component of the training and evaluation process of the training. So, it can be concluded from the above table that all the teacher educators are having the same opinion about the all parameters of the teacher training regarding academic qualification.

Discussion

There were seven parameters of teacher training on which the views of female and male teacher educators were taken. The results show that there is significant difference between the mean scores of female teacher educators and male teacher educators on almost all parameters as: achievement of objectives of teachers training, provision of facilities in teacher training institutions, relevance of contents, teaching practice and evaluation process of the training. Female Teacher educators are more confident and more positive on objectives of teacher training being achieved, facilities are provided in the teacher training institutions, relevant contents are taught during training, teaching practice component of the training and evaluation process of the training are effective. But on one parameter i.e. admission criterion of the institutions and methodology adopted by the teacher educators, there is a difference in teacher educators' views but that difference is not significant. So it can be said that female teacher educators are more confident and satisfied from the teacher training of secondary school teachers (table: 1).

There is significant difference between the mean scores of teacher educators from urban and rural on admission criterion of the institutions, objectives of teacher training achieved and methodology adopted by the teacher educators during the training. Teacher educators from rural locality are more confident and more positive on admission criterion of the training institutions, objectives of training are being achieved as well the teacher educators adopt good methodology while their counter parts from urban locality are significantly less confident than rural. While on the other parameters as: provision of facilities in teacher training institution, relevance of contents and evaluation process of institution, there is a difference but that difference is not significant. So it can be said that teacher educators from rural locality are more confident towards the teacher training of secondary school teachers (table: 2).

When ANOVA was run according to the age of the teacher educators and it was found that a significant difference exist on the admission criterion of the training institutions and methodology adopted by the teacher educators during training (Table: 3). ANOVA results show that there is a significant difference among the various groups (province wise)on all the parameters of teacher training except contents taught during the training (table: 4).

ANOVA results on all the parameters of teacher training regarding teaching experience show that there is a significant difference among the various groups on all the parameters of teacher training except objectives of the teacher training and contents taught during the training and objectives of the training (table: 5).

When ANOVA was run on all the parameters of teacher training regarding professional qualification of teacher educators. The results show that there is no significant difference among the mean scores of teacher educators on all the parameters of teacher training So, it can be said that all the teacher educators are having the same opinion about the all parameters of the teacher training regarding professional qualification (table: 6).

ANOVA results on all the parameters of teacher training regarding academic qualification of teacher educators indicate that there is no significant difference among the mean scores of teacher educators on all the parameters of teacher training. in other words it can be said that all the teacher educators are having the same opinion about the all parameters of the teacher training regarding academic qualification (table: 7).

Conclusions

- Female teacher educators are more satisfied with the teacher training of secondary school teachers.
- Teacher educators from rural locality are more confident towards the teacher training of secondary school teachers.
- The teacher educators of Different age groups have different views about teacher training institutions.
- Significant difference exists among the various groups of various provinces on all the parameters of teacher training except contents taught during the training, where there is no difference among the views of teacher educators.
- Teacher educators are significantly different to each other on all the parameters of teacher training except objectives of the teacher training and contents taught during the training and objectives of the training.
- All the teacher educators are having the same opinion about the all parameters of the teacher training regarding professional qualification and academic qualification.

Recommendations

- Quality of mail teacher training institutions should be improved regarding teacher educators and facilities provided at the institutions.
- Urban teacher training institutions should pay their attention to improve the standards to satisfy their stakeholders.
- Methodology adopted by teacher educators should be effective as it's a great source of motivation for the students (secondary school teachers).
- In Balochistan teacher training institutions for secondary school teachers should be upgraded regarding their quality and standard because results show that Balochistan is significantly lower among all provinces.
- The teachers who are professionally qualified should be appointed as teacher educators in secondary school teacher training institutions. Because this is the level of education where personalities of students can be polished accordingly.
- Evaluation process of secondary school teacher educator institutions should be made effective by involving external evaluation policy to minimize the bias in process.

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A STUDY OF THE EFFECT OF SCHOOL MUSIC EDUCATION WITH ORFF-SCHULWERK IMPROVISATION STUDIES ON MUSICAL CREATIVITY PROCESS

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Abstract
This study is designed to investigate the effect of improvisation studies with Orff-Schulwerk using Orff Instruments on musical creativity process of students and on the basis of results, is intended to make some contribution for development of an elementary school music curriculum.
The main aim of the study is to explore the effect of improvisation studies with Orff-Schulwerk on development of musical creativity.
Pre-test/post-test with control group experimental model was used in this study.
Fourth grade students are enrolled for both the study (n=21) and the control groups (n=21).
"Thinking Creatively with Sounds and Words" scale developed by Khatena and Torrance was applied as pre-test and post-test to the both groups. The study group received Orff-Schulwerk improvisation sessions for six weeks where as students of control group attended their regular music classes.
Statistical analysis showed that the musical creativity of the study group who received Orff-Schulwerk improvisation sessions increased where as in control group musical creativity remained unchanged.
Key words: Orff-Schulwerk, improvisation, musical creativity, music education, Orff instruments

INTRODUCTION

How can creative individuals be brought up in accordance with the purposes of the education? According to Rowlinson (1995), every person, without exception, has creative skill. However, creative skill is clearly suppressed for the sake of the development of other skills However, the development of creative skills is clearly under pressure from the focus on the development of other skills, both due to the routine behaviors relating to the education to which students are exposed during their school lives, and due to the activities conducted in the university education, technical education, professional education and practical fields. In many cases, practices with a creative approach are actually prevented as a solution to problems. Creativeness is underlain by the concept of "producing new things" (Kaptan and Kuşakçı, 2002, p.1)
According to Bilen (1999), music education constitutes one of the most appropriate fields of art education in raising creative individuals. Gürgen (2006, p.82) stated that music classes having an important role in raising creative individuals must be provided via modern approaches to music education, whose efficiency has been demonstrated experimentally.
Modern approaches to music education refer to a learning process which comprises of activities and games exposing the creative potential, and in which students are active and learn by doing and experiencing. These educational approaches enable individuals to discover creative skills, which may be internalized for certain reasons, by breaking ossified patterns of behavior. As individuals create something, their self-confidences increase, and therefore they establish a more healthy and balanced relationship with the external world. One of the reasons for the failure to support life-long learning, modern and creative individuals stems from teaching methods. Even if the targets required by the modern age are determined, it is impossible to realize these targets via conventional methods of education. According to Açıkgöz (2003), conventional methods give students the message that "they cannot bear the responsibility of their own learning process". This situation eradicates self-confidence, motivation and creativity of the student (Gürgen, 2006, p.86).
There are many music education methods and approaches, proven to develop students' musical creativity, which were transferred to the present time but which were not included within the music education curriculum in Turkey. One of these approaches is the "Orff Approach".
Musical creativity is a cognitive process through which one consciously and unconsciously arranges familiar musical patterns in unfamiliar or novel orders (adapted from Gordon, 1988). That process requires two types of thinking. First, one generates a number of novel musical ideas. Then, one chooses among those ideas and puts them together in ways that make musical sense. Teachers can encourage both kinds of thinking by stimulating students' imaginations and inventive powers and, at the same time, giving them knowledge and skills to use the ideas produced to create music others can hear and, at least to some extent, understand (Miner, 2007, p.1)
The focal point of this active music education approach, which is also called the "Orff Schulwerk" approach, consists of improvisation and creation. This is because improvisation and creation are parts of the natural behavior of the child. Each improvisation is an indicator of a courage. Students can express themselves only if they discover their skills and they are provided with conditions appropriate and comfortable for them (Gürgen, 2006, p.88).
The reason for choosing the topic of creativity as study area of this research is the researcher's belief that there is a great need for creative individuals in in Turkey and music education has a great role in making up this deficiency.

BACKGROUND

This section discusses improvisational and creative practices implemented via the Orff approach within the scope of the research
Wampler (1968) examined the impacts of integrating the Orff method into the California school curriculum. Classes using the Orff Approach lasting for 40 minutes were given by three project staff to 10 first and second-grade students (N=325) in five schools, twice a week. The variables examined included Children's Individual Test of Creativity (CITOC, developed by Metfessel, Burns and Foster), mid-semester evaluations of the teachers, behavior control list, attitude test and reading success Three main themes were examined: Testing the Orff approach, curriculum development and evaluation of the children's results. It was observed that children trained via the Orff method could express themselves more freely, they could comprehend the relationship between time and space more easily and they could improvise more successfully. According to the evaluations of the educators, progress was made in seven out of nine categories.
A research by Flohr (1981) five-year old children (N=29) were divided into three groups. Group One received music instruction based on the Orff Schoolwork approach with emphasis on improvisation which included question-and-answer games over a bordun, improvising phrase extensions, and playing in response to verbal stimuli. Group Two received music instructions with activities in singing, playing and moving. Group Three did not receive any music instruction. The Primary Measures of Music Aptitude (PMMA) was given before and after the twelve-week instruction to all children. ANCOVA was used to compare post-test scores, using the pre-test as covariate. No difference was found on the three groups using raw scores. Difference was found when comparing music instruction (Groups 1 and 2) and no instruction (Group 3). t-tests indicate that all groups improved on post-test ($p<.05$).Twelve-week music instruction increased young children's musical aptitude.

Bishop (1991) investigated whether there was a difference in terms of the development of musical creativity between third-grade music students. While one of the classes was trained via the Orff approach, the other class used a more conventional method. At the end of the 12-week study period, the results were evaluated via the Webster Creative Thinking in Music Scale. When pretest and posttest averages were compared, a difference was determined between musical flexibility scores, but no significant difference was observed between other sub-scores (musical comprehensiveness, musical originality and musical syntax).

A study by Aral, Akyol and Sığırtmaç (2006) examined the impact of music education via the Orff approach on the creativity of children – aged 5 to 6. The 40 children included in the study were randomly divided into an experimental group and control group. A General Information Form and Torrance Creative Thinking Test-Figure Form A were used as data collection instruments. Children in the experimental group were given music education based on the Orff approach, and children in the control group continued their normal pre-school education. Te results indicated that there was no statistically significant difference between pretest and posttest creativity scores of children in the experimental group and control group, but there was a significant difference between pretest and posttest creativity scores when no group distinction was made.

METHODS AND PROCEDURES

The present study examined whether or not improvisation practices via the Orff approach have an impact on the musical creativity of 4th-grade primary education students. The experimental study used a pre-test/post-test/control group structure. The study group consisted of an experimental group (n=21) made up of 4th grade students studying at Açı Primary School and a control group (n=21), again made up of 4th grade students.

There were 9 male students (42.9%) and 12 female students (57.1%) in both of the groups. There was therefore no gender difference between the experimental and control groups.

The "Thinking Creatively with Sounds and Words" scale, developed by Khatena and Torrance, was used in order to measure developmental changes in the students' musical creativity. This test was developed by Khatena and Torrance by conducting many studies relating to creativity over many years. This test was created by combining two different scales, "Sounds and Images" and "Evocative Sounds and Images". The "Linguistic Equivalence, Reliability and Validity pilot studies" of the scale were conducted by Duygu Piji and Esra Aslan. Analysis of the internal consistency of the test showed correlation coefficients of between (r=0.66) and (r=0.68), obtained through Cronbach's Alpha, Spearman-Brown and Guttman techniques on scores students took from the tests. The correlation coefficients indicated that the test was reliable.

Implementation Stages:

This study comprises of a pretest implemented on the experimental and control groups, a study period "Improvisation Practice via the Orff Approach" lasting for 6 weeks with the experimental group, and a posttest with both the experimental and control groups. In the first stage of the study, a pretest was implemented on both of the groups, and then studies with the experimental group were started.

"Improvisation Practices via the Orff Approach" made with the experimental group:

1st week: Students get acquainted with one another by making sounds using different parts of their bodies - the parts they prefer - in accordance with the rhythm of the sentences they establish.

2nd week: The "acquaintance" practice made in the first week is repeated with xylophones. Acquaintance sentences are established with the melodies they produce, by using the notes between "Middle C and G".

3rd week: Students try to animate a sound they chose from nature using Orff instruments.

4th week: The class is divided into four groups and each group animates sounds chosen by the teacher. After giving a specific time to the groups, the practice begins, on condition that the group ready for vocalizing performs firstly. At the end of the class, the researcher gives a study task to the same groups for the following week. Each group chooses a spokesperson, who takes on the task of writing a story about the given sound examples before the following practice.

5th week: Through voting, the class chooses one of the stories written by the spokesperson of each group in accordance with the task given the previous week. Students are given 5 minutes to think about how the story chosen via voting will be vocalized with Orff instruments. Each group makes an individual presentation via Orff instruments, with the first ready group performing first. Following the completion of the study, the researchers give the groups another week, to revise or arrange their stories, except for the group whose story was chosen for the following practice. The researcher states that each group will vocalize their own story in the following practice.

6th week: Groups other than the group vocalizing their own story the previous week tell their stories, and then make their presentations in which they vocalize the stories belonging to their own groups by using Orff instruments. As the last stage of the study, a posttest was implemented with both of the groups.

Practice with the Control Group:

While "Improvisation Practices via the Orff Approach" lasting for 6 weeks were made with the experimental group, the control group was exempted from these practices, but both the experimental group and control group received education according to the school curriculum in order to ensure parallelism in terms of information background.

1st week: The topic of "Rhythm" and "Beat", which is one of the basic components of the music, is covered, and the topic is strengthened in the 2nd class by an accompanying tongue twister, named "*One Potato*" with rhythm instruments as an activity.

2nd week: The topic of "Rhythm" and "Beat" is repeated and the study starts to cover "Pitch", which is another basic element. The placement of musical notes on the stave is introduced. In the 2nd class, the topic of a "Musical" is mentioned briefly, and the song "*Doe a Deer*", from the musical "*The Sound of Music*" is sung with its Turkish and English lyrics.

3rd week: Students practice beat and rhythm with the African song named "*O Ye Ye*", and the song "*Doe a Deer*" is repeated in the 2nd class in order to strengthen the topic of pitch.

4th week: The musical "*The Sound of Music*" musical introduced by remembering the features of the musical. In the 2nd class, instrument practice is made by remembering the notes of middle c – re – e on the stave.

5th week: The musical "*The Sound of Music*" was covered and finished.

6th week: The topics of "Melody", "Harmony" and "Polyphonic Music" are expressed, and the songs "*Do-Mi-Mi*" and "*When You Know the Notes*" are played. These two songs are sung in the 2nd class in order to strengthen the concept of polyphonic music.

RESULTS

In this experimental study, the relationship was examined between improvisation via the Orff approach and musical creativity. Improvisation training of 6 weeks was given to the students in the study group and their musical creativeness was determined through tests on the topics of Sounds and Images and Evocative Sounds and Images. The findings of the study are discussed below.

First, descriptive statistics of the groups are given and then Wilcoxon and Mann Whitney U Test results were used to determine whether or not there is a significant difference between the group scores.

Table:1 The Pre-test Practices of the students "Sounds and Images" of the sub dimension Mann Whitney U Test Results

	N	ST	SO	U	z	p
Deney Grubu	21	22,19	466,00	206,000	-0,36	0,715
Kontrol Grubu	21	20,81	437,00			

In the pretest practices, the Mann Whitney U test of the sub dimension of "Sounds and Images" showed no significant difference between pretest scores of students in the experimental group and students in the control group. (z=-0.36, p>0.05).

Table: 2 The Pre-test Practices of the students "Evocative Sounds and Images" of the sub dimension Mann Whitney U Test Results

	N	ST	SO	U	z	p
Deney Grubu	21	19,43	408,00	177,000	-1,09	0,273
Kontrol Grubu	21	23,57	495,00			

In pretest practice, the Mann Whitney U test of the sub dimension of "Evocative Sounds and Images" indicated no significant difference between pretest scores of students in the experimental and control groups (z=-1. 09, p>0.05).

Evaluating these results together, it can be concluded that the experimental group and control group had a homogenous structure before the research and they also showed similarity in terms of creativeness test sub dimensions.

Table:3 The Experimental Group "Sounds and Images"of the sub dimension Wilcoxon Test Results

	N	ST	SO	z	p
Öntest	21	7,25	29,00	-2,46	0,014*
Sontest	21	10,14	142,00		

*P< 0,05

In the experimental group, comparison of pretest and posttest Wilcoxon scores for the "Sounds and Images" sub dimension showed a significant difference in favor of the posttest scores (z=-2.46, p<0.05). These results indicate that improvisation practice using the Orff approach produced positive progress in the "sounds and images" sub dimension of the creativity test.

Table:4 The Experimental Group "Evocative Sounds and Images" of the sub dimension Wilcoxon Test Results

	N	ST	SO	z	p
Öntest	21	10,50	31,50	-2,93	0,003**
Sontest	21	11,08	199,50		

**P< 0,01

In the experimental group, comparison of pretest and posttest Wilcoxon scores for the "Evocative Sounds and Images" sub dimension showed a significant difference in favor of the posttest scores (z=-2.93, p<0.01). These results indicate that improvisation practice using the Orff approach produced positive progress in the "evocative sounds and images" sub dimension of the creativity test. This sub dimension showed a greater pretest/ posttest variation than the other sub-group, indicating a greater development in creativity for this theme.

Table: 5 The Control Group "Sounds and Images"of the sub dimension Wilcoxon Test Results

	N	ST	SO	z	p
Öntest	21	10,23	112,50	-0,70	0,480
Sontest	21	9,69	77,50		

In the control group, a Wilcoxon test of the "Sounds and Images" sub dimension showed no significant difference between pretest and posttest scores (z=-0, 70, p>0, 05). These results indicate that the students in the control group, who did not participate in any practice, did not demonstrate any statistically significant, spontaneous variation in creativity within the "sounds and images" sub dimension of the creativity test.

Table:6 The Control Group "Evocative Sounds and Images" of the sub dimension Wilcoxon Test Results

	N	ST	SO	z	p
Öntest	21	12,38	148,50	-1,62	0,104
Sontest	21	7,69	61,50		

No significant difference was found between pretest and posttest scores of the students in the control group according to Wilcoxon test analysis of the "Evocative Sounds and Images" sub dimension (z=-1.62, p>0.05). These results indicate that the students in the control group, who did not participate in any practice, did not demonstrate any statistically significant, spontaneous variation in creativity within the "evocative sounds and images" sub dimension of the creativity test.

Table:7 The Post-test Practices of the students "Sounds and Images" of the sub dimension Mann Whitney U Test Results

	N	ST	SO	U	z	p
Deney Grubu	21	26,17	549,50	122,500	-2,47	0,013*
Kontrol Grubu	21	16,83	353,50			

*p<0,05

A significant difference was seen between posttest scores of the students in the experimental group and posttest scores of the students in the control group according to Mann Whitney U test of the "Sounds and Images" sub dimension (z=-2.47, p<0.05), indicating greater creativity

among students in the experimental group. These results indicate that improvisation practice by the experimental group using the Orff approach produced positive progress in the "sounds and images" sub dimension of the creativity test.

Table: 8 The Post-test Practices of the students "Evocative Sounds and Images" of the sub dimension Mann Whitney U Test Results

	N	ST	SO	U	z	p
Deney Grubu	21	28,29	594,00	78,000	-3,59	0,000**
Kontrol Grubu	21	14,71	309,00			

**p<0,01

In the "Evocative Sounds and Images" sub dimension, the Mann Whitney U test showed a significant difference between posttest group scores (z=-3.59, p<0.01), in favor of the experimental group. These results indicate that improvisation practices by the experimental group using the Orff approach led to positive progress in the "evocative sounds and images" sub dimension of the creativity test. In light of all these findings, it can be said that, at the end of the experimental study, the improvisation practice using the Orff approach made positive contributions to the musical creativity process of the students in the experimental group.

CONCLUSION

According to the results of the study, there was an increase in musical creativity levels among 4th grade students in the experimental group, who practiced improvisation using the Orff Approach.

The educational system must primarily aim to bring up individuals who are creative and self-confident, who can create solutions to problems and who can demonstrate independence. To achieve these aims, educational approaches must avoid rote learning and should therefore involve more creative and more active methods introduced by modern educational methods.

Music classes provide an environment within which students can most comfortably develop their creativity. At the beginning of the musical creativity process, the child shows interest in the sounds and starts to play with these sounds. This shows that conversion of this natural tendency to creativity is achieved most easily through music education.

On condition that necessary materials (Orff instruments) are provided, music education via the Orff Approach can easily be practiced by music teachers. It comprises of activities that can develop the creativity of not only students but also the teachers. Music education via the Orff Approach is a "student-centered" education system; the teacher just guides the students and attends them from time to time. Students create music freely through the songs, dances and stories they form on their own.

"Improvisation" practices, which are a part of this education system, both entertained the students and strengthened their self-confidence. Evaluating the practices, it is seen that;

1. "Acquaintance via Body Percussion" functioned as a warm-up exercise for the students in terms of the improvisation and students performed this activity easily by entertaining very much.
2. "Acquaintance by Using Xylophones" was achieved in accordance with the plan, but students had some difficulty in creating distinctive and euphonic melodies using the "mallet" technique.
3. "Animation of Sounds Self-Selected from Nature via Orff Instruments" became an exercise in which students could express themselves freely. However, some students had great difficulty in animating the sounds and setting their imaginations free. Instrument handling is crucial in these kinds of improvisation practices.
4. "Group Animation of a Given Topic via Orff Instruments" was achieved in accordance with the plan, though some in-group disagreements and debates were experienced from time to time. Another feature of this study is that several students normally not taking an active role in the class surprised the researcher by displaying a surprising level of creativity in this study.
5. "Vocalization of The Chosen Story via Orff Instruments" took longer time expected and was completed in 40 minutes instead of 25 minutes. The students were highly motivated by the topic of producing stories. In particular, a story produced by a student chosen as the spokesman (Kaan Akdemir) was found to be very successful by the researcher in terms of both expression and establishing proper connections between the given sounds; the whole class chose to vocalize this story through voting.
6. "Every Group's Vocalization of Their Own Story via Orff Instruments" was the most difficult exercise to undertake, but also the one in which students showed the most improvement. Again, some disagreements were experienced between the groups, and some groups did not like the story their spokesmen determined, but this problem was solved due to the concentration that the students experienced in the vocalization process.

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A STUDY ON PROSPECTIVE BIOLOGY TEACHERS' LEARNING STRATEGIES

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Abstract
Each student has learning strategies specific to him. In order to be able to attain educational objectives, learning environments should be arranged in a manner so as to fit each strategy of learning. For the arrangement of educational environments according to learning strategies, initially, students' learning strategies should be determined by teachers. Once students' learning strategies become known, the most appropriate strategy, method and technique of teaching can be chosen and teaching can be conducted in line with students' interests. This research aims at determining the learning strategies preferred by Biology Education department students of Faculty of Education at Hacettepe University. The research, which is descriptive in nature, employs the "Learning Strategies Inventory" developed by Özdemir (2004), and cronbach alpha reliability coefficient is 0.90.Learning strategies are given as repetition, organisation, giving meaning, monitoring understanding, and sensory strategies in the inventory. The study group is composed of 131 students who attended the Biology Education Department of Educational Faculty of Hacettepe University in the 2008-2009 academic years. Arithmetic averages are used in data analysis, and the findings are discussed accordingly.

INTRODUCTION

Learning is a difficult and complex process. Students develop a series of strategies to cope with such a difficult and complex process and to make their learning more effective and permanent. Those strategies are regarded as learning strategies in field literature.
Each student has his own strategies of learning. According to Weinstein, Ridley, Dahl and Weber (1989), reasons for individuals' having different learning strategies are various. Reasons such as the individual's previous experiences, individual preferences, the perceived difficulty level of the task, prior knowledge of the learner or previous experiences in similar issues and the learner's expectations of his own abilities to perform a task in the best way possible may be listed (quoted by Güven, 2004).
Students' achievement is dependent to a great extent on their awareness of learning skills and on their leading their own learning. Individuals' becoming aware of how they learn, reaching knowledge, interpreting and using the accessed knowledge and generating new knowledge in the light of the current knowledge is only possible by learning to learn; that is to say, by learning the learning strategies. Learning strategy is a general term used for techniques facilitating the individual's learning on his own (Tunçer, Güven, 2007) and is defined as a plan to attain the learning goals (Woolfolk, 1998). Weinstern and Mayer (1985), for instance, define learning strategies as the behaviours or the thoughts students display at the moment of learning which are expected to affect the processes of acquiring knowledge, encoding it in the memory and accessing again when needed (Somuncuoğlu and Yıldırım, 1998).
Learning strategies make many contributions to the teaching-learning process. The contributions may be stated as making the student aware, increasing the student's effectiveness in learning, making sure that the student acquires the property of independent learning, contributing to students wishful and enjoyable learning, and laying the foundation for the student's after school learning (Özer, 2002). As Açıkgöz(1998) also points out, those strategies, which students will acquire, will help them to lead their learning and to secure their occupational improvement; and consequently, will play a significant role in increasing social productivity.
The aim of learning strategies is to affect students' sensory state and to enable them to choose, organise and integrate the new knowledge (Erdem, ?). Despite the availability of many different classifications of learning strategies in literature, it may be said that the classification forming the basis for such classifications is the one made by weinstern and Mayer. It is composed of five categories; namely, repetition, organisation, making meaningful, monitoring understanding and sensory strategies. The classification is briefly as what follows:
Repetition Strategies are the strategies that enable students to determine and select the knowledge, and mental repetition is on the basis of those strategies. Repetition refers to students' classifying the items presented in learning one by one actively (Özer, 1998).
In the **Strategies of Making Meaningful**, students integrate the newly learnt knowledge with the one existing in their long term memory, load meaning to it, and thus learn it. Making meaningful is the process of adding details so that the new knowledge becomes more meaningful. Strategies of making meaningful are the strategies which establish associations between knowledge units and thus secure meaningful learning (Özer, 1998).
Organisation Strategies are the strategies which make sure that the knowledge to be learnt is learnt by rearranging and restructuring it. Making the knowledge meaningful is considered important in those strategies as in the strategies of making meaningful. This is a strategy used to facilitate understanding (Özer, 1998).
The Strategy of Monitoring Understanding helps students determine, organise, implement and control their learning characteristics (Özer, 1998). Weinstern and Mayer (1986) hold the view that monitoring understanding involves a student's establishing learning aims for a learning activity, his evaluating the level of attaining the aims, and if necessary, his specifying the strategies for use in attaining the aims (quoted by Güven, 2004).
Sensory Strategies are the strategies which help to remove motivational and affective obstacles in learning. Even if students employ cognitive strategies in learning on their own, they sometimes encounter difficulties in achieving their aims. The difficulties may stem from affective factors. This is called sensory strategies which are used to remove obstacles stemming from affective and motivational factors in learning (Subaşı, 2000).
The aim of this research within the established conceptual framework is to determine the learning strategies preferred by Biology Education department students of Faculty of Education at Hacettepe University. Meanwhile, an effort is also made to determine learning strategies according to gender and grade level variables.

METHOD

Research Model

This is a descriptive study adopting a review model.

Population and Sample

The research population is composed of 215 students attending the Biology Education department of Hacettepe University Faculty of Education in the 2008-2009 academic year whereas the sample was composed of 131 students who were accessible in the population. Of them, 79% were female students and 21% were male students.

Data Collection Instrument
So as to determine the students' learning strategies, "Learning strategies Determination Scale" developed by Güven (20049 was used in the research. The scale, which was restructured by Weinstein and Mayer (1988), was classified as repetition, organisation, making meaningful, monitoring understanding and sensory strategies. Reliability of the 39-item scale was found to be 0.90.

Data Analysis
Initially, in order to determine the students' learning strategies, averages and standard deviations of the scores received from the sub-scales of learning strategies determination scale were found. Then the t test and one directional variance analysis were employed in gender comparisons and other comparisons.

FINDINGS

1. The State of Prospective Biology Teachers' Using the Learning Strategies
In the first sub-problem, an effort was made to determine the learning strategies used by prospective biology teachers. For this purpose, the averages and standard deviations of the scores received from the sub-scales of learning strategies determination scale were found. The findings are shown in Table 1.

Table 1. The States of Prospective Biology Teachers' Using the Learning Strategies

SCALE	Average	Standard Deviation
REPETITION	22,24	3,80
MAKING MEANINGFUL	42,95	6,21
ORGANISATION	25,78	5,40
MONITORING UNDERSTANDING	34,87	4,99
SENSORY	21,02	3,24

As is clear from Table 1, prospective biology teachers employ strategies of making meaningful (42.95) and monitoring understanding (34.87) more whereas they employ repetition (22.24) and sensory strategies (21.02) less.

2. The State of Prospective Biology Teachers' Using the Learning Strategies According to Gender
In the second sub-problem of the research, whether or not the state of prospective biology teachers' using learning strategies differed on gender basis was examined. For that purpose, the analysis for average scores received by prospective biology teachers from each sub-scale of Learning Strategies Determination Scale was performed on the basis of gender. The values obtained are shown in Table 2.

Table 2. The State of Prospective Biology Teachers' Using the Learning Strategies According to Gender

Scale	Gender	N	Average	Standard deviation	t	sd	p
Repetition	Female	102	22,21	4,04	-,199	127	,054
	Male	27	22,37	2,80	-,245	57,867	
Making meaningful	Female	103	43,52	6,05	2,101	128	,488
	Male	27	40,74	6,44	2,024	38,859	
Organisation	Female	103	26,31	5,30	2,235	128	,940
	Male	27	23,74	5,39	2,213	40,200	
Monitoring understanding	Female	103	35,44	4,79	2,587	128	,723
	Male	27	32,70	5,26	2,447	38,053	
Sensory	Female	101	21,42	3,15	2,714	126	,584
	Male	27	19,56	3,22	2,682	40,374	

Table 2 shows the findings concerning female and male students' learning strategies. The findings showed that female and male students received differing score averages from the sub-scales of learning strategies. It is evident from Table 2 that female students received higher averages than male students did from all the scales. The t test was used so as to determine whether or not score averages received by male and female students from the sub-scales were statistically significant; and no significant differences were found in terms of repetition, making meaningful, organisation, monitoring understanding and sensory strategies.

3. The State of Prospective Biology Teachers' Using the Learning Strategies According to Grade levels
In the third sub-problem, whether or not the state of prospective biology teachers' using learning strategies differed on the basis of grade levels was examined. . For that purpose, the analysis for average scores received by prospective biology teachers from each sub-scale of Learning Strategies Determination Scale was performed on the basis of grade levels. The values obtained are shown in Table 3.

Table 3. The State of Prospective Biology Teachers' Using the Learning Strategies According to Grade levels

Scale	Grade level	N	Average	Standard deviation
Repetition	**1st grade**	27	23,0741	4,18721
	2nd grade	12	23,5000	3,42451
	3rd grade	26	22,0769	3,52049
	4th grade	21	21,6667	3,43996
	5th grade	43	21,7442	3,97068
Making meaningful	**1st grade**	29	43,4138	6,33312
	2nd grade	11	45,1818	5,67130
	3rd grade	26	41,5385	7,26763
	4th grade	21	42,7619	6,17175
	5th grade	43	43,0000	5,63154
Organisation	**1st grade**	29	24,4483	5,27519
	2nd grade	12	26,8333	5,45783
	3rd grade	26	24,4615	5,46429
	4th grade	21	26,4762	4,27339
	5th grade	42	26,8571	5,79138
Monitoring understanding	**1st grade**	28	35,2857	5,45593
	2nd grade	12	36,1667	4,52937
	3rd grade	26	33,3077	5,48284
	4th grade	21	34,5714	4,26112
	5th grade	43	35,3256	4,81427
Sensory	**1st grade**	28	21,1786	3,48599
	2nd grade	12	21,5833	3,02890
	3rd grade	26	19,8077	3,88864
	4th grade	19	20,8947	2,97946
	5th grade	43	21,5581	2,72818

Whether or not there were statistically significant differences between score averages received from the scales of learning strategies, a one-directional variance analysis was performed; as shown in Table 3. The resultant values are shown in Table 18.

Table 4. The Results of One-directional Variance Analysis Concerning the Prospective BiologyTeachers' Use of Learning Strategies on the Basis of grade Levels

Scale	Source of variance	Squares total	Degree of freedom	Average squares	F	P
Repetition	Intergroups	56,000	4	14,000	,968	,428
	Intragroups	1793,551	124	14,464		
	Total	1849,550	128			
Making meaningful	Intergroups	113,681	4	28,420	,731	,572
	Intragoups	4858,942	125	38,872		
	Total	4972,623	129			
Organisation	Intergroups	168,849	4	42,212	1,468	,216
	Intragoups	3593,682	125	28,749		
	Total	3762,531	129			
Monitoring understanding	intergroup	99,273	4	24,818	,995	,413
	Intragoups	3117,504	125	24,940		
	Total	3216,777	129			
Sensory	Intergroups	55,473	4	13,868	1,333	,261
	Intragroups	1279,456	123	10,402		
	Total	1334,930	127		,968	,428

As can be seen in Table 4, a one-directional variance analysis was performed so as to determine the relations between the biology students' grade levels and learning strategies they employed. The F value showed that no statistically significant differences were available in terms of repetition, making meaningful, organisation, monitoring understanding and sensory strategies.

DISCUSSION AND RECOMMENDATIONS

The level of technology reached today requires that students must perform self-learning to make personal improvement and must acquire competence to monitor their learning. Therefore, learning strategies should also be taught them while teaching the basic concepts and principles of disciplines in schools. Aiyeaagbe (1998) states that students display a more positive attitude having been exposed to a curriculum appropriate to their learning strategy (Adesoji, 2008). Thus, students should be observed carefully and be helped to acquire learning strategies suitable to their cognitive structure.

Prospective teachers' becoming aware of their learning strategies during university education is important in that it facilitates their learning. Lecturers should make sure prospective teachers acquire knowledge and practical skills concerning self-learning strategies; especially repetion, organisation and sensory strategies; which are found by considerable amount of research and this current research to be less frequently used. They may assist students at university for this purpose. Besides, Students may also be encouraged to make use of published materials about learning strategies.

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A STUDY ON TEACHER TRAINEES' AFFECTIVE SUPPORT IN AN ONLINE FORUM

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Abstract
Online forum is important for learning to take place as it allows a creation of 'virtual community of inquiry' and encourages potential problem solving, critical thinking and knowledge construction among the participants. However, little empirical evidence regarding affective support among the online discussion participants has been presented. The purpose of this study is to analyze the content of students' discussion in an online forum in terms of their affective support. A total of 30 University Science Malaysia pre-service teachers who went through 20 weeks of teaching practice in secondary schools was involved in this study. An online forum was created to provide a platform for the teacher trainees to discuss their teaching experience. In this study, Fahy's (2003) Transcript Analysis Tool was used to analyze the participants' online support in terms of the questions, statements, as well as scaffolding and engaging comments that they posted in the forum. Based on the analysis of the 194 affective or moral support statements, the trainees' supports are focusing mainly on the scaffolding and engaging comments, including salutation, emoticons, closing, and agreement. More studies are needed to investigate whether such supports from peers do assist students' learning.
Key words: e-forum, online forum, affective support, teacher training

INTRODUCTION

The application of ICT and multimedia can be seen in many sectors, including education. It has brought a huge impact not only for teachers and educators for their delivery of instruction, but also on the students' learning process. Many countries have embarked on the application of ICT in their education systems. In Malaysia, for example, the Ministry of Education has outlined three policies pertaining to the use of ICT (Chan, 2002). The first policy - ICT for all students, is to reduce the digital divide between the schools. The second policy emphasizes the role and function of ICT as a teaching and learning tool, either being used as part of a subject or as a subject by itself. The third policy emphasizes the use of ICT to increase productivity, efficiency and effectiveness of using ICT for school and classroom management. As a teaching and learning tool, ICT can be used either in one specific subject or interdisciplinary. It is a subject by itself, for instance, 2D Animation, Desktop Publishing, or it can be used trans-disciplinary such as the use of ICT in mathematics, biology, social sciences, arts, humanities, language, etc.

One of the applications of ICT in education is electronic learning (e-learning). Generally, e-learning is a teaching and learning process that uses electronic network, the world wide web (also known as the web) and multimedia to deliver the content and information, and that it allows the users to interact amongst them. Now, with the rapid development of web technology, it allows learning to take place from anywhere and at anytime. The emergence of web 2.0 emphasizes more interactive and user-friendly environment, and it allows for social collaboration. Social networking sites, online forums, blogs, wikis, and video sharing sites, are examples of web 2.0 technology that facilitate information sharing and collaboration on the web. Not only it permits the students to communicate and interact with their peers, but also with their instructors or even experts from other institutions. Online discussion forum, for instance, is one such avenue for this collaboration and learning-from-others concept to be materialized. In a collaborative learning environment, the group members are required to work together to solve a given problem or achieve the learning goal. Interaction among the group members is essential in such environment, and online discussion forum is one catalyst for such interaction to happen.

The concept of collaborative learning in pairs and group of students with shared goals and values has been practiced in higher education since early 1990s (Macknight, 2000). Proponents of collaborative learning claim that the active exchange of ideas within small groups not only increases interest among the participants but also promotes critical thinking (Gokhale, 1995). Online discussion or electronic forum is one such platform that allows collaborative learning, and it is especially crucial for ill-structured programs or courses at post-secondary level. It complements the more traditional, face to face collaborative learning session in that the participants can collaborate at anytime and from anywhere as long as they are able to access the Internet. The interaction in online forum may involve discussion, dialog, debate, information sharing or even problem-sharing activities among group members. Online forum is very much needed if the students are to face real world task (such as during teaching practice) but with a very limited experience, and this avenue can be used not only for sharing knowledge and experience, but more importantly, for gaining affective and learning support.

Of late, more colleges and universities are using learning management systems as part of the teaching and learning facilities. Some examples of these management systems are WebCT, Blackboard, *LearningSpace* and MOODLE. One of the key elements within such systems is online discussion tools that permit students to engage in dialogues with each other. Not only it allows the learners to participate in any topic or issue but it also can be used by the instructor to gauge their reflective writing. One can observe and measure the input written by each participant, and an analysis can be carried out to analyze the content or reflective writing put forth by the participants. Besides that, the affective and learning support that might be presence in the reflections can be gauged and measured. According to Anderson and Simpson (2004), communication for online communities can be looked as the provision of scaffolding or support to students to enable them to attain goals in their studies and as an emotive support for each other (through the social online interactions).

In this study, an electronic forum (e-forum) will be used as a platform to assess the students' ability to discuss and interact during their 20-weeks of teaching practice. From the students' postings or reflections in the discussion forum, the affective support indicators will be identified and measured. The affective support indicators to be measured in the online forum are based on the 13 categories of support as proposed by Fahy (2003). Through e-forum, it is expected that the students and their practicum supervisors generate a sense of belonging, sharing, and communicating to each other. The trainee teachers are also expected to reflect their teaching practice, experiences and problem that they are facing during the practicum session. Therefore, this online discussion platform provides an effective learning support system to the trainees as they are away from their peers during the teaching practicum session. It also serves as a moral and motivational support for them as they no longer meet face-to-face throughout the 20-week practicum. Thus, the students' reflections or postings may provide such affective and moral support in this virtual learning and meeting environment.

RESEARCH METHODOLOGY

This study involves a total of 30 pre-service teachers from the School of Educational Studies, University Science Malaysia. These students had to undergo a 20-week teaching practice in secondary schools in Penang as part of their four-year Bachelor of Education (majoring in Interactive Multimedia) program requirement. The teaching practice is to be carried out during their final semester, in which each student will be placed in a secondary school and assigned with a supervisor. During the teaching practice, the students communicate with each other and with their supervisors via an electronic discussion forum prepared by the teaching practice course coordinator. This forum is housed in a MOODLE learning management system *(www.kursus-ptpm.usm.my/kursus)*. The topic of the online discussion forum is 'Teaching Practice – experiences, problems and issues' which is very relevant to their teaching practice session. Each student is required to post at least two messages, inputs, or reflections per week to this online forum. The students had to share their problems, reflections or personal experiences pertaining to their teaching practicum. As they did not have any teaching experience, this forum is vital for them to share their problems and experiences during the practicum. In addition, since they did not meet their peers in campus, this online, virtual discussion is the only avenue for them to meet and discuss matters pertaining to their teaching practice.

In order to analyze the students' online support from their inputs and reflections, a content analysis was used. Fahy's (2003) Transcript Analysis Tool (TAT), a tool for the classification of online interaction, was used for this purpose. The categorisations for TAT are shown in Table 1. The quantitative and qualitative coding and analysis of the participants' transcript content were done manually by the second author, and rechecked by the first author. The coding was done at the sentence level with multiple codes being used for sentences that contained more than one category.

Table 1: *The Transcript Analysis Tool (Fahy, 2003)*

Category		Definition
1A	Vertical questions	Assume a correct answer exists and can be found
1B	Horizontal questions	Invite negotiations on plausible answers
2A	Non-referential statements	Make no reference to others' comments or views
2B	Referential statements	Make direct or indirect reference to others' statements
3	Reflections	Usually guarded personal thoughts, judgments, opinions or experiences
4	Scaffolding and engaging comments	Intended to initiate, continue, encourage or acknowledge interaction, and to "warm" or personalise the interaction environment
5A	Quotations and paraphrases	From sources within or outside a conference
5B	Citations	Attributions of quoted or paraphrased materials

Based on the TAT, Fahy (2003) identified 13 sentences that represent "supportive" behaviour including TAT Type 1B – horizontal questions, Type 2B – referential statements and Type 4 – scaffolding and engaging comments as shown in Table 2.

Table 2: *Fahy (2003) affective support indicators*

No	Category	Definition
1	*Horizontal question*	Questions which do not have a 'correct' answer, but for which discussion might produce consensus or deeper understanding of the problem
2	*Referential statement*	Statement which makes specific reference to the content of a comment posted by another participant
3	*Acknowledgement*	Recognizing or acknowledging the helpfulness, ideas, comments, capabilities and experiences of others
4	*Agreement*	Expressing agreement; connecting sympathetically with the views of another participant
5	*Apology/self-criticism*	Any form of apology
6	*Closing*	Ending the post with some closing summary or leave-taking convention
7	*Emoticon*	Using an emoticon in a post to provide tone
8	*Humor*	Some effort at humor (maybe self-deprecating or ironic)
9	*Inviting*	Inviting agreement, sympathy or comment from others
10	*Rhetorical question*	Posing a rhetorical question.
11	*Salutation*	An expression of greeting, usually at the opening of the posting
12	*Signature*	Ending a post with the writer's signature or a nickname.
13	*Thank you*	Expressing thanks to another participant, or thankfulness for another's behaviour or views.

FINDINGS AND DISCUSSION

Through e-forum, the students were given the opportunity to discuss their experiences, problems and issues pertaining to their teaching practice session. The content analysis of the online forum reveals some pertinent affective supports in the students' inputs or postings. These affective statements serve to motivate and support their peers and therefore, each student's participation and involvement in the e-forum has provided some moral support for the others during the teaching practice. Table 3 indicates the frequency and percentage of the affective support indicators presence in the students' messages.

A total of 169 affective support indicators are found in this online forum. It was found that there are only 11 inputs (or 6.3%) for Category 1B (*horizontal question*), and only 5 inputs (2.9%) for Category 2B (*referential statement*). The majority of affective support indicators come from Category 4 (scaffolding and engaging comments), with a total of 159 inputs (90.9%).

Based on the findings for Category 4 (scaffolding and engaging comments), it was found that *salutation* and *emoticons* are two indicators that are highly used in the students' messages. For instance, the *salutation* indicator contributes to 39.4% of the inputs available, while the *emoticons* indicator contributes to 21.1% of the overall indicators found in these messages. The other two indicators that are widely presence in the online forum are *closing* and *agreement*, with each indicator contributes to 8.6% and 7.4% of the total indicators.

Table 3: *Weekly presence of affective support in teaching practice online forum*

Category/week		W 1/2	W 3/4	W 5/6	W 7/8	W 9/10	W 11/12	W 13/14	W 15/16	Total	%
1	*Horizontal question*	6	3	1	0	0	0	0	1	11	6.3%
2	*Referential statement*	1	1	0	0	0	0	0	3	5	2.9%
3	*Acknowledgement*	1	4	0	0	0	0	0	0	5	2.9%
4	*Agreement*	4	4	2	0	0	0	1	2	13	7.4%
5	*Apology/self-criticism*	0	0	0	1	0	1	0	0	2	1.1%
6	*Closing*	5	4	5	0	1	0	0	0	15	8.6%
7	*Emoticon*	21	7	6	1	1	0	0	1	37	21.1%
8	*Humor*	2	1	0	0	0	0	0	0	3	1.7%
9	*Inviting*	1	0	0	0	0	0	0	0	1	0.6%
10	*Rhetorical question*	0	2	2	0	1	0	1	1	7	4.0%
11	*Salutation*	36	14	6	5	2	4	0	2	69	39.4%
12	*Signature*	2	0	1	0	0	0	0	0	3	1.7%
13	*Thank you*	1	1	2	0	0	0	0	0	4	2.3%
	Total	**80**	**41**	**25**	**7**	**5**	**5**	**2**	**9**	**175**	**100%**

The other indicators for Category 4 presence in the students' postings were *rhetorical questions* (7 inputs or 4.0%), *acknowledgement* (5 inputs or 2.9%), *thank you* (4 inputs or 2.3%), *humor* and *signature* (3 inputs or 1.7% each), *apology/self-criticism* (2 inputs or 1.1%) and *inviting* (only 1 input or 0.6%).
The examples of the students' transcripts are shown in Table 4.

Table 4: *Examples of students' reflections and the respective affective support indicator*

No	Category	Example of students' inputs
1	Horizontal question	*'please provide me with some tips for teaching this Form 2 (Grade 8) class.....i just do not know how.* *What do you mean by students bullying the teacher? Please give your comment and your own personal experience.*
2	Referential statement	*You better confirm with your supervisor concerning the last date of report submission* *Please check your email or check the new topic…the due date for submission of the practicum report* *That one...please refer to your own supervisor. For my group, we need to submit the report and the log book separately.*
3	Acknowledgement	*This is also happening in my school…there are cases where the teachers have to chase the students….*
4	Agreement	*You are right [Participant1], I agree with you. The first time we enter class, we need to look stern and confident!* *I agree. How are we going to fall in love if we don't know the other party?* [in relation to the need to understand the students better] *You are correct…the students love to do stupid things to attract our attention*
5	Apology/self-criticism	*Sorry for not writing to this forum for quite some time* *I have not joining this forum for quite some time…I am having so much problem with the Internet connection at this school*
6	Closing	*Happy teaching to all of you* *OK, see you all next time* *OK my dear friends, good luck*
7	Emoticon	*Cheers from SMKTK* 😃 *Having a headache now, trying to think of next classroom activity* 😟
8	Humor	*Next time, put a side mirror on your back…sure you will not fall…*
9	Inviting	*Let us do this forum again*
10	Rhetorical question	*Trainees bring in cane in class…any comment?* *Anyone using Linear Standard Score method?*
11	Salutation	*'assalamu'alaikum….peace be upon you'* *'Hello all'* *'Hello friends'*
12	Signature	*'[Participant2]_ SMK Batu Maung'* *'from SMK Teluk Kumbar II'*
13	Thank you	*'Thanks a lot for the support and motivation from you guys…'* *'Thank you friends for the information given'*

The affective support indicators can be traced in the students' interaction and reflections. Based on the analysis, it was found that 90% of the affective support indicators involving scaffolding and engaging comments. The students had to deal with the real life problems that they are facing during the teaching practice, and as there was no face-to-face meeting with the lecturers and colleagues, they had to meet and discuss in the online forum for assistance. The scaffolding in the aspects of affective and moral supports from the peers and experts (lecturers) are indeed very helpful for them. This is in line with the concept of Zone of Proximal Development (Vygotsky, 1978) where the assistance from peers and experts are needed especially in the early part of the learning process, and the aid will gradually be reduced as the learner becomes more confident and skillful in resolving the problem at hand, or when the aid becomes unnecessary. Through this online forum, the learners not only received the learning support, but also the affective and moral support as indicated through the presence of indicators such as salutations, emoticons, closing and agreement.
The affective or moral supports by the peers as well as by the lecturers enable the teacher trainee to receive valuable inputs, ideas and knowledge concerning teaching practice. Some of the trainees have learned from their peers in overcoming the problem faced during the teaching practice (refer to the example from the 'thank you' indicator in Table 4). This is supported by Cawyer, Simonds and Davis (2002) who claimed that the moral support received by teacher trainees have aided them to overcome the problems encountered in schools. In addition, such support enables them to express their feelings, receive advice, and seek information for assistance. Through these affective supports, they are able to share their concern and problems during the teaching practice, as well as to reduce the anxiety in facing the students and schools as a whole.

CONCLUSION

Without doubt, online forum is an important platform for student teachers to share their concern and to overcome the problems faced during the teaching practice. The affective support has somehow alleviates such problems and issues at hand. Online forum is indeed very crucial when face-to-face meeting is not an option, and as such, affective supports in the online discussion are very much needed. Therefore, the reliance on affective and moral support in online forum is inevitable for learning to take place.

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A STUDY ON THE IMPACT OF BLOGGING AS A LEARNING ACTIVITY UPON LEARNING EXPERIENCES OF TEACHER TRAINING STUDENTS

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Abstract
The present research aims to identify the effects of blogging as a learning activity upon learning experiences of teacher training students. Considering the accessibility and user-friendly nature of weblogs, this electronic tool can be used in development of curriculum-enriching technological learning activities.The research was mixed method research in terms of data collection methods and draws on a case study. The statistical population consisted of 62 third-semester mathematics and chemistry teacher training students. To collect data, the research applied multiple resources such as researcher-developed questionnaire, interviews and researcher's log. Data collected through the questionnaire were analyzed by descriptive statistical indexes such as frequency and frequency percent. Analysis of the data collected through interviews was carried out by coding and categorization. The data from researcher's log were analyzed by simplification and categorization. Findings of the research indicates that blogging as a learning activity, reinforces technological skills, cognitive abilities, subject matter learning and basic research skills in students.
Keywords: weblog, blogging, teacher training students, learning experiences.

INTRODUCTION

The development of web communication tools has provided us with new learning opportunities. The social-technological potential of these tools has transformed the teaching-learning process in higher education. Weblogs, wikis, podcasts, news groups, chat rooms, video conferences, whiteboard tools etc. are some typical cases of such communication tools that provide the learner with synchronous or asynchronous access to other learning sources. According to Dron (2007), by facilitating communication, such software raise the level of learner's control and management over group interaction and development (McLoughlin and Lee, 2007). Boyd (2007) believes that by supporting interaction, presentation and feedback reception and by creating social networks in which individuals can communicate, these software have a key role in improving the learning process (Pettenatti *et al.*, 2007).
In fact, these social software facilitate social communication and collaboration, finding and sharing data in groups, content creation and management, sustained collection of knowledge and reforming content, focusing on priorities and personal needs, possibility of communication between members of the group, the opportunity to communicate with various anonymous individuals, receiving and giving feedback (Huffaker, 2005). Richardson and Price (2006) call these tools reading-writing web. They believe that in comparison with their predecessor, new web tools such as weblog provide further chances to communicate and develop diverse content.
Weblog is one of the social software that has facilitated access, use and dissemination of data and feedback presentation and reception. There are many a number of weblog hosts that provide users with free online space which can be exploited to enrich university education and design technological learning activities. Blogfa, Mihanblog and PersianBlog are among the most popular hosts in Iran, and from the foreign service providers Wordpress and edublog could be named.

REVIEW OF LITERATURE

Although only ten years have passed since the start of blogging -its integration into university courses occurred some years later-, there are several researches on the impact of weblogs upon education. In their quasi-empirical, longitudinal research, Xie *et al.* (2008) presented a course of political studies through blogging to forty-five freshman students for one semester. Findings of the research showed that blogging increases the possibility of receiving feedback from peers and reinforces reflection and in-depth learning (Finger *et al.*, 2007). Davison and Hall (2007) applied diverse learning activities such as blogging and participation in news groups in one of their library and information science courses. Using the content analysis method, they analyzed learners responses and messages and found out that blogging encourages students in deep engagement with learning material more than any other activity. According to their finding, blogging promotes sharing and supporting ideas (Kevin *et al.*, 2009).
In a study, Brock Eide and Fernette(2005) discovered that: 1) blogging reinforces students' analytical and critical thinking ability; 2) blogging is an influential factor in reinforcing intuitive, creative and collaborative thinking in students; 3) blogging improves analogical thinking in students; 4) weblog is a powerful media for accessing and analyzing quality of the data (Davi *et al.*, 2007).
In their research, Drexler *et al.* encouraged the students to develop a collaborative blog. They discovered that by participation in blogging, students become more motivated to write and their reading and writing skills improve (Drexler *et al.*, 2006).
Efimova's (2004) suggestion is creating specialized weblogs for students. She believes that creating such weblogs could expand relations between those who are interested and subject experts in a course or discipline. This way, interested students can become acquainted with some valid sources and viewpoints (Efimova, 2004).
In another study, *Avesani et al.* enumerate weblog's key learning-related features as such:

1. Personal content management system;
2. Elaboration of class learning according to the real world;
3. Facilitation and encouragement of self-expression;
4. Extension of learning activities from the class to the real world;
5. Informal nature of weblog posts;
6. Opportunity for interaction, posing questions and commenting;
7. Facilitation of students' participation in the teaching-learning process;
8. Convenient educational usage;

9. Helping realization of multiple objectives;
10. Enrichment of extracurricular activities;
11. Potential to be linked to other learning sources and documents (Avesani *et al.*, 2006)

A study of the relevant literature shows that the majority of weblog studies are methodologically case study-oriented. Also, through the review of literature it was revealed that the so far, no academic research has been conducted inside Iran on the impact of university students' blogging on their learning experience.

PROBLEM STATEMENT

One of the ways to apply ICT in education is integration of information technology with face-to-face education. Integration facilitates subject learning and acquaints the learners with technology usage, helping them to acquire critical thinking and problem solving skills (Wang and Song, 2008). In a study, Kim and Bank (2006) discovered that introducing information technology in face-to-face education could enrich and improve class teachings (Hricko, 2008, p. 80). In the university, the instructor can make use of different technological tools such as news groups, wikis, weblogs etc, to design learning activities.

Introduction of blogging as a learning activity has turned into a popular practice in academic teachings during the recent years. Various research such as William *et al.* (2006), Avesani *et al.* (2006), Brock Eide and Fernette (2005) and Davison and Hall (2007) on the impact of students' blogging shows that it develops subject expertise, raises interest in learning, encourages participation encouragement and helps presentation of diverse, different viewpoints. Studying the so far conducted research on the issue, Jacobs and Bruns (2006) found out that understanding the impact of blogging on students' learning experiences demands in-depth, rigid studies (Wang and Song, 2008, p. 76).

The quality of students' access to technology, the level of their familiarity with new learning technologies, cultural issues etc. could affect students' learning experience when it comes to blogging (Porter, 2004, p. 76). Considering that so far no studies have been conducted in Iran on the impact of blogging, this research aimed to examine the learning experiences of teacher training students in their blogging as a learning activity.

AIMS OF THE RESEARCH

The general aim of this research was to study the impact of blogging as a learning activity upon learning experiences of teacher training students. The specific goals of this research were:

1) Studying the impact of blogging as a learning activity upon technological skills of teacher training students;
2) Studying the impact of blogging as a learning activity upon cognitive abilities of teacher training students;
3) Studying the impact of blogging as a learning activity upon improvement of teacher training students' learning of the subject;
4) Studying the impact of blogging as a learning activity upon research skills of teacher training students.

RESEARCH QUESTIONS

The general question of the research was: "What is the impact of blogging as a learning activity upon learning experiences of teacher training students?" Specific research questions were:

1) What is the impact of blogging as a learning activity upon technological skills of teacher training students?
2) What is the impact of blogging as a learning activity upon cognitive abilities of teacher training students?
3) What is the impact of blogging as a learning activity upon improvement of teacher training students' learning of subject?
4) What is the impact of blogging as a learning activity upon research skills of teacher training students?

METHOD

PROCEDURE

There are various ways to integrate blogging in university courses as a technology-based learning activity. These are:

1) The instructor creates a weblog for the given course. The instructor also provides an outline and a synopsis of the material covered each session in the weblog. Students visit the weblog in the designated time period and comment or ask question about the subject.
2) Each student creates a weblog and provides the instructor and peers with the URL. In their weblog, they should publish their ideas, understanding and attitude on the course or every session's proceedings. The teacher and other students should visit the weblog and comment on the notes. Updating the weblog and visits made by other students are considered as a type of learning activity. The instructor should take the number of visits, depth and quality of the comments into consideration as factors determining participation level (Drexler *et al.*, 2006).

In the first session of the course in 2008-2009 academic year, a weblog (bualiteachers.blogfa.com) was created for students of the course "Principles of secondary School Curriculum Development". Regarding the length of the course (12 sessions), the textbook was divided into twelve sections, outlines of each section handed to students. Each group two or three students was designated with one section, which they had to summarize and send via email to the instructor. Class sessions were held for two hours every Wednesday afternoon and the group assigned with the project had to email it until 8 a.m next Monday. Other students had to post their ideas on their weblog until 10 a.m. of Wednesday, after studying the textbook. Blogging activities held for 50% of the final mark of this course. The instructor kept a log of all the comments and discussed them in the class. Student had to be prepared to expound their ideas. After moderating the discussion, the instructor rounded off the session material for students.

Before the research entered the operational phase, a survey on the students' familiarity with ICT technologies was undertaken based on the Kennedy questionnaire (2006). The question which the students had to answer was: "To what level are you familiar with the usage of internet, search engines, email, weblog and other technological facilities?" Analysis of the responses showed that 22 students have low familiarity with technological facilities, while 26 students (42%) had an average knowledge and 14 students (22.5%) believed that they have high familiarity with technological facilities.

Among the first group of students lack of facilities (10 students, 45%), lack of interest (7 students, 30.5%), lack of access to the internet and training opportunities (5 students) accounted for low familiarity. The general trend among the students with average knowledge was familiarity with some web facilities such as search engines, carrying out simple queries in websites and sending emails. These students knew little about other facilities such as blogging, using news groups etc. The skilled students were those who were familiar with email, web search tips, weblog etc.

With regard to the fact that a high percentage of students (77.5%) were had a basic knowledge of internet technology, the first method, that is, integrating the course with a weblog created by the instructor, was used for blogging as a learning activity, since it needed lower familiarity with technological skills and knowledge.

RESEARCH METHOD

The present research is an mixed research (qualitative-quantitative) that uses both approaches in relevant cases.

SAMPLE

The statistical population of this research consisted of 62 third-semester students of mathematics (34 students) and chemistry (28 students) teacher training in Bu-Ali Sina University, Hamadan, iran which had chosen the "Principles of secondary School Curriculum Development" as one of their specialized two-credit courses. Twenty-three females and thirty-nine males formed this sample. The average age was 21 years and three months.

INSTRUMENT

Multiple sources were used to gather data for this research:

a) Researcher-developed questionnaire: after a study on the literature of blogging as a learning activity, a researcher-developed questionnaire was designed.

b) Semi-structured interview: at the end of the course, 20 students were randomly selected and interviewed about four major factors, i.e. subject learning, participation level, acquisition of cognitive skills and opportunity for expression of different viewpoints.

c) Researcher's observations and logs: for every session, the research recorded a log of students' behavior and performance based on the four aforementioned factors.

VALIDITY AND RELIABILITY OF THE INSTRUMENTS

a) Questionnaire. To determine the validity and reliability of the questionnaire the following steps were taken:

Formal and content validity of the questionnaire were checked by five e-learning experts and approved after applying the necessary reforms. The reliability was determined through the Cronbach alpha coefficient(r=0/87).

b) Interview: interview questions were examined and corrected by e-learning experts.

c) Researcher log; maximum accuracy and objectivity was observed by the researcher based on the four determining factors, that is, subject learning, participation level, acquisition of cognitive skills and opportunity for expression of different viewpoints.

DATA ANALISIS

To analyze the data, the SPSS software and descriptive statistics indexes such as mean, distribution and frequency percentage were used. Qualitative techniques such as coding and categorization were applied for the analysis of the interviews and the researcher's log.

FINDINGS

Based on research questions, the findings are presented at four categories which are: improving technological skills, cognitive abilities, subject learning and everyday and research abilities.

Improving technological skills

1-5 items of the questionnaire concerned improving technological skills. Result of the analysis is presented in Table 1.

Table 1. The impact of blogging on the improvement of technological skills

Scale	Very high	High	average	low	Very low
frequency	45	120	93	40	4
frequency percent	14.5%	43.21%	32.87%	.8%	-

According to Table 1, 57/71% of the students believed that the impact of blogging on using email, access to internet resources, overcoming technology fear and working with the keyboard has been very high or high.

Interview analysis shows that blogging as a learning activity helps the students to improve skills such as using email, working with keyboard and accessing internet resources. According to one of the students: "using a weblog helped me become familiar with some other facilities and tools such as news groups, audio and visual resources and spend some of my daily time (even if not much) on these activities. My keyboard skills have also become better".

Another student highlights the role of weblog in overcoming technology fear. This student says: "in the beginning, I was not interested in using the internet at all. But gradually I found out that it's much easier than I thought."

The researcher's log also shows that the average rate of students' participation in commenting in weblogs has gradually increased during the semester. Average participation of students has been presented in Table 2.

Table 2. Average rate of students' participation

Sessions	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
Participants' frequency	40	52	55	55	59	59	59	58	62	62	62	62
Participants' frequency percent	64.5%	83.87%	88.70%	95.16%	95.16%	95.16%	95.16%	93.54%	100 %	100 %	100 %	100 %

Also, approaching the final sessions of the course, some students asked questions about facilities such as podcasts, joining news groups, finding favorite audio and visual material etc. that signaled their increasing familiarity with internet technologies.

Cognitive abilities

6-10 items of the questionnaire concerned cognitive abilities. Result of the analysis is presented in Table 3.

Table 3. The impact of blogging on the improvement of cognitive abilities

Scale	Very high	High	average	low	Very low
frequency	52	137	92	24	5
frequency percent	16.77%	44.19%	29.6%	7.74%	1.61%

As shown in Table 3, 60.96% of the respondents have regarded blogging as a learning activity effective in reinforcing cognitive skills such as critical thinking, creativity and collective thinking.
Results of the interview analysis revealed that for publishing their ideas in the weblog, students were encouraged to reflect and present reasonable opinions. As one interviewee said: "I try to think before publishing my ideas in the weblog, so that I can convey my thoughts with rational statements. That is because I'm sure all my classmates read together ideas".
Another student refers to the asynchronous nature of commenting in weblog and its impact on improving the thinking process. According to this student: "we don't have enough opportunities inside the class to express our ideas, and most of the times, our comments are unevaluated. But blogging gives me the chance to think about a topic for several days and then express myself in the best time and with meaningful statements".
Researcher's log also reveals that during the early sessions, students' comments in the class were shallow. However, gradually the students expressed their opinions using relevant arguments and evidences. Students believed that the instructor's feedback was constructive in giving depth and argumentative tone to class comments.

Subject learning

11-16 items of the questionnaire concerned 'improving subject learning'. Result of the analysis is presented in Table 4.
Table 4. The impact of blogging on the improvement of cognitive abilities.

Scale	Very high	High	average	low	Very low
frequency	63	153	139	16	1
frequency percent	16.93%	41.12%	37.36%	4.30%	.26%

As it is shown in Table 4, the impact of blogging as a learning activity on improving subject learning has been considered very high or high by 58.05%, average by 37.36% and low or very low by 6.56 percent.
Interview analyses show that the students, after studying the different comments in a weblog, examine the issue from different aspects. This opportunity helps them to engage in class discussions more preparedly. They may also rethink their understanding of the topic after reading peer opinions.
As one of the students said: "I attend the class more preparedly after I study my classmates' comments. Of course, some comments showed that the student has not fully grasped the content and has provided a shallow remark. Well-founded comments and even skin-deep ones help a better understanding of the topic."
Another student pointed to the opportunity for further discussion: "in majority of the courses there is no chance for discussion or the students are not prepared enough to debate. Blogging helps us to get acquainted with the subject of the lesson. That way, the instructor has adequate time for discussion."
The researcher's log and observations revealed that students are more willing to discuss, compared with other courses. In some cases, by studying the textbook and peer remarks, students introduced new insights. Participating in blogging helped students to fully grasp the general notion of the lesson.

Research skills

17-21 items concerned "research and daily abilities". Result of the analysis is presented in Table 5.

Table 5. The impact of blogging on the improvement of research skills

Scale	Very high	High	average	low	Very low
frequency	122	213	130	29	-
frequency percent	24.69%	43.11%	26.31%	5.87%	-

As it is demonstrated in Table 5, on the impact of blogging upon improving basic and research abilities, 67.80% of the respondents regard it as very high or high, 26.31% as average and 5.87% as low. Thus, an absolute majority believe in the constructive role of blogging on the improvement of their daily and research skills.
Interview analysis shows that participation in blogging and commenting reinforces students' writing and research abilities. This is put into words by one of the students as such: "I try to use precise, unambiguous statements so that the others easily understand what I mean. This has helped me to be accurate and direct in my writings".
Upgrading of time management and planning skills has been another corollary of blogging. This was a point admitted by most students. One of the students directly points to the impact of blogging on his time management skills.
Free expression of ideas and resolution of misunderstandings has been another achievement of blogging. Students can freely express their ideas, without facing time limits. This fosters self-motivation and active participation in the learning process.
A study of the researcher's log also shows that the students feel free to express their opinions in the weblog rather than class environment. They follow blogging as an academic activity.

CONCLUSION

With the development of social software, blogging has been introduced in higher education curriculum as a technology-based learning activity. Easy access and the user-friendly nature of this tool are regarded as its merits.

Review of the related literature shows that, blogging is one of the learning activities applied in different courses. According to the studies carried out so far, as a learning activity, blogging provides students with diverse learning experiences and improves their technological skills, subject learning and cognitive and research abilities. However, no researches have been carried out so far in Iran on the impact of blogging on students' learning experiences. Iran's cultural attributes, quality of internet access etc. necessitated conducting such a research. Therefore, the question emerged was: "What is the impact of blogging as a learning activity upon learning experiences of teacher training students?"

Findings of the research show that blogging as a learning activity improves technological skills such as using email, searching on the web, using other internet facilities such as news groups, wikis, downloading audio, visual and textual materials, proficiency in using keyboard and overcoming technology fear. These findings agree with Efimova (2004) and Drexler *et al.* (2006) studies.

Another achievement of integrating blogging with development of learning activities is improving students' cognitive abilities. According to the findings of this research, blogging fosters critical thinking and academic analysis skills in students. Free expression of ideas also helps students to develop their creative and intuitive thinking. These findings agree with studies conducted Brock Eide and Fernette (2007).

Improving the learning of lesson content is another outcome of blogging as a learning activity. Based on the findings of this research, by studying the comments of their peers in weblogs, students view the topic from different aspects and are encouraged to participate in class discussions. The collection of these factors helps students to understand the topic deeper and attend the class with in more preparedly. These findings agree with that of Davison and Hall (2007) and Drexler *et al.*

Taking part in blogging encourages students to acquire some basic skills such as time management, planning and self-motivation in learning. Also, the asynchronous mechanism of weblogs allows the students to complete their assignments in the preferred occasion; a weekly scheduling encourages them to design a personal timetable in order to carry out blogging activities. Moreover, blogging improves students' research and writing skills. Findings of the research suggest that the students try to use coherent statements in their weblog posts. Observation and analysis of peer comments, encourages them to present new ideas or solutions. This agrees with the findings of researchers such as Efimova (2004).

Of the other findings of the research is the acquaintance of students with technology application teaching and creative design of e-learning activities by the instructor. This has been frequently recorded in researcher's log and interviews. Also, according to the findings, the major challenges of blogging in learning activities include lack of access to the internet, technology fear in the first sessions and weblog's low security.

In brief, findings of this research show that blogging as a learning activity develops technological skills, learning lesson content, cognitive, basic and research skills in teacher training students.

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A STUDY TO IDENTIFY THE LEVEL OF TECHNOLOGY USE ON VOCATIONAL AREA IN PRIMARY EDUCATION INSPECTORS VIA THE METHOTS OF DATA MINING (SAMLE OF THE BLACKSEA REGION)

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Abstract
The objective of this study was to determine the levels of technology use in Primary School Inspectors and to identify whether they changed with the independently specified variables thanks to the aid of data mining algorithms. The participants took measurements packets which included a determination poll for the level of technology use and a personal information form. 317 Primary School Inspectors working in the Black sea Region participated. The obtained data was collected as raw data in the programme SPSS 15.0 and analysed by the aid of the Microsoft SQL Server 2005 Analysis Services application by applying the decision trees in data mining algorithms, Apriori in coexistence algorithms, K-Means in clustering algorithms. With the results of analysis, it is identified that the levels of technology use in Inspectors differed according to the independent variables.
Key Words: Data Mining, Primary School Inspectors, Technology Use.

INTRODUCTION

The lifelong education process has shown continuous improvement since the early ages. Community access to the advanced level of life is directly related to individual training. The developing technology to meet the continuously increasing needs of people shows its effect on every field today. As it is in every field, technology use has become an inevitable necessity in the field of education, too. Using technology effectively in education depends on that the teachers who produce training services, offer guidance in learning improve themselves in parallel with changing technology.
The teachers should not be left alone against the conditions and the challenges which are becoming increasingly difficult and complex. In this case, administrators, education specialists, and inspectors need to overcome this problem by helping the teachers and working together. Inspectors have an important role in this team work. It is necessary that inspectors should improve themselves in the ever-evolving technology by renewing themselves and they should provide with updates of new technology and new equipment to be used effectively in the educational environment and they should guide the teachers in this direction and give them professional assistance (Yılmaz, 2010).
In this study, it is aimed to determine the level of technology use of Primary School Inspectors by using Apriori in Data Mining algorithms, the decision tree and K-Means. For this purpose, an attitude scale consisting of 25 questions was prepared between the years 2007-2008 for the purpose of using technology of 317 primary school inspectors working in 18 provinces, in the Black Sea Region. The data obtained with the help of this scale is analysed by applying the process described below.

DATA MINING

Data Mining, to predict the future and to make a model, is a kind of technique to identify the various patterns and similarities between the data in a database. Using data mining tools, it is possible to identify paternal trends and behaviours which are necessary in the decision support systems for the business enterprises to make more effective decision. There are a lot of different features to do much more comprehensive and automated analysis in data mining. They are distinct from the tools used in the traditional decision support systems in the past. The most important feature Data Mining provides for the business enterprise is to define the similar trends and behaviour patterns between data groups. This process can be implemented in a simultaneously automated way. Another important function is to define unknown patterns. It is possible to reveal unknown patterns in the data with the assistance of Data Mining tools (İnan, 2003).
Data Mining is an exploring process to find out useful information automatically from the large Data Warehouses. In other words, data mining is a collection of processes consisting of the methods of advanced data analysis such as statistics, artificial intelligence and machine learning which identify the hidden patterns and the relationship in data that means nothing alone.
The Data Mining Methods are divided into two groups:

1. Predictive Methods (decision trees, regression, support vector machines etc...)
2. Descriptive Methods (clustering, network rules etc...)

The objective in predictive models is to make predictions for the future using present data while the objectives in descriptive models is to reveal the features to be modified with the secret relationships in the present data, the clusters and the data (Bozkır et all., 2009).
In this study, it is benefited from the techniques to be occupied in both models.

Clustering: As understood from the meaning, Clustering is an assignment process that is to assign each presence in a certain data cluster accordingly with their attributes. With this technique meaningful information like costumer profiles can be developed. K-Means, Expectation Maximization (EM), Hierarchical Clustering algorithms are well-known and frequently-used algorithms. In our study K-means algorithm from clustering algorithms is used (Bozkır et all., 2008).

Decision Trees: A Decision tree is a flow chart that is tree-like graph. Every node represents a testing process on an aspect. Every subdivision represents the result of the process and as a consequence, tree-classes with decision trees found last can easily change to classification rules. A decision tree is a model formed in three parts:

1. A decision tree just like in the description.
2. An algorithm to form the tree
3. to apply the tree to data and description

Decision trees are realised by an algorithm that sorts the data in the educational sample or most of the decision trees techniques formed by an expert of the subject differs from each other accordingly how the trees have been formed (Doğan, 2007). In our study, “Microsoft Decision Trees”, a decision tree algorithm which occupy in the application, is used.
Association Rules: Association rules is a determining process by analysing transactions in the data cluster or the ones observed frequently together among the records. Association rules are applied to many fields such as marketing, engineering, science and health sectors (Dolgun, 2006).

In the use of association rules, some support and confidence parameters play an important role. However, the importance value which creates the correlations belonging to the rules that set out in our study was based. In our study, "Microsoft Association Rules", an Association Rules Algorithm which occupy in the application, is used.

DATA MİNİNG WORKS İN EDUCATİON

Some of the works done nationally on data mining in education: In the work, named as "Identification of the Factors on the Use of Internet by the University Students for Educational Purposes by Data Mining Methods" (Bozkır et all., 2008) it is researched that what extend the university degree students use internet for educational purposes through three data mining algorithms (decision trees, clustering and association rules). The other work is a Phd dissertation named as "Applications of Data Mining on Students' Data" (Baykal, 2003). This dissertation offers a general idea as an introduction to data mining technology and products and explains about the data mining works done on students' data. And another work is a post-graduate thesis named as "Data Mining and the Application of K-Means Algorithm Used in Data Mining in Students' Database" (Erdoğan, 2008).

In this work, the structure of the students starting university is examined through clustering analysis. In another Phd dissertation named as "Clustering Analysis in Data Mining and An Application Related to Assessment of Educational Achievement" (Silahtaroğlu, 2004) an application related to the assessment of educational achievement in two consecutive years and its results are presented. Another work is a post-graduate thesis work named as Classification of Smart Questions in E-Learning Platform through Data Mining Techniques". In this work, e-learning lessons are tested and assessed through the support vectors machine from data mining algorithms. In the work named as "Student Achievement Analysis through A priori Algorithm", a students' achievement analysis is done by using students' grades through the a priori algorithm. In another work named as "Identification of Students' Choice Profiles in Students Selection Examination (OSS) by Data Mining Methods" the factors affecting students' achievement are researched by analysing the questionnaire data in OSYM site through clustering and classification algorithms (İnce, 2008).

MATERIAL and METHOD

Sample

Sample of the study constitutes 317 primary school inspectors working in 18 provinces, in the Black Sea Region between the years 2007-2008. The information about the attribute of the sample group is given table 1 below.

Table 1. The distribution of attributes in data cluster

Attribute Name	Attribute Type	Distribution
Sex	Text	Female: 10, Male: 307
Age interval	Numerical	25-35 age: 14, 36-45 Age:41, 46-55 Age: 143, 55-65 Age: 119
Education	Text	undergraduate: 244, degree completion :39, graduate:34
Branch	Text	Maths:230, Management in Education and Auditing:67, School Teacher: 20
Service Year	Numerical	1-15 year: 28, 16-25 year:84, 26 year and More: 205
Provinces	Text	Samsun: 56, Tokat: 38, Trabzon: 36, Ordu:31, Amasya:21, Giresun: 21, Kastamonu: 18, Rize: 17, Çorum: 16, Bolu:16, Zonguldak:11, Artvin:8, Gümüşhane: 7, Bayburt:6, Karabük:5, Düzce:4, Bartın:3, Sinop:3

Method and Means of Data Collection

In the study, as a means of Data collection, an attitude scale consisting of 25 questions developed by benefiting from literature was prepared for the purpose of using technology level of primary school inspectors. The validation and confidence of the used Poll (0,90 Cronbach Alfa)is determined.

Data Analysis

Collected Raw Data was cleaned by the assistance of "SQL Server 2005 Data Mining Add-Ins for Office 2007 packet" installed on Excel 2007 and tagged accordingly with their attributes. After that it was analysed by running Data Mining Modules that is in "Analysis Services" Packet on the production of SQL Server 2005, "Microsoft Decision Trees", "Microsoft Clustering" and "Microsoft Association Rules" algorithms on Visual Studio 2005. "Microsoft Decision Trees" algorithm is equivalent to Decision tree algorithm, "Microsoft Clustering" algorithm to K-means algorithm and "Microsoft Association Rules" algorithm to Apriori algorithm.

RESULTS AND DISCUSSION

Default settings were used in the analysis done by "Microsoft Decision Trees" algorithm, while the attributes of "age" and "sex" was used as only input aim, other attributes was used as "Predict and Input" for the purpose of both input and conjecture. Dependency Networks showing the effects of attributes to each other are available in the conducted Data Mining Model. Ties in the network 50% dilution was applied and shown in Figure 1.

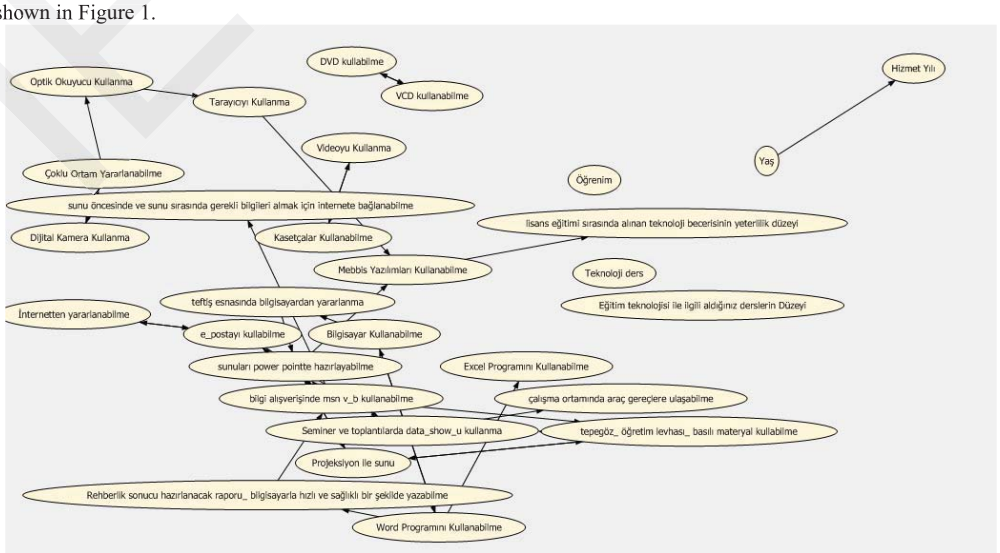

Figure 1. Dependency Network resulted in Decision Trees Algorithm.

According to the Dependency Network, these rules can be extracted as follows;

- a direct connection available between Primary School Inspectors' Computer use level and the level of benefits from Computer use during inspection,
- a direct relationship available between the benefit form internet and Primary School Inspectors' e-mail use level,
- the efficiency level of the technology use ability that Primary School Inspectors have gotten during their Undergraduate education and the ability level of Mebsis Software use,
- a direct connection available between the Primary School Inspectors' ability of doing internet connection to get necessary information during the presentation and level of benefiting from multi-ambiance,
- a direct relationship available between Primary School Inspectors' ability of the program 'word' use level and the ability level of writing the report to be written as a consequence of guidance with a computer in a quick and healthy way,

Analysis done by "Microsoft Clustering" algorithm, the data required dividing into 2 clusters and for this purpose '2' was entered as "CLUSTER_COUNT" parametre. K-means was chosen as clustering algorithm type to be applied and for this purpose '3' was entered as "CLUSTERING_ METHOD" parametre. The results are seen in figure 2.

The data was divided into two clusters as a result of analysis, the first cluster consists of 190 people and the second 127 people. While clusters 1 is between %44,8 of 55–65, %47,5 within 46–55, %7,1 within 36–45, %0,6 within 25–35 age, clusters 2 has a %26,1 within 55–65, %41,3 within 46–55, %22,2 within 36–45 and %10,5 within 25–35 age interval. Therefore; it is observed that the ones in cluster 2 are younger than the ones in cluster 1.

If we compare the attribute of computer use ability of these two clusters; the ones in cluster 1 think themselves that, in the point of the ability to use computer, %2.7 is highly efficient, %56.6 is efficient, %35 is partly efficient, and % 5.7 is rather inefficient. The ones in cluster 2 think themselves that, in the point of the ability to use computer, %42.2 is highly efficient, %50.6 is efficient, and %7.2 is partly efficient. When looked at these two clusters in the point of internet using, the ones in cluster 1 think themselves that %5.7 is highly efficient, %58.2 is efficient, %35.6 is partly efficient, and % 0.5 is rather inefficient while the ones in cluster 2 think themselves that %66 is highly efficient, %32.5 is efficient, and %1.5 is partly efficient. When we compare the other attributes about technology use such as the use of DVD, VCD, word and excel, etc. it is seen that cluster 2 is more successful than cluster 2. It is understood as a result of Clustering, in the level of technology use there are certain differences between two clusters, which the second cluster consisting of young population uses technology in their professions more than the cluster 1 does.

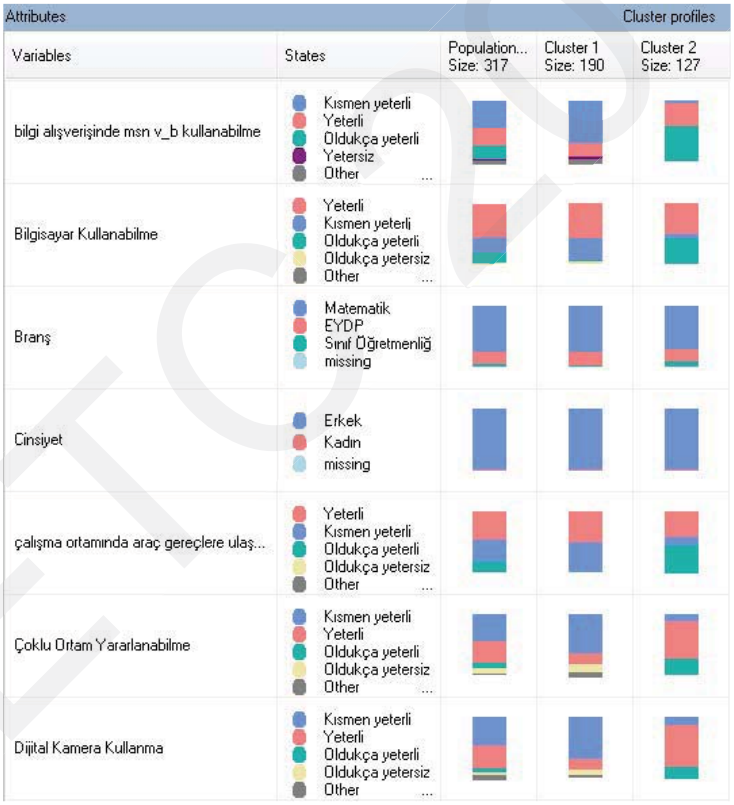

Figure 2. Clustering made accordingly with K-Means algorithm

In the analysis done with "Microsoft Association Rules" algorithm, the views of Primary Schools Inspectors about technology use in the field of their profession were investigated with the help of Association Rules Analysis. Support value is %20 while Confidence value is %80 and important ones to be extracted from hundreds of rules are given in table 2.

Table 2. The rules extracted from the analysis done with Microsoft Association Rules algorithm.

The exracted Rules	Support %	Importance
The level of lessons with the Education Technology = Rather inefficient, Technology class = No -> Reaching the tools in the work environment = Partly efficient	0,933	0,451
Education = Graduate, The level of lessons with the Education Technology you take= Efficient -> able to write the report with a computer in a quick and healthy way as a consequence of guidance =	0,913	0,638
Servise year = between 1-15 years, The level of lessons with the Education Technology you take= Efficient -> Us the Data Show in the seminars and meetings = highly efficient	0,833	0,556
The level of lessons with the Education Technology you take = Rather inefficient -> Reaching the tools in the work environment = Partly efficient	0,889	0,440
Age = between 55-65 years, The level of lessons with the Education Technology you take = Partly efficient -> efficiency level of technology using ability taken during undergraduate education = Partly efficient	0,811	0,211

CONCLUSION AND RECOMMEDATIONS

In this study, the technology use level in the field of profession was analysed with the methods of Data Mining. It was seen that the age of Primary School Inspectors, the ability of technology use they took during undergraduate education, and the efficiency level of Educational Technology classes they took during the pre-service education directly influences their level of technology use. It was observed that the efficient education Primary School Inspectors took made the level of their technology use better. It was seen that young Primary School Inspectors, graduate and undergraduate at the age between 25 and 35, are more efficient at the technology use in the field of profession than their colloquies that are at the other age interval. We think that the reason for this is the developing technology in the over last years and the increasing quality of technology education. For this reason, we recommend that it should be important to increase in-service education for Primary School Inspectors about education technology. We suppose that it will be essential to increase computer and internet education at the level of undergraduate education in all faculties.

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A WEB-BASED CONTROLLED GREENHOUSE SYSTEM AND MONITORING THE SYSTEM'S DATA

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Abstract
In this study, the control of a greenhouse system and monitoring the system data over the internet is intended. Depending on temperature and humidity, a system controlling this greenhouse is designed. The measured values received from the system are stored in a database and then these values can be monitoring through a database communication protocol through a web interface. Apache web server for the web infrastructure for the system is preferred. Remote users can observe the data belonging to the greenhouse system using PHP based web pages via the internet at any time, or may adjust the parameters for the physical configuration of the greenhouse. In this way, users from anywhere and at any time can check and track automation data without any obligation of being existence. In addition, the recorded measured values and the changes depending on the time in the system's database would shed light on the approaching studies about estimated curves. Moreover, data mining technics would be considered in future studies to develop more efficient methods of finding convenient values of the greenhouse's setting configuration, regarding this paper. Therefore the methods could be used to increase the efficiency and the quality of the greenhouse management system.
Keywords: Sera automation, Apache Web Server, PIC 16F877, remote control, web based control, data monitoring

Introduction

Thanks to the technological advances of the 21th century, many electronic devices are being used in our life. Daily works is realized by easier, cheaper costly, faster feedback, and carried with a lower-margin-error owing to the electronic devices. As a result of this, people desire to spread using of electronic devices in all area of their life (Dormido, 2004).
Electronic systems have lots of absolute advantages as well as disadvantages when compared with mankind. One of the remarkable advantages is to have less margin of error. The Margin of error is minimized because of electronic systems based on mathematical formulas. Another important advantage is the positive contribution within the long-term plans in cost and expenses compared to human factor. In addition to these general benefits, there are also some specific advantages for specific systems such as speed factor, compatibility getting electronic devices popular different areas such as entertainment, nutrition, education, transportation etc. Nutritional factor constitutes a very important part of human life. Within this area, many systems have been developed and applied to overcome dificiencies based on human factor. Agricultural products, of course, come at the beginning of nutritional factors.
Large portion of the population in Turkey makes a living by agricultural activities. One quarter of national income constitute by agricultural sector (Turkey Economic Importance of Agriculture, 2010). Therefore, technological developments are also reflected to agricultural field in the same speed. Recently, environmental problems such as air pollution, greenhouse effect and pest infestation cause degradation in the quality of products and lead to popular demand of greenhouse systems which has been used not only by European farmers, but also the farmers in Turkey for a long time.
Greenhouse systems are structure which contains panels and other various equipment fixing specific values such as temperature and humidity in stable to aimed maximum efficiency (Guilan, Xuejun, & Xindong, 2002). They are developed as a special protected against external influences. The main purpose is to obtain maximum yield from the product.
As an artificial and the best adjusted environment becoming independent from nature and making the growth of the product stable in best quality is provided by greenhouses with greenhouse automation systems (Park et al., 1996). In general, the temperature inside is controlled by panels. A fan helps to control climate in some sorts of systems (BufEngton, 1993). In some advanced greenhouse systems, proper irrigation methods are applied due to measuring of the air humadity and leaf wetness. Moreover, a fertilizing control system is designed separately to avoid confusion between irrigation and fertilizing in these types of systems. Furthermore, in literature, remote users as a client can control grenhouse systems over the web via Apache web server (Dochev, 2000). Similarly, we use such a method to control a greenhouse environment in the study.
Today, greenhouse control frameworks are being improved based on controlling with microcontroller or computer based systems. This is mainly because digital systems can perform mathematical operations very quickly and it can also reduce controlling costs. Studies for automation of greenhouse systems are ongoing. However, compared to increase in the growth of agricultural products, researching related to the simulations of greenhouse production have remained weak for last 10 years (Sun, & Chen, 2002). In this paper, similarly, a greenhouse environment is designed as a microcontrolled-based system to decrease the cost, to provide fast and accurate way for the calculation and also to show a way to the academy using remote infrastructure through the internet in greenhose automation.

EcoGreenHouse System (EGHS)

In this study, a system called for EcoGreenHouse System (EGHS) is developed which is based on microcontroller-operated automation activities. Also, at anywhere and anytime to get information from greenhouse and the possibility of remote controlling is made possible through the web. In this system, there is an automation control block with a fan and panels to adjust air condition of inside and make it stable around a reference value. Also there is another control system in automation control block that is aimed to measure the soil moisture and to operate the irrigation system in a balance of automatic calibration. In this paper, control software is programmed for the communication between computer and EGHS's hardware (Figure 1). This program makes it possible to control system through the internet as well. The most important advantage of the study is to make the design in minimum cost, so microcontroller based controlling is preferred in the design of EGHS. In addition, the system allows to be controlled from distance with using web interface program and it offers a lower cost solution when compare with other remote access systems in literature.

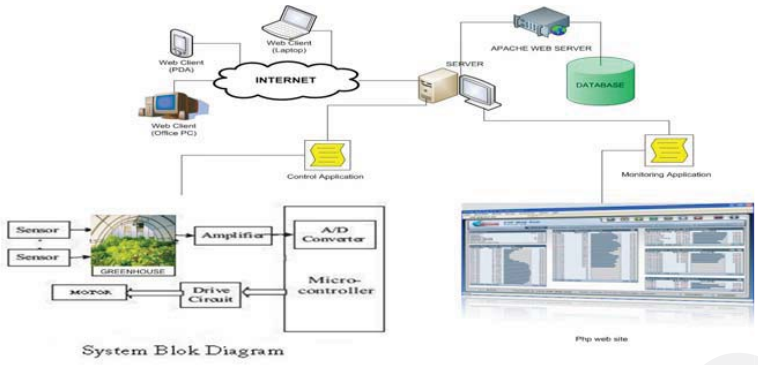

Figure 1. The system architecture of EGHS

The System Architecture of EGHS

Nowadays, microcontrollers are the most commonly used elements in control systems. Many electronic applications is consisted by these chip units owing to some features such as process management with analog signals, low cost, fast response, easy installation, and mobility. EGHS is designed over a hardware structure based on microcontroller of PIC 16F877 belonging to Microchip Company (PIC 16F877 Datasheet, 2009). Moreover, in the study, the communication between computer and hardware is realized using Max232 (MAX232 Datasheet, 2006). Software infrastructure of system includes the concept web based design and Win32 software programming. Web based software is programmed using PHP server-side script language and MS Acces database used to access and save system information instantly. The Win32 part of the design is developed in Visual Basic 6.0 programming environment by which control operations and monitoring activities is made up. EGHS's software and hardware infrastructure are explained in section 2.2 and 2.3 in details.

The Infrastructure Hardware of EGHS

In this study, the microcontroller, PIC 16F877, is used developing EGHS. RS232 is applied to the communication between computer and hardware within EGHS automation system. Primarily, information is transferred from database to microcontroller according to selected products over software and then greenhouse physical configuration is changed by hardware. The values of greenhouse are presented within the same protocol to users on software. Max232 chip is used to allow for this protocol between computer to hardware (Figure 2).

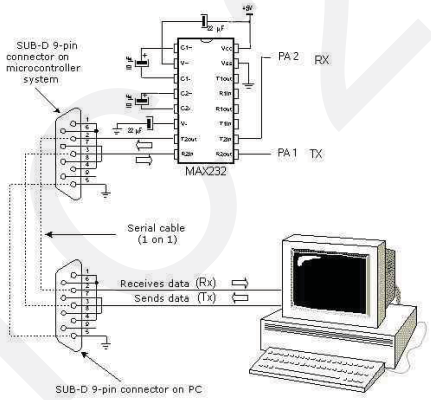

Figure 2. Realization of communication between hardware and PC over Max232

Our daily life, some measures such as temperature, humidity, wind speed, is not perceived directly by the electronic system, because those measures are in the kind of analog values. Microcontrollers take action on digital signals as all other electronic devices. The communication between the physical environment and the digital world, namely, microcontroller is offered in sensors with the support of another feature of microcontrollers that can convert to analog signals to the digital signals. Sensors are integrated circuits which are composed in some mathematic equations. In EGHS, LM35 chip is used as a temperature sensor (Figure 3a).

Figure 3a. LM35

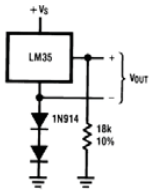

Figure 3b. between -55 ºC and 150 ºC

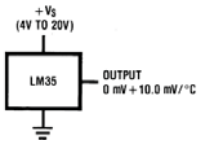

Figure 3c. between +2 ºC and 150 ºC

The measurement range of LM35 sensor varies according to the connection form. It can perform between -55 ºC and +150 ºC (Figure 3b) as well as it can measure varying from +2 ºC to 150 ºC (Figure 3c). For this study, products are over 0 ºC, thusly second connection type is applied.

Measuring soil moisture is not an easy task. There is no an accepted measurement method in literature for soil moisture (Liu, 2000). The methods used today have some advantages as well as disadvantages. In an example study, resistance of the soil was measured (Hong, & Gao, 2004). In this study, printed circuit board which has tight transmission lines is placed below the soil surface. While soil moisture increases, the increasing of currency between lines is measured.

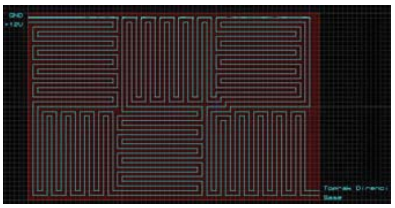

Figure 4. The appearance of soil moisture sensor developed as a sensor of this study

As you can see on Figure 4, a flow of electricity, current in the lines happens because of applied voltage. The intense of that current will inform us about soil moisture. The important part of this sensor is that it is more accurate measured and sensitives values are acquired, if the length of the lines is designed long enough. This analog information is transmitted to microcontroller from pins of this sensora and then that information is used to know how humidity of the soil is changed. Therefore, after this data is converted to digital form inside of microcontroller, the greenhouse irrigation system is controlled. Besides, step motors are used for panel controls and DC motors are also used for fan and irrigation systems.

Figure 5a. A part from designing EGHS's electronic hardware

Figure 5b. EGHS system prototype exterior of the greenhouse environment

The instant values from EGHS's sensors are shown on the LCD display. Any change in physical environment affects the values on the display. Heaters are controlled by the relays. Motors are driven through the ULN2003 chip (ULN2003 Datasheet, 2002). In Figure 5a, a part of design phase of EGHS can be seen. The design controls a prototype in Figure 5b.

EGHS System Infrastructure Software

The software section of the system is composed of two parts. For local control, an interface is programmed in Win32 interface (Figure 6a). For remote control, it is programmed in PHP language (Figure 6b). Two types of working mod 2 can be set in the software: "Auto Mode" and "Manuel Mode". Controlling the system depending on database values and observing instantaneous values are intended in Auto Mode.

Thus,

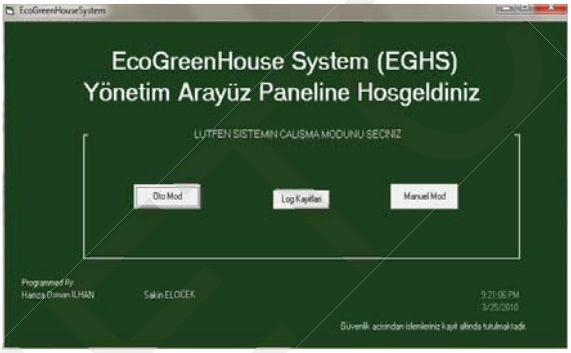

Figure 6a. EGHS Win32 application system interface

Figure 6b. EGHS system, PHP web interface

remote users can observe the instant values on a web page. The values of product quantity and the other system's data on the database can be changed with the operation of Manuel Mode. Remote users have the rights to make changes on the system configurations through this type of mode. Updating system parameters, recording new product information and modifying settings to the database are available in that mode, too. As well as, those benefits, also in the operation of Manual Mode, users can operate the equipment including heaters, panels, a fan and irrigation motors independently by hand (Figure 7).

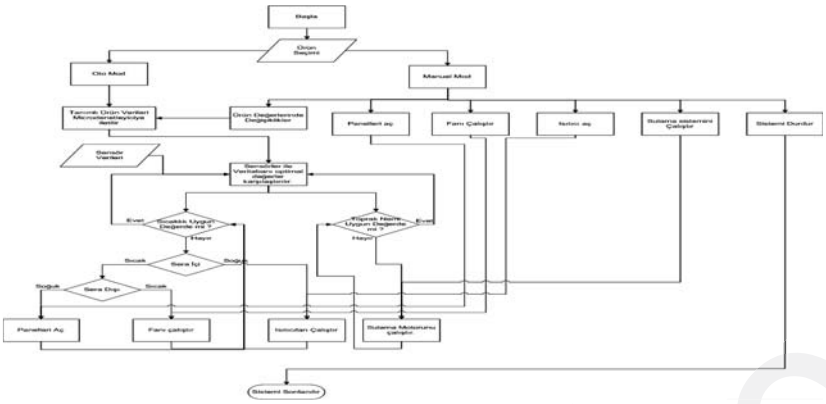

Figure 7. EGHS system infrastructure software flow diagram

Greenhouse System Audit and Monitoring System Data with EGHS

Thanks to the facility of two different working modes such as "Manual Mode" and "Auto Mode", EGHS system's functionality is improved. Instant values of EGHS can be observed through "Auto Mode" (Figure 8, Figure9). The operation of Auto Mode purposes that users can just keep an eye on EGHS's values anytime. There are different environmental conditions for each product in the database. Users can pick out the type of products which is preferred to grow in greenhouse using a remote computer through the internet. Namely, EGHS's data is accessible all over the wrold at anytime (Figure 9a, Figure 9b). Using operation of Auto Mode it can be possible that each setting related to the present products in the database is sent to the microcontroller (Figure 8a, Figure 9a). Besides, when using the Auto Mode, it is forbidden to access system data and the settings which are handled in the operation of Manual Mode.

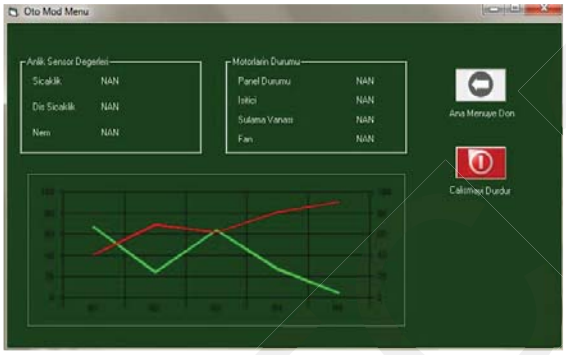

Figure 8a. Win32 interface for Auto Mode

Figure 8b. Win32 interface for Manual Mode

Present products' information on database can be changed and new values can stored in database through Manuel Mode (Figure 8b, Figure 9b). Otherwise, new values can be sent to microcontroller and system can be observed in Auto Mode depending on new values. Manuel mode gives users more flexibility control opportunity. The system is not only for one agricultural product, but also for more and different product variety by means of Manuel Mod.

Figure 9a. Php Web Interface for Auto Mode

Figure 9b. Php web interface for Manuel Mode

There are optimal values about temperature and soil moisture in the database for each product. Entering new values or modifying on an existing value is saved to the database directly in Manual Mode. The equipment of the step motor, the fan and heaters controls the temperature of inside when the temperature values coming from sensors are different from values on the database previosly. In addition to this, A DC motor is used to

control the soil moisture (Figure 7). Inside, temperature and soil moisture values of the greenhouse are kept in the database which is being maintained by a server computer via the same serial port.
EGHS has two temperature sensors to measure inside and outside at the same time. Relevant temperature bandwidth between the values of +delta (e) and -delta (e) is calculated using On-Off controlling (Figure 10) (Savas 2007).

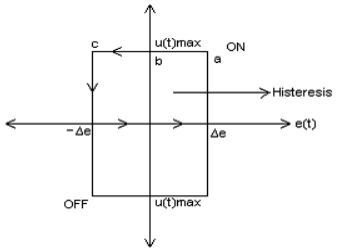

Figure 10 Setting ±delta(e) Values In On-Off Algorithm

Within this bandwidth, panels and the fan are stabilized for the greenhouse environment in efficiently with the desired physical value ensuring temperature, soil moisture, air humidity etc.. ın other words, if the temperature of inside exceeds the limits of that bandwidth, panels or the fan is started to operate. Otherwise, the temperature is kept in balance by means of the heaters.

Conclusion

Currently, greenhouse automation systems witness promising developments. Providing products in good quality and high efficiency, studies has been ongoing to make human life easier. In this paper, an application has been done having a combination of harware and software design based on microcontroller-controlled architecture through the internet. The aim of the study is to present a perspective of developing greenhouse automation systems. To do this, many of design steps explained above is applied and a system, called EGHS is build up. Another perspective of this study is to provide benefits in education. Remote monitoring systems such as EGHS can be applied for the purpose of data processing and real-time data analyse without any obligation like being with physical system (Jianen, Liren, & Xiangwen, 2003). Thus, records of database in EGHS or similar sytems would offer an insight to the product growing studies and determining of relations with earlier knowledge that can be performed in the future. Database information obtained in EGHS could be a source for researching studies based on analyzing relations for growth efficiency of agricultural products of greenhouse systems using various techniques in diferent areas such as data mining, expert systems and so forth.

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ADAY SINIF ÖĞRETMENLERİNİN GEOMETRİ ÖĞRETİMİNE YÖNELİK GÖRÜŞLERİNİN İNCELENMESİ

INVESTIGATION OF PROSPECTIVE TEACHERS' VIEWS TOWARDS GEOMETRY EDUCATION

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Özet
Bu çalışmanın amacı, sınıf öğretmeni adaylarının Van Hiele geometrik düşünme düzeylerini, geometri öğretimine yönelik görüşlerini ve geometriye yönelik tutumlarını incelemektir. Bu çalışmada nicel ve nitel araştırma desenleri bir arada kullanılmıştır. Çalışma grubunu 2009-2010 eğitim öğretim yılı I. Döneminde öğrenim gören Balıkesir Üniversitesi sınıf öğretmenliği bölümü 4. sınıf 58 öğretmen adayı oluşturmuştur. Bu çalışmada aday sınıf öğretmenlerinin geometri öğretimine yönelik görüşleri ve geometriye yönelik tutumlarına yer verilmiştir. Bu amaçla aday öğretmenlere 4 açık uçlu sorudan oluşan görüşme formu hazırlanmıştır. Aday öğretmenlerin geometriye yönelik tutumlarını belirlemek amacıyla Bindak (2004) tarafından geliştirilen ölçek ile Van-Hiele geometrik düşünme düzeylerini belirlemek amacıyla Usiskin (1982) tarafından geliştirilen ölçek kullanılmıştır. Nitel veriler içerik analizi ile nicel veriler ise SPSS 16 paket programında yer alan istatistiksel teknikler ile incelenmiştir.
Anahtar kelimeler: Geometri öğretimine yönelik görüşleri, geometriye yönelik tutumları, aday sınıf öğretmenleri, Van Hiele Geometrik Düşünme düzeyleri,

Abstract
The purpose of this study, to investigate the prospective teachers' Van Hiele geometric thinking levels, their opinions of teaching geometry and attitudes towards geometry. In this study, a combination of quantitative and qualitative research design was used. Working group consisted of 58 prospective teachers who studied 4th class in the first term of 2009-2010 academic year in Balıkesir University. This study focuses on prospective teachers' opinions of teaching geometry and attitudes towards geometry. For this purpose, interview form consisted of 4 open-ended questions. In order to determine Van Hiele geometric thinking levels and attitudes toward geometry, respectively, a scale developed by Usiskin(1982) and a scale developed by Bindak(2004) were used. Qualitative data were analyzed with content analysis and quantitative data were examined with using statistical techniques in the SPSS 16 package program
Key words: Opinions of teaching geometry, attitudes towards geometry, prospective teachers, Van Hiele Geometric Thinking Levels.

GİRİŞ

Geometri, yaşamın içinde her zaman karşımıza çıkan bir kavramdır. Bireylerin günlük hayatta karşılaşacakları problemleri çözmede önemli bir yere sahiptir. Geometri; matematiğin; nokta, düzlemsel şekiller, uzay, uzaysal şekiller ve bunlar arasındaki ilişkilerle geometrik şekillerin uzunluk, açı, alan ve hacim ölçüleri gibi konu edilen dalı (Baykul ve Aşkar, 1987: s. 104). Geometri, tanımsız terimler (nokta, düzlem, doğru, uzay, küme), tanımlı terimler, aksiyomlar ve teoremler üzerine kurulu olup, konu olarak şekil ve cisimleri incelemektedir (Altun, 2002: 357). Geometri, şekilleri ve onların özelliklerini anlamayı geliştirmede öğrencilere yardım ederek, tecrübe kazanmalarını sağlar. Geometri öğrenimi ile çevrelerindeki fiziksel dünyayı görmeye, bilmeye ve anlamlandırmaya başlar ve ilerleyen yaşlarda tümevarımlı ve tümdengelimli sistemin içinde gelişen yüksek düzeyde geometriksel düşünme ile öğrenimlerini sürdürürler. Geometrinin kuruluşundaki aksiyomatik yapının sezdirilmesi çocukların geometriye karşı olumlu bir tutum geliştirmelerine yol açar.
Geometri öğretiminde, İlköğretim I. kademe öğrencilerinin yakın çevreyi görmeleri, anlamaları, ilişki kurmaya çalışmaları sağlanmalıdır. Geometri öğretiminin amacı, öğrencilerde yüksek düzeyde geometriksel düşünme becerisi kazandırarak öğrencilere eleştirel düşünme, problem çözebilme ve matematiğin diğer konularını da daha iyi anlamalarını sağlamaktır. Geometri soyut kavramlar üzerine inşa edildiği için İlköğretim I. kademede üzerinde önemle durulmalıdır. Bu dönem çocukları somut ve sonlu nesneleri, kavramları ve ilişkileri zor anlayabileceğinden mümkün olduğunca geometri konuları çocuğun yaşadığı, görebileceği yakın çevreden izler taşımalıdır. (Kılıç, 2003: 29; MEB, 2000: 58; MEB, 2004: 23; Olkun ve Toluk, 2003: 163).
İlköğretimin I. kademesinde yer alan matematik dersinde geometri konularına yer verilmesinin sebepleri şunlardır (Baykul, 2005: 363):
1. İlköğretimde matematik çalışmaları arasında eleştirel düşünme ve problem çözme önemli bir yer tutar. Geometri çalışmaları, öğrencilerin eleştirel düşünme ve problem çözme becerilerinin geliştirilmesine önemli katkıda bulunur.
2. Geometri konuları, matematiğin diğer konularının öğretimine yardımcı olur.
3. Geometri, matematiğin günlük hayatta kullanılan önemli parçalarından biridir.
4. Geometri, bilim ve sanatta da çok kullanılan bir araçtır.
5. Geometri, öğrencilerin içinde yaşadıkları dünyayı daha yakından tanımalarına ve değerini takdir etmelerine yardım eder.
6. Geometri, öğrencilerin hoş vakit geçirmesinde, hatta matematiği sevmelerinde bir araçtır.
Ülkemizde 2004 yılında MEB Talim ve Terbiye Kurulu Başkanlığı tarafından yapılan çalışmayla İlköğretim 1–5. sınıflar Türkçe, Hayat Bilgisi, Fen Bilgisi ve Matematik programları yeniden düzenlenmiştir. Matematik dersi dört öğrenme alanına (sayılar, ölçme, veri ve geometri) ayrılarak buna bağlı olarak alt öğrenme alanları, kazanımlar ve etkinlikler oluşturulmuştur (MEB, 2005: 10). Matematik programının geometri öğrenme alanında örüntü, süsleme, simetri gibi yeni kavramlara yer verilmiştir. Geometri öğrenme alanı incelendiğinde, programın Van Hiele kuramına göre hazırlandığı görülmektedir. İlköğretimde geometri öğretiminin Van Hiele düzeylerinden ilk üç düzeyi yani "Görsel dönem, analiz ve sıralama" düzeylerini kapsaması gerektiği neredeyse tüm eğitim çevreleri tarafından kabul edilmiştir. Bu sebeple ilköğretim öğrencisi bu düzeylere uygun eğitilmelidir(Şahin, 2008).
Bu öğretimi sağlayacak aday sınıf öğretmenlerinin geometrik düşünme düzeylerinin gelişimi hakkında bilgi sahibi olmaları gerektiği düşünülmektedir. Öğrencilerde geometrik düşünmenin gelişmesine ilişkin çalışmalardan biri Hollandalı eğitimciler Dina Van Hiele-Geldof ve eşi Pierre Marie Van Hiele tarafından yapılmıştır. Van Hiele Kuramında geometrik düşünmenin gelişimi beş düzeyde gösterilmiştir. Bu beş düzey Piaget'in verdiği gelişme basamakları gibi sıralıdır. Her çocuk aynı yaşlarda olmasa bile bu basamaklardan sırayla geçmektedir. Bir basmaktaki etkinliklerle uğraşma diğer basamağa geçişi kolaylaştırmaktadır. Bu düzeyler yaşlarla doğrudan bağlantılı değildir. Ancak her insan geometrik gelişmeyi bu sıraya göre gösterir. Öğretmenin bu basmakları bilmesi eğitim-öğretim etkinliklerinin düzenlemede kolaylık sağlar (Altun, 1997, s. 319).
"I" Düzeyi (Görsel düzey): Van Hiele kuramına göre geometrik düşünmenin ilk düzeyi "görsel dönem"dir. Çocuklar geometrik şekil ve cisimleri bir bütün olarak algılar. Şekilleri görünüşleri itibariyle belirler, isimlendirir, karşılaştırır.
"II" Düzeyi (Analiz düzeyi): Van Hiele kuramına göre geometrik düşünmenin ikinci düzeyindeki öğrenci "analiz" dönemindedir. Bu düzeyde çocuklar, şekillerin özelliklerini analiz etmeye başlarlar ve şekillerin özelliklerini tümüyle açıklayabilirler.

"III" Düzeyi (Yaşantıya Bağlı Çıkarım düzeyi): Bu düzey, şekil sınıfları arasında bağ kurabilmenin geliştiği evredir. Bu düzeyde öğrenciler, şekilleri özelliklerine göre sıralayabilir ve gruplandırabilir.
"IV" Düzeyi (Mantıksal Çıkarım): Bu düzeyde öğrenciler, artık geometrik şekillerin özelliklerinden öte şeyleri sorgulama ve inceleme yeteneğine sahiptirler. Bu düzeydeki öğrenciler tümevarım yoluyla akıl yürütme süreçlerini başarabilirler ve bu sistem içinde kendilerine ispat yapabilirler.
"V" Düzeyi (En üst düzey): Bu düzeydeki öğrenciler farklı aksiyomatik sistemlerin farklılıklarını ve aralarındaki ilişkileri fark edebilirler. Değişik aksiyomatik sistemler içerisinde teoremler ortaya atar ve sistemleri analiz ve karşılaştırma yaparlar. (Altun, 1998: 331–333; Olkun ve Toluk, 2003).
Van Hiele kuramında, aşamalar yoluyla ilerleme yaş ve olgunluktan çok alınan eğitime bağlıdır. Düzeyler art arda gelen hiyerarşik bir yapıya sahiptir: Van Hiele düşünme düzeylerine göre öğrencinin bir üst düzeye geçebilmesi için önceki düzeyi başarı ile tamamlaması gerekir. Bir düzeyin geçilebilmesi için, o düzeye uygun geometrik düşünme becerilerinin kazanılması gerekir. Öğrenciler bir düzeyi atlayarak diğer düzeye geçemezler. Nitekim öğrenciye sunulan geometri, içinde bulunduğu düzeyin üstündeyse etkili öğrenme gerçekleşmez. Öğrencilerin geometride başarısız olmalarının nedenlerinden biri de öğrencilerin sahip olmadıkları düşünce seviyesindeki konuları anlamalarını beklemektir. Bununla birlikte eğitimde söz sahibi olan öğretmenlerin de geometrik düşünme düzeylerine uygun öğretim yapmamaları da geometri başarısı üzerinde önemli bir etkendir. Bu öğretimi gerçekleştirecek aday öğretmenlerin Van Hiele geometrik düşünme düzeylerinden haberdar olmaları, ayrıca 3. veya 4. geometrik düşünme düzeyine sahip olarak mezun olmaları ve matematiğin bir alanı olan geometriye yönelik olumlu tutum geliştirmiş olmaları beklenmektedir(NCTM, 2000;YÖK, 2007). Bu bağlamda, çalışmanın amacı aday sınıf öğretmenin Van Hiele geometrik düşünme düzeylerini belirlemek, geometri öğretimine yönelik görüşlerini ve geometriye yönelik tutumlarını incelemektir. Bu amaç doğrultusunda aşağıda yer alan araştırma problemlerine yanıt aranmıştır:

1. Aday sınıf öğretmenlerinin geometri öğretimine yönelik görüşleri nelerdir?
2. Aday sınıf öğretmenlerinin Van Hiele geometrik düşünme düzeyleri nedir?
3. Aday sınıf öğretmenlerinin geometriye yönelik tutumları Van-Hiele geometrik düşünme düzeylerine göre farklılık göstermekte midir?

YÖNTEM

Araştırmanın Modeli
Bu çalışmada nicel ve nitel araştırma desenleri bir arada kullanılmıştır. Öğretmen adaylarının geometri tutumlarını ve Van-Hiele düşünme düzeylerini belirlemek amacıyla nicel verilerden yararlanılmıştır. Geometri öğretimine yönelik görüşleri ise nitel verilerle incelenmiştir.

Çalışma Grubu:
Çalışma grubunu 2009-2010 eğitim öğretim yılı I. Döneminde öğrenim gören Balıkesir Üniversitesi sınıf öğretmenliği bölümü 4. sınıf 58 öğretmen adayı oluşturmuştur. Çalışma grubunun belirlenmesinde kolay ulaşılabilir durum örneklemesi kullanılmıştır. Bu örneklemede araştırmacı yakın ve erişilmesi kolay olan bir durumu seçer.(Şimşek ve Yıldırım,2004)

Veri Toplama Aracı:
Bu çalışmada aday sınıf öğretmenlerinin geometri öğretimine yönelik görüşleri ve geometriye yönelik tutumlarına yer verilmiştir. Bu amaçla aday öğretmenlere aşağıda yer alan ve 4 açık uçlu sorudan oluşan görüşme formu hazırlanmıştır. Görüşme formunun hazırlanmasında konuya ilişkin literatür taranarak, uzman görüşleri doğrultusunda düzenlemeye gidilmiştir.

1. *Lisans öğreniminiz sırasında geometri öğretimine yönelik bir ders aldınız mı? Aldıysanız bu dersin içeriğinden bahseder misiniz?*
2. *Lisans öğreniminiz sırasında geometri öğretimine yönelik bir ders almanın öğretmenlik hayatınıza etkisi sizce nedir? Açıklayınız.*
3. *İlköğretim birinci kademe programında yer alan geometri konularının öğretiminde kendinizi yeterli görüyor musunuz?*
4. *Sınıf Öğretmenliği lisans programlarında geometri öğretimine yönelik derslerin yer almasına ilişkin görüşleriniz nelerdir?*

Ayrıca aday öğretmenlerin geometriye yönelik tutumlarını belirlemek amacıyla Bindak (2004) tarafından geliştirilen ölçek kullanılmıştır. Bu çalışmada ölçeğin Cronbach Alpha güvenilirlik katsayısı .83 olarak bulunmuştur. Ölçek beşli likert tipinde olup 25 maddeden oluşmaktadır. Aynı zamanda aday sınıf öğretmenlerinin Van-Hiele geometrik düşünme düzeyleri Usiskin (1982) tarafından geliştirilen ölçekle incelenmiştir.

Veri Analizi
Nitel verilerin analizinde, araştırmacılar tarafından tespit edilen kategoriler karşılaştırılmış ve asıl kategorilere ulaşılmıştır. Kategorilerin oluşturulması sürecinde her soru kendi içersinde ayrı ayrı analiz edilmiştir. Araştırmacıların belirlediği kategoriler arasında % 80 tutarlılık olduğu gözlenmiştir. Kategorilerin belirlenmesinin ardından tablolar oluşturulmuş ve kategorileri yansıtan örnek cümlelerle zenginleştirilmiştir. Tablolar oluşturulduktan sonra kategorilere yönelik açıklamalar yapılmıştır. Açıklamalar yapılırken özellikle kategoriler arasındaki ilişkiler de ortaya çıkarılmaya çalışılmıştır. Nicel veriler SPSS 16 paket programında yer alan t testi ve tek yönlü ANOVA kullanılarak analiz edilmiştir.

BULGULAR VE YORUMLAR

Çalışmada yer alan alt problemlere ilişkin veriler analiz edilerek bu bölümde bulgu ve yorumlara yer verilmiştir.

I. Alt probleme ilişkin bulgular
1.*"Lisans öğreniminiz sırasında geometri öğretimine yönelik bir ders aldınız mı? Aldıysanız bu dersin içeriğinden bahseder misiniz?"* sorusuna 58 aday öğretmen sınıf öğretmenliği lisans öğrenimi sırasında geometri öğretimine yönelik bir ders almadığını belirtmiştir. 17 aday öğretmen ise sınıf öğretmenliği lisans programında Temel Matematik I-II ve Matematik Öğretimi I-II dersleri içeriğinde temel geometri konuları arasında yer alan açılar, üçgenler ve çizimlerine yüzeysel olarak değinildiğini belirtmişlerdir. Örneğin:

B1. Matematik dersinin içinde çok az gördük. Geometrinin temel konularını göz gezdirir gibi gördük.
B4.Az da olsa geometri konularından bahsettik.
B6. Konu anlatımı ayrıntılı bir şekilde verilmedi. Matematik dersi içinde çok yüzeysel olarak anlatıldı.
E14. Hayır almadık sadece matematik öğretimi dersi içinde açı dereceleri, belli üçgenleri gönye ve pergelle çizmeyi öğrendik.

Sınıf öğretmenliği lisans programı incelendiğinde Temel Matematik II dersinde temel düzlem geometri bilgileri (temel elemanlar, üçgen ve çokgenlerin temel özellikleri); temel uzay geometri bilgileri (küp, prizma, silindir, piramit, koni, küre, vb.); temel trigonometri bilgileri (dik üçgende trigonometrik oranlar, basit trigonometrik fonksiyonlar, vb.) ve Matematik Öğretimi II dersinin içeriğinde temel geometrik kavramlar, tanımlar, özellikler ve öğretimi; temel geometrik şekiller, cisimler ve öğretimi yer almaktadır(YÖK, 2006). Ancak öğrenci görüşleri incelendiğinde geometri öğretiminin bu dersler kapsamında yeterli ve etkili düzeyde verilmediği görülmüştür.
2. *"Lisans öğreniminiz sırasında geometri öğretimine yönelik bir ders almanın öğretmenlik hayatınıza etkisi sizce nedir"* sorusuna verilen yanıtlar incelenmiş ve iki kategori altında gruplanmıştır. Bu kategorilere ait frekans(f) ve yüzde(%) dağılımları Tablo 1' de verilmiştir.

Tablo 1. Geometri öğretimine yönelik bir ders almanın öğretmenlik hayatınıza etkileri

	Frekans (f)	Yüzde (%)
Alan Bilgisine Katkı	14	24
Öğretmen meslek bilgisine katkı	44	76
Toplam	58	100

Tablo 1 incelendiğinde geometri öğretimine yönelik bir ders almanın; 58 aday öğretmenin % 24' ü yani 14 aday öğretmen alan bilgisine katkı, %76' sı yani 44 aday öğretmenin meslek bilgisine katkı sağlayacağına dair görüş bildirmiştir. Öğretmen adaylarının alan bilgisine katkı sağlayacağı yönündeki görüşlerinden bazıları aşağıda belirtilmiştir. Örneğin:

B2. Ben sınıf öğretmenliği öğrencisi olduğum için geometri dersi benim alan bilgisi kapsamında almam gereken bir ders.

E3. Meslek hayatımızda alan bilgimize katkısı olacağını düşünüyorum.

B9. Bence özelikle sınıf öğretmenliği bölümünde bu dersin bir dönem dahi olsa geometri adı altında verilmesi gerekiyor. Çünkü ilköğretim boyunca temel olarak da olsa öğrencilere geometri bilgi veriliyor ve bu öğretim temelde ne kadar iyi olursa ileriki yıllarda edinilebilecek bilgiler daha iyi kavranabilir.

B15. Bu sene öğretmenlik uygulaması dersinde sınıf öğretmenliği öğrencilerinin takıldığı bir nokta oldu. Hem uygulama öğretmen hem de ben geometriye yönelik bir dersin eksikliği burada kendini gösterdi.

F16. Lisans öğrenimim sırasında geometri öğretimine yönelik bir ders alsaydım çevremdeki nesnelerde, günlük hayatımda geometrik bakış açımın ve geometrik düşünme becerilerimin gelişebileceğini düşünüyorum.

F20,13. Lisans öğrenimim sırasında alacağım geometri öğretimine yönelik bir ders, unuttuğum kavramları hatırlamamı ve bilmediğim konuları öğrenmemi sağlayabilirdi. çünkü şu anki bilgilerim ÖSS' de karşımıza çıkan geometri konuları ile sınırlı.

Görüşler incelendiğinde sınıf öğretmenliği lisans programında aday öğretmenlere geometri alan bilgisine yönelik yeterli düzeyde öğretim verilmediği ortaya konmuştur. Ayrıca öğretmen adayları, geometri öğretimine yönelik bir ders almanın; meslek bilgisine de katkı sağlayacağını belirtmişlerdir. Örneğin:

F5. Böyle bir ders almamız çok önemliydi. Çünkü ilköğretimin I. Kademesinde, temel geometrik bilgiler öğrencilere verilmekte ve biz bunu öğrencilerimize nasıl öğreteceğimizi bilmeden yetiştik.

B3. Geometri öğretimi, ilerleyen yıllarda derslerin anlatımı, plan yapımı konusunda bize düzenli olmayı öğretir. Bu yüzden geometrinin nasıl öğretileceği konusunda bilgi sahibi olmam gerekir.

E12. Öğrencilerin analitik düşünme becerilerine katkıda bulunan öğretmenler yetiştirilmesini sağlar.

F3. Geometri öğretiminde alacağımız ders öğrencilerin geometriye yönelik olumsuz tutumlarını, fobilerini bertaraf etmede ve öğrencilerin ilgilerini derse yönelterek başarılı bir ders işlememizde bize yardımcı olabilirdi.

E5. Mesleğe başladığımızda öğrencilerimize geometri dersi veya temel kavramlarda daha yararlı olup onların seviyelerine göre daha iyi anlatmamıza yardımcı olur.

Meslek bilgisine hangi yönde/nasıl katkı sağlayacağını belirten aday öğretmenlerin görüşleri araştırmacılar tarafından alt kategorilere ayrılmıştır ve bu alt kategoriler Tablo 2 de verilmiştir.

Tablo 2. Meslek bilgisine katkı

Meslek bilgisine katkı	Frekans (f)	Yüzde (%)
İlköğretim I. Kademede yer alan öğrencilerin gelişim seviyelerine uygun olarak programda yer alan geometri konularının öğretimine yönelik yöntem ve teknikleri tasarlama ve öğretimi gerçekleştirme	40	49
İlköğretim I. Kademede yer alan öğrencilere çok yönlü düşünme becerisi kazandırabilme(analitik düşünme becerisi, ayrıntıları görebilme, akıl yürütme, zihni çok yönlü kullanma, problem çözme becerisi)	22	27
İlköğretim I. Kademede yer alan öğrencilerde geometriye yönelik olumlu tutum geliştirme	12	14
Günlük hayat problemlerine geometrik bakış açısıyla yaklaşma	7	8
Toplam	81	100

Aday öğretmenler bu soruya birden fazla alt kategoride görüş bildirmişlerdir. Toplam 81 görüş elde edilmiştir bu görüşlere ait frekans ve yüzde dağılımları Tablo 2' de görülmektedir. Bu görüşler incelendiğinde etkili geometri öğretimi gerçekleştirmenin daha önemli görüldüğü ortaya çıkmıştır.

3."İlköğretim birinci kademe programında yer alan geometri konularının öğretiminde *kendinizi yeterli görüyor musunuz?"*sorusuna verilen yanıtlar Tablo 2 de yeterli, yetersiz ve kısmen yeterli olarak belirlenmiştir.

Tablo 3. İlköğretim birinci kademe programında yer alan geometri konularının öğretiminde yeterliliği

	Frekans (f)	Yüzde (%)
Yeterli	30	52
Kısmen Yeterli	15	26
Yetersiz	13	22
Toplam	58	100

Tablo 2' ye göre 58 aday öğretmenden % 52sinin yani 30' unun geometri öğretimde kendisini yeterli gördüğü, % 26'sının yani 15 aday öğretmenin kısmen yeterli gördüğü ve %22'sinin yani 13 aday öğretmenin kendisini yetersiz gördüğü sonucuna ulaşılmıştır. Kısmen yeterli olarak görüş bildiren aday öğretmenlerin, kendilerini ortaöğretimde aldıkları geometri bilgileri yönünden yeterli ancak bu bilgiyi ilköğretim I. Kademedeki öğrenci seviyesine uygun olacak şekilde aktarma konusunda yetersiz hissettikleri belirlenmiştir. Örneğin:

E17. Kendimi yeterli buluyorum, geometri dersine her zaman ilgi duymuşumdur. Öğretirken de zevk alacağıma ve başarılı olacağıma eminim.

B10. Bu konuda kendimi yeterli görmüyorum. Çünkü bunun eğitimini almış olsaydım. Geometri bilgisinden ziyade bu bilgiyi ilköğretim öğrencisi seviyesine indirgeyebilme becerisine sahip olabilirdim.

F8. Yeterli görmüyorum. Çünkü geometri öğretimine yönelik herhangi bir ders almadım. Diğer derslerdeki öğretimle ilişkilendirerek anlatım yapmayı düşünüyorum.

F3. Kendimi kısmen yeterli görüyorum ama bu yeterlilik burada öğrendiğim değil öğrencilik hayatım boyunca öğrendiğim almış olduğum bilgilere ve deneyimlere dayalı çünkü üniversitede bu dersi geliştirici etkinliklere fazla yer verilmedi.

E1. Evet lisede gördük geometri. Bu alanda kendimi yeterli görmüyorum.
E7. Geometri sorusu çözebilecek kadar yeterli görüyorum. Ama öğrencilere anlatabilecek kadar yeterli değilim.
E14. Hayır yeterli görmüyorum. Çünkü bilmek ve anlatabilmek, öğretebilmek çok farklı şeyler. Biliyorum ama anlatımı, öğretimi için ayrıca çaba göstermem gerekeceğini düşünüyorum.
Geometri konularının öğretiminde kendisini yeterli olarak gören aday öğretmenlerin bu yeterliklerini ortaöğretim bilgilerine dayandırmaları dikkat çekicidir. Nitekim aday öğretmenlerin görüşlerinden geometri öğretim yöntemlerinden haberdar olmadıkları anlaşılmaktadır. Bunun yanı sıra aday öğretmenlerin % 52 sinin kendisini yeterli görmesine karşın Van Hiele geometrik düşünme düzeylerinden sadece üçüncü düzeye erişebilenlerin yüzdesi %8.6' dır. Bu durum göz önüne alınması gereken bir bulgudur. Aday sınıf öğretmenlerin geometri öğretim teknikleri ve Van Hiele geometrik düşünme düzeylerinin gelişimi konusunda yeterli bilgilerinin olmadığı düşünülmektedir. Bu eksikliğin lisans programında geometri öğretimi dersinin bulunmamasından kaynaklandığı yönünde görüş bildiren aday öğretmenlerin % 93ünü oluşturmaktadır.
4."*Sınıf Öğretmenliği lisans programlarında geometri öğretimine yönelik derslerin yer almasına ilişkin görüşleriniz nelerdir?"* sorusuna aday sınıf öğretmenlerinden 4' ü ders almaya gerek olmadığını, 54' ü ise ders almanın gerekli olduğunu vurgulamıştır. Bu dersin sınıf öğretmenliği programı içerisinde yer alması gerektiğini düşünen aday öğretmenleri; zeka geliştirme, zevkli ve faydalı bir ders olması, ilköğretim I. kademede geometri öğretiminin yer alması, etkili öğretimin gerçekleştirilebilmesi yönünde görüş bildirmişlerdir.

II. Alt probleme ilişkin bulgular
Aday sınıf öğretmenlerinin Van Hiele geometrik düşünme testine verdikleri yanıtlar SPSS programına girilerek analiz edilmiş ve düzeylere ait frekans(f) ve yüzde (%) dağılımları tablo 3' te verilmiştir.

Tablo 3.Aday sınıf öğretmenlerinin Van Hiele geometrik düşünme düzeyleri

	Frekans (f)	*Yüzde (%)*
1. düzey (Görsel Düzey)	46	79,3
2. düzey (Analiz Düzeyi)	7	12,1
3.düzey (Yaşantıya Bağlı Çıkarım Düzeyi)	5	8,6
Toplam	58	100

Tablo 3 incelendiğinde çalışmaya katılan sınıf öğretmeni adayları farklı yüzdeliklerde Van Hiele düşünme düzeylerinden sadece ilk üç düşünme düzeyini sergiledikleri belirlenmiştir. Bu araştırmada, sınıf öğretmeni adaylarından % 79.3 ünün 1. düzeyde, % 12.1'inin 2. düzeyde ve sadece %8.6 sının 3. düzeyde olduğu görülmektedir.

III. Alt probleme ilişkin bulgular
Araştırmanın üçüncü alt problemi olarak "aday sınıf öğretmenlerinin geometriye yönelik tutum puanları ile Van-Hiele geometrik düşünme düzeylerine arasında anlamlı bir ilişki var mıdır? "sorusu incelenmiştir. Öğretmen adaylarının geometriye yönelik tutum puanlarının, Van-Hiele geometrik düşünme düzeyleri değişkenine göre farklılaşıp farklılaşmadığını belirlemek amacı ile Tek yönlü varyans Analizi (ANOVA) kullanılmıştır(Büyüköztürk, 2006). Analiz sonuçları tablo 4 ve tablo 5 de verilmiştir.

Tablo 4. Öğretmen adaylarının Geometriye Yönelik Tutum Puanları Değişkenine İlişkin Betimsel Veriler

Van-Hiele Geometrik Düşünme Düzeyleri	N	$\bar{x}$	sd
1.Düzey (Görsel Düzey)	46	37.5	8,2
2.Düzey (Analiz Düzeyi)	7	58.5	10,4
3.Düzey (Yaşantıya Bağlı Çıkarım Düzeyi)	5	93.6	17,3
Toplam	58	44.9	18.9

Tablo 5. Tek Yönlü Varyans Analizi (ANOVA) Sonuçları

Varyansın Kaynağı	Kareler Toplamı	sd	F	p
Gruplar arası	15626.7	2	87.55	.000
Grup içi	4908.0	55		
Toplam	20534.8	57		

Tablo 4' de yer alan ortalamalar incelendiğinde, farklı geometrik düşünme düzeyine sahip öğretmen adaylarının geometri tutum puanları arasında 3. Düzeyde yer alan öğretmen adayları lehine olduğu görülmüştür. 3. düzey ile 2.düzey öğretmen adaylarına ait ortalama puanları arasında 45.1 ve 3. düzey ile 1.düzeyde bulunan öğretmen adaylarının ortalama puanları arasında 56.1 puanlık bir fark bulunmaktadır. Ortalamalar arasında gözlenen farklılığın anlamlı olup olmadığını belirlemek için yapılan tek yönlü ANOVA sonuçlarına göre öğretmen adaylarının geometriye yönelik tutum puanları, sahip oldukları geometrik düşünme düzeylerine göre anlamlı bir farklılık gösterdiği tespit edilmiştir. [F(2-55)=87.55: p<.05]. Anlamlı çıkan F değerleri için farkın kaynağını belirlemek üzere çoklu karşılaştırma testlerinden Scheffe Testi kullanılmıştır (Büyüköztürk, 2006). Scheffe testinin sonuçları Tablo 6'da verilmiştir.

Tablo 6. Öğretmen adaylarının tutum puanlarına ilişkin Scheffe testi sonuçları

(I) Geometrik Düşünme Düzeyi	(J) Geometrik Düşünme Düzeyi	(I-J) Ortalama Farkı	p
1.Düzey	2.Düzey	-20.98	.000
	3.Düzey	-56.01	.000
2.Düzey	3.Düzey	-35.02	.000

Tablo 6'ya göre 3.Düzeyde yer alan öğretmen adaylarının tutum puanlarının 1.ve 2. Düzeyde yer alan öğretmen adaylarının tutum puanlarında daha fazla olduğu belirlenmiştir. Yani geometriye yönelik tutum puanları en yüksek olan grup 3.düzeyde yer alan öğretmen adayları ve tutum puanları en düşük olan grubun ise 1. düzeyde yer alan öğretmen adayları olduğu sonucuna ulaşılmıştır(Büyüköztürk, 2006). Öğretmen adayları arasında 4. ve 5. düzeye ulaşan öğretmen adayı olmadığı için sadece üç grup üzerinden inceleme yapılmıştır. Sonuç olarak düzey yükseldikçe tutum puanlarının da arttığı gözlemlenmiştir. Elde edilen bulguları literatürde yapılan çalışmaların sonuçları da desteklemektedir. Mc Clandon(1990), ilkokul öğretmenlerinin geometrik kavramları anlamalarını değerlendirmede Van Hiele Modeli ve geometri öğretimine karşı tutumlarını geliştirme başlıklı çalışmasında son test puanlarının geometrik düşünme düzeyleri ve geometri öğretimine ilişkin tutumları arasında anlamlı bir farklılık tespit etmiştir. Bunun gibi pek çok araştırma bulguları desteklemektedir. (Duatepe, 2000; Kılıç,2003; Olkun, 2002; Toluk, 2002)

SONUÇ VE ÖNERİLER

İlköğretim öğrencilerine geometri öğretecek olan öğretmenlerin 3. ve 4 . geometrik düşünme düzeyine sahip olarak mezun olmaları beklenmesine karşın aday sınıf öğretmenlerinin %8.6sının 3. düzeye ulaşabilmiş olması düşündürücüdür. Bu durum öğretmen adaylarının sahip olmadıkları düşünme düzeyine uygun geometri öğretimini nasıl gerçekleştirebilecekleri sorusunu akla getirmektedir. Bu durum aday sınıf öğretmenlerinin geometriye yönelik tutumlarını etkilemiş, elde edilen sonuçlara göre tutum puanlarının Van Hiele geometrik düşünme düzeylerine paralel şekilde değişim gösterdiğini ortaya koymuştur. Sonuç olarak öğretmen adaylarının tutum puanlarının 1. düzeydeki aday öğretmenler için ortalama 37.5, 2. Düzeydeki aday öğretmenler için ortalama 58.5, 3.düzeydeki aday öğretmenler için ortalama 93.6 olduğu belirlenmiştir.

Araştırma kapsamında şu öneriler yer verilmiştir: 1. sınıf öğretmenliği lisans programında geometri öğretimi ve geometri derslerinin yer alması gerektiği düşünülmektedir, 2. sınıf öğretmenlerine çocukta geometrik düşünme düzeylerinin gelişimi, eğitim öğretim ortamının bu gelişim özelliklerine göre düzenlenmesi, geometri öğretim teknikleri konusunda çağdaş yaklaşımların, dinamik yazılımların geometri öğretiminde kullanılması gibi hizmetiçi eğitim verilmesi gerekir,3. halen öğrenim gören aday sınıf öğretmenlerine yönelik geometri alan bilgisi konusunda kapsamlı bir araştırma yapılabilir.

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AİLELERDE İNTERNET KULLANIM PROFİLİ VE VELİLERİN ÇOCUKLARININ İNTERNET KULLANIMINA YÖNELİK GÖRÜŞLERİ: ŞARKIŞLA İLÇESİ ÖRNEĞİ

DOMESTIC INTERNET USAGE PROFILE AND PARENTS' VIEWS ON INTERNET USE OF CHILDREN: ŞARKIŞLA DISTRICT SAMPLE

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Özet
Çağımızın bilgi ve iletişim aracı olan İnternet, özellikle ADSL teknolojisinde yapılan önemli yatırımlar sonucunda hızla yaygınlaşmaktadır. İnternet ilköğretim düzeyi son eğitim programında öne çıkan proje ve performans görevlerinde önemli bir başvuru kaynağı haline gelmiştir. Bu açıdan bilgi kaynağı olarak sağladığı kolaylıklar ile gün geçtikçe önem kazanan İnternet, ailelerin bu teknolojiye bakış açılarını da önemli ölçüde etkilemiştir. Evlerde kullanımı yaygınlaşan internetin kullanım durumunu belirlemek amacı ile yapılan bu araştırmada öğrenci velilerine evlerindeki İnternet kullanım durumları sorulmuştur. Araştırma 2008-2009 öğretim yılında Sivas ili Şarkışla ilçesindeki Milli Eğitim Bakanlığı'na bağlı ilköğretim okullarının öğrenim gören öğrenci velilerinden oluşmaktadır. Bu kapsamda 94 öğrenci velisine ulaşılmıştır. Araştırma sonucunda öğrencilerin velilere oranla daha sık interneti kullandıkları, evlerin yarısında İnternet bağlantısı bulunduğu ve bağlantı türü olarak ta ADSL teknolojilerinin daha çok kullanıldığı, öğrencilerin evden ve okuldan daha çok İnternete bağlandıkları, çoğunlukla yalnız olarak interneti kullandıkları ile velilerin İnternet kullanımları konusundaki genel düşünceleri sonuç olarak ortaya konmuştur.
Anahtar Sözcükler: İnternet kullanımı, aile ve İnternet, ailede İnternet kullanımı

Abstract
Internet, the information and communication agent of our age is getting more widespread through the investments on ADSL technology. Internet has become an essential reference source for project and performance tasks especially distinguishing in the new primary school curriculum. This point of view, facilities of Internet as an information source is becoming more of an issue, and families' perspectives to technology has been affected significantly. This research was held to detect the state of Internet use, which is getting more widespread. Student parents were asked about their Internet use status. Example of the research consists of some parents whose children are students in Primary schools which belong to National Education Ministry in Sivas Şarkışla at 2008-2009 academic year. We reached 94 parents in the scope. At the end of the research findings are showed that students use Internet more often, half of the houses have Internet connection and most of them are connected by ADSL technologies, students connect to the Internet mostly at home or at school, students use Internet alone. Also parents thoughts about using Internet are presented.
Keywords: Internet usage, parents and Internet, domestic internet use

GİRİŞ

Gelişen bağlantı teknolojileriyle beraber özellikle yaygınlığı giderek artarak dünyayı bir ağ gibi ören Internet, günümüz eğitim programlarını hem doğrudan hem de dolaylı olarak etkilemektedir. Güncel eğitim programları, okullarda kurulan bilişim teknolojisi sınıfları ile öğrencilere doğrudan bilgisayar ve internete yönelik eğitimler sağlarken, diğer derslerde verilen performans ödevleriyle de öğrencileri dolaylı olarak İnternette araştırma yapmaya sevk etmektedir. Teknolojinin eğitim alanında da bu hızlı gelişimine ayak uydurmak giderek önem kazanırken bu gelişimi takip edemeyen ya da direnç gösterenlerse çoğu alanda bu yetersizliğin kaygı ve sıkıntısını yaşamaktadırlar. Öğrenci velileri artık günümüzde kendi iş yaşamlarında gereksinim duymasalar bile, kendi çocukları için internetle tanışmakta ve kullanmayı öğrenme ihtiyacı hissetmektedirler.

Amaç

Bu araştırmanın amacı öğrenci velilerinin görüşleri doğrultusunda kendilerinin ve öğrencilerin internet kullanım profillerinin belirlenmesi ve velilerin çocuklarının internet kullanımına yönelik görüşlerinin ortaya konulmasıdır. Bu amacı gerçekleştirmek için aşağıdaki sorulara cevaplar aranmıştır.

1. Veliler interneti hangi sıklıkta kullanmaktadırlar?
2. Öğrenciler interneti hangi sıklıkta kullanmaktadırlar?
3. Evde internet bağlantısı var mıdır, varsa hangi internet servis sağlayıcısı kullanılmaktadır?
4. Öğrenciler internet bağlantısı için en çok hangi yeri kullanmaktadırlar?
5. Öğrenciler interneti çoğunlukla ne şekilde kullanmaktadırlar?
6. Çocuklarının internet kullanımı konusunda velilerin düşünceleri nelerdir?

YÖNTEM

Bu bölümde araştırmanın modeli, çalışma evreni, veri toplama aracı, verilerin toplanması ve analizi açıklanmıştır.

Araştırmanın Modeli

Betimsel bir çalışma olan bu araştırma, tarama modelindedir. Araştırmanın amaçlarına uygun olarak tarama modellerinden tekil tarama modeli kullanılmıştır. Öğrenci velilerinin İnternet kullanım durumlarından elde edilen bilgiler bulgular şeklinde ortaya konmuştur.

Çalışma Evreni

Araştırmanın evrenini 2008–2009 öğretim yılında Türkiye'nin ortalama büyüklük ve gelişmişlikteki bir ilçesi olan Sivas ili Şarkışla İlçesinde bulunan Milli Eğitim Bakanlığı'na bağlı ilköğretim okullarında öğrenim gören öğrenci velileri oluşturmaktadır. Şarkışla ilçesinde toplam 10 adet okul bulunmaktadır. Araştırma evreninin büyüklüğü nedeni ile rasgele örnekleme yöntemi ile örneklem alınmıştır. İlçedeki okullardan biri olan Hürriyet İlköğretim Okulu örnekleme dahil edilmiştir. Bu okulda ilgili eğitim dönemi süresi içerisinde ve ankete gönüllü olarak katılan öğrenci velilerinin yanıtları analiz edilmiştir.

Veri Toplama Aracı ve Verilerin Toplanması

Ailelerin İnternet kullanım profilleri ile velilerin çocuklarının İnternet kullanımına yönelik görüşlerini belirlemek amacıyla araştırmacılar tarafından bir anket geliştirilmiştir. Anket iki bölümden oluşmaktadır. Birinci bölümde velilere ve ailelere yönelik kişisel bilgiler ile İnternet kullanımı konusundaki maddeler yer alırken, ikinci bölümde ise velilerin çocuklarının İnternet kullanımı konusundaki genel düşüncelerini içeren ve 3'lü likert şeklinde ifade edilen (1- Katılmıyorum, 2-Kararsızım, 3- Katılıyorum) maddeler yer almaktadır. Yine bu bölümde açık uçlu soru ile velilerin interneti ne olarak nitelendirdikleri sorusu yer almıştır. Hazırlanan anket Bilgisayar ve Öğretim Teknolojileri Bölümünde görev yapan iki alan uzmanının görüşüne sunularak kapsam geçerliği sağlanmıştır.

Verilerin Analizi

Öğrenci velilerinin kişisel bilgileri, veli ve öğrencilerin İnternet kullanım sıklıkları, öğrencilerin İnterneti ne şekilde kullandığı, evde kullanılan İnternet servis sağlayıcısı gibi tüm bilgiler ile velilerin İnternet için yaptığı nitelendirmelerin analizi için yüzde ve frekans değerleri kullanılmıştır. Ayrıca velilerin İnternet kullanımı konusundaki düşünceleri ise yüzde, frekans ve aritmetik ortalama değerleri kullanılarak yapılmıştır. Yapılan tüm analizlerde anlamlılık düzeyi 0,05 olarak alınmıştır. Araştırmanın istatistiksel çözümlemelerinde SPSS 15.0 (Statistical Package for the Social Sciences) paket programı kullanılmıştır.

BULGULAR VE YORUMLAR

Ev ortamında İnternet kullanım profilinin belirlenmeye çalışıldığı bu araştırmada, öncelikli olarak araştırmaya katılan velilerin genel özelliklerini tanımlamayı sağlayacak demografik bilgiler verilmiştir (Tablo 1).

Tablo 1. Araştırmaya katılan öğrenci velilerine ait demografik bilgiler

		f	%
Velinin Yakınlığı	Anne	45	47,9
	Baba	43	45,7
	Diğer	6	6,4
	Toplam	94	100
Velinin Yaş Aralığı	25'den az	8	8,5
	26–35 arası	20	21,3
	36–45 arası	55	58,5
	45 ve daha yukarı	11	11,7
	Toplam	94	100
Velinin Eğitim Durumu	İlkokul	38	40,4
	Ortaokul	22	23,4
	Lise	27	28,7
	Üniversite	6	6,4
	Diğer	1	1,1
	Toplam	94	100
Ailenin Aylık Toplam Geliri	Düşük	16	17,0
	Orta	53	56,4
	İyi	22	23,4
	Çok İyi	3	3,2
	Toplam	94	100

Tablo 1 incelendiğinde, araştırmaya katılan velilerin yarıya yakının anne (% 47,9) ve diğer yarısının da babalar (% 45,7) olduğu görülmektedir. Yaş aralığı olarak büyük bir çoğunluğunun sırası ile 36–45 ile 26–35 yaş aralıklarında olduğu söylenebilir. Eğitim durumu açısından üniversite mezunu oranı (% 6,4) az olmakla birlikte diğer eğitim durumları (ilkokul, ortaokul ve lise) açısından yaklaşık bir dağılım olduğu ifade edilebilir. Velilerin yarısından fazlası (% 56,4) aylık toplam aile gelirini orta seviyeli olarak belirtmiştir.

Velilerin İnternet Kullanma Sıklıkları

Aile içerisinde İnternete kullanımının belirlenmesinde görüşlerine başvurulan velilerin kendilerinin internet kullanımlarının da önemli olduğu düşünülerek, onların internet kullanım sıklıkları araştırılmıştır. Elde edilen bulgular Tablo 2'de verilmiştir.

Tablo 2. Velilerin İnternet Kullanma Sıklıkları

	f	%
Günde birkaç kez	18	19,1
Haftada birkaç kez	29	30,9
Ayda birkaç kez	10	10,6
Çok nadir veya hiç	37	39,4
Toplam	94	100

Velilerin internet kullanım sıklıklarındaki farklılık dikkat çekicidir. Velilerin yarısı interneti günde birkaç kez (%19,1) veya haftada birkaç kez (%30,9) kullandığını ifade ederken, diğer yarısı ayda birkaç kez (%10,6) veya çok nadir ya da hiç (%39,4) şeklinde bir kullanım sıklığı ifade etmiştir. Diğer dikkat çekici bir konu ise velilerin büyük bir çoğunluğunun interneti ya çok nadir ya da hiç kullanmadığıdır.

Öğrencilerin İnternet Kullanma Sıklıkları

Araştırma alt amaçları doğrultusunda velilere yöneltilen bir diğer soru ise öğrencilerin interneti kullanma sıklıklarının ne olduğu sorusu olmuştur. Velilerin bu soruya verdikleri yanıtlardan elde edilen bulgular ise Tablo 3'te görülmektedir.

Tablo 3. Öğrencilerin İnternet Kullanma Sıklıkları

	f	%
Günde birkaç kez	16	17,0
Haftada birkaç kez	65	69,1
Ayda birkaç kez	8	8,5
Çok nadir veya hiç	5	5,3
Toplam	94	100

Tablo 3'te görüldüğü üzere, öğrencilerin büyük bir çoğunluğunun (%69,1) internet kullanım sıklığı haftada birkaç kezdir. Bu oranı günde birkaç kez takip etmektedir (%17,0). Elde edilen bulgularda dikkat edilmesi gereken nokta bu verilerin öğrenciler yerine velilerden alınmış olmasıdır.

Evlerde İnternet Bağlantı Durumu ve Kullanılan İnternet Servis Sağlayıcısı (ISS) Türü

Araştırma kapsamında evlerde internet bağlantısının var olup olmaması ve bağlantı bulunan evlerdeki İnternet Servis Sağlayıcı türü de araştırılmıştır (Tablo 4).

Tablo 4. Evlerde İnternet Bağlantı Durumu ve Kullanılan ISS

		f	%
İnternet Bağlantısı	Var	49	52,1
	Yok	45	47,9
	Toplam	94	100
Kullanılan ISS Türü	TTNET ADSL	40	81,7
	Smile ADSL	3	6,1
	Biri ADSL	3	6,1
	Diğer (Dialup vb)	3	6,1
	Toplam	49	100

Araştırmaya katılan 94 veliden 49'unun (%52,1) evinde internet bağlantısı bulunmaktadır (Tablo 4). Bu oran düşük gibi görünebilir. Ancak Türkiye İstatistik Kurumu - TUIK tarafından yapılan araştırma sonucunda hanelerde internet erişim oranı %30 olarak açıklanmıştır (TUIK, 2009). Bu oranla kıyaslanması durumunda oranın Türkiye ortalamasının üzerinde olduğu da görülmektedir. Diğer yandan tercih edilen ISS konusunda da ADSL teknolojilerin ve özellikle de TTNET ADSL'nin önemli bir orana (% 81,7) sahip olup, yeni yaygınlaşmaya başlayan diğer ISS sağlayıcılarının oranları eşit ve % 6,1'dir.

Öğrencilerin İnternet Bağlantısı İçin En Çok Kullandıkları Yerler

Son yıllarda ADSL teknolojilerinin yaygınlaşması ve gerek ev gerek okullarda bu teknolojinin yaygın bir şekilde kullanılmaya başlanması internet bağlantısının yapıldığı yeri de değiştirmiştir. Bu kapsamda araştırmaya katılan velilere öğrencilerin en çok nereden İnternete bağlandıkları sorulmuştur (Tablo 5).

Tablo 5. Öğrencilerin İnternet Bağlantısı İçin En Çok Tercih Ettikleri Yerler

	f	%
Ev	37	39,4
Okul	36	38,3
Arkadaşının Evi	8	8,5
İnternet Kafe	6	6,4
Diğer	7	7,4
Toplam	94	100

Velilerinin görüşleri doğrultusunda öğrencilerin en çok evden (%39,4) İnternete bağlandıkları görülmektedir. Evlerdeki bağlantı sayısının oranı dikkate alındığında bu oran manidardır ve evlerde bağlantı oranının artırılması durumunda bu oranın artması da beklenebilir. Bu oranı okul (%38,3) takip etmektedir. Arkadaşının evi (%8) ve İnternet kafe (%6,4) ise az oranda tercih edilen yerler olarak görülmektedir. TÜİK (2009) tarafından hane halkı bilişim teknolojilerinin kullanımı konusunda yayınlanan raporda da ev en fazla orana sahip (%57,1) bağlantı yeri olarak görülmektedir. Ancak aynı raporda internet kafe %24,1'lik bir orana sahiptir. Araştırmada elde edilen %6,4'lük oran ise velilerin görüşleri olması ile açıklanabilir. Öğrencilerin ailelerinden habersiz/izinsiz olarak internet kafeyi kullanmış olabilecekleri söylenebilir.

Öğrencilerin İnterneti Kullanım Şekilleri

Ailelerin internet kullanımı konusunda çocuklarının denetleyip denetlemediğini belirlemek amacıyla, onlara çocuklarının İnterneti nasıl kullandıkları şeklinde bir soru yöneltilmiştir. Elde edilen bulgular Tablo 6'da görülmektedir.

Tablo 6. Öğrencilerin İnterneti Kullanım Şekilleri

	f	%
Kendi başına	50	53.2
Kardeşi ile	20	21.3
Arkadaşı ile	16	17.0
Anne Baba	5	5.3
Diğer	3	3.2
Toplam	94	100

Öğrencilerin internet kullanımı konusunda çoğunlukla yalnız bırakıldığı görülmektedir (%53,2). Bu oranı sırası ile kardeşleri (%21,3) ve arkadaşları (%17,0) ile bağlanan öğrenciler izlemektedirler. Anne-baba ile birlikte bağlanan öğrenci oranı ise sadece %5,3'te kalmıştır. Kabakçı ve diğerleri (2009) tarafından yapılan araştırmada ailelerin belirli zaman dilimlerinde de olsa çocuklarla birlikte İnternete bağlanması önerildiği düşünülürse, bu oranın çok az olduğu ifade edilebilir. Anne-baba ile bağlantının düşük çıkmasının ailelerin İnternet kullanımı konusunda yeterli bilgiye sahip olmamalarından kaynaklandığı söylenebilir.

Velilerin Öğrencilerin İnternet Kullanımına Yönelik Görüşleri

Velilerin öğrencilerin internet kullanımı konusundaki bilgi düzeylerine yönelik görüşleri ile bu teknolojiden yararlanmaları konusundaki düşüncelerini belirlemek amacı hazırlanan 3'lü likert şeklindeki maddelere verilen yanıtlar analiz edilmiş ve elde edilen bulgular Tablo 7'de verilmiştir.

Tablo 7. Öğrencilerin İnterneti Kullanımına Yönelik Veli Görüşleri

		Katılmıyorum	Kararsızım	Katılıyorum	$\overline{X}$	ss
Çocuğumdan internet kullanımı konusunda bilgi alırım	f	15	13	66	2.54	.757
	%	16.0	13.8	70.2		
Çocuğum benden daha iyi internet kullanır	f	11	12	71	2.64	.686
	%	11.7	12.8	75.5		
Çocuğum internete bağlıyken güvenlik kaygısı duymam	f	38	23	33	1.95	.872
	%	40.4	24.5	35.1		
Çocukların internet kullanması sakıncalıdır	f	28	29	37	2.10	.830
	%	29.8	30.9	39.4		
Çocuklar için İnternetin zararı yararından daha fazladır	f	21	29	44	2.24	.799
	%	22.3	30.9	46.8		
İnternet günümüzde çocuklar için bir zorunluluktur	f	43	18	33	1.89	.898
	%	45.7	19.1	35.1		
Çocuğumun internet kullanması beni sevindirir	f	22	30	42	2.21	.802
	%	23.4	31.9	44.7		

Tablo 7'deki maddelere bakılarak, veliler İnternet kullanımı konusunda çocuklarının daha iyi olduklarını ifade ettikleri görülmektedir ($\overline{X}$ =2.64). Velilerin %75,5'i bu maddeye katılmaktadırlar. Diğer yandan yine velilerin büyük bir çoğunluğu (%70,2) İnternet kullanımı konusunda çocuğundan bilgi aldığını ifade etmektedir. Her iki maddeye verilen yanıtlar doğrultusunda çocukların ailelere oranla daha iyi İnternet kullandıkları ve velilerine İnternet kullanımı konusunda bilgi verdikleri ifade edilebilir. Velilerin çoğunluğu (%40,4) çocukları İnternete bağlıyken güvenlik kaygısı duymaktadırlar. Ancak bazı velilerin ise (%35,1) güvenlik kaygısı bulunmamaktadır. Diğer önemli bir bulgu ise velilerin çocuklarının İnternet kullanımını sakıncalı bulmasıdır ($\overline{X}$ =2.10). Bir başka ifade ile öğrenci velilerinden bazıları (%39,4) internetin çocukları için sakıncalı olduğunu ifade etmektedir. Yine benzer bir bulgu olarak velilerin %46,8'i internetin çocukları için yararından çok zararı olduğunu ifade etmiştir. %30.9'u bu ifadeye kararsız kalırken, %22,3'ü ise yararının daha çok olduğunu belirtmiştir. İnternetin çocukları için bir zorunluluk olduğu yönündeki maddeye ise veliler katılmamışlardır. En düşük ortalamaya sahip madde yine bu maddedir ($\overline{X}$ =1.89). Bir başka ifade ile velilerin sadece %35,1'i çağın bilgi kaynağı olan İnternetin kullanımını bir zorunluluk olarak görmüşlerdir. Ancak aileler çocuğunun İnternet kullanımının kendilerini sevindireceği yönündeki maddeye ise farklı yaklaşmışlardır. Velilerin %44,7'si çocuğunun İnternet kullanımının kendisini sevindireceğini belirtirken, bu fikre katılmayan veli oranı %23,4 olmuştur. Bir başka ifade ile velilerin oran olarak İnterneti yararından çok zararlı olarak görmelerine ve bir zorunluluk olarak görmemelerine rağmen, onların İnternet kullanımlarından sevindikleri de ifade edilebilir. Bu bulgu çocuklarının ödev yapma gibi konularda velilerin sorumluluğunu ve yükünü kaldırmasından kaynaklanmış olabilir.

SONUÇLAR

Velilerin görüşleri doğrultusunda ailelerin İnternet kullanım profillerinin ve velilerin öğrencilerin İnternet kullanımına bakış açılarının belirlenmeye sağlandığı bu araştırmada aşağıdaki temel bulgular elde edilmiştir.

- Velilerin bazıları İnterneti sıklıkla kullanmasına karşın, İnterneti çok nadir kullanan veya hiç kullanmayan veli sayısı da oldukça fazladır. Ancak öğrencilere bakıldığında ise öğrencilerin büyük bir kısmının İnterneti günde veya haftada birkaç kez kullandığı görülmektedir. İnterneti öğrenciler velilerine oranla daha sık kullanmaktadırlar.
- Evlerin ancak yarısında İnternet bağlantısı bulunmaktadır. Ancak diğer yarısında ise İnternet bağlantısı yoktur. ISS türü açısından ADSL teknolojileri ve özellikle TTNET ön plandadır.
- Öğrencilerin İnternete en çok bağlandığı yerlerin başında ev gelmektedir. Bu oran internet bağlantısı bulunan ev oranı ile paralellik göstermektedir. Okul ise yine İnternet bağlantısının yapıldığı yerler içerisinde en çok tercih edilen yerlerden biri olmuştur. Ancak İnternet kafeler çok düşük oranda kalmıştır. Bu sonuçta veli görüşleri olmasının etkisi olduğu söylenebilir.
- Öğrenciler interneti çoğunlukla kendi başlarına kullanmaktadırlar. Ancak kardeşi ve arkadaşları ile bağlanan öğrenciler bulunmasına karşın aile ile İnternet bağlantısının yapılması oldukça az oranda kalmıştır.
- İnternet kullanımı konusunda çoğu veliler çocuklarının kendilerinden daha bilgili olduğunu ve onlardan bilgi aldıklarını kabul etmektedirler.
- Veliler çoğunlukla çocukları İnternete bağlı iken güvenlik kaygısı duymaktadırlar. Yine velilerin büyük kısmı tarafından İnternet kullanımının sakıncalı bulunduğu, yararından çok zararı olduğu düşüncesine sahip olunduğu görülmüştür.
- Veliler sakıncalı ve yararından çok zararlı bulmalarına karşın çocuklarının İnternet kullanımının kendisini sevindireceğini ifade etmişlerdir.

ÖNERİLER

Elde edilen bulgular doğrultusunda aşağıdaki önerilerde bulunulabilir;

- Velilerin İnterneti kullanım oranı öğrencilerine göre oldukça düşüktür. Çocuklardan sorumlu kişiler olarak İnternet okuryazarlığının onlara rehberlik edecek düzeye çıkarılması gerekir. Bu yönde tüm ihtiyaç duyan velilere etkinlikler düzenlenmelidir.
- Ailelerin İnternete bakış açıları İnternetin olumsuz, zararlı göründüğü şeklindedir. Ailelerin çağın bilgi kaynağı ve kullanımı kaçınılmaz olan bu teknolojiyi tanımalarına katkı sağlayacak tanıtımlar yapılmalıdır.
- Tanıtım konusunda veliler öğrencilerin kendisinden daha bilgili olduğunu kabul etmektedirler. Milli Eğitim Bakanlığı gibi kurumlarca öğrencilerin ailelerine İnternet kullanımı konusunda eğitim vermelerini sağlayacak projeler geliştirilebilir.

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AN EVALUATION OF THE ATTITUDES OF GEOGRAPHY TEACHER CANDIDATES TOWARDS COMPUTER IN CHINA

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Abstract
With approximate 1.3 billion citizens, China is the world's most densely populated country and the third largest country in the world in terms of territory. China has undergone rapid, profound economic and social change and development in recently. Naturally these development and changes have reverberated to education. Especially, with the developments of computer technology together computer assisted instructions have started to become widespread in China such as over all the World. Moreover, geography information systems have increased in more and more importance of computers in geography lessons. On the other hand, computers are used not only in education they are used but also in everyday of life for variety activities in china.
The examinating of educational characteristics and student attitudes of such excessively great country which is in tendency opening outer from closed administration in recently is in making great reflection in education world, because knowledges about education in China are less. Even a lot of educational researchs have been done by only Chinese academinians. In such an occasion, this research is made by using attitude measurement with aim to bring to light the attitudes of geography teacher candidates towards computer use in Shanghai, China.

Introduction

Review of the Literature

Universites and schools in China as well as all over world have been affected from technological developments and are mainly used new technologies in education-teaching processes. The utilization from developing technology and the using of them by adapting to education area computer and internet education area from among these technogies have carried great weight in term of increasing quality of education (Yeşilyurt, et al. 2007).
Developments in information technologies play a significant role within changing structure of knowledge and spreading it to different areas and this affects significantly the field of education too (Birişçi, et al. 2009). The computer technology develops so dramatically that it has brought great impact to the whole world. However, the information industry of China cannot keep up with that of the world, which is closely linked to the education (Zhao, 2006).
The road to creating effective teaching and learning atmosphere in geography course is to provide participation of students to course by means of warning richnesses. The computers are one of the warning richnesses because of using them to draw attention of students in education atmosphere (Arslan, 2005).
With globalization, the interaction between information and technology has increased. Thus, the interaction in science forced the nations to review their educational processes and adapt them to the new age. This vital change has invalidated the slow approaches that used to put students under burden of enormous amount of knowledge and has turned to the methods which modernize the ways to information because information has started to penetrate into the daily lives of people rapidly and expanded its interactive zone (Özel, 2007).
Computers have been used in education for more than four decades, and they have now been accepted "unconditionally" as an integral part of our entire educational system. The increase in computer use is rapid and has also generated new challenges (Yushau, 2006). At present, computers have emerged in schools at all levels in increasing numbers. As a result, current students have had far more exposure to the computer than the subjects studied in the 1980s (Ray, et al. 1999). A computer-enriched learning environment was positively correlated with students' attitudes toward computers in general, and the role of computers in facilitating teaching and learning (Teo 2006).
The basis of the education is to demonstrate how to use and in which shape knowledge by providing knowledge saving. With a computer, teaching and learning can be enhanced learning materials can be projected on a screen permanent on a screen, permanent retention of information can be achieved and students' self learning can be increased (Birişçi, 2009). The role of the computer is to provide regular review and practice on basic concepts and skills (Suppes, 1969).
Teacher candidates' attitude to computer is an important factor which affects education-teaching processes. Attitude is effective in behavior determination of individual and for this reason to be measured of attitude or to be known of them is a wanted situation (Tezbaşaran, 1997). Nevertheless it is a variable which cannot be observed as direct. Attitude has constituted one of social pscyhology subjects and social pschylogy is interest in form, change, transmutataion, measurement of attitudes (Gerçek, 2006). Gordon Allport defined the concept of attitude in general as follows: "An attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" In other words, attitude is determined by experience and impacts upon the individual's behaviour (Blignaut, 2009)
Attitudes are thought to influence future behaviour, and have implications for such things as the use of computers or the choise of careers (Busch, 1995). Attitude is an inner psychic state influencing behaviour. Therefore, we can understand an inner state from actions and words. For instance, we may presume that a person actively avoiding a computer has a negative attitude towards it. Attitude is not an inborn, instinct phenomenon; it mainly depends upon person's experience and its impact in a new situation. Consequently, attitudes are formed in the process of experience and their change is possible due to the internal and external factors (Saparniene et al , 2005) somewhat apart attitude was defined by Wolman in his "Dictionary of Behavioral Science (1973) as "A learned predisposition to react consistently in a given manner (either positively or negatively) to certain persons, objects or concepts" (Benton, et al 1985). Attitudes have cognitive, affective and behavioral components. They reflect the way people think of, feel and intend to react under certain circumstances. The development of different human activity sectors and consequently behavior, are effected by computers and information communication technology in general (Bebetsos, Antoniou, 2009).
Students' attitudes, whether positive or negative, affect how they respond to the materials presented in an instructional setting and learning environment. Attitudes have long been recognized as important predictors of individual differences in many educational endeavors (Teo 2005). Students' attitudes towards computer play a role determinative in using of them for education activities. The seminal work on attitudes carried out by Fishbein and Ajzen (1975) proposed that attitudes toward an object play an important role in influencing subsequent behaviors. This is particularly important in the educational context where computer technology is playing an increasingly larger part in learning. If the interaction between the student and the technology is not good, this will hamper the learning process (Noyes, Garland, 2005).
To provide with use actively data processing technology of students in education primarily must be examined towards computer and these attitudes must be rendered positive (Çelik, et al. 2005).
It is believed that computer attitudes not only play an influential role in determining the extent to which students use the computer as a learning tool but also future behaviors towards the computer such as using it for further study and vocational purposes (Teo, 2006).
Technology is the main support for the students learning developments nowadays. With shifting from the teacher-centered instruction to student-centered instruction, the role, activities, attitudes, reflections of the students become more important concern to overlook the

effectiveness of technology in instruction. Computers are the main technology support as a tool for effective learning and teaching process. Computer based instruction and computers programs, tools as itself provides much facilities and supports to students' educational life. Computers are update mechanism for the education and it is not only for education, these developments affect all global, cultural and economical life standards as well (İşman, et al., 2004).

The successful implementation of a computing system depends not simply on the quality of the technology, but also on the acceptance of that technology by its users. For this reason, the attitudes of people towards computers are an important topic of investigation (Clarke, 1998).

Research-based learning has come into question schools in China recently. This learning method has need computers (Turan, et al. 2009). For this reason, it is extreme important the attitudes of geography students towards computers. Especially GIS (geography information system) and the new technologies in education have more increased this importance.

Nowhere are these changes occurring more dramatically than in China, which has one of the world's fastest growing economies and rapidly changing societies. Modern China, which for decades was an essentially closed society, is integrating with the world economy at a breath-taking pace, at least in its industrialized eastern region (Fang, Warschauer, 2004). China set information technology as its first priority in the 10th five-year (2001–2005) plan. The plan declared that information technology will serve as a leading agent to modernize education. All higher education institutions and high schools are to be connected to the Internet, and Internet access will be available for most elementary schools in cities as well (Chen, at.al.2002)

Method

This study was conducted in the period 2008 to 2009 at Geography Education Section for Teacher Candidates of Department of Geography, East China University, Shanghai. The survey was designed to obtain information about geography education students' attitudes towards computers

With this aim, necessary literature was scanned by researcher. Afterwards a questionary which had been developed by İşman and his friends (2004) was applied to geography students.

Sample

Sample selected by the method of random sampling as a hundred seven one students registered in courses during Fall 2008-2009 school year at section of geography education student East China Normal University, in Shanghai, China who are and undergraduate students. Sophomore (2nd grade) students didn't yet participate to computer assisted geography teaching course at university. Junior (3rd grade) students participated this one a years ago.

Instrument

The research instrument in this study was a questionnaire divided into two sections. The first section of the questionnaire collected the students' demographic variables, namely gender, grade, students' educations of father and mother and students'having computer ownership at home.

The second section of questionnaire were consisted of the Computer Attitude Questionnaire (CAQ) using the Likert scale that comprised five points ranging from''strongly disagree'' (1) to ''strongly agree'' (5). There were 38 items at this instrument.

Data Collection

Geography education undergraduate students' perceptions were analyzed through the prepared questionnaire. The data acquire from questionaire were statistically analyzed by means of SPSS program 17.0 and statistical operations such as T Testi and ANOVA. Test were carried out along with frequency and percentage techniques to determine the discrepancy between the opinions of the subjects according to gender, grade, education level of their mothers, education level of their fathers, and having computers at their homes.

The main purpose of this study was to investigate students' attitudes about computers based on gender, grade, education level of their mothers, education level of their fathers, having computers at their homes by the support of statistical analysis and evaluation that questionnaire results are the basis of these evaluations. The light of quantitative data analysis examines demographic data and frequencies for all items in the survey.

Participants

The demographic characteristics of geography students are presented in Table 1. Participants were 171 volunteer students enrolled at Geography Education, Geography Departure, East China University, in Shanghai, China. They consisted of 29.8% (51) male and 70.2 % (121) female.

Table 1. Characteristics of the Participants

	f	%
A.Gender		
1.Male	51	29.8
2.Female	120	70.2
TOTAL	171	100
B.Grade		
1.Sophomore	58	33.9
2.Junier	113	66.1
TOTAL	171	100
C.Education level of students' father		
1. Primary school	8	4.7
2. Secondary school	31	18.1
3. High school	62	36.3
4. Undergraduate level	55	32.2
5. Postgraduate level	15	8.8
TOTAL	171	100
D.Education level of students' mother		
1. Primary school	16	9.4
2. Secondary school	62	36.3
3. High school	48	28.1
4. Undergraduate level	39	22.8
5. Postgraduate level	6	3.5
TOTAL	171	100
E.The having computer at home or dormitory		
1. No	36	21.1
2.Yes	135	78.9
TOTAL	171	100.0

Data Analysis and Presentation of Findings

Frequencies of Individual Items

The frequencies of all the items are shown in table 2. According to the single item indicating overall strongly disagree to strongly agree with computer attitudes. The frequencies of the items are shown in table 2:

Table 2: Frequencies and Percentages of Individual Items

	Strongly disagree		Disagree		Undecided		Agree		Strongly Agree	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
1.I am not afraid to engage with computer.	11	6.4	37	21.6	27	15.8	72	42.1	24	14.0
2.I have no enough skills to use computer.	21	12.3	54	31.6	32	18.7	54	31.6	10	5.8
3.I want to do my studies at computers.	5	2.9	37	21.6	41	24.0	60	35.1	28	16.4
4.I involve computers to my life in all fields.	12	7.9	55	32.2	42	24.6	51	29.8	11	6.4
5. Engaging with computers make me angry.	34	19.9	71	41.5	34	19.9	27	15.8	5	2.9
6. If there should be problem to solve in computer, I try to solve problem.	8	4.7	28	16.4	33	19.3	82	48.0	20	11.7
7.It is not interesting to solve problems with computers	27	15.8	74	43.3	29	17.0	37	21.6	4	2.3
8. Learning computers is only loosing time for me.	57	33.3	76	44.4	18	10.5	18	10.5	2	1.2
9. I do not believe that I can be successful at any computer lesson	39	22.8	72	42.1	28	16.4	29	17.0	3	1.8
10. I do not want to use computer out of needing it.	24	14.0	67	39.2	40	23.4	36	21.1	4	2.3
11.Studying at computers requires good emotions for me	14	8.2	40	23.4	48	28.1	59	34.5	10	5.8
12.I like to read books for getting information about computers	15	8.8	51	29.8	39	22.8	57	33.3	9	5.3
13. I hate computers.	64	37.4	57	33.3	31	18.1	16	9.4	3	1.8
14. I believe that I can do all my studies with the help of computers.	21	12.3	60	35.1	46	26.9	36	21.1	8	4.7
15. I do not try to overcome problems at computers.	17	9.9	86	50.3	35	20.5	28	16.4	5	2.9
16. I have to know how to use computer for my future success.	7	4.1	22	12.9	36	21.1	80	46.8	26	15.2
17. It is a very hard task to participate any kind of courses for learning computer for me.	13	7.6	65	38.0	45	26.3	39	22.8	9	5.3
18. I believe that I do not be good user at computer.	14	8.2	71	41.5	36	21.1	41	24.0	9	5.3
19. I stand in front of the computer until overcoming problem about computer program when I face with.	8	4.7	59	34.5	48	28.1	50	29.2	6	3.5
20. I do not believe that I can get help from computer in my daily life	38	22.2	87	50.9	25	14.6	18	10.5	3	1.8
21. I become uncomfortable while people around me talk about computer.	36	21.1	89	52.0	26	15.2	18	10.5	2	1.2
24. I do not escape any chance to experience new update products at computers.	11	6.4	57	33.3	56	32.7	39	22.8	8	4.7
22. I can learn computer language by myself.	12	7	53	31.0	44	25.7	50	29.2	12	7.0
23. I do not spend any money in computer related books.	20	11.7	69	40.4	34	19.9	39	22.8	9	5.3
25. It is enjoyable for me to learn new things in computer courses.	9	5.3	25	14.6	43	25.1	73	42.7	21	12.3
26. It is difficult to use computers.	16	9.4	74	43.3	30	17.5	41	24.0	10	5.8
27. I do not want to stop engaging with computer.	6	3.5	30	17.5	29	17.0	85	49.7	21	12.3
28. Computers increase the probability of finding jobs.	6	3.5	20	11.7	30	17.5	84	49.1	31	18.1
29. I get nervous when I think on studying with computers.	25	14.6	63	36.8	39	22.8	35	20.5	9	5.3
30. I believe I will succeed in my computer courses.	18	10.5	24	14.0	55	32.2	60	35.1	14	8.2
31. I have never used computer before.	87	50.9	41	24.0	24	14.0	16	9.4	3	1.8
32. I do not want to solve problems with computers while there are other materials.	22	12.9	56	32.7	40	23.4	51	29.8	2	1.2
33. If I have to use computers, I do not think that it will be problem for me.	10	5.8	35	20.8	34	19.9	75	43.9	17	9.9
34. It is necessary to know and use computer for geography education.	6	3.5	10	5.8	30	17.5	83	48.5	42	24.6
35. If I could not overcome problem that I faced with computer, I continue to think on that.	5	2.9	18	10.5	51	29.8	85	49.7	12	7.7
36. It is important for me to become success in my computer courses.	5	2.9	12	7.0	45	26.3	88	51.5	21	12.3
37. Computers confuse my mind.	10	5.8	57	33.3	48	28.1	54	31.6	2	1.2
38. If the matter is about computer, I trust myself .	5	2.9	42	24.6	55	32.2	61	35.7	8	4.7

As can be seen from various items in the Table 2, Chinese geography education students have display to large extent positive attitudes towards. For example Item 1, 3, 7, 16, 27, 28 35, 36 have put clearly forward this result.

t-test of Individual Items

According to Independent Samples Test results at done for gender; all values are higher than the standard value that is 0.05 except the values of I have to know how to use computer for my future success (Item 16), I do not believe that I can get help from computer in my daily life (Item 20), Computers increase the probability of finding jobs (Item 28), I have never used computer before (Item 31). It is important for me to become success in my computer courses (Item 36). The results regarding these items are given below.

Using an alpha level of .05, a computed t value of –2.92 indicates that there is a significant difference between the mean levels of male and female students on opinion "I have to know how to use computer for my future success." (see Table 3). Female students' attendance (M=3.70) to this opinion students is more height opinion than that of junior students (M=3.21).

Table 3: Gender Differences over Opinion "I have to know how to use computer for my future success.

Group	Number of Cases	Mean	Standard Deviation	Standard Error
Males	51	3.2157	1.154	.161
Females	120	3.7083	.938	.085
t value	Degrees of Freedom	2-tail Probability		
-2.92	169	.004		

Other a meaningful difference between the mean levels of males and females according to t test is on opinion (t=-2.50; p<05) "Computers increase the probability of finding jobs." As is seen in Table 4, female geography education students (M= 3.79) are more believed than male students (M=3.37) that computers increase the probability of finding jobs.

Table 4: Computers Increase the Probability of Finding Jobs.

Group	Number of Cases	Mean	Standard Deviation	Standard Error
Males	51	3.3725	1.094	.153
Females	120	3.7917	.960	.087
t value	Degrees of Freedom	2-tail Probability		
-2.50	169	.013		

As is can be seen in Table 5 another meaningful difference among genders is on opinion "It is important for me to become success in my computer courses." Female students (M=3.75) have more paricipated than male students to this opinion than male students (M=3.35).

Table 5: Gender Differences over Opinion "It is Important for me to Become Success in My Computer Courses".

Group	Number of Cases	Mean	Standard Deviation	Standard Error
Males	51	3.3529	.955	.133
Females	121	3.7500	.842	.076

t value	Degrees of Freedom	2-tail Probability
2.70	169	.007

The students' responses related "The having the computer at home or dormitory" was analysed with t test as well. In result of t test analysises, there have been found meaningful statistical relationships between the students having the computer at home and dormitory with the students not having computer in 4, 20 and 28 items. Results are below.
The students having computer (M=3.10) have more participated to opinion "I involve computers to my life in all fields."(See Table 6) than those not having computer (M=2.44) this response is meaningful (t=-3.35; p<.05).

Table 6: The Attendance to Opinion "I Involve Computers to My Life in all Fields."

Group	Number of Cases	Mean	Standard Deviation	Standard Error
students not having computer	36	2.4444	.93944	.156
Students having computer	135	3.1037	1.07394	.092

t value	Degrees of Freedom	2-tail Probability
-3.35	169	.001

Other a meaningful difference between students not having computer and the having computer according to t test is on opinion (t=-2.95; p<05) "I do not believe that I can get help from computer in my daily." As is seen in Table 7 any students not having computer (M=2.58) have more attached to this opinion than those of having students (M=2.08).

Table 7: The Attendance to Opinion "I do not believe that I can get help from computer in my daily life."

Group	Number of Cases	Mean	Standard Deviation	Standard Error
students not having computer	36	2.5833	.93732	.156
students having computer	135	2.0815	.89819	. 077

t value	Degrees of Freedom	2-tail Probability
2.95	169	.004

Table 8 show that there is a significant difference (t=-2.14;< .05) between students. Students having computer (M=3.78) have more participated to opinion "Computers increase the probability of finding jobs." than those of not having students (M=3.22).

Table 8: The Attendance to Opinion "Computers Increase the Probability of Finding Jobs."

Group	Number of Cases	Mean	Standard Deviation	Standard Error
students not having computer	36	3.2222	1.12405	.187
students having computer	135	3.7852	.95718	.082

t value	Degrees of Freedom	2-tail Probability
-3.01	169	.003

Third reseach using t test are done over students grades. As is mentioned in beginning sophomore (2nd grade) students didn't yet participate to computer assisted geography teaching course at university. Junior (3rd grade) students participated this one. According to Independent Samples Test results at done for grades; all values are higher than the standard value that is 0.05 except the values of I hate computers (item 13) and If the matter is about computer, I trust myself (item 38).
Table 9 show that there is a significant difference (t=-2.14;<.05) between students. Sophomore students (M=1.81) have less participated to opinion "I hate computers" than junior students (M=2.16).

Table 9: The Attendance to Opinion "I hate computers".

Group	Number of Cases	Mean	Standard Deviation	Standard Error
Sophomore	58	1.8103	1.03376	.135
Junier	113	2.1681	1.03426	.097

t value	Degrees of Freedom	2-tail Probability
-2.14	169	.034

The other significant difference between these students is on opinion "If the matter is about computer, I trust myself". Sophomore students (M=2.89) have less participated to opinion "I hate computers" than junior students (M=3.27).

Table 10: The Attendance to Opinion "If the matter is about computer, I trust myself."

Group	Number of Cases	Mean	Standard Deviation	Standard Error
Sophomore	58	2.8966	.98568	.129
junier	113	3.2743	.89889	.084

t value	Degrees of Freedom	2-tail Probability
-2.51	169	.013

ANOVA Test is done for subjects related students' mother and father educations.
According to ANOVA results that were done for the students' father education level, all values are higher than the standard value that is 0.05 except the values "I have no enough skills to use computer." (Item 2), Engaging with computers make me angry." (Item 5), and "I believe I will succeed in my computer courses." (Item 30). Hereby there were statistically significant differences at the p<.05 level in item 2, 5 and 30 according to father's education. To determine a difference among groups was used the Tukey HSD. Results were indicated in Table 11, 12, 13 and 14.

Table 11: Means and Standards Deviations for Item 2 (I have no enough skills to use computer.) according father's education.

					95% Confidence Interval			
Education	N	Mean	SD	Std.Error	L.Bound	U.Bound	Lowest	Highest
A. Primary school	8	3.12	1.35	.47	1.99	4.25	1	5
B. Secondary school	31	2.70	1.00	.18	2.34	3.07	1	4
C. High school	62	3.25	1.08	.13	2.98	3.53	1	5
D.Undergraduate level	55	2.63	1.14	.15	2.32	3.94	1	5
E.Postgraduate level	15	2.33	1.34	.34	1.58	3.07	1	4
Total	171	2.87	1.16	.08	2.69	3.04	1	5

Table 12: Means and Standards Deviations for Item 5 (Engaging with computers make me angry.) according father's education.

					95% Confidence Interval			
Education	N	Mean	SD	Std.Error	L.Bound	U.Bound	Lowest	Highest
A. Primary school	8	2.37	1.18	.41	1.38	3.36	1	4
B. secondary school	31	2.61	.98	.17	2.25	2.97	1	5
C. High school	62	2.66	1.07	.13	2.38	2.93	1	5
D.Undergraduate level	55	2.09	1.04	.14	1.80	2.37	1	5
E.Postgraduate level	15	2.06	.96	.24	1.53	2.59	1	5
Total	171	2.40	1.06	.08	2.24	2.56	1	5

Table 13: Means and Standards Deviations for Item 30 (I believe I will succeed in my computer courses.) according father's education.

					95% Confidence Interval			
Education	N	Mean	SD	Std.Error	L.Bound	U.Bound	Lowest	Highest
A. Primary school	8	2.87	.99	.35	2.04	3.20	1	4
B. Secondary school	31	2.61	1.17	.21	2.18	3.04	1	5
C. High school	62	3.25	1.05	.13	2.99	3.52	1	5
D.Undergraduate level	55	3.38	1.06	.14	3.09	3.66	1	5
E. Postgraduate level	15	3.26	1.09	.28	2.65	3.87	1	5
Total	171	3.16	1.10	.08	2.99	3.33	1	5

Table 14. Tukey HSD results of item 2, 5 and 30 for father's education.

Scales	df	SS	MS	F	p	Significant difference
2. I have no enough skills to use computer						
Between groups	17.976	4	4.494			
Within groups	211.194	166	1.272	2.51	.004	C- D C- E
Total	229.170	170				
5. Engaging with computers make me angry						
Between groups	12.562	4	3.141			
Within groups	180.596	166	1.887	2.88	.024	D-C
Total	193.158	170				
30. I believe I will succeed in my computer courses.						
Between groups	12.654	4	3.164			
Within groups	172.971	166	1.042	3.03	.019	D-B
Total	185.626	170				

According to ANOVA results that were done for the students' mother education level, all values are higher than the standard value that is 0.05 except the values of 33, "If I have to use computers." These meaningful differences have been clearly seen in Table 15 and 16.

Table 15: Attence to opinion to item 33 "If I have to use computers mother's education." according to mother's education.

					95% Confidence Interval			
Education	N	Mean	SD	Std.Error	L.Bound	U.Bound	Lowest	Highest
A.Primary school	8	2.37	1.20	.30	1.73	3.01	1	4
B.Secondary school	31	3.59	.91	.11	3.36	3.82	2	5
C.High school	62	3.39	1.02	.14	3.09	3.69	1	5
D.Undergraduate level	55	3.10	1.16	.18	2.72	3.48	1	5
E. Postgraduate level	15	3.66	1.03	.42	2.58	4.75	2	5
Total	171	3.31	1.08	.08	3.15	3.47	1	5

Table 16: Tukey HSD results of item 33 for mother's education.

Scales	df	SS	MS	F	P	Significant difference
2						
Between groups	21.876	4	5.469			
Within groups	179.072	166	1.079	5.070	.001	B-A
Total	200.947	170				

Conclusion

These researches of results show that geography education students in Shanghai, China have indicated generally positive attitude toward computers. It can be said that Chinese geography teacher candidates have attached importance to computer as a part of their education and life. However some differences among students have been found related computers attitudes according to gender, having computer, education level of students' father and mother.

Today, Computer assisted instructions (CAI) have been seen as an important element of education at schools and universities of China in this context, the future of geography education with computer have depended significantly on the attitudes of students.

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AN INTEGRATABLE ONLINE FULL EXAMINATION MODULE FOR E-LEARNING SYSTEMS: ONEX

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Abstract. The aim of this study is to introduce a module, organizing question banks and producing examination forms using the question banks, which can also be integrated into different e-learning systems. This online examination system, OnEx, creates question banks according to knowledge, comprehension, application, analysis, synthesis, and evaluation taxonomy and it gives the chance to prepare question types which are open-ended, short-answer, multiple-choice, true-false, or matching. OnEx, reports the detailed information about the learning levels and at which learning level the students are successful or not following the examinations. With the help of this reporting system, it is possible that the students will be able to take the proper support from the experts during the learning period.
Keywords: on-line examination module, e-learning systems, e-question bank, e-measurement and e-evaluation, OnEx, UML.

INTRODUCTION

Measurement and Evaluation, being inseparable components of education and teaching, are used to assess whether educational goals are being achieved. Another purpose of using measurement and evaluation is to enhance and support student learning.
Mastery Learning Model was developed by Benjamin S. Bloom (Source). Mastery learning was built up on the assumption that; " if positive learning conditions provided, almost anyone can learn the previously set new behaviours independent from their IQ level" (Source). Mastery learning had been provided for programmed teaching. Programmed teaching, fundamentally brings in two improvements, individualization of learning and minimization of errors. Programmed teaching has been the foundation for using computers in learning, teaching and evaluation processes. Currently, it is very well understood that, tests conducted both on internet and on corporate intranets by using widely accepted e-learning applications can provide an effective and cost efficient way of testing knowledge, competency, and behavioural changes (Hancer, 2009).
When we closely examine the testing modules used in e-learning applications we can see that the existing modules are not able to provide any means for complete measurement and evaluation. This incompleteness of measurement and evaluation further causes a lack of understanding what students really do or do not learn. However, tests composed towards measuring the students' ability of critical thinking are necessary to enable lasting learning to occur, as well as is necessary for measurement and evaluation.
Blackboard, as one of the commonly-used e-learning systems around the globe, lets users conduct online exams through its built-in system of examination forms containing all types of related questions. However, Blackboard does not classify questions according to their cognitive entry levels. Besides, it has been observed that there was not any validity analysis for questions (Meryasoft, 2009).
Moodle, which is developed by Martin Dougiamas as a part of his thesis work, can also compose online examination forms using all types of related questions, however it lets only one type of question to be used. It does not allow for classification of questions according to cognitive levels. Moreover, it has been observed that there was not any validity analysis checks for questions, whereas Moodle does conduct item analysis for questions.

MEASUREMENT AND EVALUATION IN LEARNING

Measurement and evaluation can note two concepts which are closely related. In reality, measurement and evaluation are different concepts. Measurement provides objectivity, but evaluation includes personal conclusions.

Basic Concepts of Measurement and Evaluation In Learning

Basic concepts related to measurement and evaluations in education are:
Measurement: Measurement is a way of observation. It helps us determine a certain quality of a characteristic or a process. We have to look for its certainty, objectivity, credibility, and the ability to provide data in numerical values, to find what makes measurement superior to other observation techniques. Data in numerical form simplifies statistical analysis and interpretation, and further enhances the ability to make more absolute and clear judgments.
Reliability: In educational systems, it is important to be able to measure the activities of teaching and learning. Errorless measurement provides correct and real data to teachers about the subject's or the individual's certain qualities. This is the reason for the need for credible measurement, which is free from constant, biased and random errors as much as possible, in education (İşman, 2006).
Validity: Validity is the degree of contribution of a measurement tool to the purpose (Bahar, 2006). According to Demirel (2007), validity in general, is the degree of ability of a measurement tool or a methodology to assess what it intends to measure accurately, independent on any other characteristic (Kizlik, 2009)
Usability: Usability consists of six main issues (İşman, 2006):

- Examination tool to be used should be economically viable. It shouldn't cause any additional costs neither on teacher nor students.
- Duration of the application should be well adjusted.
- A guideline, depicting all the relevant information needed, should be present in the beginning of each exam.
- Exam papers should be arranged, enabling an easy and orderly way of use for the teacher.
- Exams should be easy to grade, bearing no additional burden for the teacher.

Evaluation: Evaluation is indispensable for education. Evaluation in education shows whether the goals have been reached and in what degree (Yıldırım, 1983). Evaluation is an act of judgement unlike measurement. The basic principal of measurement is to convey the results in numerical values, whereas in evaluation it is all about judgements made by interpretation of numerical values based on certain criteria.

Tools And Methods In Measurement

Exams are the leading tools for educational measurement tools. Other tools aside from exams are homework, laboratory work, projects, portfolio building, articles, field studies, surveys, observation etc. As mentioned above, selection of measurement tools should be chosen, in general, based on the subject, education model, measurement goals, and evaluation model (Kabacı ve Karakaya, 2003).
Exam types aiming to measure cognitive adequacies, which are amongst educational goals, can be: long answer exams, short answer exams, multiple choice, true/false, matching questions exams, and oral exams.

E-Test Plan Steps

Computers offer great ease in the application of the test plan. The eleven-step test plan as a tool for classic tests are adopted for online tests. Eleven steps for an E-test plan should be as follows:

1. Setting up the start and end dates
2. Assessment of the test goals
3. Preparation of table of specification
4. Setting the number of questions
5. Selection of test items
6. Scoring the test items
7. Setting the test duration
8. Implementation of the test
9. Evaluation of the test
10. Sending feedback to the student
11. Item analysis studies

Step 1 defines the period that the students can take the test. Students cannot take the test before or after this pre-defined period. The test stays active only between start and end dates and will be shut down by the system automatically after the end date.
The steps 2-5 include of assessment of the test goals, preparation of table of specification, and setting the amount of questions are similar to a classic test plan. The teacher defines the number of questions, how many questions from which category, and which subjects to be included in the test. Instead of writing down test items, as it is done in the classic test plan, the system automatically provides the related questions from already developed question banks, after the teacher prepares the table of specification. The teacher does not spend time writing test items, instead she uses test items already present in the system.
Step 6, scoring the test items, each test, automatically created in the system, will receive their relevant scorings. Setting the test duration, defines the duration of the test as it does in the classic test plan. It is important to mention the duration, since the test will be online, there will be a countdown after the test starts. Steps of both implementation and evaluation of the test are different from the case of the classic test plan, as both will be conducted by a computer. Sending feedback to the student is an important step; including showing the test results to the student, and stating the point grade, along with data for right and wrong answers and blanks. There is no additional burden on the teacher since the item analysis is conducted again by a computer. Question cards are also prepared by the computer, and the teacher does not need to prepare score cards for grading. All in all, since all of these steps mentioned are handled by a computer, it saves time and effort for the teacher.

ONEX ONLINE EXAMINATION SYSTEM

This section talks about tools and methods used in developing the system, as well as process analysis of measurement and evaluation, analysis, design and development of the OnEx System, followed by an evaluation of the system.

Tools

OnEx, which is an online test system was developed as a master's thesis ,and it was coded in PHP language and using MySQL databases. The resulting original software is hosted in an Apache Web server bought by Istanbul University Scientific Research Projects Secretariat under the project scope no. 3246.
Adobe Dreamweaver CS3 is used to developed the visual interface for the system. JavaScript is used to control data entry, to assess the number of choices in a question dependent on the subject, and to bring up a question entry screen according to the preferred question type.

Method

Two separate system analyses were conducted in the development of OnEx system. First is the process analysis of measurement and evaluation; second is aimed at coding for the development of OnEx system. Analysis and design details for coding purposes were not mentioned in this study.
Process Analysis of Measurement and Evaluation: In this phase, all the measurement and evaluation criteria, which ensure the measurement of achievement in education and teaching were considered to develop a test module aiming for total measurement of achievement in an e-learning system.
OnEx automatically applies and ensures the rule for picking three, four, and five multiple choices for first to third grade, fourth to eighth grade, and nineth to twelveth grade respectively taking measurement rules also into consideration. An example would be the system bringing up four choices if the teacher is preparing a test for seventh grade. Additionally, the system does not allow for creation of questions having choices of "all of the above" and/or "none of the above". Even if the teacher misses these rules, the system will not allow these types of errors to occur.
Answer choices can range from six to a maximum of fifteen, for matching questions exams. Even if the teacher picks less than six answer choices, the system will automatically enlists up to six sub-questions. Furthermore, the answer list needs to contain three more choices than sub-questions. The system automatically ensures the proper application of this rule. All of the sub questions and answer choices are properly numbered or contain symbols. The system again will make sure that all the sub-questions and answer choices are numbered or contain a symbol, providing a consistent test format.

The teacher should not use more than one blank in the sentence and must not start the sentence with a blank, for fill-in-the-blanks questions. The teacher will get an error message if this rule is not followed.
The teacher can compile examination forms. The teacher needs to enter the information to relevant areas on the screen, including the number of questions from each question type, and the number of questions from which question category. The system will not allow more than three question types, as well as the combined use of matching questions and true/false questions at the same time.
The steps from UML methodology was applied in analysis, design and documentation of the OnEx project. The reason for UML methodology to be used is that OnEx is an integratable examination module for e-learning systems. As is known, data in e-learning systems are subject-oriented, therefore it is reasonable to use a subject-oriented software development methodology. When subject-oriented methodologies were examined, it can be seen that UML methodology is the right one for this project, which contains all the strengths of other methodologies in itself (Ayvaz, 1999). Ayvaz states UML process steps as follows; 1.Use case Modelling, 2.Use case Verification, 3.Category Modelling, 4.State transition diagrams, 5.Component Modelling, 6.Development Model, 7.General Concepts. UML steps are modelled using Visual Paradigm CASE.

Development of OnEx System

There are five distinct user types and a guest user for observation purposes. Each user type has different tasks and authorization in the system. Fig.1 shows users in the OnEx system.

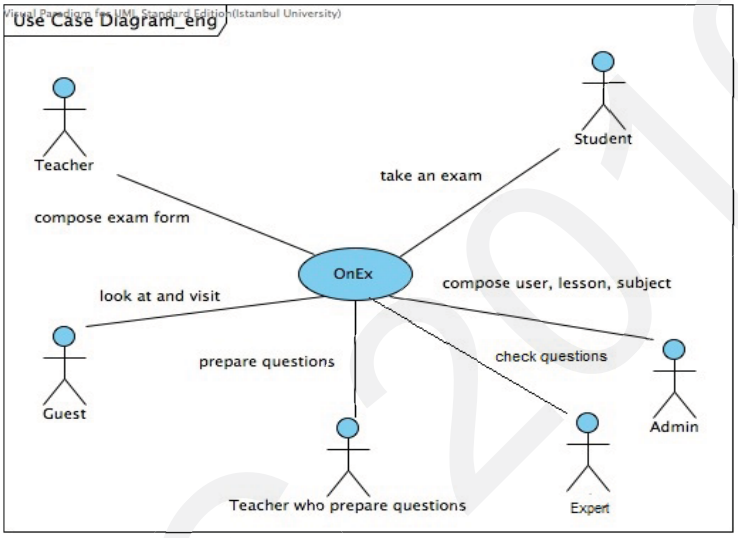

Fig. 1 visualizes the Use Case Diagram of OnEx System

Admin (System Administrator): Administrative tasks for the system as a whole are conducted in this entry level. The system administrator sets up users, assesses authorizations and subjects, and develops classes and class related subjects. He can create new subjects, as well as edit and delete existing ones. He also determines languages in the system. Besides viewing questions, he cannot prepare, control, edit or delete them.
Expert: Expert controls the questions prepared by the teacher. He decides whether questions are aligned with relevant categories. If necessary, the expert can send a message to the teacher by using the message panel. Expert can also prepare questions. Any questions prepared by an expert are sent to other experts to ensure control.
Teacher Preparing Question: Teacher Preparing Questions (TPQ) can enter questions to be used in an online exam. S/he can edit or delete her questions. S/he can reply to any message from the expert. She can view the test statistics and question cards. She can review questions prepared by the computer according to item analyses. If any corrections by the teacher made to questions prepared by the computer, questions will automatically be sent for the expert's attention.
Teacher Using Questions: Teacher Using Questions (TUQ) can prepare examination forms for her class using question banks. She can assess the test takers for her test. She can view the test statistics and question cards. She can send test-related messages to students.
Student: Student takes the tests using the system in a certain time period. Student will see the results immediately after taking the test.
Guest: Guest can navigate through the system for observational purposes.

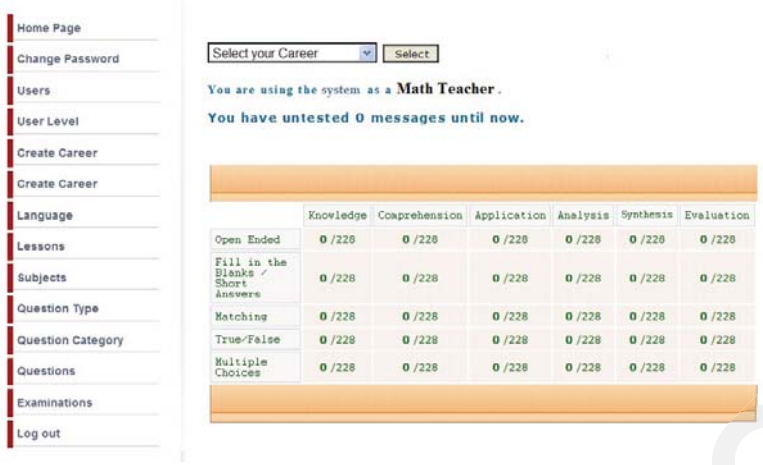

Fig. 2 Home Page Screen of OnEx System

Fig. 2 is the screen shot of the screen when the user enters the system for the first time. User (teacher) needs to use her own username and password. In this screen, the teacher can see the number of questions from which category. Furthermore, since there is a possibility that the teacher may have more than one teaching field, the system allows her to switch between subjects. For example, suppose a math teacher also wants to prepare questions for her science class, she can do it by simply changing her subject as science teacher

EVALUATION OF SYSTEMS

Online examination modules of Blackboard and Moodle are evaluated since they are widely used e-learning systems. WebCT is not examined due to Blackboard's acquisition of the software. This evaluation is done according to the criteria from Table 1. Complete set of features are not included.

Table 1 : Comparison Of Systems For Measurement And Evaluation

Criteria	Blackboard	Moodle	OnEx
All types of questions can be used	+	+	+
Number of answers in multiple choice tests according to class grade	-	-	+
Limits the number of sub-questions in matching questions between 6 to 15	-	-	+
Ensures three more answers than sub-questions in matching questions	-	-	+
Excludes "all or none of the above" as answers in multiple choice tests	-	-	+
Categorizes questions according to the question level	+	+	+
Expert control on questions submitted by teachers	-	-	+

OnEx automatically applies the rule of three, four and five choices in multiple choice questions for the grades first to three, fourth to eighth, and nineth to twelveth consecutively. Even if the teacher did not know about this rule, the system will not allow the teacher to proceed preventing any errors. However, there is no limit for the teacher about the number of multiple choice answers, which reduces the validity of the question. Another point to consider while preparing multiple choice questions is the exclusion of "all of the above" or "none of the above" answers. Current online examination modules do not control this, but OnEx does. OnEx further presents any numbers or dates in the choices in an ascending order.

In matching questions the number of sub questions are limited to a minimum of six and a maximum fifteen. The system will enlist six sub-questions even if the teacher did not list six of them. Also there should be at least three more answers than sub-questions. If teacher misses this rule, the system automatically ensures that there are at least three more answers than sub-questions.

In the case of fill-in-the-blanks questions:

- The system will not let the teacher use more than one blank in each sentence.
- The system will not allow the teacher to leave the bank at the beginning of the sentence.

OnEx groups the questions under categories and saves them therefore the teacher can reach all types of questions while preparing an examination form, enhancing her ability to conduct a real measurement and evaluation.

OnEx, unlike other e-learning systems, aims to ensure the compatibility of any question under relevant category submitted by the teacher, by employing at least three experts to control the question. Questions need to have at least two thirds of confirmation from the experts to be counted as compatible.

It will take a substantial amount of time for the teacher to prepare an examination form with questions from different categories which also meets the criteria, therefore OnEx can prepare examination forms according to the criteria and category preference of the teacher, since the questions are already in the system.

Questions are only categorized at the cognitive level in the system, excluding affective and psychomotor levels. There are not any categories in the question bank related to affective and psychomotor levels since these are not measurable only by questions. Measurement of affective behaviour is only possible through observation of students and helping them to explain their thoughts clearly. In the psychomotor level, the methods of exercising the target skill, producing a skill product by exercising the target skill, or producing a product by exercising target skill can be used for measurement. These types of measurement are not included in thesis study. However, the dynamic structure of the system allows addition of different question categories. An exam can only contain three types of questions, and cannot contain matching, true/false, and fill-in-the-blanks questions at the same time. OnEx also takes this rule into account.

By using OnEx to prepare the examination form, the teacher can choose which students can take the test. This directly correlates with students whom are enrolled in the course in the e-learning system that OnEx will be integrated to. Following the test, students can see the

results on screen, and print the result screen with the help of the web browser. The system, on the other hand, presents details about the test including, questions answered, how many right and wrong answers, and questions not answered.
OnEx also sends student test results to the teacher via a report titled "Test Results Report". This interface also enables sending feedback to students via e-mail. The report also gives information about how many questions from which category were asked by this particular student, and the number of right or wrong answers to questions according to the category. This way, teacher can see the deficiencies of the student on each different category and therefore better assess in which areas the student needs help and help them to improve by targeting these deficiencies. There is a negative correlation between the level of difficulty for each question and the rate that it has been answered correctly. Therefore, in order to assess the difficulties of questions the system simply stores the information about the rates of right and wrong answers for the questions. After the system assesses the difficulty level of the questions, questions will be automatically sorted from difficult to easy. Additionally, after the preparation of each examination form points from each question should be determined by the teacher. Since OnEx is still developing its question bank, and the difficulties of questions are undetermined, all questions have same points.
The system security was examined by an expert and they found 90% secure for modules of submitting questions to the system, preparation of tests, and student examination. While OnEx deals with the tasks of users on the surface, at the back end, authorizations for the users are being defined according to their usage areas by the system administrator.

CONCLUSION

Mastery learning is important because of many aspects in education and teaching. Mastery learning is vital for development of skills, providing systematic education, quality of education, and cultivation of student abilities. It is important to assess, in which circumstances students can learn more or less. And since learning continues during the examination, if measurement and evaluation is done properly, student achievements can be presented completely, and the results form measurement and evaluation may reduce negative factors affecting student achievement.
In order to make OnEx compatible with any platform flawlessly, open source PHP and MySQL database are used. Any user can reach the system through any web browser problem-free, because the system is designed to be internet based.
We can conclude by stating some points which can be helpful to the further development OnEx:

1. Teachers or Teacher candidates can use the system, providing feedback about the usability of the system. Because measurement and evaluation knowledge of the teacher candidates are more up to date, they can provide valuable feedback.
2. OnEx, not only as measurement and evaluation tool, can also be used as a supplementary tool in teaching. By adding areas for teachers to send the students a feedback to reinforce relevant knowledge, OnEx can help enhance learning.
3. OnEx can be developed towards the needs of different countries and languages, through the use of multi-language support and developments depending on feedback and needs of users from those countries.

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AN INTEGRATED EFL INSTRUCTIONAL DESIGN MODEL FOR ONLINE LEARNING

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Abstract
In this study, the instructional design of an integrated online English course design model is presented. The course includes presentation of language components grammar, vocabulary, with reading, writing, speaking and listening skills exercises. The types of exercises, which are commonly used in English courses and course books, were transferred into an online environment in the form of interactive exercises. The design of the course is based on cognitive theory learning principles as its foundation and adopts the effective features of web-based materials and communicative foreign language instruction techniques as its main points of reference. The author merged her experience in the fields of Online Education and English Language Teaching and build up an online elementary level course consisted of both the tutorial and follow up interactive exercises. The author categorized online exercises according to their availability of use and her expertise. The suggestions here are believed to be beneficial for the designers of any online language teaching course and other practitioners.
Keywords: English language teaching; online learning; multimedia

Introduction

The need to learn a foreign language in time has increased and become a necessity rather than making bilingual or trilingual individuals privileged in society. Besides being the common language in business and communication, English language today enables individuals' to access global knowledge via the basic source of knowledge, the Internet. As clear need of English language is never-ending but increasing in time and technology has now advanced to such an extent that individuals might learn a language and do practice on it through online language learning materials. Emergence of new approaches and methods in education has called for use of communicative skills-based teaching of a language more than memorization of language chunks. It is assumed that a foreign or second language should be learnt similar to the way a mother-tongue is learnt in its natural environment functionally and communicatively. However, it is not always so practical to provide learners with the native speakers of target language. In such circumstances, the most reasonable way to bring natural language spoken environment to class with native language speakers is to benefit from Internet technology. Hence, one individual might take the advantage of; (a) time and place flexible learning (anywhere/anytime learning); (b) self-paced learning (according to one's own speed of learning); (c) immediate feedback (with limitless interaction compared to in-class teaching); (d) plentiful practice with a variety of interactive exercises; (e) multimedia enriched learning environment (by fostering different learning styles); (f) monitoring own progress and achievement in the target language. Thus, an active learning of language is carried out in a learner-centered environment.

Clark, (1994) asserts that media do not influence learning under any conditions but it is the instructional methods that influence learning. He further (1983) added that "media do not directly influence learning but certain elements of different media (animated motion, zooming) might serve as sufficient (but not necessary) conditions to facilitate the learning of students…" (p. 448). This claim of Clark indicates that there should always be a method to teach online and the instructional techniques should be there to support the method.

Four language skills are rarely used alone in everyday life. In order to present learners with a communicative setting, skill integration should be formed as communicatively as in real life; as they are normally brought together in real life. It is generally observed that in an authentic setting, the use of any skill may lead on very naturally to the use of another. According to Grellet, (1981) "There are few cases in real life when we do not talk or write about what we have read or when we do not relate what we have read to something we might have heard.''(p. 8). According to Abbott, Wingard and Mckeating (1981) there are psychological and practical reasons for the integration of skills: (a) there is a large overlap among the component skills of the four skills and many elements are in common; (b) in real-life communication, there is a frequent alternation between receptive and productive activities; (c) people have individual differences in the way they learn, integration makes use of all these abilities so that everyone can learn something from this process; (d) if something is taken in through more than one channel, it is more likely to be learned well. Practices in these skills can be mutually reinforcing; that is, the channels can reinforce each other; (e) students even of the same age, sex and cultural background are often not interested in the same thing (1981, p. 93). Similarly, their interests over the skills activities may have differences. Using an integrated skills approach enables the learners to develop their ability in the use of two or more of the four skills within real contexts and in a communicative framework. Hersan Z.M. points out that "Nowadays, communication is the major aim for learning a foreign language. In daily life, these skills are seen in integration, for example, after reading a letter, usually an answer to this letter is written. So in the classroom the activities should be taught in integration in order to arrive at ease in communication." (1998, p. 22). Therefore, to teach these four skills in close association facilitates learning.

The Integrated Instructional Design Model of the Online EFL Course

In the online course, in each unit grammar is presented within video clips prepared and recorded by the instructor. These clips are embedded into the content. Vocabulary and grammar items that are taught in one unit are interrelated. For instance, in a unit where the grammatical items "some and any" are being thought, the countable and uncountable nouns, samples such as food and drink are presented in vocabulary part. The reading and writing sessions as well includes grammar and vocabulary elements that have been presented in that unit. Concerning the previous example in the same unit at reading part a reading passage including some and any are given and in the writing part learners are guided to write a paragraph including these items again (Figure 1). Real-time weekly speaking sessions focus on the grammatical items of the unit and some drill and practice exercises are carried out as a follow up activity. A typical online course provides learners with some vocabulary and grammar drill and practice after a brief tutorial about each. And these often resemble the traditional workbook exercise making little use of the multimedia capabilities of the Internet (Heift, 2001).

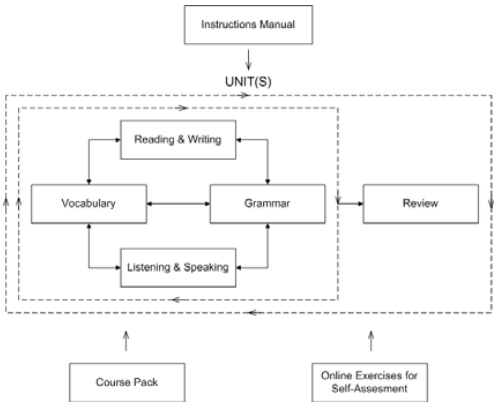
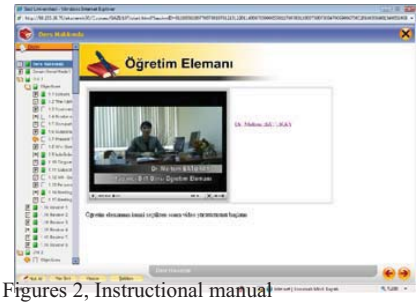


Figure 1. The instructional design model of the integrated English language course

Components of the Online English Course

The Online English Course content is presented through via the Learning Management System (LMS). Differing from typical online English language teaching, an innovative model is suggested including the following parts in every other unit of the online English language course:

Instructional Manual: The learners are informed about the aim of the course its contents via a video recorded instructional manual page (Figure 2). Next page, they are introduced with the instructions they should follow throughout the course (Figure 3).



Figures 2, Instructional manual

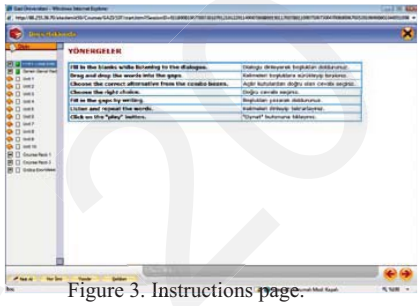


Figure 3. Instructions page.

Vocabulary: Words are taught by using real pictures and with their pronunciations. The target words are additionally presented in context to learners. Learners are able to see the use of words in sentences after their presentation with visuals. Learners are able to listen to the pronunciation of the words by a click. There are follow up exercises after the presentation of each vocabulary part(Figure 4).

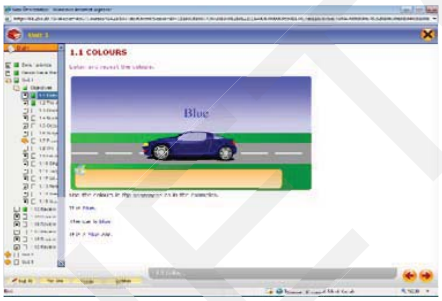


Figure 4. A sample of vocabulary presentation.

Grammar: Video supported grammar tutorial which is in the native language of the learners has been enriched with synchronized animated explanations. There are interactive buttons to be clicked during the tutorial to keep learners alert. Use of native language in the streaming video is assumed to increase comprehension of the learners. Sample sentences and explanations on structures are given on the web pages. There are follow-up exercises for the revision of the grammatical structures (Figures 5 & 6).

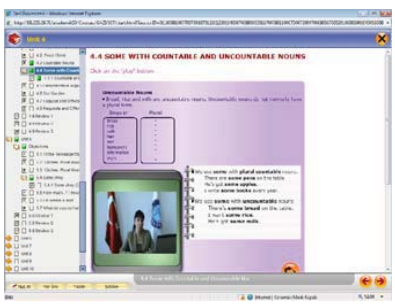


Figure 5. & 6. Grammar tutorial with videoclips.

Listening and Speaking: This part includes "fill in the blanks by listening" type exercises which focus on listening comprehension and spelling. Learners fill in the blanks while listening and have the opportunity to check their answers and see the correct answers on the same page. After listening learners are exposed to the functional language patterns used in the listening activities. These patterns are additionally revised in the weekly real-time speaking sessions supported with some drill-and-practice exercises. There are no or very rare unknown words and grammatical structures for the learners in listening texts. Listening texts or dialogues are vocalized by two native speakers to expose the learners with a native pronunciation and efficient dictation (Figure 7).

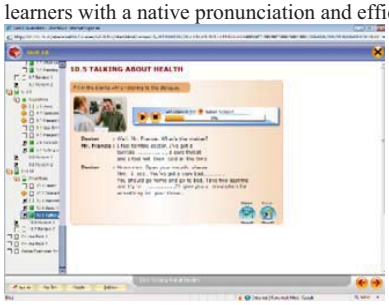


Figure 7. A sample listening exercise.

Reading and Writing: In every unit, there is a reading passage including the vocabulary and grammar that have been studied that week. The reading texts involve pre-taught grammatical issues and vocabulary to avoid from rendering so much unknown words which is believed to frustrate learners. A writing assignment follows up each reading activity which works as a model for learners for writing their own paragraphs. Learners are guided with the given prompts to write their paragraphs (Figure 8).

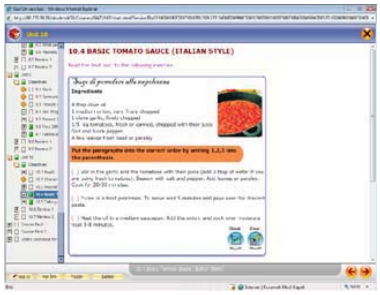


Figure 8. A sample reading and writing exercise.

Review: Each review part includes interactive exercises of vocabulary, grammar and functional language patterns that have been studied throughout the units. Various exercises such as drag and drop, matching, fill in the blanks by writing, combo box and multiple choice test are used. Review parts are opportunities for the learners to revise what they have learnt and to determine their mistakes or deficiencies.

Course Pack: Learners are presented with the handy tables that they need time to time throughout the course.

Figure 9. A sample page of Course Pack.

Figure 10. Online Exercises for self-assessment page

This part includes all necessary tables such as Non-Progressive Verbs List, Past Participle Verbs List. It is thought that handy tables will help learners to access knowledge more easily without interrupting their concentration. Otherwise, they have to search for it in the unit which is time-consuming (Figure 9).

Online Exercises for Self-Assessment: This part provides the learners with online exercises concerning the learnt elements of English throughout the course. The web sites chosen by the instructor prevent learners' getting lost in the cyberspace while looking for exercises according to their levels. The exercises on the web-sites provide self-assessment opportunity for the learners at which learners are able to assess what or how much they know about the course.

Interactive Exercises Used in the Online Course

The online learning material provides the learners with interactive and communicative great many exercises. The material bases its error analysis for each exercise on anticipated wrong answers classified by Garrett (1987). That is, error messages associated with possible errors are stored in the computer and are presented if the learner's response matches with those possible errors (Heift, 2001). This eradicates the problem of one correct answer rigidity. Learners are able to check their answers with 'Check' button and access all correct answers whenever they want by clicking on 'See Answers' button. Here are some of the exercises used in the course:

Radio Button: It is used for true/false exercises as an after-reading exercise and for grammar exercises (Figure 11).

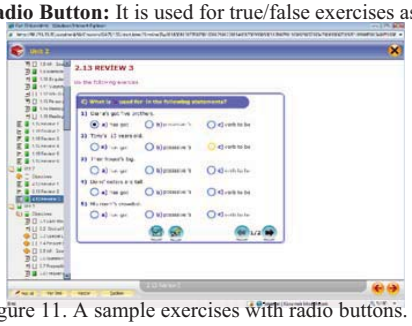


Figure 11. A sample exercises with radio buttons.

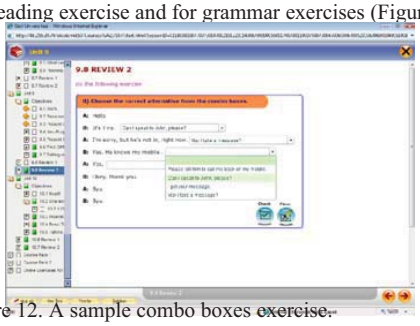


Figure 12. A sample combo boxes exercise.

Combo Boxes Exercises: It is used mostly for exercising vocabulary but also for grammar. For the user friendliness of this exercise, there should not be too much alternatives and long answers for the choices (Figure 12).

Multiple Choice Exercises: It is particularly used for exercising on vocabulary and grammar. Learners are provided with four to five choices.

Fill in the Gaps by Writing Exercises: The learners are expected to complete sentences by filling in the blanks that appear in sentences (Figure 13). This exercise is mostly used for grammar or for checking the spelling of vocabulary. At elementary level, the task requires short-answers and usually one gap is contained. Heift (2001) suggests that for higher skill levels and to make the task more challenging, more than one gap can be contained.

Matching Exercises: It is used for exercising vocabulary as the learned vocabulary has been matched with their definitions or pictures. The researcher again believes that matching exercise is one of which works best with the questions including long answers (Figure 14).

Figure 13. A sample fill in the gaps by writing exercise

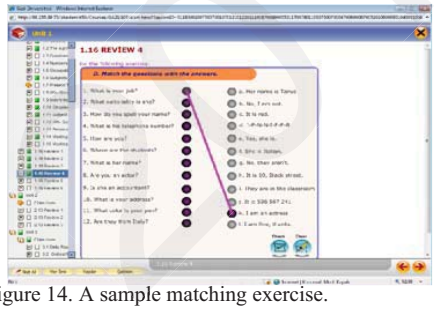


Figure 14. A sample matching exercise.

Drag and Drop Exercise: It is mostly used for exercising on vocabulary since it is not user-friendly when you drag an online sentence to a gap. That is, this exercise works better with short-answer questions (Figure 15).

Figure 15. A sample drag and drop exercise.

Conclusion

This study demonstrates an instructional design model of an online EFL material. The material adopts a communicative approach to language learning which necessitates use of communicative strategies in a web-based language learning environment by enabling learners to be exposed to English language in its natural environment. The skills, grammar and vocabulary exercises are integrated in order to expose the learners to a real-life context. The material enables individuals to practice English language with a great number and variety of exercises which contributes to the reinforcement and/or preservation of learnt language skills, structures or units. Consequently, in a multimedia rich environment learners are exposed to all language skills communicatively and in an integrated way.

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AN INTERACTIVE ATTENTION BOARD FOR INDIVIDUALS WITH DISABILITIES

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Abstract
This paper proposes a novel tool named by "Interactive Attention Board" (IAB) and a software based on IAB named by "Interactive Attention Boards Software" (IABS) for special education. The proposed IAB system is an interactive system based on combination of hand-eye coordination, ADD/ADHD, and learning theories developed by various psychologists, and used for hand-eye coordination and attention improvement. Moreover, the IAB system offers an interactive environment both for disabled individuals and educators, and enables a rapid improvement of disabled individuals' responses to various stimulants, and increases attention duration on a certain object. In the short term, IAB aims to decrease disabled individuals' the reaction time to stimulants, and to increase total concentration and attention period on a single object. In the long term, IAB helps the educator to teach individuals about various cognitive concepts such as long, short, small, big, and colors, as well as educational concepts such as animals, vehicles and professions.
Keywords: *interactive learning environments; teaching/learning strategies; human-computer interface; computer aided learning*

INTRODUCTION

IAB is an interactive visual and auditory education material which is basically intended to improve hand-eye coordination, increase attention duration, and decrease reaction time. IAB is intended to remedy the deficiency of current educational materials used to augment the hand-eye coordination of individuals with certain disabilities, namely ADD/ADHD, particularly Mental Retardation (MR) and Autism.
The main purpose of the study is to develop a new tool according to educational requirements of individuals with autism and/or MR and so disabled individuals all. Educational development of some autistics is very slow, because their perceptions are very problematic and their attentions' periods on a certain subject are too short. More, some of them are interested in only a number of activities and they are worried quickly. Since the learning process would be satisfied if attention during certain time of period on a subject which is desired to learn is satisfied, several objects and subjects that they are interested in for long periods observed. Main activities and games in IABS were inspired by activities which excites them and which are likely take their interests. Furthermore, Autism and MR were the inspiration disorders for the study however the study developed according to many different disabled individuals who have attention problem. Consequently, studies aims to improve attention period on a certain subject, hence, to augment the educational development.

LITERATURE REVIEW AND MOTIVATION

Many different aspects of hand-eye coordination has been studied over the years including assessing the attention period, increasing the reaction speed, understanding the relationship between reaction and visual stimulus. In addition, there are various researches on attention deficit disorders (ADD) and attention deficit hyperactivity disorders (ADHD). While a number of the studies have attempted to understand the common causes of ADD-ADHD and to find a way to decrease ADD-ADHD in children and adults, others have focused on developing treatment tools. This section reviews the literature regarding hand-eye coordination, ADD, ADHD and technology tools developed to improve hand-eye coordination and to treat ADD-ADHD.
Much research into ADD and its effects on the human life has been conducted, and the critical importance of ADD and ADHD has been perceived in education, particularly in special and primary education. A recent study has attempted to explore the characteristics of children who sustained injuries as a result of having ADD-ADHD (Badger et al, 2008). They set out to identify and understand the risk factors of injuries, and they searched for ways to educate individuals to protect a repetition of injuries. In a recent paper investigating the role of mind wondering, Smallwood et al (2008) emphasize the human cost of absent mindedness, concluding that "Successful learning requires that individuals integrate information from the external environment with their own internal representations". In their article, they investigate the role of mind wandering play in education.
In an article, Batista et al (1999) explained that the neural activities regarding visually guided reaching begin with an image on the retina and end with impulses to the muscles. A plan for reaching is constructed at some point during this process. They assumed that this plan is made during the time of the coordinates of the arm, the specifying direction and amplitude of the movement, or in the coordinates of the eye because visual information is initially gathered in this reference frame.
Harris and Wolpert (1998) presented an integrated theory of eye and arm movements, they assumed the neural control signals are corrupted by noise whose variance increases with the size of the control signal. Next, they propose the variance of final eye and arm position depends on the presence of noise in neural control signals. Another piece of research entitled "From eye to hand: Planning goal-directed movements" by Desmurget et al (1998) emphasized the lack of understanding of the nature of the neural mechanism required in movement planning. In this study, the target localization, definition of the initial state of the motor apparatus, and hand trajectory formation were identified as main tasks that the nervous system needs to manage. Our study has been based on individual with autism and/or MR educational requirements and the idea "when a peripheral visual stimulus is briefly presented in an empty surround, and an observer is required, after a delay of a few seconds, to point toward the remembered location of that target, the responses are strongly influenced by eye orientation at the time of pointing" (Enright, 1995). This present study aims to develop a new tool (combination several hardware tools) and related software with the assistance of emergent technologies improve attention and hand-eye coordination.
There are a number of materials and tools such as Visual education attention card sets, Simple pictures with compositions, Paper work with geometric figures, Tread and color beads, Short and simple texts, Balloons, Memory cards, etc. which are used to improve hand-eye coordination and visual attention have long been in use. These materials and tools have several advantages such as ease of manipulation by educators, low cost, high availability, and low maintenance because they are not dependent on emergent technologies. However, with the exception of computer games, most are not interactive themselves, the interaction is supplied by trainer or educator. In addition, many of them are not developed for individuals who need special education. Moreover, computer games developed to improve hand-eye coordination require ability to use mouse or keyboard, and therefore are usually unsuitable for special education because many of disabled individuals lack the capacity to use these kinds of computer peripherals.
Numerous ADD/ADHD treatment and assessment methods developed for both academics and commercial purposes have long also been in use. These methods offer various approaches to remedy ADD/ADHD problems, such as stimulant medications techniques, worksheets and programs, educational software, generic strategy developments, reading-writing exercises, reminders, electronic agendas (Newideas, 2009; MyAdhd, 2009; Lund & Lund, 2008; Parker, 2009; Addcoach, 2009; Teach ADHD, 2009; Miranda et al, 2002; Rabiner & Coie, 2000; Reid & Lienemann, 2006; Baker et al, 2003; Northup & Gulley, 2001; Sahin, 2006). Although almost all of the reviewed studies have attempted to treat ADD/ADHD, none of them offers an interactive improvement tool for individuals with disabilities, particularly individuals with MR or Autism.

This paper explains the development of an Interactive Attention Board Software (IABS), drawing on previous research and theoretical work. IABS can be effective in improving visual attention and hand-eye coordination for individuals with disabilities especially mental retardation and autism. The basic principle of IABS is to remove negative effects and disadvantages of non-interactive educational materials in special needs education, and to improve quality of training using technological equipment and computers. Since IABS has been developed in computer environment, as well as supporting interactivity the computer software facilities can be used for many additional purposes such as storing individuals' information, training data, and trends. Moreover, IABS also enables comparison of previous training data with current results, therefore, creating the opportunity to assess and evaluate individuals' improvements over time.

Perception and the facts that affect perception

The human brain has a strong tendency to organize different stimulants as objects which contrast with a certain background. There are a number of important factors to identify what can be perceived such as attention, preparatory set, motivation, sensory depravation and learning. In addition, factors which affect perception can be divided into two main categories: the features of the stimulus and of individual who perceives (perceiver). The first factor which can affect perceptional selection is change in stimulus (used by many advertising company to increase advertising effectiveness), other factors include repetition, size intensity. In the aspect of individual, expectations, interests, needs, beliefs and individual values are other factors which can affect perception: Attention (*Intensity and Size, Contrast, Repetition, Movement),* Preparatory Set, Learning, Sensory Deprivation, Motivation (Cuceloglu, 1991:122; Morgan and King, 1971; Morgan, 1995).

INTERACTIVE ATTENTION BOARD (IAB)

IAB is based on various theories about factors that can affect perception, such as attention theory, intensity and size, contrast, repetition, and movement of stimulus and objects. IAB consists of target and reward stimulant figures, videos and pictures, various animations, educational features enhanced with database applications to assess individuals' improvements. Although IAB has been developed for use in special education, especially for individuals with severe and moderate mental retardation, and autism, it can also be used to improve hand-eye coordination and auditory reactions of individuals with mild mental retardation and ADD/ADHD. Furthermore, it can be an effective alternative to conventional class materials in childhood education.

In ADD/ADHD therapies, various types of trainings activities are used, such as perceiving the details of objects or environment, remembering previous works, aligning objects and subjects, increasing reaction speed through games, and finding the appropriate reinforcement and using them in the relevant place and time. However, there is no training policy or standard or material for target group in special education. We believe that IAB can meet this deficiency of non-existing materials.

Interactive attention board software (IABS)

Interactive Attention Board Software (IABS) consists of 5 main features:

Training/Exercise

In this case, many different attention-exercising tests are applied to prepare the individual for each test stage. The details of this exercising will be given in the operational details section.

Test

The real test environment is established for the assessment and education of individuals, and all data gathered from an individual's test are recorded.

Statistics

In the statistics case, the individuals' test results are compared, individuals' improvements or regressions are shown graphically, and reported.

Data Processes

In data processes unit, database operations are managed.

Individual Education Plan (IEP)/Options

In this section, personal information of individual and educator are manipulated. Moreover, the special personal requirements and identifiers of individuals (trainees) are also recorded such as rewards, appropriate colors, sounds, etc. In addition, the Individual Education Plans (Goals, objectives, behaviors) are also identified in this section.

Operational Details of IAB

The educator (trainer) and special needs student (trainee) sit together in front of a LCD screen with a touch screen feature. In the first execution of IABS, the educator should record the individual personal information and set up options related to the disabled individual such as, age, diagnosis, training type, goals. After choosing these initial settings, IABS is ready for training sessions.

Training/Exercising and Test

For Disabled Individuals with Moderate and Light Mental Retardation

The scenario used for both exercising and testing is illustrated in Figure 1. Firstly, the screen is filled with blurred and mat colored object (size, color and blur level of object vary in accordance with the individuals' options identified by educator as individual personal requirements in IEP/Option section, in this scenario a rectangle was used, however other objects, which take attention of individuals, can be used, and then educator starts the exercise. Next, a rectangle is flood filled with bright red, and then active stimulus starts to move, leaving gradient trace on rectangles at a speed of 10 rectangles/second. After each 10-15 rectangles are activated and traced (the number of rectangles depend on size of the screen), the active stimulus direction is changed to up or down. After 3-4 seconds, the active stimulus stops, and starts to blink until the individual touches it. The educator asks the individual to touch the active stimulus, and assist physically individual to touch the object if necessary. When the individual touches the active stimulus, the object fits to screen (fill the whole screen), and a reward (both visual and auditory) stimulus appears on the screen for 5 seconds. For every target stimulus touch, a different reward stimulus or sequence of rewards should appear. According to an individual's characteristics different kinds of reward stimulus can be identified by educator, such as a picture of the individual's mother, favorite toy, item of the clothing, or a cartoon character. Sample reward stimuli can be found in Figure 2.

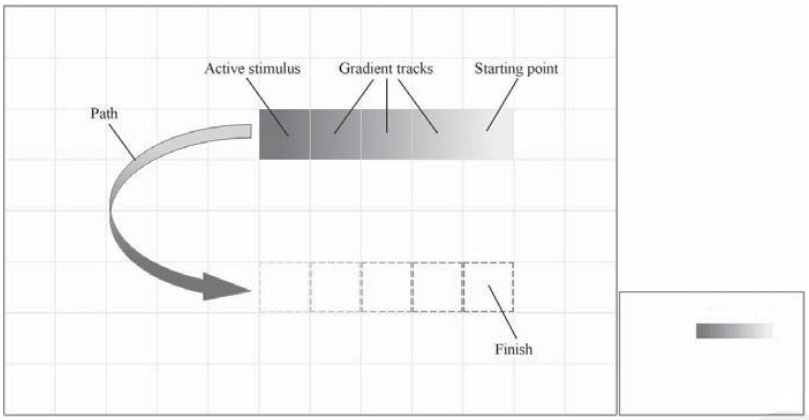

Figure 1. Tracking and touching use-case (left side for use-case description, right side for its exact appearance)

Figure 2. Sample rewards which can promote individuals

After a reward stimulus disappears, the active stimulus reappears within 0.5 second, and the training continues. If the individual touches a wrong point while training, the active stimulus disappears for five seconds before reappearing. After a number of exercises on the same stimulus, the educator relinquishes the physical assistance, and only indicates the stimulus, and asks the individual to touch it. After a while, only verbal assistance is given by the educator. This period continues until the individual touches the active stimulus independently. When independent attention is achieved on the stimulus, the educator asks the individual to touch the stimulus (such as a game or a competition environment) as fast as possible to improve reaction time to the stimulus.
After exercising on the initial training, the test stage is able to be applied. In the test case, the educator and individual sit front of the LCD as well as exercising mode, and test is started. At the beginning, the educator reminds the individual to touch the correct stimulus (active stimulus) immediately when it appears or stops (it depends on the test type). The educator does neither assist the individual physically nor verbally during the 60 tests. In the first ten, the stimulus blinks for five seconds, in the second, for four seconds and so on. During the test study, all the data about the individual, such as reaction time and wrong/correct touches, are recorded (This test data will be compared to next test data).

For Disabled Individuals with Profound and Severe Mental Retardation
In the case of testing an individual with profound and severe mental retardation, the exercising and testing should be simplified. In the first stage, a bright red rectangle fills the whole screen and blinks slightly. A touch at any location on the screen in five seconds is to be rewarded. In the early stages of this training, the educator acts as model (showing how a touch can be made) and shows before asking the individual to touch the screen. If the trainee shows no willingness, the educator assists the individual with verbal, visual or physical assistance. This process is applied five times.
In the next stage, the size of the rectangle is reduced to 1/4 of the screen size and continues blinking. Figure 3 demonstrates this scenario. Any touch at any red region on the screen is rewarded for 5 seconds. Meanwhile, the rewards in this training can also be selected from previously identified rewards meaningful to the individual. If the individual shows no willingness, the educator assists the individual with verbal, visual or physical assistance, as in the first stage. In this stage, the individual performs this application five times. In the third, the similar procedure is applied five times but with a reduced rectangle (1/8 of the screen) and the same assistance is given at this stage.

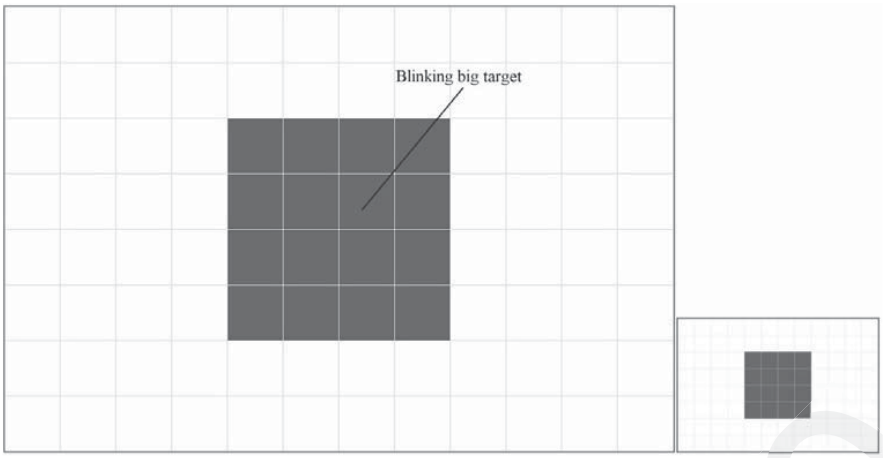

Figure 3. Perceiving and touching use-case (left side for use-case description, right side for its exact appearance)

In the test stage, the educator and the trainee are front of the screen which is divided into two different colored rectangles, each 1/16 the size of the screen, white for the educator and red for the trainee (colors can be changed if necessary), however none of them appears initially. Firstly, the white rectangle appears for the educator who touches the target stimulus in the educator side causing the rectangle to expand to the whole screen flash, and then a reward object appears for five seconds. Second, the rectangle in the individual's side appears as a target stimulus. When the individual touches the stimulus on the screen, the red rectangle expands until it eventually fills whole screen and flashes, and then a reward object appears for five seconds. This application is repeated until the individual perceives the stimulus. When the trainee's achievement in perception is quite satisfied, previously divided screen is integrated and the whole screen is left to the individual.
During all exercises and testing studies, the educator encourages the individual with certain words such as "Look at, there is a light here, and I touch that light. Ooooo, do you see what a beautiful object", "Yes it is your turn, the red light, come on catch it immediately" etc. More, many other test types provided by the IABS, such as testing for touching single stimulus, tracking stimulus, moving stimulus, touching dual stimulus with both hands etc. IABS also offers some additional tools for explaining certain concepts.

Data Gathered During Test and Assessment
A number of data is gathered from the tests to be used for assessing the improvement of the individual, and recorded in a form of individual tuple on the database. Table 1 shows the tuple structure for a single training.

Table 1. Individual training data structure

Data	Description	Unit
Individual_Id	Individual who oversees the test	String
Test_Id	Test type which is applied	Integer
Test_Scenario	Test style which is chosen from the options	Integer
Test_No	Test number in the test period	Integer
Response_Type	How the individual's responded the stimulus	[Omitted/Correct/Wrong]
Response_Time	Individual's reaction time	m-second
Date/Time	Time of training	Date-time

In the table, Test_Scenario field is used to identify the test style which can be identified in options according to individual's special needs and includes features, such as reward type, object type and colors. This is very useful for determining the optimum conditions for test environment for the individual's comfort and convenience.
Using each individual' training data, a number of statistics can be generated for several features, such as assessment and evaluation of an individuals' improvement. These are listed in Table 2. In addition, IABS enables current statistical results be compared with previously computed results.

Table 2. A number of statistics which can be generated by IABS

Statistic Type	Unit
Which test is trained by the individual	String
Total number of the wrong responses (touching wrong locations)	Integer
Total number of the correct responses (touching correct locations)	Integer
Total number of the omissions (non-response)	Integer
Total number of the correct responses (with physical/verbal/visual assistance)*	Integer
Total number of the correct responses (independent)*	Integer
Average reaction (response) time for wrong responses	Msec
Average reaction (response) time for correct responses	msec
The fastest reaction (response) time for wrong responses	msec
The slowest reaction (response) time for wrong responses	msec
The fastest reaction (response) time for correct responses	msec
The slowest reaction (response) time for correct responses	msec
Average achievement (percentage of perceiving the stimulus)	%

* optional

Using these data, individuals' improvements can also be illustrated in form of several graphics which can be used to assess and evaluate the individual's current status. As well as individual level, this data can assess groups of individuals having similar disabilities. Although it is unlikely that two individuals would have exactly the same type and level of disability, statistical data for ADD/ADHD may be able to provide interesting comparative trends.

CONCLUSION

This paper presents a new technological tool IAB and a software IABS that can be used to improve hand-eye coordination and attention duration of individuals with certain type of disabilities, particularly MR and Autism. Using the IAB system, a case study has been conducted, and the results showed that very impressive improvements were obtained using IAB system. In fact, it is not possible to say with certainly that this system can attain the same level of improvement for every disabled individual, because it is unlikely that two individuals in special education would have exactly the same type and level of disability. However, this system can be used in special education for augmenting the ADD/ADHD treatments and hand-eye coordination, and statistical data gathered from the system may be used for a range of different purposes, such as comparing individuals with similar disabilities, and comparing the achievements of an individual over a period of time.

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AN INVESTIGATION INTO TEACHERS' ICT INTEGRATION STAGES

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Abstract
The aim of the study is to determine teachers' ICT integration stages according to CEO Forum's standards and factors affecting their integration. Teachers are expected to use ICT in their teaching practice. Hence, it is crucial that their integration stages and factors affecting it are examined. A survey methodology was employed for this study. A sample of 200 teachers was selected randomly out of 460 teachers working in primary schools in Uşak, Turkey. Researchers of this study developed an ICT integration questionnaire. Analysis of the data reveals that the teachers are in three different stages in ICT integration. A significant relationship is discovered between feelings of inadequacy in using ICT and exhibiting stage 1 behaviors. It is also clear that the ICT knowledge of teachers is the most important variable for the teachers who were at the third (the highest) stage of ICT integration. A model showing interrelations among factors influencing ICT integration behaviors were drawn for further studies to be tested.
Keywords: ICT, Teachers, Integration Stages, Attitudes, Self Inadequacy

INTRODUCTION

The study investigates the relationships among teachers' Information and Communication Technologies (ICT) integration stages, teachers' feelings of self inadequacy in using ICT and level of perceived knowledge in ICT usage and their attitudes towards the use of ICT in teaching and learning.
In the literature ICT integration stages manifest itself in five different consecutive stages; entry, adoption, adaptation, appropriation and invention (CEO, 1999). Teachers' quality of use of ICT in teaching and learning, professional development, administrative work etc. determines their stages of integration. The stages, teachers' typical applications in the stages and possible factors affecting ICT integration are discussed in the literature. Despite this and its importance, there is not enough body of empirical research trying to determine teachers' actual ICT integration stages.

INTEGRATING ICT INTO TEACHING

Integrating ICT into teaching for subject teachers has become an important issue in Turkey for the last decade. There is a pressure onto teachers coming from almost every part of the society; from policy makers, senior management, their peers and students (Altun, 2002). Thus, teachers are expected to use ICT in their teaching practice one way or another. Hence, it is crucial that ICT integration stages and factors affecting the stages need to be examined.

ICT Integration Stages

According to Comber, Lawson and Hargreaves (1998), it is important to identify teachers' integration stages because necessary policies can be introduced at any time when trying to enhance quality of teachers' ICT usage. They (1998) also argue that "…previous attempts to foster an 'educational revolution' through the introduction of computers largely failed because teachers were uncertain about how ICT could be integrated into the curriculum…" (p. 372).
The implementation of an innovation has an array of levels (Hall, 1995). Although there are similar technology adoption models (Dawes, 2001; Comber *et al.*, 1998), CEO Forum's standards are most commonly used to illustrate the levels of teacher ICT integration (CEO, 1999). CEO Forum suggests five consecutive stages of integration.
Entry: Students Learning to Use Technology. At this stage, teachers are not themselves users of technology. If students are using technology, they are using it in ways determined by someone other than the teacher without participation from the teacher. …
Adoption: Teachers Use Technology to Support Traditional Instruction. Teachers are beginning to use technology, usually to enhance their own productivity, mandated either by the school or through their own initiative. They experience an advantage doing traditional tasks with a new tool and begin to see the power of the tool for other applications…
Adaptation: Technology Used to Enrich the Curriculum. Teachers begin to use technology in ways that are connected to the curriculum, and in ways that are already familiar. …Teachers at the adaptation stage tend to direct students to inquiry rather than allowing student-directed learning experience.
Appropriation: Technology is Integrated, Used for its Unique Capabilities. … In the classrooms (of teachers) at this stage, technology begins to reveal its potential to produce improvements in learning, as students master higher-order thinking skills, and more complex concepts and skills than they would have encountered without technology…
Invention: Discover New Uses for Technology. At this stage, teachers are defining classroom environments and creating learning experiences that truly leverage the power of technology to involve students in tasks that require higher-order thinking skills as well as mastering basic concepts and skills. ..
CEO Forum (1999:14-15).
Teachers should be equipped with the necessary skills and knowledge in order to use ICT. They should also be trained to learn how to integrate information and communication technologies is a vital issue for educators to tackle. Therefore, teachers not only have to be able to handle ICT, but also have to be able to transfer skills and knowledge into the classroom, which requires that their ICT training has to have an element of education and pedagogy (Lawson and Comber, 2000a: Fisher, 1996). Teachers are more likely to use ICT in teaching and improve their skills if their ICT training is meaningful for their individual needs (Lawson and Comber, 1999). Hence, any training intents to integrate ICT into classroom settings has to be provided by the trainers who are competent in teaching technology and curriculum needs. Moreover, it is important to note that teachers may be at different levels of technology integration stages (Acun, 2003).
Teachers at the higher-level of technology integration stages are more likely to utilize the benefits of ICT in their teaching. When teachers realize the potential for improving learning through the effective use of technology, and when their competencies in ICT are improved they become competent technology users. Only then they start to change the way they teach (Altun, 2002).
Studies on ICT identify some important points about having training in ICT: that it should be appropriate to classroom use, hands-on practice, provide on-the-spot help and provide opportunities to work and share with other teachers. Training must also be timely and appropriate for both teacher professional development and school resource development (SOIED, 1999; Acun, 2003). These, however, are not only factors affecting ICT integration. Their attitudes, feeling of adequacy/inadequacy, self efficacy and administrative support are also important when trying to further teachers in their ICT integration stages (Alev, Altun and Yiğit, 2009; Katic, 2008; Akkoyunlu and Kurbanoğlu, 2004; Jimoyiannis and Komis, 2007).

IMPORTANCE OF THE STUDY

The present study contributes to theory by providing insights into teachers' actual ICT integration stages. The level of teachers' ICT integration and quality of their use determine whether or not they create any added values to teaching practice. Studies examining the issue of ICT integration in teaching and learning mostly concentrate on the factors affecting the integration alone. Hall (1995) argues that implementation of a change in any innovation has to be assessed at the individual level. The present study attempts to identify at which stage the teachers are in ICT integration on an individual basis, and then investigates factors affecting their integration stages.

METHOD

Research Question

The main research questions formulated for the study are:
What are the teachers' ICT integration levels in each stage?
How are knowledge, attitudes, feeling of self inadequacy of teachers, and administrative support related to the level of ICT integration stages?

Population and Sample

The population of the study consists of 460 primary (4-8 grades) school teachers working in the public school system of Uşak, Turkey. Grades in primary schools were divided into three stages, the first stage is 1 to 3, the second stage is 4 to 5 and the third stage is 6 to 8. Since the most of ICT usage is intensified in the last two stages, our sample was drawn from the second and the third stages. Instruments were distributed to a random sample of 200 teachers in 37 primary schools over the course of five days. The number of instruments returned was 149.

Depended and Independent Variables

The study utilized the integration stages as depended variables. The integration stages described in the literature are most probably contingent upon teachers' attitudes towards ICT usage, their feeling of self inadequacy and their perceived level of knowledge about ICT usage. Hence, in this study attitudes, knowledge and self inadequacy were treated as independent variables to explain the variance in teachers' ICT stages. Such treatments of variables in this study is not very common (Alev, Altun, and Yiğit, 2009; Katic, 2008; Jimoyiannis and Komis, 2007, Leng, 2008). The study also includes gender, years of experience, and administrative support as background or demographic independent variables

Procedures

To measure teachers' integration stages, attitudes, self inadequacy, knowledge and administrative support, a set of item pools were generated for every and each of the variables. The items in all instruments were subjected to a factor analysis spontaneously. A varimax rotation was used to extract factors. The varimax rotation in factor analysis revealed seven dimensions. After operational definitions have been formulated for each dimension, a score on each dimension was calculated for each respondent by adding teachers' responses grouped under each dimension. The score was divided by the number of items in the respected dimension. This procedure yielded a score on each dimension for each teacher. Likert type scaling was used across all items. For items in ICT integration stages, self inadequacy and administrative support, teachers were asked to rate their behaviors on the fallowing scale: (1) Never, (2) Seldom, (3), Occasionally, (4) Often, (5) Always. For items in attitudes scale, teachers were asked to rate their attitudes on the following scale: (1) Never feel like this, (2) Seldom feel like this, (3) Occasionally feel like this, (4) Often feel like this, (5) Almost always feel like this. Teachers were asked to rate their knowledge about ICT on the following scale; (1) have no knowledge, (2) have little knowledge, (3) have some knowledge, (4) have a great deal of knowledge. Resulting factor structure is shown in the table 1. As shown at the bottom of the table 1, reliabilities (Crombach Alpha's) of each dimension were very high.

Table 1 Factor analysis of items in the instruments

	Dimensions						
	Inadequacy	Knowledge	Stage3	Attitudes	Stage2	Stage1	Administration
	inadeq8(.79)	knowled9(.81)	stage25(.76)	attitu8 (.80)	stage7 (.75)	stage1(.72)	administ1(.80)
	inadeq3(.79)	knowled1(.79)	stage24(.72)	attitu11(.77)	stage8 (.74)	stage6(.69)	administ4(.78)
	inadeq1(.78)	knowled10(.77)	Stage18(.69)	attitu9 (.75)	stage10(.74)	stage2(.65)	administ2(.62)
	inadeq2(.77)	knowled8(.75)	stage22(.67)	attitu13(.70)	stage14(.63)	stage4(.49)	
	inadeq9(.71)	knowled6(.74)	stage13(.67)	attitu5 (.67)	stage12(.60)		
	inadeq7(.69)	knowled7(.73)	stage23(.67)	attitu3 (.62)	stage9 (.59)		
	inadeq6(.63)	knowled4(.65)	stage19(.66)	attitu7 (.60)	stage15(.57)		
	inadeq4(.61)	knowled3(.58)	stage20(.61)	attitu12(.55)			
Variance	11.85	11.42	10.20	9.86	8.35	5.51	4.31
Cumulative Variance	11.85	23.28	33.48	43.34	51.69	57.20	61.52
Reliability	.92	.91	.86	.86	.85	.74	.65

Note: The numbers in parenthesis are factor loadings under their respective dimension.

CEO Forum's a-five-stage ICT integration model was used for the study. However, items generated to measure teachers' ICT integration in five different stages converged under three dimensions in factor analysis as shown in table 1. Content and meaning of items in each dimension were examined and named accordingly. Dimensions were named as Stage 1, Stage 2 and Stage 3. Items in the first stage comprise such characteristics of people's showing basic skills and having little knowledge of ICT. They use ICT because their students use them. The second stage items reveal that teachers started to use ICT in their daily life, and to make their everyday school operation easier and smoother in such applications as typing lesson plans, worksheet and keeping students' registry. Items in the third stage show that teachers started to manipulate existing ICT applications and software for their subject teaching. They started to use the internet and e-mail to enrich their teaching and students' learning experiences but still rely mostly upon conventional classroom environments. The CEO Forum classification of stages is somehow reduced to three stages in the present study. That is; stages of 2 and 3 in CEO Forum's classification (adoption and adaptation) converge into one in our research and stage 5 (innovation) behaviors were displayed at all by the teachers involved in this study.

Analysis

Stepwise regression techniques were used to explain variance in level of ICT integration stages. To explain variances in each stage, attitudes, self inadequacy, knowledge, administration support, gender, years of experience were entered into the model as independent variables. Variances accounted for by the remaining independent variables are explained. Using the stepwise regression results, a path model for integration was generated for to be tested in further studies.

RESULTS

Findings suggest that teachers tend to score high on entry stage (mean=4.11), followed by stage two (mean=3.63) and stage three (mean=2.15). These mean that it becomes harder to show integration behavior as stages becomes higher. This is theoretically sound. Table 2 shows descriptive statistics related to major variables.

Table 2 Descriptive Statistics (n=149)

	Mean	Std. Deviation
Stage3	2,15	,85
Stage2	3,63	,95
Stage1	4,11	,78
Teachers' Feeling of Self Inadequacy	2,06	,83
Teachers' Knowledge	2,96	,56
Teachers' negative attitudes towards ICT	1,67	,75
Lack of administrative Support	2,24	,91
Years of Experience	12,76	9,14

Correlation analysis was carried out to explain the relationships among dependent and independent variables.

Table 3 Correlations among Variables (n=149)

	Experience	Stage3	Stage2	Stage1	Inadequacy	Knowledge	Attitudes	Administrative
Experience	1,00							
Stage3	,09	1,00						
Stage2	-,26	,29	1,00					
Stage1	-,19	,10	,31	1,00				
Inadequacy	,29	-,14	-,48	-,53	1,00			
Knowledge	-,03	,43	,37	,39	-,44	1,00		
Attitudes	,19	,12	-,32	-,38	,44	-,10	1,00	
Administrative	,11	-,01	-,13	-,17	,22	-,15	,17	1,00

Note: Correlations larger than .17 (absolute value) are significant at .05 level

Correlations among variables as show in table 3 reveal that stages have low or moderate relationships among themselves. This suggests that each stage's behavior is relatively independent of each other. Mastering in one stage does not guarantee graduating into the next stage. As stage 1 behaviors are more likely to be related to teachers' self inadequacy (r=-.53, p<.01). Stage 3 behaviors are more likely to be related to teachers' ICT knowledge (r=.43, p<.01). Similarly stage 2 behaviors are more likely to be related to teachers' feeling of self inadequacy (r=-.48, p<.01). Moreover, while negative attitudes towards technology are related to stage1 and 2 behaviors (r=-.38 and r=-.32, respectively, p<.01 for both), they are not related to stage 3 behaviors. These results imply that for stage 3 negative attitudes and self inadequacy do not explain teachers' behaviors. Behaviors in stage 3 appear to be depended on teachers' level of knowledge in ICT. Thus, it is important to improve teachers' know-how on ICT to further teachers in stage 3 behaviors rather than working on their attitudes.

Negative attitudes is not directly related to teachers' knowledge on ICT and yet self inadequacy is related to both knowledge and attitudes. This may imply that self inadequacy is a mediating variable between ICT knowledge of teachers and their attitudes towards ICT. The effect of level of knowledge on attitudes towards ICT is contingent upon and runs through self adequacy. For knowledge to have any negative or positive impact on attitudes, level of self inadequacy is an important mediator. In-service training will not have any effect on teachers' attitudes towards ICT unless their feeling of self inadequacy is improved. This is an interesting and important finding. Any knowledge based activity that intends to help teachers integrate ICT into teaching in stages 2 and 3 has to tackle with their feeling of adequacy.

Level of lack of perceived administrative support is found to be related to only stage 1 behaviors, which means that teachers already reached up to stage 2 and 3 does not concern with the lack of administrative support. For those who are at the second and third stage are not influenced by administrative support. This might be mostly because they internalized those behaviors and became self sufficient in dealing with small technical problems etc. However, one should not disregard that administrative support is important for the teachers at the first stage. Additionally, it is a fact that passing from stage 1 through stage 3 depends on reaching to stage 2. Nevertheless stage 1 does not necessarily guarantee to reach stage 2. A tendency has been discovered as the year of experience increases, perceived in adequacy and negative attitudes increase. Similar tendency occurs for displaying stage 1 and 2 behaviors.

A difference between male and female teachers is observed for stage 3 behaviors and attitudes towards ICT. On average male teachers (mean=2.35) more frequently exercise stage 3 behaviors than female (mean=1.92) teachers (p<.001). Male teachers (mean=1.82) tend to have more negative attitudes towards ICT than female teachers (mean=1.50) teachers (p=.01).

Stepwise regression procedures were used to examine the contribution of negative attitudes, self inadequacy, knowledge, years of experience and gender to each stages of teachers' ICT integration. It seems that negative attitudes and self inadequacy did not account for a significant change in explaining the variance in teachers' ICT integration for stage 3 behaviors. It is found that a teacher is more likely to exhibit stage 3 behaviors when he/she has high level of knowledge on ICT and when he/she reaches stage 2. Additionally, male teachers are more likely to reach stage 3 than female teachers.

Table4 Stepwise Regression for Predicting Variables Affecting Stage3 Behaviors

	β	Std Error	Std. β	t	*p*
Constant	.654	.400		1.634	.104
Knowledge	.492	.118	.325	4.162	.000
Gender	-.417	.124	-.246	-3.360	.001
Stage2	.179	.070	.201	2.572	.011

$R^{2=}$.26; Adj.$R^{2=}$.24; F=16.89 p<.001

When stepwise regression method is used a linear combination of level of ICT knowledge, level of stage 2 behaviors and gender, altogether, explained 26 per cent of variance in stage 3 behaviors (F=16.89, p<.001). All other variables did not contribute an increment into the variance in stage 3 behaviors above and beyond the contribution of these variables. The highest unique contribution belongs to level of teachers' knowledge followed by gender and stage 2 behaviors.

Table5 Stepwise Regression for Predicting Variables Affecting Stage 2 Behaviors

	β	Std Error	Std. β	t	*p*
Constant	3.043	.558		5.448	.000
Self Inadequacy	-.455	.089	-.398	-5.107	.000
Knowledge	.357	.133	.210	2.681	.008
Gender	.319	.134	.168	2.384	.018

R^2= .29; Adj.R^2=.28; F=19.81 p<.001

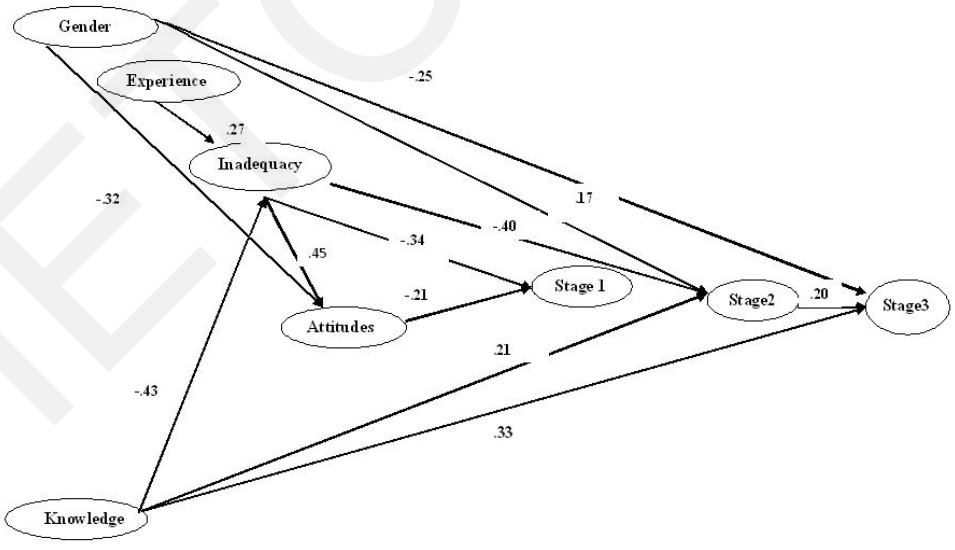
Stepwise regression revealed that 29 per cent of variance in stage 2 behaviors is explained by the linear combination of level of knowledge, feeling of self inadequacy and gender (F=19.81, p<001). All other variables did not contribute an increment into the variance in stage 2 behaviors above and beyond the contribution of these variables. The highest unique contribution belongs to level of teachers' self inadequacy followed by level of ICT knowledge and gender of teachers. Contrary to the findings in the significant correlation between stage 1 and 2, stepwise regression suggests that these two stages are not directly related. Feeling of inadequacy and level of knowledge seems to moderate this finding. It seems that further studies need to be conducted to uncover mediating variables unknown in this model.

Table 6 Stepwise Regression for Predicting Variables Affecting Stage1 Behaviors

	β	Std Error	Std. β	t	*p*
Constant	4.244	.398		10.675	.000
Self Inadequacy	-.316	.078	-.338	-4.043	.000
Teachers' Knowledge	.299	.105	.215	2.851	.005
Teachers' Attitudes	-.221	.078	-.213	-.826	.005

R^2=.34; Adj.R^2=.33; F=25.27 p<.001

Stepwise regression revealed that 34 per cent of variance in stage 1 behaviors is explained by the linear combination of self inadequacy, level of knowledge and negative attitudes towards ICT usage (F=25.27, p<001). All other variables did not contribute an increment into the variance in stage 1 behaviors above and beyond the contribution of these variables. The highest unique contribution belongs to level of teachers' self in adequacy followed by level of ICT knowledge and negative attitudes.
The model resulting from stepwise regressions showing the relationships among variables that explain the variances in level of ICT integration stages is generated to be tested in further studies. Male participants in gender variable was coded as 1and females as 2 in the model. The attitudes variable represents negative attitudes towards ICT.



Numbers on the arrows represent standardized β coefficients

CONCLUSION

This study suggests that in Turkish context a five-staged ICT integration requires a new classification. In CEO Forum's classification stages, informed by the findings of this study, somehow need to be adjusted into 3 stages. That is, adoption and adaptation stages converge into one in our research and innovation stage behaviors were not exhibited by the teachers involved in this study. Teachers have different and distinguishable levels of ICT integration stages. Every stage requires different set of applications and behaviors. This is an indication of relative independence of each stage's behavior. Acquiring enough skills and knowledge in one stage does not secure reaching up to the next stage. Advancing from the lowest integration stage to the highest one does not necessarily follow a linear path.

Knowledge is the most important variable in showing stage 3 behaviors while self inadequacy is the most important variable for exhibiting stage 2 behaviors. Any attempt aimed at improving teachers' stage 3 behaviors has to deal with their knowledge rather than concentrating on improving their attitudes. Self inadequacy does not have a direct effect on stage 3 behaviors.

Although self inadequacy has a relationship with knowledge and attitudes, negative attitudes are not related to knowledge. This might be an evidence of self inadequacy's possible role in being a mediating variable between ICT knowledge and attitudes. For knowledge to have any negative or positive impact on attitudes, level of self inadequacy must be lessened. According to the model shown above any effort trying to improve teachers' attitudes is not likely to have a direct impact unless their feeling of self adequacy is improved. Any knowledge-based activity that intends to help teachers integrate ICT into teaching in stage 2 has to nourish their feeling of adequacy. Stage 1 and 2 are not directly related. Administrative support or lack of it seems to be not an issue for those who are at the second and third stage. This might be mostly because teachers displaying stage 2 and 3 behavior are self sufficient in dealing with small technical problems etc. In contrast, administrative support is imperative for the teachers at the first stage. Additionally, it is a fact that passing from stage 1 through stage 3 depends on reaching to stage 2. Nevertheless stage 1 does not necessarily guarantee to reach stage 2. There must be some paths between stage 1 and stage 2. Further studies need to be conducted to uncover mediating variables unknown in this model. Moderating and mediating variables to explain variances in all stage behaviors needs to discover in further studies.

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AN INVESTIGATION OF T-PCK MODEL IN A TEACHER TRAINING PROGRAM

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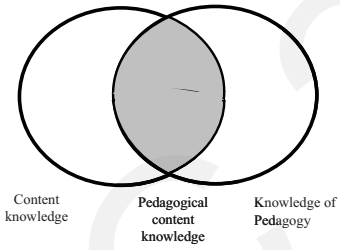
Abstract
The purpose of this study is to investigate the teacher education program for its compatibility of technological pedagogical and content knowledge (TPCK) model. This model implies that the knowledge of students, technology and content should be inter-connected and the teacher should have the ability to combine their skills and knowledge of what to teach to how to teach in a technological context. A sample of 184 senior students is selected from various teacher education majors: Science, mathematics, social studies, elementary and Turkish language education. A 64-item instrument adapted by the researchers is used to collect data. Correlation techniques are implemented and Pearson correlation coefficients are calculated for sub-constructs of the model. A matrix of these coefficients are demonstrated and discussed. The results show some significant relations among TPCK model sub-constructs and the model is implemented in our teacher education program from low to moderate level.

INTRODUCTION

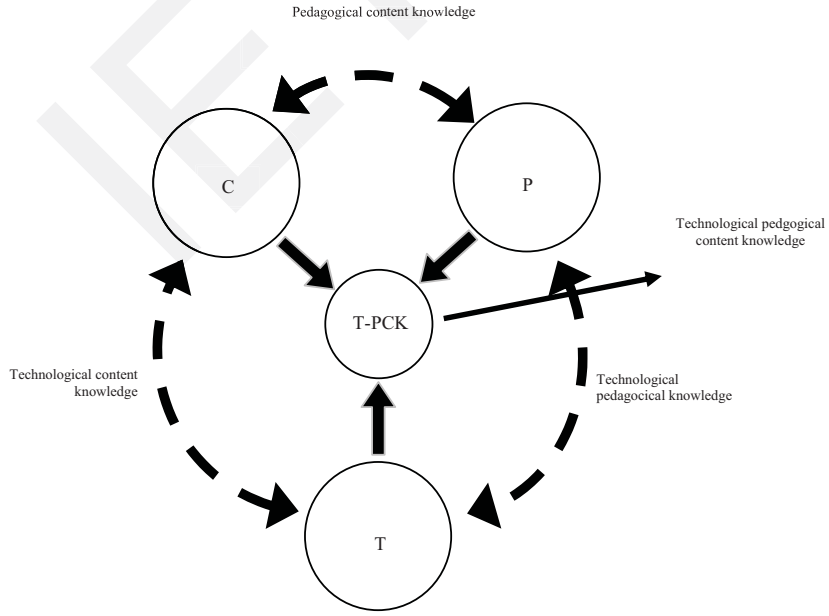
Significant technological developments have lately been observed in this era of information for all areas of civilization including education. Changes establish a base for reconsidering and revising values and skills of the notion of a "good teacher", as well as introducing new concepts in the literature. Pedagogical and content knowledge have been frequently studied in the last several years (Shulman, 1986). It is commonly claimed that pedagogical skills combined with content knowledge is an essential base for good teachers' characteristics and also for teacher training programs (Park & Oliver 2008; Shulman 1986; Yüksel 2008). Pedagogical content knowledge involves making informed decisions on delivering the content with appropriate pedagogy (Cochran et al., 1993; Shulman 1986). Learning occurs best when the content (what to teach) is combined with pedagogy (how to teach).
As described by Shulman (1986), pedagogical content knowledge (PCK) is the combination of knowledge and skills of how to teach an organized body of topics and problems to meet different student characteristics and needs in a learning environment.

Figure 1. Pedagogical content knowledge scheme



PCK model describes pedagogy knowledge as knowledge about students, evaluation, teaching strategies, and determination of educational goals in relation to the content being taught (Park & Oliver, 2008).
Mishra ve Koehler (2006) brought this argument to a next level by announcing an additional third knowledge: Technology. Thus, teaching is actually interoperability of using all three sets of skills and knowledge areas: To know what to teach in most suitable ways with best matching technology. This mode is called technological pedagogical content knowledge (T-PCK) and shown in Figure 2.

Figure 2. Technological pedagogical content knowledge (Koehler & Mishra, 2005)



Kuskaya-Mumcu et al. (2008) describes the components of TPCK model as following:

- Technology refers the knowledge of internet, video, boards and other technological materials.

- Pedagogy refers the knowledge of teaching methods, strategies and processes.
- Content refers to the knowledge of subject being taught.

According to the model, all three sets of skills needs to be used in order to adapt technology in the classroom. Using technology in a productive and meaningful way also helps teacher-created materials effectively emerge. This, in turn will provide students with a enriched learning environment (Seferoğlu, 2007; Yalın, 2008).

T-PCK model has recently been a research focus. Findings show improved learning environments and fostered achievement when T-PCK model is used compared to a technology-focused classroom settings (Cavin 2007; Harris et al., 2009; Swan 2006). This suggest that learning with technology is strictly dependent upon the content being taught and the pedagogy being implemented.

In his unpublished doctoral thesis, Selim (2009) studied TPCK model on mathematics teacher education program. The results showed a significant correlation among three components of TPCK: Technology, pedagogy and content knowledge.

Purpose of this study is to further investigate the different teacher education majors to seek connections of content, pedagogy and technological knowledge. Findings will show whether programs offer an enriched environment for prospective teachers to be competent in content, able to make appropriate decisions of pedagogy, and capable of selecting technology to create meaningful learning environments.

METHOD

Method of this study is correlational in nature. Basic purpose is to find to what extent these three variables (technology, pedagogy and content knowledge) are associated with the latent variable (Gay, 1992). We intended to seek inter-correlations among TPACK model variables. As we discussed earlier, content knowledge, pedagogical knowledge and technological knowledge should be connected from the results of the instrument for a teacher education program designed for TPACK model.

Sample

Data collection included a sample of 184 senior students from mathematics, science, social studies and elementary education majors and Turkish Language programs. The sample consisted of 96 female (52%) and 88 male (48%) participants.

Table 1. Gender distribution of sample

Gender	N	%
Female	96	52
Male	88	48
Total	184	100

Students' majors are mainly from elementary majors (N=85, 46%). Table 2 shows the frequencies and percentages of students' majors.

Table 2. Students' distribution of different teacher education programs

Education Majors	N	%
Mathematics	25	14
Science	29	16
Elementary	85	46
Social Studies	31	16
Turkish Language	14	8
Total	184	100

Instruments

An instrument originally developed by Schmidt, Evrim, Thompson, Koehler, Mishra, and Shin (2009) was adapted to collect data. To sustain validity, the instrument is translated into Turkish and the statements are semantically analyzed by a team of researchers using the literature definitions of the main constructs of TPCK model. Then the items changed to maintain their meanings in Turkish teacher education context. The overall reliability of the instrument revealed as .94. An exploratory factor analysis then carried out to seek significant subscales including the main constructs of TPCK model. Eight factors were extracted by principal component analysis with varimax rotation. Reliability scores of subconstructs are displayed in Table 3.

Data Analysis

A bivariate pearson correlation analysis is implemented to analyze data. Bivariate correlation shows how a variable changes interdependently with another. The analysis revealed a matrix of bivariate correlation coefficients of pairs of variables. The coefficients changes from 0 to 1, the latter showing exact dependency. The closer the coefficient to one, the bigger the relationship would be between two variables.

Table 3. Reliabilities of TPCK instrument sub-constructs.

Factor	# of Items	Chronbach α
Pedagogical Knowledge (PK)	7	0,93
Technological Knowledge (TK)	7	0,83
Mathematical Content Knowledge (MK)	7	0,90
Social and Language Studies Content Knowledge (SLSK)	14	0,88
Science Content Knowledge (SK)	7	0,89
Technological Pedagogical Knowledge (TPK)	9	0,90
Technological Pedagogical Content Knowledge (TPCK)	7	0,83

FINDINGS

As a result, we found significant correlations some of which pointing at weak to moderate levels of dependencies. Main components of TPCK model revealed low correlation in this sample, while overall measures of TPCK variables (TPCK and TPK; TPK and PK) are moderately correlated.

Table 4. Correlation coefficients matrix for TPCK and its sub-constructs

	PK	SLSK	SK	TPK	MK	TPCK	TK
PK	1,000						
SLSK	,412**	1,000					
SK	,288**	,080	1,000				
TPK	,724**	,448**	,417**	1,000			
MK	,425**	,207**	,636**	,504**	1,000		
TPCK	,266**	,255**	,430**	,477**	,404**	1,000	
TK	,277**	,399**	,392**	,501**	,397**	,492**	1,000

** correlations significant at .001 level

Table 4 shows the correlation coefficient matrix where the significant Pearson correlations are flagged with double asterisk showing p<.001. The constructs here are extracted from the exploratory principal component analysis and we tested the overall analysis my Kaiser-Meyer Olkin sampling adequacy, and Bartlett's test of sphericity. KMO value is acceptable when greater than .6, and in our case KMO is found to be .849 which implies the analysis is satisfactory particularly with this sample set. Bartlett's test turned out to be significant (Chi sq. 6911.68, p<0.001) showing the correlation matrix is not an identity matrix, and the results are tenable.

DISCUSSION

The results show significant relationships among the sub-constructs as well as the main factors of TPCK model. Moderate to high correlation between TPCK measure and TPK indicates that the students' knowledge of technology, pedagogy and content combined is moderately linked to their knowledge of using technology in educational settings. In other words, senior students point out they have the ability to make reasonable decisions of using technology for instructional purposes. TPCK model holds the assertion that having independent pieces of information about technology, pedagogy and content does not necessarily result in teachers' acceptable instructional choices. This complies with our results.

Another significant finding is that the TPK variable is found to be moderately related to PK. According to TPCK model, pedagogical knowledge itself is less useful when it is not connected to technology and content. In this finding, we can infer that the students think they can pick the technologies in various educational settings where different student needs require certain learning approaches.

This study by and large shows that our teacher education model corresponds to TPCK model moderate to weak degree. The insignificant or low correlations such as the relationships of content with technology and content with pedagogy indicates the need for better prepared students for connecting the content with appropriate technology and the pedagogy. This study also needs to be carried out with a larger sample and more detailed statistical analysis techniques which account for the error terms and intra-class correlations.

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ANADOLU ÜNİVERSİTESİ BİLİŞİM TEKNOLOJİLERİ ÖĞRENCİLERİNİN İNTERNET METAFORLARININ BELİRLENMESİ

DETERMİNATION OF ANADOLU UNIVERSITY INFORMATION TECHNOLOGY STUDENTS' INTERNET METAPHORES

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Özet: İnternet'te kullanıcı sayısının her geçen gün katlanarak artmasına paralel olarak dünya çapında enformasyon dolaşımının gerçekleştiği İnternet daha da karmaşık bir yapıya dönüşmektedir. İnsanlar benzer durumlarda olduğu gibi bu karmaşık yapının doğasını ve potansiyeline ilişkin düşüncelerini vurgulamak için genelde metaforlardan yararlanırlar. Bu çalışmanın amacı Bilişim Teknolojileri öğrencilerinin kullandıkları İnternet metaforlarını belirlemektir. Bu amaç doğrultusunda araştırmacılar tarafından geliştirilen bir anket formu 2009-2010 öğretim yılında Anadolu Üniversitesi Eğitim Fakültesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü'nden 113 öğrenciye uygulanmıştır. Araştırmadan elde edilen bulgulara göre Bilişim Teknolojileri öğrencilerinin yaygın İnternet metaforlarıyla birlikte kendi İnternet metaforlarını da kullandıkları görülmüştür.
Anahtar Kelimeler: İnternet, metafor, İnternet metaforları, Bilişim Teknolojileri öğrencileri

Abstract: In parallel to the exponentially growing number of users Internet has become an even more complex structure by large circulation of information. As in similar situations people use metaphors to emphasize their idea about the nature and potential of this complex structure. The main purpose of this study was to identify Internet metaphors of Information Technology students. For this purpose a questionnaire developed by researchers and applied to 113 Information Technology students in the 2009-2010 academic years at Anadolu University, Education Faculty, Department of Computer Education and Instructional Technology. According to the findings from the research, Information Technology students also used their own Internet metaphors with the common Internet metaphors.
Keywords: Internet, metaphor, Internet metaphors, Information Technology students

GİRİŞ

İnternet, günümüzde toplum hizmetine sunulan bilişim teknolojileri uygulamalarının merkezinde yer almaktadır. Hemen her türlü toplumsal yapılanma ve guruplar İnternet üzerinden faaliyet göstermeye başlamışlardır. Benzer bir durum eğitim-öğretim alanında da yaşanmaktadır. Eğitim amaçlı bilgi kaynakları İnternet üzerinden hedef kitlelere ulaşılmakta ve bu uygulamaların sayısı her geçen gün çeşitlenerek artmaktadır. Böylece İnternet günümüz eğitim-öğretim hizmetlerinin vazgeçilmez bir aracı haline gelmiştir.

İnternet kullanıcıları İnternet'i farklı biçimlerde algılar ve bu ortamı tavsif etmek için farklı metaforlar kullanırlar. Günümüzde İnternet'in farklı özelliklerini ön plana çıkaran çok sayıda metafor kullanılmaktadır. Bu metaforları uzay, otoyol, su, sınır, politik, pazar, canlılık ve oyun/eğlence olmak üzere 8 başlık (metafor ailesi) altında toplamak mümkündür.

Dünya çapında enformasyon dolaşımının gerçekleştiği İnternet oldukça karmaşık bir yapıya sahiptir. İnsanlar İnternet'in doğasını ve potansiyeline ilişkin düşüncelerini vurgulamak için genelde metaforlardan yararlanırlar (Johnston, 2009). Bunun nedeni ise metaforların, akıl yürütme yoluyla uzun bir sürede yapılacak karşılaştırmaları, çalışan belleğe sistemle ilgili ilk karşılaştırmayı yükleyerek sistemin anlaşılmasındaki başarıyı ve doyumu kolaylaştırabilmeleridir (Carroll ve Ihomas, 1982). Diğer bir ifadeyle karmaşık bir yapıya sahip bir şeyi anlamak için iyi bildiğimiz bir şeyi kullanarak açıklayabiliriz. Bu nedenle İnternet'te ilişkin oluşturulan metaforlar İnternet'in yapısının nasıl anlaşıldığına dair bize önemli fikirler verebilir. Çünkü metaforlar sadece açıklayıcı değil, aynı zamanda onu oluşturan kişinin tasarım tarzı ve bilişsel yapıları şekillendirmesine ilişkin önemli ipuçları sağlarlar (Wyatt, 2008).

Eğitim amaçlı İnternet kullanımında İnternet'in hangi amaçla nasıl kullanılabileceği kişinin İnternet algılarıyla doğrudan ilgilidir. Kişilerin bir konuya ilişkin algıları ve onu anlamlandırma durumları, konuya ilişkin oluşturdukları metaforlarla anlaşılabilir, somutlaştırılabilir. Ross'a (1992) göre bir şeyi tasvir etme biçimimiz veya yolumuz o şeyi algılama biçimimizi, algılama biçimimiz ise o şeyi kullanma biçimimizi etkiler. Bu nedenle meslekleri gereği İnternet'i eğitim amaçlı yoğun olarak kullanması beklenen Bilişim Teknolojileri öğrencilerinin İnternet'e ilişkin kullandıkları metaforların büyük önem taşıdığı düşünülmektedir.

Bu çalışmanın amacı 2009-2010 öğretim yılında Anadolu Üniversitesi Eğitim Fakültesi Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) Bölümü öğrencilerinin kullandıkları İnternet metaforlarını belirlemektir. Bu amaç doğrultusunda araştırmada cevabı aranacak sorular şunlardır:

1. BÖTE öğrencilerinin kullandıkları yaygın İnternet metaforları nelerdir?
2. BÖTE öğrencilerinin kullandıkları kendi İnternet metaforları nelerdir?

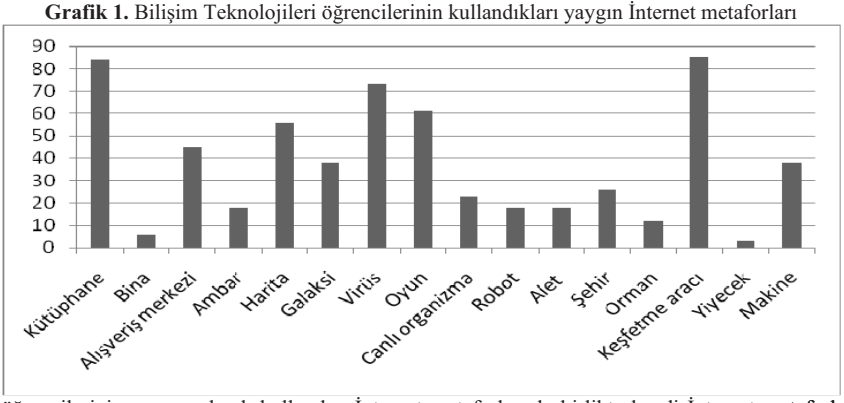
YÖNTEM

Bilişim teknolojileri öğrencilerinin kullandıkları İnternet metaforlarının belirlenmeye çalışıldığı bu betimsel araştırmanın katılımcılarını 2009-2010 öğretim yılında Anadolu Üniversitesi Eğitim Fakültesi Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) Bölümü'nün 2, 3 ve 4. sınıfında okuyan 113 öğrenci oluşturmaktadır. Araştırmada veri toplama aracı olarak araştırmacılar tarafından geliştirilen bir anket formundan yararlanılmıştır. Anket formunda Bilişim teknolojileri öğrencilerinin yaygın olarak kullanılan İnternet metaforlarıyla birlikte kendi oluşturduklar İnternet metaforları da sorgulanmıştır. Verilerin analizinde SPSS 17.0 programından yararlanılmıştır.

BULGULAR

Bilişim Teknolojileri öğrencilerinin kullandıkları İnternet metaforlarını belirlemek amacıyla öğrencilerin öncelikle yaygın olarak kullanılan İnternet metaforlarının hangilerini ne sıklıkta kullandıkları belirlenmeye çalışılmıştır. Araştırmadan elde edilen verilere göre Bilişim Teknolojileri öğrencileri yaygın İnternet metaforlarından en fazla ağ (83,04), keşfetme aracı (%75.89), kütüphane (%75), virüs (%65.18) ve oyun (%54.46) metaforlarından yararlandıkları elde edilmiştir. Bununla birlikte bilişim Teknolojileri öğrencilerinin % 81.4'dünün aynı zamanda kendi İnternet metaforlarını oluşturdukları görülmüştür. Bilişim Teknolojileri öğrencilerinin kullandıkları yaygın İnternet metaforları ve katılma sıklıkları aşağıda Grafik 1'de verilmiştir.

Grafik 1. Bilişim Teknolojileri öğrencilerinin kullandıkları yaygın İnternet metaforları



Bilişim Teknolojileri öğrencilerinin yaygın olarak kullanılan İnternet metaforlarıyla birlikte kendi İnternet metaforlarını da oluşturdukları görülmüştür. Bu metaforlardan en sık vurgulananlarından bazıları bilgi denizi, bilgi dünyası, bilgi deposu, bilgi havuzu, çöplük, evren ve arkadaştır. Burada öğrencilerin özellikle bilgi havuzu, bilgi denizi bilgi dünyası gibi İnternet'in bilgi paylaşımı rolüne dikkat çeken metaforlar oluşturmaları dikkat çekicidir. Ayrıca oluşturulan bu metaforları neden oluşturduklarını açıklarken öğrencilerin İnternet'teki bilgi trafiğine ve boyutuna vurgu yaptıkları görülmüştür. Bunun sebebi alanları gereği Bilişim Teknolojileri öğrencilerinin İnternet'i daha çok bilgi üretimi, erişimi ve paylaşımı amacıyla kullanmaları olabilir.

TARTIŞMA VE SONUÇ

Bilişim Teknolojileri öğrencilerinin kullandıkları yaygın İnternet metaforlarına bakıldığında Ağ metaforunun açık alan metafor ailesine ait olup İnternet'in paylaşım gücüne vurgu yapmak amacıyla kullanıldığı, Keşfetme aracının sınır metafor ailesine ait olup İnternet'in yeni ve güncel bilgileri keşfetmeye açık bir alan olma özelliğine vurgu yapmak amacıyla kullanıldığı, kütüphane metaforunun ise kapalı alan metafor ailesine ait olup İnternet'in bilgi paylaşımı boyutuna vurgu yapmak amacıyla kullanıldığı görülmektedir. Bu nedenle Bilişim Teknolojileri öğrencilerinin İnternet'in özelikle bilgi erişim ve paylaşım özelliklerine odaklandıkları söylenebilir. Benzer bir durum Bilişim Teknolojileri öğrencilerinin oluşturdukları kendi İnternet metaforlarında da görülmüştür. Öğrencilerin bilgi havuzu, bilgi denizi, bilgi dünyası gibi İnternet'in bilgi erişim ve paylaşım boyutuna dikkat çeken metaforlar kullandıkları görülmüştür.

Konuyla ilgili ileride gerçekleştirilecek çalışmalarda daha fazla katılımcıyla Bilişim Teknolojileri öğrencilerinin kullandıkları İnternet metaforlarının; sınıf, cinsiyet, günde ortalama internet kullanım süresi, internet kullanım yılları ve İnternet kullanımındaki yeterlilik düzeyleri gibi çeşitli bağımsız değişkenlere göre incelenebileceği düşünülmektedir.

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ANALYSIS OF UNIVERSITY LEVEL STUDENTS' EXPERIENCES ABOUT THE GROUP WORK ACTIVITIES FOR EFFECTIVE LEARNING

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Abstract
Group assignments or group activities suppose learners to perform activities sharing common goals. No doubt learning of each individual is an individual process but group activities help learners to learn by helping each other. This article discuss students experiences about group learning activities and explains that group work enhances students' learning experiences, promotes attitude to be responsible to perform their duties, help learners to learn problem solving skill , develop positive behaviors , collection of learning materials and promote decision making skill. This study also depicted that group activities are applied almost in all subject areas. Students are satisfied about the evaluation procedures of teachers but complained that teachers do not explain the nature of work they demand in group activities. The study suggested applying group activities in all subjects and while proposing learning tasks to students in groups, divides tasks and clear nature of tasks to students by teacher.

INTRODUCTION

Teaching is process of sharing and transferring skill of teacher to students. It is process to impart knowledge. Teacher, learner, content, environment and teaching learning skills are main components of teaching learning process. No doubt, all components of teaching learning process are important but teaching method is considered basic component for effective teaching. On the basis of review of literature available on teaching skills, observation of teaching learning situations and self experiences, teaching situations are divided in two main classes: group teaching and individualized teaching. Individualized teaching supposes to teach each student individually keeping in view needs of students. Individualized teaching learning skill is based on the assumption that every time people learn something independently and that they reinvent themselves. Group teaching means to teach a group of students at same time by applying same technique. Group work in teaching is a technique that means to work on a project/ activity for learning sharing same goals. In group activities, students work in groups to achieve common goals and contribute in individual accountable ways.

Group method is activity oriented technique of teaching and learning. Group work method is based on the fact that students are given different pre-planned and pre constructed tasks where learners are proposed to perform tasks by their own efforts. (Miller , 2003)

Group activities in learning process have their own value. It is effective for all abilities groups in different ways. Most of times, the teacher employs group activity based method towards the bright learner groups. (Allen, 2003). Group method of teaching provides challenges to the bright learner. This method helps the average student have better intake of the work done in the regular class

Group activity based method also helps to lot of slow learners. They become motivated to work with fellow members and through group discussion tasks learning process become easy for them (kim & Kellough ,1995). This kind of teaching learning skill is important in many ways. It is not only helpful to develop interaction among students but also develop team spirit qualities like as cooperation, trust, risk taking, empathy, listening, sharing, and to respect others. Group teaching is actually a form of interactive teaching and cooperative learning that are related to modern concepts in the field of teaching and learning skills. But due to problems related to group work, most of time teachers avoid to apply this technique. Some times, they debate learning individually is excellent and on other times they argue teaching in proposing group activities is much difficult for teachers to supervise and evaluate.

This study was planned to evaluate students' views about group activities in teaching learning process. It was based on assumption that students of university level can judge the value of group work activities in teaching learning process.

OBJECTIVES OF STUDY

This study focused on following objectives

- Evaluate the value of group work technique of teaching for effective learning.
- Evaluate current practices for applying group work technique at university level
- Suggest some measures for betterment of application of group work technique in teaching learning process

METHODOLOGY

This study was a survey type case study. A convenient sample of 350 university level students was chosen from the Islamia University of Bahawalpur, Pakistan but only 288 answered. Others did not return the questionnaire A self developed questionnaire was used as tool to collect data for study. Data was analyzed on SPSS to compute percentages of responses and means of scores to conclude results.

FINDINGS

- Majority of students (89%) expressed their liking to work in groups
- Majority of students ((82%) had experiences to work in groups at university level.

Gender wise analysis of students' views about the importance of group work

Gender	N	Mean of Scores
Female	180	27
Male	108	31
Total	288	29

- In opinion of males, group work is more beneficial (mean =31) as compared to in opinion of female (Mean= 27).

Department wise detail of students' opinion about the importance of group work in effective learning

Department	N	%	Mean Score
Statistics	12	4	34
Chemistry	10	4	33
Social Work	8	3	33
Physics	11	4	32
Education	24	7	32
Physical Education	21	7	32
Engineering	12	4	31
Bio Technology	16	6	30
Commerce	23	8	30
English	14	5	30
Geography	20	7	29
Educational Training	20	7	29
It	16	6	29
Psychology	23	8	28
Economics	6	2	28
Economics	6	2	28
Fine Arts	14	5	26
Agriculture	15	5	25
Urdu	8	3	25
Mathematics	15	5	24
Mean			**29**

Overall mean score of students' opinions about importance of group work was higher than mean score of total group (29) of students of social work, Statistics, Chemistry, Physics, Education, Physical Education, Biotechnology, English, and Engineering departments. It ranged from 34 to 30 and mean score of students of IT, Economics, Fine Arts, Urdu, Psychology, Mathematics and Agriculture was lower than mean score it ranged among 28 to 24.

Nature of discipline wise analysis of students' responses about the importance of group work activities

Nature of Discipline	Department	N	% of N	Mean Score
Pure Sciences	Mathematics, Geography, Bio Technology, Physics, Chemistry, Statistics	84	30	**30.33**
Social Sciences	Psychology, Educational Training, Education, Physical Education, Social Work	96	32	30.8
Professional Degrees	Information Technology (IT), Agriculture, Engineering, Commerce	66	23	**28.75**
Arts &Humanities	English, Urdu, Fine Arts, Economics	42	15	**27.25**
Average mean	**29**			

Nature of discipline wise analysis explained that students; of pure sciences and social sciences related subjects feel group work learning activities more important (means= 30.33 & 30.8) as compared to those who belong to professional degrees and arts and humanities related degrees (means+ 28.75 & 27.25)

Details of students' opinion about reasons to prefer group work learning activities

Statement	Percentage of responses of agreed	Percentage of responses of disagreed
Data collection for course materials become easy for students by Working in groups	89	11
Group work enhances students' learning experiences	86	14
Group works give training about problem solving skill among students.	83	17
Group work promote quality of responsibility among students	82	18
Group work develop positive behaviors in students	79	21
Group work is more helpful for seeking decisions making.	78	22
Mean	**82.83333**	**17.16667**

About the reasons to value group work in teaching learning process by admitting benefits of group work activities majority of students

- 89% admitted that group work is helpful to collect courses related learning materials
- 86% admitted that group work enhances students' learning experiences
- 83% admitted that group work train students for problem solving
- 82% admitted that group work promotes quality of responsibility to perform duties.
- 79% admitted that group work help learners to adopt positive behaviors.
- 78% admitted that group work help students to seek decision making

Evaluation of role of teachers in group work activities.

Statements	Yes	No	Undecided
Teachers provide students a chance to select their own group members	78	10	12
Appropriate time duration is given to students by teacher for each activity	72	12	16
Tasks are divided equally among students by teachers	64	17.3	18.7
Teachers evaluate students' work satisfactorily	62	27	11
Groups are formed by teachers	55	34	11
Tasks are cleared to students by teachers.	8	82	10
Average Mean	**57**	**30**	**13**

Comparison of mean scores indicated related to role of teachers in group work, in view of majority of students (57%), teachers play positive role related to different matters of group work activities. Moreover it explains majority of students

- 78% agreed that teachers provide students chances to select their own group members by self choice.
- 72% agreed that appropriate time duration is given to students by teacher for accomplishment of each activity.
- 64% agreed that tasks are divided equally among students by teachers for group activities.
- 62% agreed that teachers evaluate students' work satisfactorily
- 55% agreed that groups for group activities are formed by teachers.
- 82% agreed that tasks are not cleared to students by teachers.

DISCUSSION

Teaching is interesting but not easy task. Most of educationists of today recommend interactive teaching styles, activities based teaching skills, and discourage one way communication styles, and teacher centered teaching methods and adoption of any styles that can make learner possible to play passive role during learning process. A reason behind this philosophy is a view that cooperative learning procedures are easy, effective and interesting for students. Moreover, learning by self efforts provides chances of active learning to students. No doubt, group work tasks given to students are a form of interactive learning, cooperative learning and a source of effective learning. Thomas (1991) also views; Group work provides more chances for learning because of their psychology to get influence by others. Group work inspires them to be motivated to solve their problems by competing others by self effort. In case of difficult tasks they get help of others and do given tasks too. It is helpful for development of positive behavior.

A result of this study depicts adoption of this style (group activity based teaching) by teachers at university level in Pakistan. It is helpful for understanding practical value of the technique in view of educationists. Results indicate, an interesting dimension of view of science students who always keep in mind application of formulas /scientific rules and regulations while studding and doing practical work in field but give more importance to group activities as compared to students of arts who generally look more friendly and social in general observations. It shows that people working in science laboratories perhaps have more belief on human relation development and social life too. It is their practical experience that they can make their lives easy, productive and more joyful by working in social groups and by promoting cooperation among human beings.

Role of teacher while applying the group activity based teaching evaluated by teacher has depicted an important observation that teachers are not evaluating students properly that's why only 62% has showed their confidence about the satisfactory evaluation by teachers. Reasons behind this can be biased opinion of students for teachers, over work load of university level teachers, weak competency of teachers about the evaluation skills or just carelessness by teachers. So, teachers must be serious conscious about the students' evaluation matters.

A result that many (82% app.) don't clear tasks proposed by teachers to students is also appealing in sense that it needs serious attention of evaluators and teachers. Reasons behind this majority of teacher's attitude can be the reason that teachers want to apply purely learner centered based teaching skills. They have a vision that university level students must do more and more self efforts. Moreover they might be in favor to asses students' abilities in depth. But students always want favors and easy tasks. So, it can be a good opinion to clear tasks to students but give some targets by skillfully developed tricky tasks to students.

CONCLUSIONS

- University level students like to work in groups. Male feel it more important as compared to female.
- Group work activities for teaching learning purposes are proposed to students at university level
- Students feel Group work beneficial for effective learning because it is helpful for collection of learning materials easily, enhances students' learning experiences, train them for problem solving skill, make them responsible, develop positive behaviors, develop decision making skill.
- Most of teachers play positive role while proposing group work activities based teaching to students. like as mostly teachers form groups by self but they keep in mind students' choices to select their own liked group members, give appropriate time duration to students for accomplishment of given activities, give equal tasks to students for group based activities and evaluate students' work satisfactorily. But they don't clear proposed nature of tasks to students.

RECOMMENDATIONS

- Group work tasks must be offered to students in each course by all departments.
- While proposing tasks to students in groups, tasks must be divided and cleared to students by teacher.
- All teachers must keep in mind the individual characteristics of students while proposing nature of tasks.

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APPLICATION OF SENSOR NETWORK TECHNOLOGY ON INDUSTRIAL TECHNOLOGY EDUCATION

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Abstract
Technology of e-learning has been gradually applied to all kinds of professional teaching fields. However, practicing and operation in real environment cannot be replaced by the method of e-learning such as multimedia and interactive simulations. The present e-learning system has very limited benefit for course of experiment and practical training, especially for the course which requires to experiment in clean room (ex. MEMS). Thus, the quality and quantity of industrial technology education cannot be improved. The reasons are listed below: 1.Traditional skill-training environment is an open space, students'mistakes are easy been found out during practicing. Thus, it is more effective for instructor to do on-the-spot correction. Oppositely, instructor is not easy to find out the problems which students face and help them right away if they are practicing in clean room of the factory. 2. Instructor is hardly to record students' learning process of experiment and practical training, and then loses a lot of opportunities to analyzing leaning situation and improving teaching method. 3. Traditional technique can enhance teaching effectiveness by increasing equipment/place and teaching time in an appropriate way. However, for the course of experiment and practical training which require expensive teaching equipment（ex. MEMS）and strict teaching environment（ex. clean room）, it is not easy to expand equipment/place or extend teaching time. 5. It is wasting a lot of time and materials for students to practice during repeated mistakes.
In order to overcome obstacles of traditional experiment and practical training course and enhance functions of present e-learning system, the study is going to take sensor network technology as foundation to developed web services system. The system is able to present the students 'operation and results right away, thus students can be guided appropriately when they face problems during experiment and practical training. Besides, the system is able to record students' learning process of experiment and practical training. These data of learning process will be helpful for building adaptive u-learning environment for skill-training.

INTRODUCTION

With recent advances in micro-electro-mechanical systems (MEMS) and wireless communication technologies, wireless sensor networks have come out from laboratories and will be used everywhere to change our future lives. Wireless sensor networks are more attractive and useful than traditional wired sensing systems because of their ad-hoc and easy deployment. This new technology expands our sensing capabilities by connecting the physical world to the communication networks and enables a broad range of applications (Akyildiz, Su, Sankarasubramaniam, and Cayirci, 2002). Sensor networks are the integration of sensor techniques, distributed computation, and wireless communication techniques. The network can be embedded in our physical environment and used for sensing, collecting data, processing information of monitored objects, and transferring the processed information to users. The architecture of the sensor node's hardware consists of five components, i.e., sensing hardware, processor, memory, power supply, and transceiver (Tubaishat, Madria, 2003). For many applications, a sensor network operates in three phases. In the first phase, sensors take measurements that form a snapshot of the signal field at a particular time. The measurements are stored locally. The second phase is information retrieval in which data are collected from individual sensors. The last phase is information processing in which data from sensors are processed centrally with a specific performance metric (Dong, Tong, and Sadler 2007). Such a network is composed of many tiny low-power nodes, each consisting of actuators, sensing devices, a wireless transceiver, and possibly a mobilize (2002). These sensor nodes are massively deployed in a region of interest to gather and process environmental information.
The higher capital cost of acquiring MEMS's equipment within each university presents a considerable financial challenge. Much time and cost are used to teach these techniques. Particularly, computerized machines are continuously increasing in use. The development of educating engineers on computerized machines becomes much more difficult than with traditional machines. This is because of the limitation of the extremely expensive cost of teaching. The quality and quantity of teaching cannot always be promoted in this respect. The traditional teaching methods cannot respond well to the needs of the future. Most of technology education relies on "cookbook"-oriented experiments that provide students with a technical question, the procedure to address the question, the expected results of the experiment, and even an interpretation of those results. By contrast, self-directed learning is to encourage students to learn inductively with the help of teaching systems. This method gives students more freedom to come up with a question to investigate, devise an experimental procedure, and decide how to interpret the results. Long pointed out that there are at least six kinds of cognitive skills appear to be particularly important in successful self-directed learning. They are as follows: goal setting skills, processing skills, other cognitive skills, some competence or aptitude in the topic or a closely related area, decision making skills, and self-awareness. Effective, or successful, self-directed learning depends on information gathering, information monitor students' processing and other cognitive activities, and in the way they react to information. The evolution of computer and Internet technologies has made it easy to access learning contents from almost anywhere, anytime, and at user pace. Self-directed e-learning focuses on the independent learner, one who engages in education at his own pace, free from curricular obligation. A number of tools, some purposefully and others serendipitously, have become key enablers of this learning paradigm. For example, tools such a Google Scholar, CiteSeer Research Index, etc. make it possible to do literature search without stepping out of one's room (Desikan, DeLong, Beemanapalli, Bose, and Srivastava). The advance in the optical-fiber network makes real-time transmission of a large amount of data, such as three-dimensional models or video images, possible between remote places. In particular, by connecting virtual environments through the broadband network (Paquette, Ricciardi-Rigault, Paquin, Liegeois, Bleicher, 1996), a three-dimensional virtual world can be shared between remote places. The field oú virtual reality (VR) initially focused on immersive viewing via expensive equipment, is rapidly expanding and includes a growing variety of systems for interacting with 3D computer models in real-time (Sung & Ou, 2003). Various applications in fields including education, training, entertainment, medicine and industry have been developing, and more and more areas will gain benefits from using VR (Craig, Sherman, 2003). In the past few years, a number of interactive VR systems have been developed. An educational virtual environment (Bouras, Philopoulos, Tsiatsos, 2001) is a special case of a VR system where the emphasis is more on education and collaboration than on simulation.

DEVELOPMENT OF SENSOR NETWORK ENVIRONMENT

The new technology of wireless sensor network expands sensing capabilities by connecting the physical world to the communication networks. In order to support self-directed learning in MEMS technology, many sensor devices need to be deployed in the laboratory to collect real-time information of students' motion and machine operation conditions. The Zigbee modules were used to build a wireless sensor network in this research. The proposed architecture of the sensor network system is shown in Figure 1. The overall system architecture

consists of a Web camera, a Zigbee dongle (base node), a server, and wireless sensor nodes. The wireless sensor nodes consist of two key parts, referred to as the static and the mobile nodes. The static sensor nodes are scattered in the laboratory and they form a multi-hop mesh networking topology. A key role of the static node is to transfer all the data packets coming from the mobile node back to the dongle. The other key role of the static node is to provide a sufficient number of anchor points for the localization. Each of these sensor nodes has the capability of collecting data and routing data peer-to-peer to the Zigbee dongle. The Zigbee dongle is used to bridge the sensor network to Internet. It provides a serial interface and a wireless connection for node programming and data transfer. The server is connected to the Internet to enable remote users to access the laboratory monitoring system. The mobile node, comprising an accelerometer worn by students, is for monitoring student motion and position in an indoor environment.

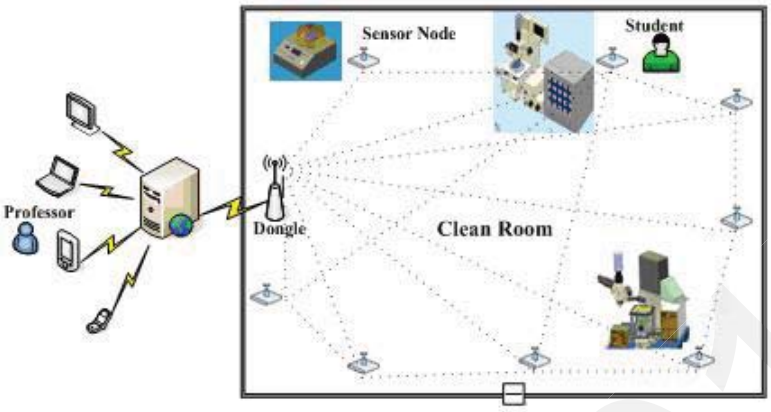

Figure 1. Architecture of the wireless sensor network system

nfDuring the process of experiment and practice, student needs to rotate hands by hands while operating machines, and adjust machining parameters. Also, there are some machines require students to touch pedals by feet and adjust machining parameters. Therefore, the study intends to incorporate ultra-thin force sensing unit (0.127mm) into a Zigbee node, make flexible force sensors, and then install handles and pedals, as shown in Figure 2.

"Are students able to use tools correctly?" is the necessary subject needs to be trained during experiment and practice. Therefore, the study plans to connect Zigbee node with PIR325 infrared sensing unit to make wireless infrared sensor (Figure 3), and then install it in the tool box.

Besides, the study connects Zigbee node with three-axis micro electro-mechanical system (MEMS)-based accelerometer to make wireless accelerometer. An accelerometer is a device measuring proper acceleration. It is available to detect magnitude and direction of the acceleration as a vector quantity. The sensor is worn on student; it can not only detect and record student's position inside the laboratory but also know their movement.

Figure 2. A flexible wireless force sensor

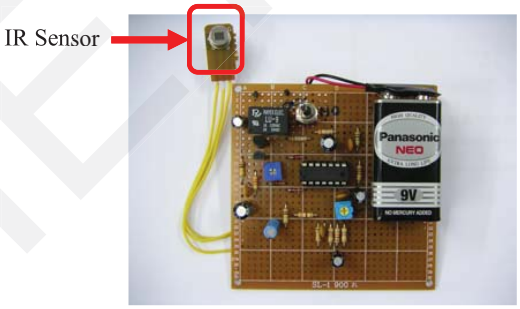

Figure 3. An IR wireless sensor

A graphical user interface (GUI) was designed for remote users to carry out the desired operations such as sending commands and parameters to drive the sensor nodes and visualizing the measurement results. The thesis use ASP.NET and Microsoft Visual C# to write an internet program in order to achieve the goal of quick and convenient information process. Figure 4 shows the Web GUI when a user is monitoring the laboratory environment at the remote client side. A remote user is able to adjust the view angle of camera to get required video data by click on the mouse.

This interface accepts remote client side to get information about which node he/she wants to monitor by clicking on the buttons and checkboxes on the panels. After that, click the sensor which has been installed on the node, and observe sensors' signal. The data of selected sensors are collected and sent to the Web GUI at fixed time intervals. Figure 5, the top-left corner is the information measured by force sensor, as time's changing, down-left corner shows force sensor's instant information. On the other hand, the top-right corner is the information measured by IR sensor, as time's changing, down-left corner shows student's current position in laboratory.

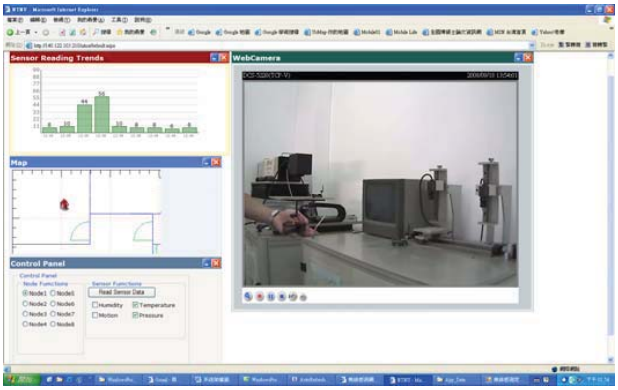

Figure 4. GUI of the wireless sensor network system at the remote client side

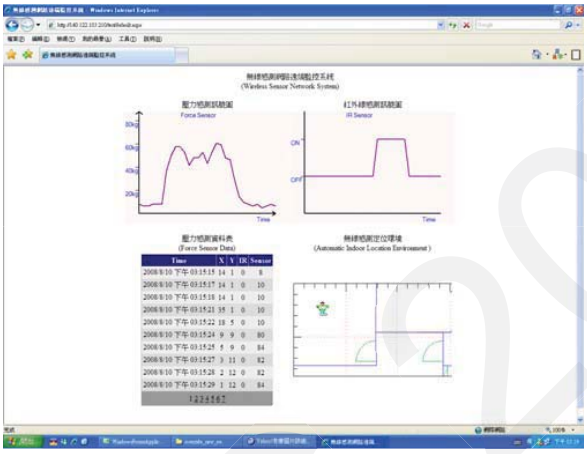

Figure 5. Real time monitoring of force and IR sensors at the remote client side

Practical training is the important teaching strategy to improve students' industrial technology competence. The study uses sensor network technology to develop ubiquitous learning and teaching web services environment for industrial technology education. The developed system was applied to the course of MENS manufacturing. According to related data, teacher shows high satisfaction to this system. Comparing to manufacturing course in previous years, average time of practical training of each student has been shortened a lot, and the usage of material has been lowered as well. This indicates that even practicing in clean room of factory, teacher can aware problems faced by students during the process of practice through the system developed by this research. Thus, teacher can appropriately guide students to avoid repeated mistakes.

Comparing with manufacturing course of other class, students of experimental group are doing much better on MEMS industrial technology. One of the main reasons is that because the system records students' learning process of experiment and practice, it enables teachers to analyze situation of students' practical training and give appropriate guide. This shows, for industrial technology education, the web services environment developed based on sensor network technology can achieve the goal of adaptive teaching and learning.

ACKNOWLEDGMENT

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ASSESSING THE EFFECTIVENESS OF ONLINE EDUCATION FROM THE STUDENTS' PERSPECTIVE. A STUDY OF VIRTUAL UNIVERSITY (VU) OF PAKISTAN.

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Abstract
In this paper we investigate students' perceptions about the effectiveness of their online education. The sample consisted of 180 participants of VU of Pakistan. By using correlation matrix and regression analysis, it was found that the following areas are important for students about the effectiveness of online education; Instructor competence, Course structure, and Technology. The results of our research showed that faculty at VU (virtual university) are delivering online education that meet the students' needs in regard to course structure and instructor competence. Results also indicate that students think that course structure and instructor competence are more important for the effectiveness of online education than technology.
Key words: Instructor Competence, Online education, Course structure, Effectiveness

Introduction

Online education is increasingly becoming common in higher education for supporting traditional education as well as emerging as an opportunity for delivering entire education online. In online education multimedia materials are used to support learning and the ability to adapt the course content to meet a wider range of learner interests and abilities. The Online education holds great promise for improving education (Johnson, 2004). The use of Web technology for the education purpose has changed the face of education. The WWW (World Wide Web) has become a valuable educational means and offer new educational experience for students which were not earlier possible (Sher, 2008). Henry (2001) defines E-learning as "*the appropriate application of the internet to support the delivery of learning, skills and knowledge in a holistic approach not limited to any particular courses, technologies, or infrastructures. It considers e-learning core products of content, technology, and services*".

In recent years Online education has gained more popularity and the trend is expected to continue. The Sloan Center for Online Education reported more than 3.1 million students of U.S. enrolled in at least one credited online course in fall 2005. The Sloan Center also reported that these enrollments increasing at an annual rate of approximately 35 percent a year. According to these figures, NASULGC's 215 member institutions currently enrolled approximately 3.6 million students in total (Sloan Consortium, 2007).

According to Zapalska & Brozik (2006) through online education, now it is possible to get an online degree conveniently and in a suitable way. Online education also helps students to achieve their career objectives according to their expectation, which may be not possible in traditional education. Due to different set of the social order, online education attracts people differently. The reason for the attraction includes differing level of age, gender, income, education, location, and market size & employment status. Online education will also share some of the burden of traditional classrooms. As the colleges and universities has been experiencing as the size of the student body increases rapidly (Whittaker, 2007). Stewart (2004) argued that online education is also contributing its vital role in order to accomplish social responsibility. Because social realization demands that education be made available for all people like physical handicaps with out the constraints of geographic, cultural, financial, and for gender divisions.

Online education plays a significant role in Pakistan, as in Pakistan a university drop-out rate in face-to-face Higher Education is very high. Especially because of outreach to the remote areas, rural population, and the cultural problems faced by the women in face-to-face education (Bhatti & Arif, 2006). Therefore VU (virtual university) of Pakistan opened its virtual doors in 2002 for the students. The VU, from Pakistan was first University which completely based on modern information and communication technologies launched by the Government of Pakistan as a public sector university. It has a clear mission; to provide tremendously affordable world class education to aspiring students across the country. The VU use free-to-air satellite television broadcasts and Internet, which allows its students to follow its thorough programs apart from of their physical locations. As the VU holds federal charter, therefore its degree is accepted and recognized in the country as well as out of the country.

The VU started in 2002 and in a short period of time it has more than a hundred associated institutions covered over sixty cities of the country, providing infrastructure support to the students. Pakistani students residing abroad are also enrolled in the University's programs. This article focuses on key issues affecting the effectiveness of online education, and ought to find students' perception about the effectiveness of their online education.

Literature Review

Effectiveness of Online Education

Institutions with good image and having better structure for delivering courses online provided better outcomes. In addition, online environment provided great opportunities of interactions for instructors and students to interact each others. This will increased the possibility of achieving expected goals and objectives (Bore, 2008). Marks (2005) argued that three types of interactions are more important for the quality of online education than others which are interaction between student to student, instructor to student and student to its course content.

According to Banerjee & Brinckerhoff (2002), for getting the good results from the online education the technology must be available to all students, well-known hardware and software must be used, and students and faculty must have the required skills and expertise required to perform in a virtual environment. The way of teaching and the better online access to students from teachers have increased the effectiveness of online education. Due to the availability of broadband technology and electronic books the attractiveness of online education has increased.

Along with the cost effectiveness, online education has more flexibility, convenience, easily accessibility, wide reach and consistency in used (Gunasekaran et al. 2002).
Online education requires the consideration of a number of factors. These are commitments from the administration and the faculty, the quality of lecture delivery, significant amount of time to develop the right course structure, communication among students and between students and the instructor, and the different role of the faculty members (Peltier et al. 2007). Richardson (2009) reported that there were no significant differences were found between the students of online and face-to-face education in term of course quality and delivery method, throughout the whole academic period. In order to make students successful in an online education instructor should be devoted, motivated and must be equipped with enough computer knowledge (Killion, 2000).

Level of Technology
Since the online teaching and learning atmosphere spread out and matures, innovative and advanced ways of interactions are substituting the face-to-face education. New communication alternatives have been developed. These advanced communication systems and web-based conferencing has provide an opportunity to students and teachers a convenient way of learning (Mcneil, Robin & Miller, 2000). Zaidel (2007) added that as the use of information technology become well-known in education. Modernized way of communication came in to being, which change the preference of students from face-to-face to online education. Now students feel that up to date technology will improve their learning.
The Internet has become commonly available in universities almost all over the world. And it's offering new ways of communication, collaboration and delivery methods to students and teachers. However internet has to be used seriously and practically towards the achievement of goals (Ngor, 2001). The speed of the internet and its connectivity increased and improved day by day. Communication between students and teachers regarding class interactions, courses, projects, assignments and events will soon be so simple like, now talk on a wireless phone (Lee, 2005). Now-a-days the students can get benefits from the latest technology in many ways. They can access and use the course material repeatedly. Students can use this course material conveniently due to its availability of online (Turney et al. 2009).
In online education students by using an internet connection can collect instructions, compose and put forward assignments, and raise questions to the instructor and fellow students at any time and at any place (Sher, 2008). Additionally, internet is a major technological advancement which has changed our society and also our universities worldwide. So universities have to take benefit from this technology for the online delivery methods. Better used of technology is a critical success factors in online education (Volery & Lord, 2000).
Dorrian & Wache (2008) argued that in online education most up-to-date technology is becoming commonly used according to the different needs of the student's and their satisfaction. But some students have very little know-how about the latest technology. Therefore technical support is important for student's to understand and better use of the technology. Granitz & Greene (2003) reported that mostly the dissatisfaction of the students occurred due to a lack of teacher training, technology problems, student inexperience with online education, and a failure in communication with faculty and others students. In this study level of technology is as an independent variable. Level of technology includes convenient and up-to-date technology, which VU are using at this time.
H1: Level of technology plays an important role in the effectiveness of online education.

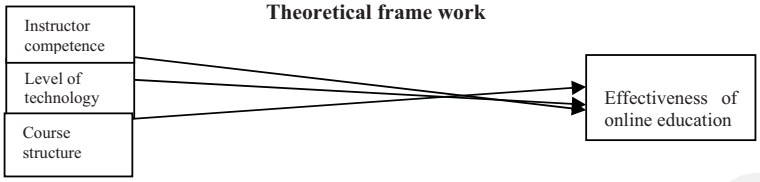
Instructor Competence
Cragg et al. (2008) argued that in online education instructors are less active as compared to face-to-face education. Mostly the interaction takes place among the students than with instructor. Therefore it would noted, that online students relied more on the course readings and each other than the instructor to fulfill their course learning objectives. According to Muirhead (2000) instructors in online education have experienced more workloads as compared to traditional education. These workloads include creating online courses, providing technical help to students, and constantly improving their knowledge and skills about technology.
It is found that for the student satisfaction in online education both quality and quantity of interaction of a student with his instructor, and class fellows play a vital role. So there is a need to plan well structured instructional activities during the whole semester i.e. assigned the projects or assignments to students individually and in the groups (Yukselturk & Yildirim (2008). In online education it is very difficult for instructor to access the performance of students individually. Instructor must consider the different types of students to develop the evaluation criteria, assignments and projects (Banerjee & Brinckerhoff, 2002). For this purpose the instructor as a facilitator must monitor the whole communication process and provide effective feedback, persuade group learning, mediate properly in online discussions and encourage students to participate fully in the whole process (Conaway et al. 2005).
For students succeed in the online education, teachers need to understand how students learn, how they perceive and how they process information. Students can have different learning styles. Instructor must be understand and identified the different learning styles of the online students. Because this will help the instructor to plan proper teaching strategies to accommodate the differing level of students needs (Zapalska & Brozik, 2006). Swan (2002) argued that for the success of online education three factors are more important than others. These are a consistent course design, quality and timely interaction between student and instructor, and an effective and useful discussion during the semester. In this study the researchers also takes the instructor competence as an independent variable. It includes timely and quality interaction, feedback, and instructor productiveness.
H2: The more the instructor is competent the more will be the effectiveness of online education.

Course Structure
Just like the traditional education, in online education the quality of course delivery is also important. Course structure, course content, and amount of interaction between the students and faculty members are the key component of effective course structure. In ordered to develop the effective course structure enough time is needed (Peltier et al. 2007). Young & Norgard (2006) reported that mostly the students preferred consistent course design during the whole semester so that they can easily find the direction of courses. They also added that poorly designed courses during the semester will lead to student's frustration. This frustration with inconsistent course design may convert into a poor learning outcome for students. According to Drago et al. (2005) management should develop a course in which students will involve more, interaction with faculty and other student's increases and hire the instructor that have the appropriate teaching style for online course delivery. This will finally lead to the effective online education program.
The online students hold expectations similar to traditional students with reference to course outcomes and delivery method of the course. These expectations are that the instructor will be educated, well-prepared, organized, and to provide clear and concise explanations to answer questions. Therefore instructor should treat the students on the equal basis and made unbiased evaluation on time (LaBay & Comm, 2003). Malley (1999) argued that online education has significant advantages as compared to traditional education. These advantages include saving time, convenient schedule, and taking more courses at a time. But there are many additional activities are required for the delivery of courses online. These activities are class management, summarizing content, observing and evaluation of student's performance, clarification of course, and finally the continuity of course (Conceição, 2006).

Instructor and designers should be able to understand and comprehend the unique learning environment of online education. So that courses should be delivered successfully in order to meet the student's expectations (Sahin, 2007). In order for the successful accomplishment of quality measurement and for improvement of online educational environment, need the same management commitment as traditional teaching and learning (Zhao, 2003). And finally researchers take the course structure also an independent variable. It includes online course design, course interaction, and course content.

H3: The more the quality of course structure is the more will be the effectiveness of online education.

Theoretical frame work



Methodology

Subject

Survey was conducted at VU of Pakistan. The reason for selecting the VU was, that it is the only university in Pakistan which offering hundred percent online education. For this purpose two campuses of VU, Wah and Islamabad were selected. Undergraduate and graduate students of these campuses were invited to take part in this survey in the spring of 2009. The sample consisted of 180 participants of VU of Pakistan and the total response rate was 81.7 percent. Table I provides a summary of the respondents' demographics

Table I. Respondents' demographic profile	**Frequency**	**%**
Gender		
Male	69	46.9
Female	78	53.1
Age		
Under 25	113	76.8
25–30 years	22	15.0
Above 30	12	8.2
Student's type		
Part time	63	42.9
Full time	84	57.1
Academic program		
Graduate	32	21.8
Master	115	78.2

Procedure

Questionnaire was self administered. Firstly it was decided to collect data through online i.e. to get e-mails of the students from the faculty of these two campuses, whose were teaching online in the spring 2009 semester. But at that time exams of the student's were held. The researchers felt if we e-mail this survey to students. It may be possible that due to the exams students were less concerned about this survey. Therefore researchers personally visited these two campuses of Wah and Islamabad and collected data.

Measure/Instrument

For measuring the effectiveness of the online education, researchers used some items of Moore & Benbasat (1991) cited by Malley & McCraw (1999). While for measuring the Instructor competencies Arbaugh (2000) has developed items cited by Susan Y & McGorry (2003). For measuring the effect of technology on the effectiveness of online education, researchers used the TAM (Technology Acceptance Model). This model has been used previously by Davis et al. (1989) cited by Susan Y & McGorry (2003). Some items of this model were used, which were more relevant to our study. While survey Monkey developed items were used for measuring the quality of course structure. These items have been developed by Young & Norgard, (2006) by using Survey Monkey (http://www.survey.monkey.com).

A questionnaire was developed. It has two parts. First part contained demographic information and the second part contained the variables and their items. In order to measure, the scale was adopted. The scale contains 22 items. Each was a measured on five-point Likert scale with response options ranging from strongly agree to strongly disagree.

Data analysis

Reliability analysis

Each variable was assessed for reliability using coefficient α. Summary of the reliability of the scale was achieved during the study is used to measure the dependent and independent variables, presented in Table II.

Table II. Reliability analysis	**No. of Items**	**Cronbach Alpha**
Course structure	9	0.804
Effectiveness	4	0.643
Instructor competence	4	0.705
Technology	5	0.597

Results

The correlation matrix (Table III) indicates that course structure is positively and significantly correlated with effectiveness of online education (0.377(**), **.p<.001). Correlation analysis establishes that instructor competence have significant relationship with effectiveness of online education (0.394(**), **.p<.000). There is no significant relationship between the technology and effectiveness of online education (0.159), p>.159)

Table III. Effectiveness of Online Education

Course structure	Pearson Correlation	.377**
	Sig. (2-tailed)	.001
	N	147
Instructor competence	Pearson Correlation	.394**
	Sig. (2-tailed)	.000
	N	147
Technology	Pearson Correlation	.161
	Sig. (2-tailed)	.159
	N	147

Note: **. Correlation is significant at the 0.01 level (2-tailed).

Table IV presents the regression coefficient of independent variables on dependent variable i.e. effectiveness of online education. Out of these three independent variables Course structure and Instructor competence had a significant effect on the effectiveness of online education while technology had no significant effect on the effectiveness of online education.

Table IV: Regression analysis	Beta	t-value	P-value
Constant		2.441	.017
Course structure	.523	3.963	.000
Instructor competence	.435	3.933	.000
Technology	-.402	-2.793	.007

n = 147 ; R Square = .304; Adjusted R Square = 0.276;
F = 10.770; Significance F = 0.00;
Dependent variable = Effectiveness of online education

Discussion

The purpose of current study was to examine relationship between the Course structures, Instructor competence and technology with the effectiveness of online education among students of VU in Pakistan. As per hypothesis, course structure emerged as a determinant of effectiveness of online education. Course structure was consisted into three parts i.e. course design, course interaction, and online course content. The results of the survey indicated that majority of the students at these two campuses of VU preferred consistent course design across courses to support ease of navigation. It was reported that when courses were poorly designed then students became irritated with their courses. Students were also asked regarding assignments, lecture material, and evaluation criteria in their online courses. And most of the students agreed that lecture material was valuable in their online courses and that evaluation criteria were satisfactory. In the section of online course interaction it was found that quality of discussions in their courses were high.

As per the second hypothesis instructor competence also emerge as a determinant of effectiveness of online education. The majority of students agreed that interaction between students and instructors is necessary for the effectiveness of online education. Especially timely interaction is an important element of an instructor competence in online education. Along this instructor should be able to understand the diversity of the students and make accurate assessment of assignments, projects and exams. It was also reported that students felt themselves isolated and uncertain, when instructors did not respond in a timely manner instead of their great efforts.

In the last hypothesis of this study, it is found that there is a relationship between technology and the effectiveness of online education, but not significant. Students think that course structure and instructor competence is more important for the effectiveness of online education than technology. As VU is using the modern information and communication technologies and provided basic training of using technologies to their students. Therefore mostly students of VU have basic know-how about the used of latest technology like WWW, digital, electronic instruments and devices. Students also have facility to interact with electronic resources such as multimedia, audio and video resources, simulations and presentations. Now in Pakistan internet is available almost all of the big cities and universities. So that's why students think that course structure and instructor competence is more valuable to them than technology, for the effectiveness of online education

Recommendations

As in an online education there is no need to takes notes physically due to the availability of materials in electronic format. Therefore students suggested that VU design its online courses which should be brief, well defined, precise and concise in nature so that students can easily understand it. Secondly there is a need of this; VU increase the numbers of its campuses to those remote areas of Pakistan which are still inaccessible. Since students of these areas also have the desire to get education but because of these reasons; financial, geographical, social issues for female they cannot get it. And particularly VU may play its vital role for the increase of literacy rate in Pakistan. In addition, VU may enhance the portfolio of its offered courses so that more segments of the students will get benefit from it.

Limitations and future research direction

There are certain limitations of this study. The small sample size may not completely represent the majority of student's of VU. Additionally, two campuses of the VU of Pakistan i.e. Islamabad and Wah were selected. This may not reflect the results of the whole VU campuses. For the future research point of view, one can compare the educational system of VU with AIOU (Allama Iqbal Open University), in Pakistan. Furthermore, the effectiveness of online education for the Pakistani students can be measured on the basis of gender, income, geographical area and occupation.

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ATTITUDES AND COMPETENCES IN ICT AT THE UNIVERSITY CASES: MEXICO, UNIVERSIDAD AUTÓNOMA DE CHIHUAHUA, UNIVERSIDAD VERACRUZANA AND SPAIN, UNIVERSIDAD DE SALAMANCA.

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Abstract
Postmodernity is signed by earth´s unification through information and communication technologies (ICT). Through ICT virtual spaces are created, in those humans generate knowledge, interact and relate in ways that before were unimaginable; therefore the need to study ways in which competence in the use of ICT are acquired, as well as the scenarios in educative environments, attitudes and responses given by diverse social actors who enter in contact with new modalities in academic formation at the university.
The purpose of this study that incorporates a research in different universities is to analyze the way in which those processes are done in university´s sphere at Salamanca, in Spain, as well as the University Autónoma of Chihuahua and Veracruzana in Mexico. For this purpose this paper begins with theoretical foundation as a common frame to interpret the outcome of the study, results in terms of attitudes, competence and innovation in relation to ICT.
Key words: Attitudes, competence, and Information and Communication Technologies, ICT competence

Introduction

Technologic revolution has signed the last decade of the XX century and the first one in the XXI century, has generated new paradigms[1] in all sectors, without doubt, the use of technology has and still is creating new forms in which educative practice is done, in that sense Tezanos (apud Escudero 2004) comments that educative technology has evolved in a meaningful way in recent years, its advance is a clear reflection of the meaning that communication and information technology has acquired in the past century, as a matter of fact, it can be called the third great transformation generated, until now, by humanity, after the agriculture and industrial ones.
A turn in the course of history has been made in the ways of production, living and knowledge acquisition for human kind, it can be said that a model or a technological pattern, a new way of doing things, therefore the construction of a new paradigm accepted by global society.
González (apud Arras y Valencia, 2008) considers that this revolution has promoted a new society marked by global changes, innovational technologies and information, influencing economy, politics, competitive aspects, work market, education strategies, new forms of recreation and interaction between people, etcetera. All this implies that technology and paradigm change are not given in a void, by themselves, according to Cabero (2004), they are given in the womb of society, in a specific social context, in which ICT become a media that molds learning construction and compel redesign of organizational structures and create variants in education´s valuation, as well as the responsibility of the teacher in guiding the student in acquiring technological competences, which implies that the teacher possesses the needed technological competences.
In that sense the effort of UNESCO (2008), in setting up norms of competences in ICT for teachers, is understandable, and was given at the conference Moving Young Minds, and set three approaches to improve the quality of education, reduce poverty and inequity, advance the standards of living, and prepare a country's citizens for the challenges of the 21st century.

- Increasing the technological uptake of the workforce by incorporating technology skills in the curriculum—or the technology literacy approach.
- Increasing the ability of the workforce to use knowledge to add value to economic output by applying it to solve complex, real-world problems—or the knowledge deepening approach.
- Increasing the ability of the workforce to innovate and produce new knowledge and of citizens to benefit from this new knowledge—or the knowledge creation approach.

Therefore, the competencies that are to be developed in respect to ICT are equivalent to a technological alphabetization, because they are connected not only with educative development, but with the social and productive one, and will also be factor that will make the difference in the insertion in society, in the language of the world´s interchange, and will generate the development of communities.
This approach implies the development of competencies in ICT that emerge as paradigms in education, in that sense it is said that a competent person is one who does very well what is expected, as Ibarra (apud Estévez et al, 2003; p. 5) expresses, a competence is a "…group of abilities, knowledge and attitudes that are needed to optimal performing in an occupation, or a productive function." When relating this concept to the use of ICT, it can be said that they are a group of abilities, knowledge and attitudes applied to the use of information and communication systems, including the equipment that the activity implies, and in according with the ICT Skills, (apud. Godoy, 2006), to the capability of making Web designs, presentations, data bases, programs to elaborate graphics, calculus pages, data bases, Web, e mail, Chat applications and text processors.
Such competencies are to be attained, in some way in the formal environment of education, therefore one must refer the concept of educative technology that is conceived by Ramírez (1999; p. 425) as a "model of organization integrated by persons meanings and conceptualizations through the use of diverse technological media (TV, multimedia, printed documents and computing nets as well as teleconferences) that facilitate the cooperative elaboration, implantation and evaluation of environments and educative open and flexible programs that fulfill the needs of the existing dynamics to the interior of the community and of an emerging global society." All this require a positive attitude from all social actors involved in this process, this means aspects as thoughts and meaning, by perceiving the value of technology use, etcetera. This according to García-Valcárcel (2009, 55) represents a challenge because university teaching has to deal with teachers proposals that

[1] Paradigm from Kuhn´s perspective (2006, pp. 88-104), is a model or an accepted pattern that reaches its position because it succeeds in solving problems that the scientific group considers urgent.

allow to improve information access and knowledge, as well as the development of collaborative actions and critical understanding of the advantage of telematic nets, because their use facilitates interdisciplinary collaboration, as well as professional development of interuniversity's work group.

According to this development education, with the use of technologies, according to Arras and Valencia (2008), has made a turn incorporating a new paradigm in its processes, paradigm that goes hand with hand with postmodernity characterized by electronic unification of the earth and, with it, of a virtual space in which ubiquity can be given because of the potential of technology and the processes they generate. All this brings a danger to fall in an existential void and acquisition of light knowledge -that goes with the lack of depth with which this times are signed- and that represents a challenge to overcome for those who search that through an educative processes a profound knowledge can be attained in order for humans to have a formative process for a lifetime, recognizing themselves as subjects capable of doing and creating each moment with the consciousness of a commitment with themselves, the other, the society, and the works, and at the same time to have and allow equity of opportunities with independence of gender, circumstance or environment.

Methodology

To make this research, of an empirical nature and of mix character –qualitative and quantitative-, the method analytical and synthetic were used, as well as the theory-deductive. This research is of an applied form, its type is descriptive and the mode is bibliographic and field research.

A questionnaire and interviews were used as techniques to attain information, as well as bibliographic tools.

Objective

The general objective that guided this study was: To analyze the attitudes and competences in ICT in university students.

Universe

Students from the University of Salamanca, Veracruzana University and University Autonoma of Chihuahua. To select the sample the class which professor was using ICT as a significative mean in teaching were subjects to the study. In accordance to researcher's availability, 20 is the number of teachers and groups to be the sample of this research in each university. 1710 are the students, distributed in the three universities, which integrate the sample, as is shown in table 1.

Table 1. Distribution of data by university (student´s sample)

	Frecuencia	Porcentaje
Chihuahua	699	40.9
Salamanca	495	28.9
Veracruz	516	30.2
Total	1710	100,0

Basic characteristics of identification for the global sample are:

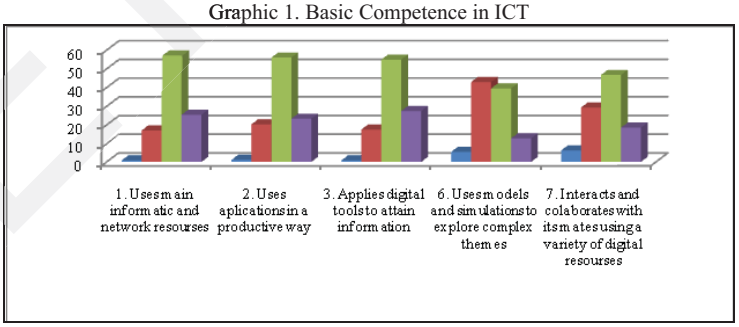
- 59,4% are females y 40,6% are males
- 97,1% is in a physical presence model of education; the rest semi-presence.
- The highest percentage (81,3%) of classes that participate in the project are developed in a base number of students between 20 y 50; in 13,5% of the classes, registered students are less than 20; in 5,3% the number of students in class are over 50.

Data from innovational experiences in ICT use in teaching-learning processes was gathered from 59 classes from the three universities.

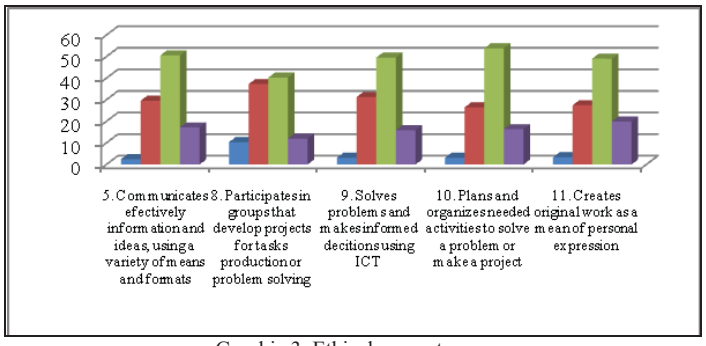
Results

As levels of ICT competence in students, in this research a classification was done taking in consideration the basic, profounding and ethical ICT competences. Information referring each item in the questionnaire is presented in a graphic, with the other items with which they form a dimension. The students' responses were as follow, taking in consideration that blue represents the answers with value one, which means nothing, red represents a value for two which means a little, three is for enough and four for much.

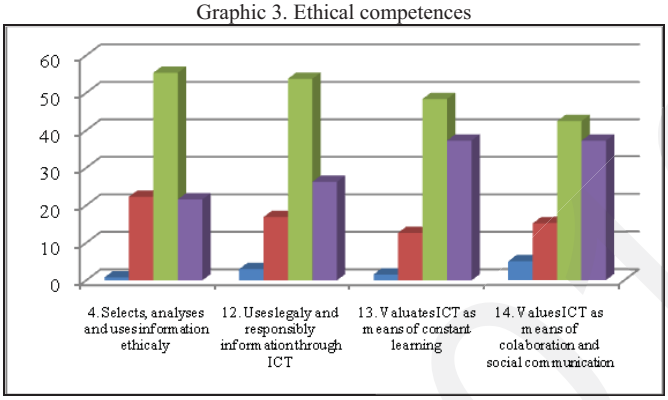
Graphic 1. Basic Competence in ICT



Graphic 2. Application and profound competences



Graphic 3. Ethical competences



As one can see, most of the percentages of the different items from the questionnaire in levels of competence in ICT, are gathered in the categories of 4 and 5, which clearly indicates that in general, students value in a positive way their own competences in relation to ICT domain, especially those related with teaching and learning processes (use of informatics resources and net work, getting information through digital tools…) and those related to attitudes (value they give to ICT as a mean of learning and collaborating, legal and responsible use of information…).
The competence domains in which students' recognize a greater level of capability are:

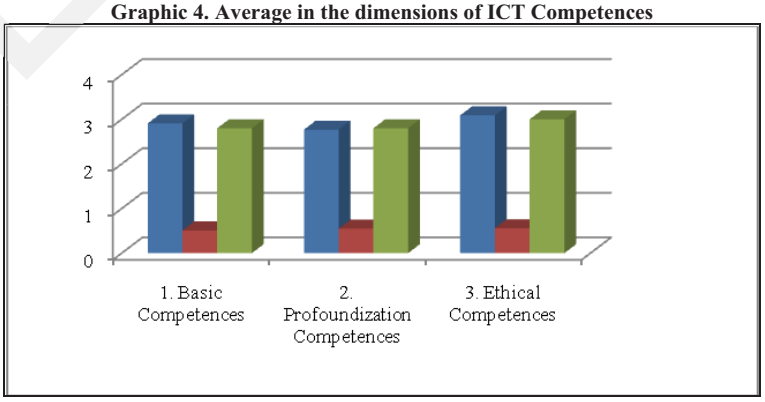
- Values ICT as an instrument of continuous learning.
- Values ICT as a mean of collaboration and social communication.
- Applies digital tools to get information.
- Uses the main informatics network resources.
- Makes a legal and responsible use of information through ICT.

The competence domain worst valuated (with medias less than 2.7), that could be recognized as weak points are:

- The use of models and simulations to explore complex themes.
- Group participation in Project development to produce tasks or solve problems.

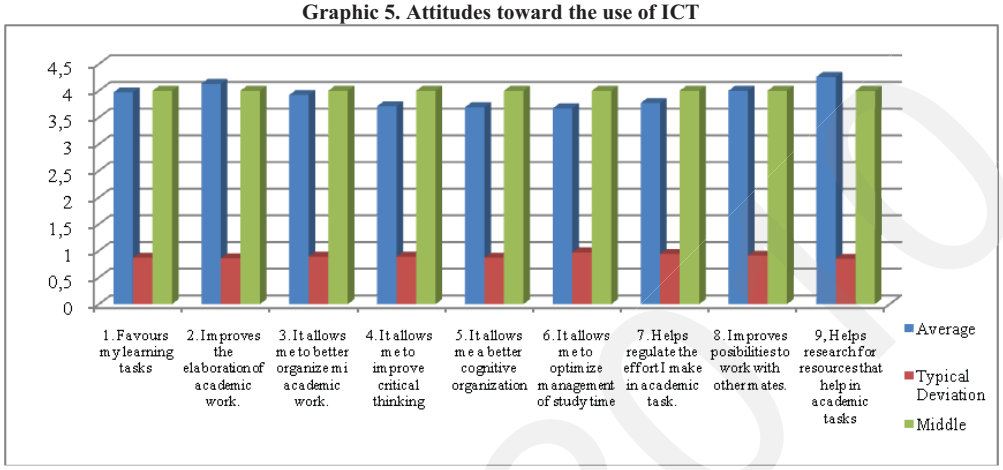
The rest of the competence domains present values between 2.7 and 3, which can be considered as satisfactory from the point of view of the grading criteria, and the normative one, because the average of the level of the competences is situated in 2.92, with a typical deviation of 0.46, which determines that 68% of students that answered the questionnaire would be situated with values between 2.46 and 3.38, which indicates levels of competence that can be considered adequate. It is important to remember that it is a self valuation of their levels of competence. This fact demands our thinking of forming students in ICT in the process of teaching-learning, especially in competences of problem solving, group work, project development, use of models and simulation to explore complex themes, and communication through ICT.

Graphic 4. Average in the dimensions of ICT Competences



In graphic four, it some descriptive data are presented, such as media, typical deviation and median, from each one of the dimensions considered in the analysis of competence levels. The level of domain in competences called basic, reaches a media value of 2.9 on a scale of 4, this result cannot be considered high, and none reaches over 3.5. Therefore we want to pinpoint the fact that ICT incorporation in teaching practice at the university cannot disregard the previous task of students' formation in ICT use, specially, of course, when the tools that are required increase in complexity. The levels of higher competency, according to students, are the ethical items.

Graphic 5. Attitudes toward the use of ICT



This result derives from a scale of 1 to 5, ("I totally agree") and the media value for all items is over 3.7, and the highest value is given to item 9: "ICT help research for resources in academic tasks." This is what students considered the highest contribution of ICT for their learning activities.

Next positive valuations of ICT are produced when the highest percentages of answer correspond to category 4 ("I agree") and are referred to the following learning strategies:

- ICT Favor my learning tasks
- ICT help improve elaboration of academic work
- ICT allow me to better organize my work
- ICT help regulate effort in academic tasks.
- ICT Improve possibilities to work with other mates

It could be said that students value positively what ICT are giving them as a support in those learning strategies that without technologies would cost a lot in regard to effort and time consumed, such as search for documents and academic tasks presentation.

The strategies they valuated less positive were:

- ICT allow me to develop critical thinking
- ICT allow me to optimize time management
- ICT allow me to a better cognitive organization

Conclusions

This research started with the purpose of analyzing the attitudes and competences in ICT in university students, and in regard to attitudes it can be seen that it shows a positive tendency of students as a collective unit, with a global value of 3.6 in a scale from 1 to 5, which means that they consider relevant the use of ICT in their learning and trust themselves in their abilities and competences to interact in ICT environments.

The study also shows great areas of opportunity to university teachers in regard to focus their teaching activities in the areas of critical thinking, model simulation, project development and problem solving, because students consider this as weak areas, and technologies by themselves cannot improve learning if students are not capable of constructing knowledge, so teachers must design activities with which, through the use of ICT, students are able to travel in the world of profound learning with the motivation and commitment needed to improve this world.

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ATTITUDES OF REGULAR AND SPECIAL NEEDS TEACHERS TOWARD COMPUTERS AND INFORMATION AND COMMUNICATION TECHNOLOGY

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Abstract
Computers and related technologies provide important means of instruction for regular students and students with special needs. Integrating computers and technologies in schools has lagged their development and use. The future use of computers and technologies in schools largely depends upon teachers' knowledge and skills and their attitudes toward implementing computers and ICT into the curriculum. This exploratory study investiaged attitudes held by regular and special needs teachers in Cyprus toward using computers and ICT. Regular teachers made greater use of computers and technolgies than special needs teachers. Overall, teachers reported they used computers daily to access the Internet for using electronic mail, Facebook, and online chats, but computers and technologies did not play any substantive role in their classrooms for instruction. No teacher in either group reported using these tools in school: films or videos, the Internet, audiocassette players, or Microsoft PowerPoint. Yet regular and special needs teachers generally regarded computers and technologies positively. To integrate computers and technologies within schools requires that teachers understand their potential to help students. Teachers need instruction in using computers and related technologies. Teacher preparation programs must include computers and ICT as essential components in teacher education.
Key words: teachers, attitudes, computers, technology, special education

INTRODUCTION

The development and use of computers and related information and communication technology (ICT) technology have become ubiquitous in modern societies. The United Nations Educational Scientific and Cultural Organization ([UNESCO], Anderson & Van Weert, 2002) has worked toward ensuring that students in all nations gain access to the most effective means to prepare students to thrive in the 21st century. In describing the use of ICT in schools, UNESCO identified four stages of implementation into the curriculum: (a) discovering ICT tools, (b) learning how to use them, (c) understanding how and when to use ICT tools to achieve particular goals, and (d) specializing in their use (p. 17). The first two stages identify the use of ICT in regular classrooms in schools in Cyprus.
Computers play a key role in education (Bureau of Labor Statistics, 2009; Moeini & Uzun, 2009). For example, teachers' use computers to access the Internet to retrieve information, introduce students to a wide scope of new content, and provide a basis for independent study and research. The use of computers and ICT in classrooms provides potential educational advantages for active engagement (Gross, Szekrenyes, & Tuduce, 2003), motivation (Kremenska, 2007), interactive learning (Bureau of Labor Statistics, 2009), and improved student achievement (Means, Toyama, Murphy, Bakia, & Jones, 2009).

TEACHERS' ATTITUDES TOWARD USING COMPUTERS

Since the 1980s, numerous researchers have recognized the need to identify teachers' attitudes toward the use of computers in the classroom (Cavas, Cavas, Karaoglan, & Kisla, 2009; Loyd & Loyd, 1985; Stevens, 1980; Woodrow, 1991). Hardy (1998), Long and Steffey (1991), and Willis, Thompson, and Sadera (1999) found that teachers often expressed positive attitudes toward using computers in schools, particularly for accessing information on the World Wide Web. Computers have also been used for teaching students with special needs (Moeini & Uzun, 2009; Peak, McPherson, Barrio, Knezek, Ellison, & Christensen, 2009; Yamamoto, 2008; Yusuf & Fakomogbon, 2008) and integrating technology for special needs students (Cook & Pittman, 2003). Despite teachers' support for using computers in schools, many teachers have not integrated computers and technology or used these tools to supplement instruction (Bauer & Kenton, 2005; Dumoulin & Bourdeau, 2000; Yusuf & Fakomogbon, 2008). Billions of dollars have been spent to equip classrooms in the United States with computers, but no substantive evidence has yet been presented that student performance has increased significantly among children or adolescents as a result of using computers or ICT (Peak, et al.). Bennett (2002) questioned whether schools would ever implement the potential for learning that computers and ICT offer. He argued that more effective education would result only if citizens, educators, parents, and politicians understand how computers could be used in schools effectively and software developers would create useful software: "Until schools can permit a major alteration in the way teaching is carried on, they must necessarıly continue to miss out on the improvment that computer technology can bring" (p. 625).

PROBLEM STATEMENT

Countries throughout the world regard ICT as a core component for learning (Anderson & Van Weert, 2002). In particular, the use of computers is considered as essential to learning as reading, mathematics, and writing. The use of computers and ICT is an important means to secure equal access to education and to equal quality (Moeini & Uzun, 2009). Yet many teachers have not integrated computers and technology or used these tools for instruction (Bauer & Kenton, 2005; Dumoulin & Bourdeau, 2000; Yusuf & Fakomogbon, 2008). The rate and extent of implementation of computers and other aspects of ICT in schools is relared to the attitude of teachers and school officials toward their use. Because it has been assumed that special needs students would benefit from the use of computers and other technologies, their use to instruct students with special needs has increasingly interested educational professionals in Cyprus.

PURPOSE OF THE STUDY

This exploratory study sought to identify the attitudes of a sample of regular and special needs teachers (N = 26) in Cyprus toward the classroom use of computers and ICT. Data in this study were collected during interviews conducted by the researcher.

RESEARCH METHODS

A qualitative research method was used in this study. The researcher asked 16 opened-ended and closed-ended questions during semistructured interviews to collect data to use as the basis for understanding teachers' attitudes toward computers and ICT. The sample, a purposeful sample of 11 regular and 15 special needs teachers, were employed in schools in Cyprus (see Table 1), which displays the age, gender, and years of teaching experience of the sample members. All teachers in the sample were younger than age 36, and the vast majority was age 30 or younger. Nine (82%) of the 11 special needs teachers had taught no more than 2 years. The majority of regular teachers (n = 9, 60%) had taught 3 years or more.

Table 1.*Age, Gender, and Teaching Experience of Sample*

	Special Needs Teachers	%	Regular Teachers	%
Gender	*n*		*n*	
Female	7	64	8	53
Male	4	36	7	47
Total	11	100	15	100
Age				
22-25	5	45	4	27
26-30	5	45	7	47
30-35	1	9	4	27
Total	11	99	15	101
Years of Teaching Experience				
Fewer than 1	4	36	0	0
1-2	5	45	6	40
3-5	1	9	2	13
6-10	1	9	7	47
Total	11	99	15	100

Note: Percentage columns do not always equal 100 because of rounding.

Guided by curriculum experts and the content of items on attitude surveys used in previous studies, an interview form was developed and tested on four teachers. Responses of these teachers were recorded on audiocassette tapes and analyzed to confirm that responses were directly related to the target questions. After revising the form based upon teachers' feedback, the researcher interviewed and collected data during February–November 2009.

The research process in this study consisted of three concurrent processes: data reduction, data display, and conclusions and verification. These processes occurred concurrently during and after data collection (Miles & Huberman, 1994). Data reduction refers to selecting, focusing, simplifying, abstracting and transforming collected data. Data were reduced to make them more readily accessible and understandable (Berg, 2004; Kvale, 1996) and displayed is ways that allowed for drawing conclusions (Berg; Miles & Huberman). The third component, conclusions and verifying outcomes, did not begin until data collection was completed (Miles & Huberman).

Coding Data. During interviews, the recorded responses of participants were encoded in print and numbered. Results were classified as one of four different forms (Yıldırım & Şimşek, 2005). Interviewer notes and audiocassettes were given to a qualitative expert to evaluate. The researcher was not restricted to asking only preselected questions. Respondents were told in advance that the questions posed would be used a guide. Questions were asked for clarification and understanding. Some questions were intended to extend a response or clarify a previous comment, and additional questions were sometimes based on statements heard during earlier interviews. Comments were solicited about topics when respondents did not provide the information the researcher sought. Interviews were conversational and informal. After each interview, the researcher wrote a 1-2 page summary to record information and comments evoked during interviews.

Each recorded interview was transcribed into text. After interviews were completed for a particular school, the converted interviews were read, and thematic elements were used to construct a matrix for respondents' answers to questions and comments. Comments, information, notes, and quotations were grouped according to themes. A code list was created and relevant information served to develop a key list. To accuracy of the information was checking using the accuracy formula suggested by Miles and Huberman (1994), which yielded a score of 94%. (A rating of 70% or more is regarded as accurate.)

Codes were categorized according to themes and organized to determine similarities among responses. Based on themes and codes, participants' answers and comments were encoded as clearly and directly. To determine which notes a particular respondent contributed, footnotes were inserted within quotation marks. Later, these notes were linked to the corresponding respondent. During the final stage, a detailed analysis of the information and data collected were completed and conclusions were formulated.

FINDINGS

Teachers were asked about their use of computers (see Table 2). All teachers in both groups stated they used a computer. Only two teachers stated that they did not have a computer, and only one teacher reported not having an e-mail account. Seven of 11 (64%) regular teachers and 4 (36%) of 11 special needs teachers reported having a Facebook account,

Table 2. *Teachers' Access to Computers*

	Yes	%	No	%
1. Do you use a computer?				
Special Needs Teachers	11	100	0	0
Regular Teachers	15	100	0	0
2. Do you have a computer?				
Special Needs Teachers	9	82	2	18
Regular Teachers	15	100	0	0
3. Do you have an e-mail account?				
Special Needs Teachers	10	91	0	0
Regular Teachers	15	100	0	0
4. Do you use Facebook?				
Special Needs Teachers	7	64	4	36
Regular Teachers	11	73	4	27

All 15 (100%) regular teachers and 7 (64%) of 11 special needs teachers reported using a computer each day. Four special needs teachers reported using a computer 3-4 times each week.

Table 3. *Frequency of Use of Computers*

Frequency	Yes	%
Daily		
Special Needs Teachers	7	64
Regular Teachers	15	100
3-4 times each week		
Special Needs Teachers	4	
Regular Teachers	0	0

Communication, convenience, and self-improvement were the three most frequently mentioned factors for using computers (see Table 4). To acquire information and to participate in an international online community were noted by several regular teachers. Not all teachers,

however, regarded computers positively. During an interview, one teacher said, “Today, the computer is unfortunately a necessary device for improvement.” However, a regular teacher said, “Technology is giving me the opportunity of being part of an international academic world in my field, so it helps me to improve my knowledge by reading research.”

Table 4. *Teachers' Use of Computers and Technology*

What uses do you make of technology and computers?				
Uses	Special Needs Teachers		Regular Teachers	
	n	%	*n*	%
Communication	4	36	6	40
Self-improvement	4	36	6	40
Convenience	3	27	4	27
Access	2	18	2	13
Source	2	18	0	0
Information management	2	18	2	13
Sharing	2	18	0	0
Information	2	18	8	17
Curiosity satisfier	2	18	0	0
Necessity	1	9	2	13
Socialize	0	0	4	27
Research	0	0	4	27
Participate in an international online community	0	0	6	40
Successful			3	40

Books and the Internet were reported by more than half of the teachers in both as sources for following developments in their selected fields (see Table 5). Four regular teachers reported reading academic journals, but no special needs teachers reported this practice. Books were used by teachers in both groups. One teacher stated during an interview, “Of course I use books. They are the most reliable and the most accurate sources.” Regular teachers reported the greater use of the Internet.

Table 5. *Sources for Following Developments in Selected Field*

Which devices, tools, and methods do you use to follow developments in your field?				
Sources	Special Needs Teachers		Regular Teachers	
	n	%	*n*	%
Book	8	73	8	53
Internet	6	55	12	80
Television	3	27	2	18
Attend conferences	2	18	0	0
Consult experts	2	18	0	0
Academic journals	0	0	4	27

All regular teachers reported allotting time for using computers for Internet activities (see Table 6). Special needs teachers ranked the use of computers for chats as their most frequent activity. More than half of special needs teachers and regular teacher allotted time for using Facebook and reviewing research. Regular teachers identified chats and using computers to operate Microsoft Office programs as the most frequent activity. During an interview, a female teacher said, “I find Facebook very useful in terms of socializing. I engage in social life from which I am away all day thanks to it.” An interviewed male teacher said, “There are plenty of harmful websites, and I choose chatting with my friends. It is better than spending time in nonsensical sites.”

Table 6. *Computer Activities*

How do teachers spend time when using computers?				
Activity	Special Needs Teachers		Regular Teachers	
	n	%	*n*	%
Chat	11	100	10	67
Facebook	7	64	12	80
Research	6	55	14	93
Internet	2	18	15	100
Watching video	1	9	0	0
Listening to music	1	9	2	13
Reading newspapers	0	0	4	6
Microsoft Office programs	0	0	15	100

Technology was reported as scarcely used by special needs and by regular teachers (see Table 7). Playing music on a mobile phone was the only use of technology mentioned by more than two of three teachers. Regular teachers did not identify any use of technology. A female teacher said, “The perception levels of the students in my classroom do not necessitate use of technology. If it is necessary, sometimes I use my mobile phone to play music, but that’s all. There is need for more.” Another female teacher said, “Our students do not need technology at all.” More striking were the technologies that teachers did not mention; for example, no teacher in either group identified using film or videos, the Internet, audiocassette players, or Microsoft PowerPoint—commonly used technologies to enhance instruction and to offer options for understanding course content.

Table 7. *Use of Technology in the Classroom*

For what purpose do you use technology in the classroom?					
Activity		Special Needs Teachers		Regular Teachers	
		n	%	*n*	%
Play music on phone	mobile	8	73	0	0
Play music on player	cassette	2	18	0	0
Play		2	18	0	0
None		3	27	0	0

All regular teachers concluded that technology affected children and increases their interests (see Table 8). Special needs teachers differed, 7 (64%) teachers saying that technology does not affect children. Moreover, special needs teachers did not believe that technology helped to motivate children, to increase learning, or to aid remembering remember what they learned. The vast majority of regular teachers credited technology as positively related to motivation, learning, and memory. A male special needs teacher said, “Of course I don’t believe in the necessity to use technology. It does not affect children with disabilities.” One female special needs teacher said, “I tried [using technology] again and again. It is not effective. Useless.”

Table 8

Does the use of technology and computer affect children?				
Effect	Special Needs Teachers		Regular Teachers	
	n	%	*n*	%
Does not affect	7	64	0	0
Affects	3	27	15	100
Increases interest	1	9	15	100

Special needs teachers and regular teachers differed in consulting colleagues for information regarding developments in their fields (see Table 9). About half of special needs teachers reported consulting colleagues, but no regular teacher reported doing so. Teachers in both groups reported using the Internet, but the groups differenced markedly in their use of newspapers and academic journals. The latter two resources were not reported as used by any special needs teachers. The majority of regular teachers stated they read newspapers and academic journals to remain informed about developments in their fields.

Table 9

How do teachers follow developments related to their field?				
Effect	Special Needs Teachers		Regular Teachers	
	n	%	*N*	%
Consult more experienced colleagues	6	55	0	0
Books	4	36	6	40
Internet	3	8	12	80
Newspapers	0	0	10	67
Academic journals	0	0	10	67
Conferences	0	0	4	27

CONCLUSIONS

The use and integration of computers and ICT in schools worldwide continues to increase within regular and special education classrooms (Anderson & Van Weert, 2002; Means, et. al., 2009; Moeini & Uzun, 2009; Yamamoto, 2008). To supplmement educational programs and improve student performance, the use of computers and ICT potentially serve as important means to secure equal access and equal educational quality for special needs students (Moeini & Uzun, 2009). Many teachers, however, have yet to advantage students by integrating computers and technologies in school (Bauer & Kenton, 2005; Dumoulin & Bourdeau, 2000; Yusuf & Fakomogbon, 2008). Teachers' attitudes toward the implementation of computers and ICT play a key role in their use.

This study investiaged the attitude of regular and special needs teachers in Cyprus toward using computers and ICT. All teachers reported using computers, and with one exception, all teachers used electronic mail. All regular teachers reported using computers daily compared with 64% of speical needs teachers. A majority of regular teachers and special needs teachers reported using Facebook and chatting online. The principal reasons reported by teachers from both groups for using computers were communication, convenience, and self-improvement.

Books and the Internet were identified as the most frequent sources of information about their selected fields. Few teachers acknowledged reading academic journals. Participating in online chats was identified by the majority of regular teachers and by all special needs teachers as their most frequent computer activity. The majority of regular teachers stated they read newspapers and academic journals to remain informed about developments in their field.

Among activities related to technology that teachers specified they used in the classroom, playing music on a mobile phone was the most popular activity. Not one teacher in either group reported the use of film or videos, the Internet, audiocassette players, or Microsoft PowerPoint, even though regular teachers believed that technology motivated and positively affected students' performance. The majority of special needs teachers stated that technology did not motivate children or improve academic achievement.

This study was exploratory, so strong conclusions cannot be made about the use of computers and ICT by regular and special needs teachers in Cyprus. Regular and special needs teachers generally regarded computers and technologies positively, a finding reported in previous studies, but their potential for helping students, and particularly for assisting special needs students, has yet to be realized. It is reasonable to conclude that regular teachers and special needs teachers in Cyprus would profit from workshops and professional development programs focused upon the use of computers and ICT in schools. A wealth of information is available online that teachers could use to maintain currency in their selected fields.

All teachers need to understand the potential for learning that computers and ICT offer them and their students. Lacking a personal knowledge about computers and ICT thwarts the teaching and use of computers in schools. Recommendations proposed by Bauer and Kenton (2005) remain timely: (1) that teachers receive ICT instruction; (2) that schools integrate computers and technologies into the curriculum; (3) that schools provide the hardware and software needed to do so; and (4) that the use of computers and ICT becomes an essential component of teacher preparation programs.

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ATTITUDES TOWARD INTERNET USAGE OF TEACHER CANDIDATES

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Abstract
The aim of this study is to investigate the attitude of teacher candidates toward the internet usage. The research was conducted among university students who are teacher candidate in TRNC. The sample for the research consists of 230 university students used by incidental sampling method.
In this study the "Internet Usage Attitude Scale" developed by Tavşancıl and Keser (2002) and the Cronbach's alpha reliability coefficient of 0,96 were used as a means of collecting data.
Considering purposes of the study percentage documentation average, t-test, ANOVA, Pearson moments correlation were figured out in data analysis. The statistical significance level was accepted as 0,05 in the study. The result of this study showed that there is a significant difference toward internet usage attitude to the teacher candidates.
Keywords: Internet usage, attitude, teacher candidate.

INTRODUCTION

Element that makes internet, which has become indispensable technology of human life in rapidly changing world, indispensable is that it provides possibility to reach every kind of information and people whenever you want. Ten years ago there was restricted knowledge what the internet was, however today, with the active usage of it, the internet becomes one of the most important part of human life. The biggest international computer web is called "internet" that connect all computers to each other all over the world and in this way provides communication among people. (Yalın, 2002).
The importance of the internet is understood better by people in this information era. With the development in science and technology, information has become not only an abstract concept but also an important power for who use it and can turn information into technology. With the usage of technology in other words the internet as a means of an education technology tool, classrooms can turn into electronic places in which students attend to the process actively, teachers are guide, and cooperative learning is realized. Internet that is a tool in providing students life long learning, in providing information that students need also provides them to take responsibility in reaching the information (Akkoyunlu and Yılmaz, 2005).
Scott and O'Sullivan claimed that internet is a concept that makes it possible to communicate all people directly without looking at class, gender, race, and nationality, make democratic attendance to life richer, and make society as a virtual community. (Deryakulu and Eşgi, 2001).
Using internet as a tool for life long learning requires using computer knowledge and skills. In this situation it can be said that internet is contemporary innovation and requirement as a source of learning. However, only information and skill are not determining factor. We can encounter with, in addition to information and skill, being in a positive affective features with the object, being interested as important factors.
Teaching can be defined as arranging information and environment in order to realize learning. Not only the place where learning is realized is understood but also it means methods, tools, and materials that can be a guide for learners while transferring the information (Demirel, Seferoğlu and Yağcı, 2002). Using tools in the classroom will create an effective teaching environment. Instead of memorizing information, practical learning will realize. It will take attention of the student and make them involve into the course. Therefore the success of the students will increase. Many studies show that using tools in the classroom have positive effects (Teker, 1990; Altıntaş, 1998; Atılboz, 2001).
Change and development in education field depend on many factors. One of the most important factors is teacher. Accepting innovation and being aware of the developments in education technology are required for teachers in order to realize the change. As stated by Alkan (1998), all specialization areas such as general management, teaching, assessment, etc. can be made more effective by facilitating from education technologies. In this way, teachers can be made to spend much more time to interaction by saving them from standard teaching and service operations. And also student can reach learning facilities that are suitable for their abilities and expectations.
With the usage of the internet in education, traditional teacher and student concept has changed. Now on, the role of the student is not only take the information that is served to them but seeking the information, make it suitable to use it in daily life, and benefit from it. In this way, "life long learning" can be realized more commonly. Thus, most of the society can become life long learning position. With the internet, "place" concept becomes out of the concepts that determine benefiting from the information or not (Karasar, 2003).
In using computer, it has become compulsory for teachers to gain teaching aimed internet usage and to help students to utilize from the web that is structured as world wide by passing large document, animations, experiments and innovations that they utilize on the students. In addition, usage of the internet in education provide environment for individuals to share and discuss information mutually. Moreover it provides environment in which students and teachers who are in different regions to communicate each other and it make them gain making researches and searches skills on this web (Altun ve Altun, 2000).
According Cobun, people learn 83% of what they learn by seeing, 11% by hearing, 3.5% by sniffing, 1.5% by touching and 1% by tasting. (Ergin, 1995; Şahin and Yıldırım, 1999). Supporting learning with many materials that appeal to many sensing organ can make learning easy and long lasting. Benefits of using tools in teaching can be ordered like these: (1) provides multiple learning environment, (2) helps meeting students' personal needs, (3) takes interest, (4) eases remembering, (5) concretizes abstract things, (6) saves time, (7) provides secure observation, (8) provides presenting consistent contents, (9) can be used repeatedly, (10) ease understanding of content by combining it (Yalın, 2000 ; Tan and Erdoğan, 2004). Internet that is a technologic product has various usage areas. They can be ordered like this: teaching, research, social interaction, communication, sharing knowledge etc. Now, internet is used as a teaching material and it is stated that it is more superficial than other teaching materials.
One of the using type of the internet to support classical education environments is creating Course Web pages and publishing them on the internet (Yavuz and Karaman, 2003). In one of their study Callan and Oddie compared web based and paper based materials, they stated that students found web based materials more funny and effective and web based materials are cheaper and easier in terms of management and update although there isn't important difference between them (Yavuz ve Karaman, 2003).
It is an important problem to test the validity and reliability of the internet. Tat is to say that the accuracy validity, usefulness, timeliness, objectivity, accountability of the information that is available on the internet needs to be tested. As a result, we have to accept that internet is indispensable part of our lives with its various usage areas. For this reason, determining teacher candidates' attitude towards internet and their usage purpose of the internet that is a technologic tool was seen important. It is thought that this study will contribute academicians who study on this subject, curriculum constructivists, and trainers in national education.

Purpose of the Research
The aim of this research is to analyze the university students' level of attitude towards e-learning in terms of socio-demographic features.

The Statement of the Problem
The research question was expressed like this: "Do the attitudes of university students towards the internet differentiate according to socio demographic characteristics?"
Answers were sought to sub-questions below suitable for this main problem:

1. Do the attitudes of university students towards the internet differentiate meaningfully according to gender?
2. Do the attitudes of students towards the internet differentiate meaningfully according to having personal computer?
3. Do the attitudes of students towards the internet differentiate meaningfully according to the thought of whether the internet contribute to our lives or not?
4. Do the attitudes of students towards the internet differentiate meaningfully according to the year of the internet usage?
5. What are the levels of the university students' attitude towards the internet?

RESEARCH METHODOLOGY

Research Design
This research was realized by survey model. Survey models are research approaches that aim to determine the situation that is existent now as it is. The case, event, individual or object that is the subject of the research are tried to be defined in their own conditions and as they are (Karasar 2006).

Universe and sample
Students who study in Turkish Republic of North Cyprus were selected as the universe of the study. Total 206 students who are selected by convenience sampling method constitute sample. 56.8% (n=117) of them are girls and 43.2% (n=89) are males.

Data collection tools
"Internet Usage Attitude Scale" that was developed by Tavşancıl and Keser (2002) and whose Cronbach-alpha reliability coefficient is 0.96, was used in the research.

Analysis of data and interpretation
In analysis of data mean, t-test and one-way variance analysis (ANOVA) were used. Significance level was accepted as .05.

RESULTS

In this part findings that were found as a result of analysis are presented. The first sub-question of the research was expressed as "Do the attitudes of university students towards the internet differentiate meaningfully according to gender?" In order to determine whether there is a statistically meaningful change among students' attitude towards the internet according to gender t-test was used. It was found that university students' attitude towards the internet according to gender does not show a meaningful differentiation. It can be said that male students' attitude towards the internet ($\bar{x}$=102,528) is more negative than female students ($\bar{x}$=104,775). However this difference does not found meaningful.

Table 1: t-test results of candidate teachers' attitude level towards the internet according to gender, having personal computer, thought whether the internet contribute to our lives or not

Demographic features		n	Mean	Std. Dev.	df	t	p
Gender	Female	117	104,162	12,775	204	0,905	0,367
	Male	89	102,528	12,933			
Having personal computer	Yes	153	105,294	12,778	204	3,591	0,000**
	No	53	98,150	11,568			
Contribute of the internet to our lives	Positive	197	103,842	12,860	204	2,036	0,043*
	Negative	9	95,000	9,334			

*p<0,05 **p<0,001

The second sub-question of the research was expressed as "Do the attitudes of students towards the internet differentiate meaningfully according to having personal computer?" In order to determine whether there is a statistically meaningful change among students' attitude towards the internet in terms of having personal computer t-test was used. It was found that university students' attitude towards the internet according to having personal computer show a meaningful differentiation [$t_{(204)}$= 3,591 p<0,001]. As it is seen Table 1score means of the students who have personal computer is higher than the students who do not have personal computer. In this situation, it was determined that having computer is effective on the attitude towards the internet.
The third sub-question of the research was expressed as "Do the attitudes of students towards the internet differentiate meaningfully according to the thought of whether the internet contribute to our lives or not?". In order to determine whether there is a statistically meaningful change among students' attitude towards the internet in terms of the thought whether the internet contribute to our lives or not t-test was used. As a result of t-test attitudes of students towards the internet differentiate meaningfully according to the thought whether the internet contributes to our lives or not [$t_{(204)}$= 2,036 p<0,05]. As it is seen Table 1, score means of the students who think the internet has positive contribution to our lives is higher than the students who think the internet does not have positive contribution to our lives. In this situation, it was determined that the thought whether the internet contributes to our lives or not independent variance is effective on the attitude towards the internet. This situation can be interpreted natural result of positive attitude towards the internet.
The fourth sub-question of the research was expressed as "Do the attitudes of students towards the internet differentiate meaningfully according to the year of using computer?". In order to determine whether there is a statistically meaningful change among students' attitude level towards the internet according to the year of the internet usage knowledge one way variance analysis (ANOVA) was applied. As a result of ANOVA test, it was determined that candidate teachers' attitude towards the internet differentiates meaningfully according to the year of the internet usage ($F_{(3-202)}$=7,934 p<0,001).

Table 2: ANOVA results of university students' attitude towards the internet according to the year of the internet usage

		n	Mean	Std. Dev.	df	F	p	Sig. Dif.
The year of the internet usage	1-3 year (a)	40	96,925	11,127	3	7,934	0,000*	a-c**
	4-5 year (b)	45	101,533	12,520				a-d**
	6-9 year (c)	66	104,151	12,967	202			b-d**
	10 year + (d)	55	108,945	11,840	205			
	Total	206	103,456	12,838				

*p<0,001 **Difference in favor.

In order to determine groups that causes differentiation scheffe test was applied to the data. According to Scheffe meaningfulness test, difference was derived from the student groups who state their internet usage year as "1-3 year" and "6-9 year". In this situation, it was determined while the year of the internet usage is increasing, the attitude towards the internet increases in positively.
The fourth sub-question of the research was expressed as "What are the levels of the university students' attitude towards the internet?"

Table 3: Average and standard deviation values about the attitude towards the internet

Attitude level towards the internet	n	Mean	Std. Dev.
	206	103,456	12,838

In Table 3, the mean and standard deviation of scores of the students' attitude towards the internet are given. It was determined that mean of the university students' attitude towards the internet is at good level ($\bar{x}$=103,456).

RESULTS AND SUGGESTIONS

According to the research, it was determined that university students' attitude towards the internet was affected by independent variables having personal computer, thought of whether the internet have contribution to our lives or not meaningfully and it was determined that university students' attitude towards the internet was not affected by independent variables gender. But, increase is seen while the class grade is increasing. Moreover, it was found that university students' attitude towards the internet was at good (positive) level.
These suggestions were given as a result of the research:

- ✓ When it is thought that students who have personal computer have positive attitude towards the internet, support can be given to the candidate teachers to have a personal computer by their families or authorities.
- ✓ A qualitative research can be done that searches the internet usage and attitude towards the internet of the students who do not have personal computer.
- ✓ The courses on the usage of the internet in the process of learning and teaching can be added to the syllabuses. In this way students can acquire knowledge and skills about the usage of the internet.

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AUTOMATIC RECOGNITION OF REANIMATION EVENTS FROM PHYSIOLOGICAL PARAMETERS

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Abstract-Patients hospitalized in intensive care are subject to close supervision by nursing staff. A large number of biological parameters are recorded online at high frequencies (one measurement per second) on these patients.
These records produce important streams of temporal data that caregivers must analyze each patient visit. The ICUs are in demand for tools to help the interpretation of this data flow, to limit the cognitive load that represents their interpretation. The aim of this work is to develop a methodology to recognize, automatically, specific events occurring to the patient, from biological parameters. We need to recognize external events (disconnection of sensors, tracheal suctioning, change of state...)
The occurrence of these events is reflected in the biological parameters by simultaneous changes in the pattern of signals and their variance. The automatic recognition of these events will be using an extraction algorithm episodes and temporal change of variance.

INTRODUCTION

Following the technological evolution of processes in many industrial fields and the increase of infrastructure availability, particularly sensors, operators responsible of processes supervision must quickly interpret a data stream and are thus important subjects to a cognitive overload increasingly strong. This increased flow of data has
prompted the scientific community to automatically migrate to the development of new surveillance systems with the following objectives:

- Facilitate the interpretation of the data flow from the various sensors of a system
- Detect anomalies occurring on the system and alert operators (detection function)
- Provide decision support by providing a diagnosis for the problem (depending on fault location and identification) The detection function is to recognize and identify anomalies in real-time of system behaviour.

The monitoring system detects that the system no longer works properly and generates an alarm to alert the operator, without specifying its origin.
The diagnostic function goes further in the analysis of the situation specifying to the operator the anomaly cause.
The knowledge needed to develop a detection function or diagnosis are not the same. The achievement of a detection function only requires knowledge of the system functioning. Any difference in behaviour observed on the system in connection with the behaviour in good working generates an alarm. The diagnostic function requires the knowledge of
behaviour of the system malfunction, including the knowledge of the
signature of each fault to diagnose.
The performance of a surveillance system is measured by:

- Its ability to recognize the presence of an anomaly, estimated by the rate of non-detection:
- Its ability to recognize the absence of an anomaly, estimated by the rate of false alarms.
- Its detection speed, estimated by the delay in detection. In Intensive Care Units (USIS), most patients suffering from various diseases require partial or total respiratory support, which justifies an important oversight. These patients should be monitored with particular care and all studies (clinical but also economic and sociological) on this subject concur in demonstrating the need for tools to aid monitoring and decision. [1]

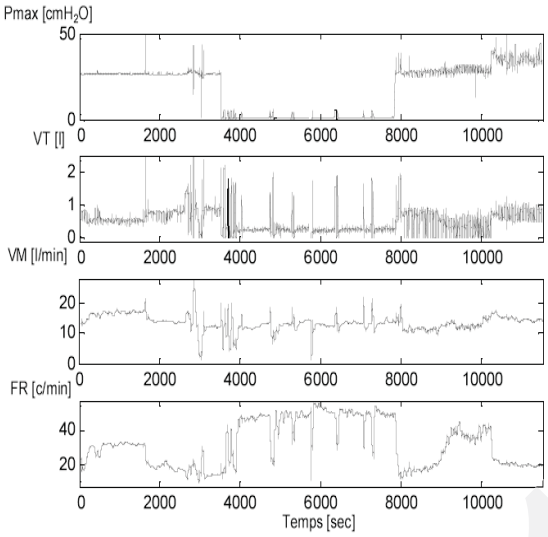
Advances in anesthesia and intensive care will be targeted at reducing the duration of medication, monitoring, accelerating and improving the quality of recovery. The automatic recognition of clinical events and the intelligent detection of
alarms prove to be crucial for the design of medical surveillance tools. Surveillance systems based on alarms threshold for each parameter are "primitive". In general, they introduce a noise instead of informing the relevant way of real clinical events. One consequence of this noise is the complacency of the nursing staff. Whereas the information fusion for clinical recognition of scenes, representing acceptable or harmful situations (clinical events), would be very informative for the staff. [2]
In practice, recognition of clinical events directly from physiological data or
expert knowledge is not an option. As the physiological phenomena are slow and data are noisy, clinicians are more interested in the evolution of a parameter (or several) on an interval of time rather than a precise moment. In addition to the complexity of data, expert knowledge is imprecise on the expected evolution of the normal or abnormal behavior on given patient.
In fact, clinicians can not describe in advance the events they would like the system detects. The difficulty of describing such developments can also be explained by the fact that:

- Each patient is unique and physiological responses to various events are highly variable among patients.
- The process of medical decision can be based on elements not accessible to machines (anxiety of the patient, the smells of the room care,.)

PROJECT PRESENTATION

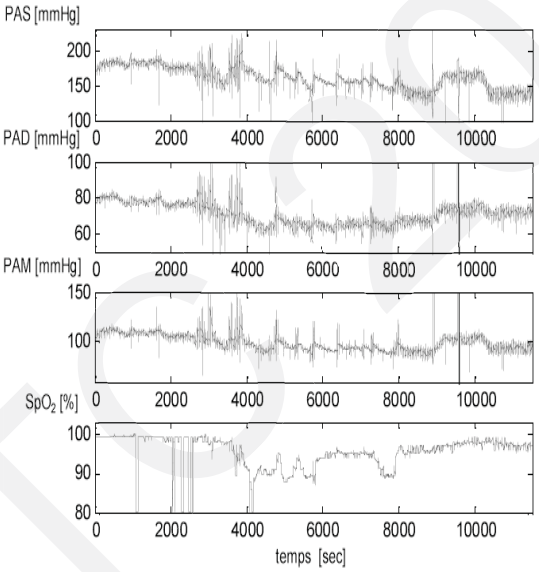
In order to present the data type with which we will work, Figures 1 and 2 represent a recording made on a patient in the ICU. The physiological variables are recorded at a frequency of one measurement per second Fig 1 shows the physiological variables to monitor hémodynamic function (systolic blood pressure (SBP),
diastolic (DBP), mean (MAP), heart rate (HR) rate, oxygen saturation (SpO2) and Fig2 to monitor the respiratory function (respiratory frequency (FR), expired volume (VT), maximum pressure in the airway (P max), minute ventilation (VM). We can observe on these records the presence of noise artifacts. These signals are highly non stationary, their mean and variance evolves over time.

Fig 2. Physiological parameters associated to respiratory function



ART STATE

Fig 1. Physiological parameters associated to hemodynamic function



Much work has been developed in the field of processes monitoring:
The situation assessment in complex systems is often performed by expert operators taking into account the evolution of signals and comparing it to previous experiences. The criteria used by operators to compare real situations with previous ones are not easily explained and they are part of the cognitive process [5].
The aspect of the qualitative representation of the data is given by a method of extraction in trend line for converting a temporal series into a series of temporal episodes describing the evolution of the variable. The information provided by the method is as follows:
"Variable is stable since the time t1 until time t2, at the value v1. It is increasing from the time t2 to t3 of the value v1 to the value v2...
It provides information on the evolution of the signal average. another information which relates to a change in the signal variance can also be calculated. The underlying idea of transforming the signal into a time trend is that the physiological events appearing in the process create particular temporal forms on the signal that will be more easily recognized on the trend [3].
The solution for alarms filtering that occurred during the monitoring of patients hospitalized in intensive care unit (ICU) is that the designed system is based on temporal episodes extracted online from biological parameters.
The advantage of using semi-qualitative temporal episodes is that the trend information identifies specific situations of the signal, which will be more easily recognized on the trend, such an equilibrium state near the threshold alarm or probe disconnect. The developed system is implemented to operate on line [1].
The information available on these systems is a set of
measurements from different sensors and an expert knowledge non modeled using differential equations. The methods include extracting relevant features of the signals and then merge them using a decision model replicating the human expertise. Two lines of research have been particularly
discussed: the trend analysis which has the advantage of highlighting the transients in a signal to use them in the decision model and pattern recognition, that enable to exploit the static links among variables. Applications include monitoring of patients hospitalized in intensive care units and the recognition of physiological states (sleep phases, hemorrhagic shock) [4].
Thus, our contribution is to control the physiological parameter CF (heart) of patients in intensive care units. Using the method of trend extraction is interesting, it aims at:
– Semi qualitative data Extraction from monitoring;

–Filtering of alarms from the standard alarms system. Our work lies on the design of a tool for monitoring patients for decision support during clinical events requiring or not medical intervention. The main aspect of this tool is the intelligent detection of alarms in order to reduce the number of false alarms generated by the traditional alarms system. The development of such a tool hence, involves the study of physiological mechanisms at play in response to respiratory complications or deteriorating health of the patient, and diagnosis (or diagnostic support) that can be done with modern techniques at our disposal.

The achievement of this tool can be interesting and useful in the context of its use at the hospital of AIN Tedla MOSTAGANEM. At the service of resuscitation, intensive care physicians have observed several cases of threshold overtaking on the heart frequency.

The automation of alarms can be used to monitor ICU patients permanently.

Conclusion

The work of this article is still in design phase, it is within the general framework of support for patient monitoring in USIS. This area is very special and has many difficulties:

- Data complex in nature: High-dimensional, ambiguity, vagueness and uncertainty.
- A noise due to the large number of false alarms generated by conventional monitoring systems, the consequence is the complacency of the nursing staff.
- The great number of recorded data on patients results in a delay in decision-making by medical staff during an alarm.
- Medical knowledge with difficulty recognized.
- These characteristics are pushing the development of original surveillance systems, relevant and responsive to such constraints. Our choice of this method of trend extracting and the alarm filtering system are following this way.

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AVRUPA'DA MESLEK EĞİTİMİ İÇİN KREDİ TRANSFERİ UYGULAMASI

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Özet
Avrupa'nın ekonomik bütünleşmesinin gerçekleştirebilmesinin önemli etkenlerinden biri çalışanların hareketliliğidir. Ancak ülkelerin eğitim sistemlerindeki farklılıklar ve ülkelerin farklı sosyal-ekonomik gerçeklikleri çalışanların hareketliliğini kısıtlamaktadır. Diğer tüm alanlarda olduğu üzere mesleki eğitimi sistemlerinin karşılaştırılabilirliği sağlamak için Meslek Eğitimi için Avrupa Kredi Transfer Sistemi adlı çalışmalar yapılmaktadır. Bu çalışmada aday ülke konumunda olan Türkiye'yi de yakından ilgilendiren Avrupa Kredi Transfer Sistemi incelenmektedir.

Abstract
One of the important factors that will have support European integration is mobility of its citizen. Diversity of national education systems and differences of social-economic circumstances of countries limit the mobility of people. As it is in other areas attempts are made to provide a comparable system of the qualification obtained Union states. European Credit System for Vocational Education and Training System is developed and will be ready to be applied in 2012 to transfer obtained learning outcome credits by individual abroad to their in home countries. In this work European Credit System for Vocational Education and Training System is investigated which is in Turkey's area of interest.

Anahtar Sözcükler: Öğrenme çıktısı, meslek eğitimi, kredi transferi.

MESLEK EĞİTİMİNDE AVRUPA KREDİ SİSTEMİ

Mesleki Eğitiminde Avrupa Kredi (Transfer) Sistemi (ECVET- European Credit (Transfer) System for Vocational Education and Training) bireylerin belirli yeterlikler için kazandıkları bilgi ve becerilerin diğer AB üyesi ülkelerce tanınması ve transfer edilmesi için tasarlanmıştır. Böylelikle AB üyesi ülke vatandaşlarının ülkelerarası dolaşımını cazip duruma getirerek bireylerin farklı ülke ve öğrenme ortamlarında öğrenme deneyimleri kazanmaları için fırsat sağlayacaktır. Aday ülke durumundaki Türkiye'nin ilgili kuruluşları da Mesleki Eğitiminde Avrupa Kredi Transfer Sistemine uyum amaçlı olarak çalışmalar yapılmaktadır.
Çalışanların hareketliliği Avrupa'nın ekonomik ve sosyal bütünleşmesi için gereklidir. Bunun ötesinde ülkelerin deneyimlerinin değişimi ve Avrupa yurttaşlığının yaşama geçirilmesi amaçları için hareketlilik önem taşımaktadır. Mesleki Eğitimi için Avrupa Kredi (Transfer) Sistemi (ECVET) birinci kademe meslek eğitimi öğrencilerinin ülkeleri dışında kazandıkları öğrenme çıktılarının ülkelerinde tanınması ve aktarılmasını amaçlayarak hareketliliğe olanak tanımaktadır (Avrupa Topluluğu Komisyonu, 2006).
Avrupa Birliğini ECVET'i kurmaya yönelten, 2000 yılında Lizbon'da toplanan Avrupa Konseyi'nin aldığı kararlar olmuştur. Bu toplantıda Avrupa Konseyi, daha iyi istihdam ve daha fazla sosyal uyum ile sürdürülebilir ekonomik büyümeyi başarabilmenin koşulu olarak Avrupa Birliği'ni dünyanın en rekabetçi ve en dinamik bilgi temelli ekonomik alanına dönüştürmek amaçlanmıştır. Bu büyük iddiayı başarmak için ekonominin radikal dönüşümünün yanı sıra sosyal güvenlik ve eğitim sistemlerinin de yeniden biçimlendirilmesi öngörülmüştür. (Avrupa Topluluğu Komisyonu, 2006).
ECVET 12 Kasım 2002'de toplanan Avrupa Komisyonu Eğitim Konseyinin ilke kararıyla 30 Kasım 2002'de açıklanan Kopenhag Bildirge'sine dayanarak geliştirilmiştir. 2002'de alınan kararlar 2004 Maastricht bildirisi ile 32 Avrupa ülkesinin mesleki eğitimden sorumlu bakanları, Avrupa sosyal ortakları ve komisyonlarınca antlaşmaya varılmış ve yenilenip güçlendirilmiştir.
Avrupa'da çok sayıda kişi eğitim etkinliklerine kendi ülkeleri dışında katılmaktadır. Bu türden hareketliliğin çekiciliği, özellikle ülke dışında kazanılan öğrenme çıktılarının ülkelerine aktarımı, geçerliliği ve tanınırlılığı gibi etkenler nedeniyle sınırlanmaktadır. Bu durum meslek eğitiminin bir sisteminden diğer bir sistemine ve okul dışı öğrenmeden okulda öğrenmeye geçiş durumları için de geçerlidir. Bu nedenle hareketlilik içinde eğitimleri sırasında bireylerin bir ortamdan diğerine geçiş yaparken süreç içinde izleyecekleri bir sistemin gerekliliği ortaya çıkmıştır. ECVET özellikle ülkeler arası geçişlerde bireylerin kazandıkları öğrenme çıktılarından yararlanabilmeleri için yarar sağlayacak bilgi değişim aracı olmaya aday durumdadır. Avrupa alanında mesleki eğitimin farklı doğası, ülkelerin sayısının fazlalığı ve ulusal ya da sektörel sistemlerin yeterlilik ölçütlerinin farklılıkları ECVET'in Karşılaşacağı temel zorluklardan biri olmaktadır.

ECVET İlkeleri

ECVET''in dayandığı ilke ve temel düşünceler aşağıda listelenmiştir. (Avrupa Topluluğu Komisyonu, 2006).

- ECVET, yeterliliklerin transfer edilebilir ve biriktirilebilir öğrenme ünitelerinin (bilgi, beceri ve iş görme yeteneği) kredi puanları ile birlikte açıklandığı bir yöntemdir.
- ECVET kişilerin önceden kazandıkları öğrenme çıktılarının bir öğrenme ortamından diğerine, bir eğitim sistemden diğerine hareket eden kişilerin önceden kazandıkları öğrenme çıktılarının aktarımı ve toplanmasını sağlamaya yöneliktir.
- ECVET üye ülkelerin ve paydaşların kendi yeterlilik sistem ve meslek eğitimlerine göre gönüllü katılım temeline dayanır
- ECVET bireysel öğrenme kredilerinin toplanması ve aktarımı sırasında, eğitim sağlayanların birbirleriyle arasındaki sinerjiyi artıracak, iş ortağı kuruluşların işbirliğini sağlayacak bir mekanizma olacaktır.

Türkiye'de de mesleki eğitim yönetim modelleri değişmekte, yeni birimler kurulmakta ve mesleki eğitim alanında faaliyet gösteren kurumların görevleri yeniden tanımlanmaktadır. Değişimlerde amaç; kurumlar arası işbirliğini düzenlemek ve uluslararası, bölgesel, sektörel ve yerel tabanlarda kurumsal düzenlemeleri güçlendirmektir. Mesleki eğitimde devam eden bu değişim sürecinde; katılımcılığın güçlendirilmesi ve mesleki eğitim alanındaki paydaşların, sosyal ortakların, iş ve sivil toplum örgütlerinin, öğretmen ve eğitimcilerin ve öğrencilerin rolleri yeniden tanımlanmaktadır. Hareketli iş gücünün farklı ülkelerdeki yetkinliklerin mevcut düzeylerinin görülmesi, tecrübelerin paylaşımı ve mesleki eğitimin cazip kılınması amaçlanarak; worldskills ve euroskills gibi mesleki eğitim yarışmaları düzenlenmektedir. AB üyelik süreciyle birlikte ivme kazanan iş gücünün hareketliliği ve bu hareketli iş gücü içerisinde yer alan bireylerin sahip olduğu yeterliliklerin değerlendirilmesi gündeme gelmiştir. ECTS ve ECVET sistemleri; öğrenme çıktılarının transferi, tanınması ve toplanmasına olanak tanıyan teknik çerçevelerdir. ECVET; Ulusal yasalar ile belirlenmiş yeterlilikler çerçevesinde hareketliliği esas alarak, öğrenme çıktılarının taşınmasını sağlayan gönüllülük esaslı bir sistemdir. ECVET ile ilgili Avrupa komisyonu kararı 2009 Haziran ayında yürürlüğe girmiştir. Avrupa Komisyonu ve Konseyi, ülkelere gerekli alt yapıyı hazırlayarak 2012 yılından itibaren bu sistemin uygulanmasını önermektedir. 2014 yılında Avrupa Parlamentosu ve Konseyi tarafından sistem gözden geçirilecek ve gerektiğinden yeni düzenlemeler yapılacaktır. ECVET'in uygulanması süreci Tablo-1'de görülmektedir. (MEB Belgeleri, 2009)

Tablo-1: ECVET'in uygulanması süreci (CEDEFOP Notları, 2009).

<table>
<tr><th>2009</th><th>2010</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th></tr>
<tr><td colspan="3">Test Süreci</td><td colspan="2">Geliştirme Süreci</td><td rowspan="2">Raporlama ve Gözden Geçirme</td><td></td></tr>
<tr><td colspan="4">Ülkelerin ECVET'in uygulanmasına yönelik olarak gerekli koşulları oluşturması</td><td></td><td></td></tr>
<tr><td colspan="3"></td><td colspan="4">Uygulama</td></tr>
</table>

ECVET aracılığıyla, bireylerin öğrenme çıktılarının Avrupa içerisinde taşınması ve böylelikle bireylerin öğrenim sürelerinin uzamaması temin edilecektir. Bu sistemde; Örgün(formal),Yaygın(non-formal) ve alaylı (in-formal) öğrenme yöntemleriyle elde edilen öğrenme çıktılarının tanınması sağlanacaktır (Avrupa Parlamentosu Belgesi, 2009).
Haziran 2009 tarihinde uygulamaya giren "Mesleki Eğitim'de Kredi Transfer Sistemi kurulması"na yönelik karar kapsamında; üye ülkelerde ECVET ile ilgili denemeler yapılması ve zamanla devreye koyulması çağrısı yapılmıştır.
"Mesleki Eğitim'de Kredi Transfer Sistemi kurulmasına yönelik karar kapsamında; komisyonun başkanlığında bir Avrupa ECVET ağı kurulması öngörülmektedir. Bu ağ içerisinde; mesleki eğitim ile ilgili paydaşların olması öngörülmektedir. Bu ağ aracılığıyla; Üye ülkelerde ECVET'in desteklenmesi, yaygınlaştırılması ve bilgi ve tecrübe paylaşımına yönelik bir platform oluşturulması amaçlanmaktadır. Ağ yapısı içerisinde; üye ülkelerin mesleki eğitim temsilcileri, mesleki eğitim veren kurumlar ve sosyal ortaklar yer alacaktır. Ulusal yaşam boyu eğitim programları ajansları, CEDEFOP ve ETF network ile güçlü bir ilişki içerisinde olacaktır. Bu ağ en az yılda bir defa toplanacaktır.
"Mesleki Eğitim'de Kredi Transfer Sistemi kurulmasına yönelik karar kapsamında; Avrupa ECVET ağı içerisinden bir ECVET kullanıcıları grubu kurulması ön görülmektedir. Bu grup; kullanıcı rehberinin güncellenmesi ve ECVET uygulanmasındaki işbirliği süreçlerinde kalite ve uyumun sağlanmasını temin edecektir. Grup, yılda 2 kez toplanacaktır. Bu iki yapılanmanın çalışmalarına 2010'un ilk çeyreğinde başlaması planlanmaktadır (ECVET Bülteni, 2009).

ECVET ile ilgili AB Komisyon ve Konsey Kararları
ECVET; tüm bireylerin ülkelerarası dolaşımda elde ettiği bilgi, beceri ve yetkinliklerin transfer edilmesine, taşınmasına ve toplanmasına olanak tanıyan bir sistemdir. Bu sayede; iş dünyasının taleplerinin karşılanmasına olanak tanır. Örgün, Yaygın ve Alaylı öğrenmeyle elde edilen öğrenme çıktılarının tamamı ECVET tarafından değerlendirilir.2000 yılında düzenlenen Lizbon toplantısında, bilgi toplumunun taleplerine cevap verilmesinde yeterliliklerin görünürlüğünün artırılması gerektiği kararı alınmıştır. 2002 yılındaki AB konseyi Barselona toplantısında, mesleki eğitim alanında (VET) görünürlüğün düzeltilmesi ve tanınma yöntemlerinin önemine vurgu yapılmıştır. AB konseyinin 19 Aralık 2002 kararında(Kopenhag süreci), mesleki eğitim alanında Avrupa'da yürütülecek işbirliklerinin güçlendirilmesi kararı alınmıştır. Konseyin 2004 ortak taslak raporu ve komisyonun 2010 Eğitim ve Öğretim çalışma programında mesleki eğitim alanındaki kredi transfer çalışmalarının önemi vurgulanmıştır. Konsey ve komisyonun 2008 yılındaki ortak ilerleme raporunda, mesleki eğitimin kalitesini ve cazibesini artıracak çabaların artırılmasına vurgu yapılmıştır. Konseyin ve üye ülke bakanlarının 15 Kasım 2004 tarihinde konseyde yaptığı toplantıda, mesleki eğitim alanında Avrupa Kredi transferi, sistemi geliştirme ve uygulama çalışmalarına önem verilmesi kararı alınmıştır.18 Haziran 2009 tarihinde ECVET'in kurulmasına dair parlamento ve konsey kararı alınmıştır (Avrupa Parlamentosu Belgesi, 2009).
ECVET'in uygulanmasında amaç, bir yeterliliğe sahip olmak isteyen bireylerin değerlendirilmiş öğrenme çıktılarının transferinin, tanınmasının ve toplanmasının sağlanmasıdır. ECVET uygulaması sonucu sağlanacak yararlar şunlardır;

- Bireylerin öğrenme çıktılarının ve görünürlüğünün anlaşılması mümkün olacaktır.
- Ülkelerarası hareketlilik mümkün olacaktır,
- Eğitim ve öğretim alanında Avrupa işbirliğine katkı sağlayacaktır

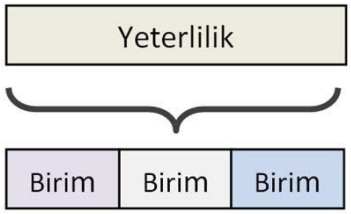
ECVET Kavramları
ECVET üzerinde fikir birliğine varılmış bir dizi kavram üzerinden biçimlendirilmiştir. Bu kavramlara aşağıdaki bölümde açıklanmaktadır.
Yeterlilik: Yetkin bir kurum tarafından belirlenmiş bir standarda göre, bireylerin öğrenme çıktılarına sahip olduğunun belirlenmesi sonrasında yapılan değerlendirme ve geçerliliğin sonucudur.
Öğrenme Çıktıları: Bireyin ne bildiğinin, anladığının ve ne yapabildiğinin ifadesidir.
Öğrenme Çıktıları Birimi(Birim): Bir yeterliliğe ait elemandır. Değerlendirilebilen, geçerli kılınabilen ve birbiriyle uyumlu bilgi, beceriler ve yetkinlik dizilerinden oluşur.
Öğrenme Çıktılarına Ait Kredi(Kredi):Bireyin değerlendirilmiş öğrenme çıktılarına ait dizilerdir. Bir yeterliliğin elde edilmesi amacıyla veya öğrenme çıktılarının transferi amacıyla kullanılır.
Yetkin Kurum: Yeterliliklerin tasarlanması ve verilmesi, birimlerin tanınması, ECVET puanlarının atanması, öğrenme çıktılarının geçerliliğin tanınması ve sağlanmasını yürütmekle görevli kurumdur.
Öğrenme Çıktılarının Değerlendirilmesi: Bireyin sahip olduğu bilgi, beceriler ve yetkinliğin boyutunun belirlenmesinde kullanılan yöntemlerini ve süreçlerini ifade eder.
Öğrenme Çıktılarının Geçerliliğinin Sağlanması: Bireylerin elde ettiği değerlendirilmiş öğrenme çıktılarının, birim ve yeterlilikler açısından gerekli olacak tanımlı çıkışlar olup olmadığının belirlenmesidir.
Öğrenme Çıktılarının Tanınması: Kazanılan öğrenme çıktılarının birimler ve yeterlilikler aracılığıyla test edilmesi sürecidir.
Karşılıklı Güven Ve İşbirliği (Mutual Trust And Partnership): Ortak organizasyonların birbirine güvenini ifade eder.
İyi niyet anlaşmaları (Memoranda of Understanding) ve Öğrenme anlaşması (Learning Agreement) belgeleri kullanılır.
Ecvet Puanları: Bir yeterliliğe ait öğrenme çıktılarının ağırlığının ve birimlerin bağıl ağırlıklarının sayısal gösterimidir (Avrupa Parlamentosu Belgesi, 2009).

ECVET YÖNTEMLERİ

ECVET'de yeterlilikler, öğrenme çıktılarına ait birimler ve bu birimlere ait ECVET puanlarıyla ifade edilir. Transfer ve toplama süreci ile kayıtlara ait transkriptler ve ECVET kullanıcılarına ait tamamlayıcı dokümanlar ECVET'de kullanılan araç ve yöntemlerdir.

Öğrenme Çıktıları ve Birimleri
Birim, yeterliliğin bir elemanıdır. Değerlendirilebilen, geçerli kılınabilen ve birbiriyle uyumlu bilgi, beceriler ve yetkinlik dizilerinden oluşur. Bir yeterlilik birçok birimden oluşur. Bu nedenle, bireyin yeterliliğe sahip olması için gerekli birimlerin tamamlanması(toplaması)

gerekir. Birimlerin tamamlanması farklı ülkelerde ve farklı öğrenim biçimlerinde (Örgün, Yaygın ve Alaylı) olabilir. Birimlerin tamamlanması ve öğrenme çıktılarının tanınmasında ulusal düzenlemeler dikkate alınır.
Birimin Sahip olması gereken Özellikler: Yeterliliği oluşturan birimler şu özelliklere sahip olmalıdır: Kavramlar; bilgi, beceriler ve yetkinlikler tanımlanarak açıklanmalıdır, Yeterliliği esas alacak konu bütünlüğü korunmalıdır, Birimde yer alan öğrenme çıktılarının ayrı değerlendirilmesi ve geçerliliğin sağlanması mümkün olmalıdır. Bir birim, sadece bir yeterlilik için tasarlanabileceği gibi birkaç yeterlilik içinde kullanılabilir. Beklenen öğrenme çıktılarının tanımlandığı birimler için; öğrenme çıktılarının nereden ve nasıl elde edildiği (Örgün, yaygın ve alaylı öğrenme) önemli değildir. Birimin ilişkili olduğu yeterlilik veya yeterliliklere ilişkin özgün başlığı olmalıdır, EQF(AYÇ) yeterlilik seviyesi referans gösterilmeli, mümkünse NQF(UYÇ) seviyesi ve seviyeye karşılık gelen ECVET puanları belirtilmelidir. Birime ilişkin öğrenme çıktıları belirtilmelidir, Birimlere ait öğrenme çıktılarının değerlendirme işlemleri ve kıstasları açıklanmalıdır. Birimlerin ECVET puanları belirtilmelidir(Avrupa Parlamentosu Belgesi, 2009).



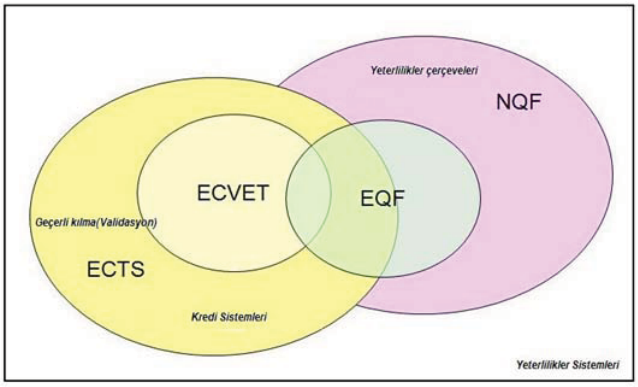
Şekil 1 Öğrenme çıktılarına ait birimler(4).

Öğrenme çıktılarının transferi ve toplanması
Bir sistem içerisinde kazanılan öğrenme çıktılarına ait birimlerin değerlendirilmesi gerekir. Değerlendirilen birimler yetkin bir kurum tarafından geçerli kılınır ve tanınır. Bu süreç sonunda istenen yeterlilik elde edilir. Değerlendirme, geçerlilik ve tanınma süreçlerine ait prosedürler ilgili yetkin kuruluşlar ve eğitim sürecindeki ortaklarca hazırlanır. Örgün öğrenim sürecinde elde edilen ECVET kredilerinin transferinde kurumların işbirliği elde edilir. İşbirliğinde amaç; Memorando of Understanding(MoU) kullanılarak işbirliği genel çerçevesini oluşturmaktır. Memorando of Understanding'in (MoU) Sahip olması gereken Özellikler: Kurumlar statülerini ve yetkinliklerini kabul ederler, Kurumlar; birbirlerinin kalite güvence, değerlendirme, geçerli kılma(geçerlilik) ve tanıma kriter ve prosedürlerini kredi transferi için yeterli görürler, MoU amaçlarına uymayı beyan ederler,Kredi transferinin amaçları için yeterliliklerin EQF referans seviyelerine göre karşılaştırılmasını onaylarlar.Süreç içerisinde yer alacak diğer kurumları ve görevlerini tanımlarlar. Yaygın ve alaylı öğrenme ile elde edilen öğrenme çıktılarına ECVET sisteminin uygulanması için, ayrı bir düzenleme yetkin kurum tarafından yapılır(1).

Öğrenme anlaşması ve bireysel transkript
İki ortağın ve bir hareketli bireyin olduğu bir sistemde; kredi transferinin uygulanmasında, öğrenme anlaşması gerçekleştirilir. Öğrenme anlaşması, öğrenmede ve geçerli kılmada görev alan yetkin kurumlar ve hareketli birey arasında MoU çerçevesinde gerçekleştirilir. Öğrenme anlaşması'nın sahip olması gereken özellikler: Ev sahibi ve gönderen kuruluşlar tanımlanmalıdır. Ev sahibi kurum öğrenme çıktılarına yönelik eğitim veren ve değerlendiren kurumdur. Gönderen kuruluş ise bireyin sahip olduğu öğrenme çıktılarının; geçerliliğini, tanınmasını ve toplanmasını sağlayan kurumdur. Ev sahibi kuruluş; öğrenme çıktılarını değerlendirmesi sonrasında bireye ECVET kredisi verir. Elde edilen öğrenme çıktıları ve karşılık gelen ECVET puanları, bireyin bireysel transkriptine kaydedilir. Gönderen kuruluş; kredinin geçerliliğini sağlar ve öğrenme çıktılarını tanır. Gönderen kuruluşun; kredinin geçerliliğini sağlaması ve öğrenme çıktılarını tanınmasını başarılı bir şekilde yapılabilmesi, Ev sahibi kuruluşun öğrenme çıktılarını başarılı bir şekilde değerlendirmesine bağlıdır(1). Bireylere mesleki eğitim veren iki kurumun hareketlilik faaliyeti içerisinde yer alan bireyin öğrenme çıktılarının ECVET sisteminde transferi Şekil-2'de gösterilmiştir.

Şekil. 2. Bireyin öğrenme çıktılarının ECVET sisteminde transferi
(Avrupa Komisyonu Belgesi, 2006–2).

ECVET Puanları
Yeterlilikler ve birimler için tamamlayıcı bilgi sunan sayısal ifadelerdir. ECVET'in ortak bir kullanımını sağlaması amacıyla; örgün mesleki eğitimdeki bir yıllık öğrenme çıktıları 60 ECVET puanıyla değerlendirilir. ECVET'de puan atama işlemi iki şamada gerçekleşir. İlk olarak yeterliliğe toplam bir ECVET puanı atanır. Daha sonra bu puan birimlere dağıtılır. Birimlere dağıtım esnasında, birimlerin bağıl ağırlıkları dikkate alınır. ECVET puanlarının atanması, yeterliliklerin ve birimlerin tasarımı aşamasında yapılır (Avrupa Parlomentosu Belgesi, 2009).
ECVET esnek ve bireysel bir gelişime olanak tanır ve mesleki eğitim alanındaki diğer kredi istemleriylede uyumludur. Yüksek öğretimdeki ECTS (European Credit Transfer and Accumulation System)'nin tamamlayıcıdır. Yaygın ve alaylı öğrenmeyle elde edilen öğrenme çıktılarının, AB konseyinin 28 Mayıs 2004 tarihli kararlarına göre değerlendirilmesi esastır. ECVET sistemi; 23 Nisan 2008 tarihli Avrupa Parlementosu ve konseyi düzenlemesine göre kurulan European Qualification Framework for LLL(Yaşam boyu öğrenim için AYÇ) ile uyumludur. EQF'in ana amacı; elde edilen yeterliliklerin şeffaflığını, karşılaştırılabilirliğini ve taşınabilirliğini artırmaktır. ECVET ise; öğrenme çıktılarının yeterliliğe ulaşmak amacıyla transferine, tanınmasına ve toplanmasına olanak tanır. ECVET; 15 Aralık 2004 tarihli Avrupa Parlamentosu ve Konseyi kararına uyumludur. Bu karar, yeterliliklerin görünür kılınmasında tek bir topluluk çerçevesi oluşturmayı (EUROPASS) benimser. ECVET; Avrupa Parlementosu ve Konseyinin 18 Aralık 2006 tarihli kararıyla uyumludur. Bu karar, Eğitim ve öğrenim amacıyla topluluk içerisinde yapılacak hareketlikler ile ilgilidir (European Quality Charter for Mobility) (1). Mesleki eğitim alanındaki yeterlilikler ve kredi sistemleri ilişkisi Şekil-3'de görülmektedir.



Şekil. 3. Mesleki eğitim alanındaki yeterlilikler ve kredi sistemleri ilişkisi
(ECVET Seminer Notları, 2008)

TÜRKİYE ve ECVET

Mesleki Eğitimde Avrupa Kredi Sistemi ECVET ile ilgili olarak ülkemizde MEB bünyesinde çalışmalar yürütülmektedir. Bakanlık EARGED (Eğitimi Araştırma ve Geliştirme Dairesi Başkanlığı) ve PKM (Projeler Koordinasyon Merkezi Başkanlığı) eşgüdümüyle çalışmalar yürütülmektedir. Milli Eğitim bakanlığı bünyesinde mesleki ve teknik eğitim alanından sorumlu olan birimler, YÖK, sosyal taraflar, MYK temsilcileri ve Ulusal ajans temsilcileri bu çalışmalara katılmaktadır. İnsan Kaynaklarının Mesleki Eğitim Yoluyla Geliştirilmesi Projesi (İKMEP) kapsamında ECVET konulu iki çalıştay düzenlenmiştir. İlk çalıştay; 19–23 Ekim 2009 tarihleri arasında, ikinci çalıştay 5–8 Ocak 2010 tarihleri arasında Ankara'da gerçekleştirilmiştir. Düzenlenen bu çalıştaylarda; Avrupalı uzmanlar tarafından Avrupa'da yürütülen çalışmalar hakkında sunumlar yapılmıştır (Milli Eğitim Bakanlığı Belgeleri, 2010). Mesleki Yeterlilik sınav ve belgelendirme yönetmeliğinin "Kredilendirme" başlıklı sekizinci maddesi, ECVET ile ilgili düzenlemeleri içermektedir. Bu maddede Ulusal yeterliliklerde kullanılacak kredi değerlerinin tespitinde ve kredilerin değerlendirilmesinde uygulanacak usul ve esasların MEB, YÖK ve diğer ilgili tarafların görüşü alınarak MYK Yönetim Kurulu tarafından belirleneceği hükmü yer almaktadır (Resmi Gazete, 2008).
Türkiye'de ECVET ulusal öncelikleri henüz belirlenmemiş olup bu çalışmaları yürütecek bir kurum yetkilendirilmesi yapılmamıştır. Kurumlar mevcut mevzuatlarını esas alarak, çalışmalarını yürütmektedirler.

SONUÇ VE DEĞERLENDİRME

Türkiye'de eğitim konusunda ilgili tarafların en fazla yakındıkları konulardan biri mevcut mesleki ve teknik sisteminin ülkenin gerektirdiği olan nitelikli iş gücünü yetiştirmemesidir. Ülkelerin gelişmesinde önemli etken olan nitelikli iş gücünün eksikliği sürekli dile getirilmektedir. Avrupa Birliği'ne aday üye konumundaki ülkenin uyum sürecinde Birliğin kurum ve kuruluşlarıyla iş birliği içinde olması ve uyum çalışmalarıyla eğitim sistemimizde olumlu gelişmelere yol açma umudu taşımaktadır. Avrupa'nın özellikle hızla gelişen dünya sosyal-ekonomik koşullarına uygun olarak stratejiler geliştirmek istemesiyle öngördüğü adımlardan biri meslek eğitimini yeniden biçimlendirmek olmuştur. Bunun bir sonucu olarak uygulamak istediği meslek eğitiminde kredi transferi uygulamaları Türkiye için de yarar sağlayacaktır. Meslekleri gerçekleştirmek için gerekli bilgi, beceri ve iş görme yeterliliği tanımları ile bunların kazanılmasının açıklaması olan öğrenme çıktıların tanımlanması meslek eğitiminde yeterlik gibi kalite konularını gündeme getirecektir.
Meslek eğitiminde kredi transferi uygulamasının gerektirdiği hazırlık ve altyapı çalışmaları yeterince özenli gerçekleştirilebilirse kuruluşlar arasında işbirliği ile ortaya çıkacak sinerji artışı meslek eğitiminde yeni ve olumlu gelişmelere kaynaklık edebilir.

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BİLGİ VE İLETİŞİM TEKNOLOJİLERİNİN (BİT) ÖĞRETME-ÖĞRENME SÜRECİNE ENTEGRASYONUNDA HEMŞİRE EĞİTİMCİLERİN ROLÜ

NURSE EDUCATORS' ROLE IN INTEGRATION OF THE INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) TO TEACHING-LEARNING PROCESS

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Özet
Bireysel ve mesleki yaşama giren bilgi ve iletişim teknolojileri, tüm alanlarda olduğu gibi sağlık bakımı alanında da etkili ve verimli hizmet sunma olanağı sağlamakta, hemşirelik eğitimi ve uygulama alanlarında önemi giderek artmaktadır.
İlgili literatürde, bilgi ve iletişim teknolojilerinin kullanımının yirmibirinci yüzyılın evrensel özelliklerinden biri ve hemşirelik eğitiminin temel öğesi olduğu, hemşirelerin bilgisayar okuryazarı olmaları gerektiği belirtilmektedir. Ayrıca, hemşirelik eğitimi programlarının mezunlarına bu özellikleri kazandıracak biçimde yapılandırılmasının gerekliliği ve bu konuda hemşire eğitimcilerin önemli rol ve sorumluluklarının da olduğu vurgulanmaktadır. Buna karşın, ülkemizde hemşirelik alanındaki çalışmaların daha çok bilgisayar ve bilgisayara dayalı teknolojilere odaklandığı, bilgi ve iletişim teknolojilerinin hemşirelik eğitimine entegrasyonunda hemşire eğitimcilerin rollerinin literatürde yeterince ele alınmadığı görülmektedir.
Bu açıklamalar ışığında derlemede, bilgi ve iletişim teknolojilerinin öğretme-öğrenme sürecine entegrasyonunun önemi ve hemşire eğitimcilerin rol ve sorumluluklarının tartışılması amaçlanmaktadır.
Anahtar kelime: Bilgi ve iletişim teknolojileri, Eğitimci, Hemşire eğitimci, Hemşirelik eğitimi

Abstract
The information and communication technologies that effect individual and professional life provide effective and productive serving in all areas of health care as is the case in the other fields. Also, it has gained importance more and more in nursing education and clinical settings.
In the related literaure it is emphasized that using information and communication technologies is the universal quality of tweny-first century and the fundamental component of nursing education. Also, it is stated that nurses should be computer literate. Moreover, the nursing education programs should be designed for graduated nurses to earn these qualities. However, it is seen that the researches in the field of nursing in our country, focus more computers and computer-based technologies, and the nursing educators' roles in integration of the information and communication technologies haven't take place in the literature.
In light of explanations, in this article, it is aimed to discuss the importance of integration the information and communication technologies to teaching-learning process and nurse educators' role and responsibilities.
Keywords: Information and communication technologies, Educator, Nurse educator, Nursing education

GİRİŞ

Bilgisayar, mikro elektronik ve telekomünikasyon üçlüsü olarak nitelendirebileceğimiz bilgi ve iletişim teknolojilerindeki (BİT) gelişmeler, toplumdaki tüm alt sistemleri olduğu gibi eğitim sistemini de etkilemektedir. Endüstri, ekonomi, sağlık, iletişim gibi birçok toplumsal sistem, eğitim kurumlarının teknolojiyi doğru ve etkin olarak kullanabilen bireyler yetiştirmesini beklemektedir. Eğitim sistemi de aynı işlevi eğitimcilerden beklemekte ve bu beklenti sadece BİT kullanımını öğretmeyi değil aynı zamanda BİT'i öğretme-öğrenme sürecinde kullanmayı da kapsamaktadır. BİT'in öğretme-öğrenme sürecinde etkili olarak kullanılabilmesinde, eğitimcilerin BİT'e yönelik bilgi, beceri ve olumlu tutuma sahip olması önem taşımaktadır (Baki 2002; Demirarslan ve Usluel 2005; Cüre ve Özdener 2008; Gülbahar 2007; Haşlaman ve ark. 2007; Jung 2005; Moule 2003; Wang and Woo 2007).
Bilgi ve iletişim teknolojilerinin öğretme-öğrenme sürecine entegrasyonuna ilişkin tanımlar incelendiğinde, tanımların benzerlik gösterdiği, öğrenme hedeflerinin kazanılmasında bilgi ve iletişim teknolojilerinin bir araç olarak kullanılmasının öne çıktığı dikkati çekmektedir (Jung 2005; Moule, 2003; Usluel ve ark. 2007). BİT'in öğretme-öğrenme sürecine entegrasyonu genel bir yaklaşımla, öğrenmeyi arttırmak için herhangi bir bilgi ve iletişim teknolojisinin kullanılma süreci olarak tanımlanmakta, donanım ya da yazılımın öğretme-öğrenme sürecine basit bir şekilde yerleştirilmesinden daha kapsamlı olduğu vurgulanmaktadır. Bu noktadan hareketle, BİT'in öğretme-öğrenme sürecine entegrasyonundan söz edebilmek için eğitimcilerin, eğitim etkinliklerinde BİT'i düzenli olarak kullanmaları gerektiği belirtilmektedir (Jung 2005; Usluel ve ark. 2007; Wang and Woo 2007). Haşlaman ve arkadaşlarına göre (2007), BİT'in öğretme-öğrenme sürecine entegrasyonu eğitimcilerin;

- öğrencilerin bireysel gereksinimlerini dikkate alarak BİT ile desteklenmiş etkin ve verimli öğrenme yaşantıları planlamasını,
- BİT ile zenginleştirilmiş uygun öğrenme ortamları oluşturmasını,
- BİT kullanımını içeren öğretim planlarını uygulamaya geçirmesini içermektedir.

BİT'in öğretme-öğrenme sürecine entegrasyonu; bilginin yapılandırılması süreçlerinde, üst düzey öğrenme becerilerinin gelişmesinde ve öğrenci başarısının artmasında önemli rol oynamaktadır. BİT, öğrenme için gerekli olan öğrenci-içerik, öğrenci-öğrenci, öğrenci-eğitimci ve öğrenci-arayüz gibi çok yönlü iletişimi sağlayarak, öğrenci çalışmalarını bireysel gereksinimler doğrultusunda öğrencinin kendi algılama ve anlama hızına göre sürdürmesini sağlamaktadır (Baki, 2002). Öğretme-öğrenme sürecinde etkili BİT entegrasyonu, öğrencinin öğrenmesini kolaylaştırmaktadır. Wang and Woo (2007), BİT'in öğretme öğrenme sürecine entegrasyonunu mikro, orta, makro olmak üzere üç düzeyde ele almaktadır. BİT'in ders düzeyinde etkili olarak kullanımını mikro düzey, BİT'in konu alanında etkili olarak kullanımını orta düzey, BİT'in müfredat/eğitim programı ile bütünleştirilmesini makro düzey BİT entegrasyonu olarak adlandırmaktadır.
Moule (2003), BİT entegrasyonunun başarısının eğitim kurumunun şartlarına, kurumda sistem çapında değişim ve gelişimlerin sağlanması için entegrasyon sürecindeki her bir faktörün ortaya konulmasına ve birbirleriyle etkileşimlerinin incelenmesine bağlı olduğunu

belirtmektedir. Literatürde, oldukça karmaşık ve çok boyutlu olan entegrasyon sürecinin sürekli değerlendirmelerle etkililiğinin arttırılmasının bir zorunluluk olduğu vurgulanmaktadır. Bu doğrultuda BİT'in öğretme-öğrenme sürecine etkili entegrasyonu için;

- Kurum yönetiminin desteklemesi,
- Kurumda BİT koordinatörünün olması,
- Eğitimcilerin BİT'e karşı tutum, değer ve inançlarının belirlenmesi,
- Eğitimcilerin bireysel gereksinimleri doğrultusunda hizmetiçi eğitim programlarının düzenlenmesi,
- Entegrasyonla ilgili etkinliklerin kurum yönetimi, BİT koordinatörü ve eğitimcilerin işbirliği ile gerçekleştirilmesi,
- Kurumda eğitimciler arası iletişim ağlarının geliştirilmesi,
- Kaynaklara erişimin sağlanması,
- Kurumun donanım ve yazılımının güncellenmesi gerektiği belirtilmektedir (Akpınar, 2005; Jung 2005; Usluel ve ark., 2007; Uyangör, 2005; Wang and Woo, 2007).

BİT'in eğitim programlarına entegrasyonu ile ilgili gelişmeler öğrenci ve eğitimcilerin rollerinin yeniden tanımlanmasını gündeme getirmekte; tekno-öğrenci, tekno-öğreten veya e-öğretmen, e-öğrenci gibi kavramların öne çıkmasına yol açmaktadır. Eğitimciyi sadece konuyu aktaran değil, teknolojinin, var olduğu ortamda gelişmesi için teknolojiyi uygulayan, düzenleyen, yönlendiren konumlarına getirmektedir (Orhon, 2010). Gelişen ve değişen BİT, hemşirelik eğitiminin de ayrılmaz bir parçası haline gelmiş mesleki nitelik, rol ve sorumluluklar açısından bazı değişimlere yol açmıştır. Bu durum BİT'in, hemşirelik eğitimine entegre edilmesinde hemşire eğitimcileri anahtar konuma getirmiştir (Bayık, 2001; Bonnel at all. 2005; Kısa ve Kaya, 2006; McNeil at all, 2003).

Uluslararası Eğitimde Teknoloji Derneği (ISTE), eğitimcilerde bulunması gereken nitelikleri; teknoloji okur-yazarı olma, derslerinde teknolojiden yararlanabilme, öğrencilerini teknoloji kullanmaya yöneltebilme, öğrencilerine bilgiye ulaşma ve bilgiyi kullanma becerilerini kazandırmada öğrenme çevresini teknoloji kullanabilecekleri şekilde düzenleyebilme, bilgi ve iletişim teknolojilerinin etik ve yasal kullanımı konusunda model olma, mesleki gelişimleri ve deneyim paylaşımı için meslektaşları ile internet üzerinden işbirliği yapabilme (ISTE, 2008) olarak belirlemiştir.

Milli Eğitim Bakanlığı (MEB) 2006 Yılında Yayınlanan Öğretmenlik Mesleği Genel Yeterliklerinde BİT alanında öğretmenlerde bulunması gereken becerileri; BİT ile ilgili yasal ve ahlaki sorumlulukları bilme ve bunları öğrencilere kazandırabilme, teknoloji okur-yazarı olma, BİT'deki gelişmeleri izleyebilme, meslekî gelişimini desteklemek ve verimliliğini artırmak için BİT'den yararlanabilme, BİT'den (çevrimiçi dergi, uygulama yazılımları, e-posta, vb.) bilgiyi paylaşma amacıyla yararlanabilme, BİT'i kullanarak farklı deneyimlere, özelliklere ve yeteneklere sahip öğrencilere uygun öğrenme ortamları hazırlayabilme, ders planında BİT'in nasıl kullanılacağına yer verebilme, materyal hazırlamada bilgisayar ve diğer teknolojik araçlardan yararlanabilme, teknolojik ortamlardaki (veritabanları, çevrimiçi kaynaklar vb.) öğretme-öğrenme ile ilgili kaynaklara ulaşabilme ve bunları, doğruluk ve uygunlukları açısından değerlendirebilme, teknoloji kaynaklarının etkili kullanımına model olabilme ve bunları öğretebilme, öğrencilerin farklı ihtiyaçlarını dikkate alarak öğrenci merkezli stratejileri destekleyen teknolojiler kullanabilme, teknoloji yoğun öğrenme ortamlarında davranış yönetimi için stratejiler geliştirebilme ve uygulayabilme, BİT'i kullanarak verileri analiz edebilme, BİT'i kullanarak sonuçlardan velileri, okul yönetimini ve diğer eğitimcileri haberdar edebilme olarak belirlemiştir (MEB, 2006). MEB BDE Projesi Danışma Kurulu (1991) ise, öğretmenlerin bilgi teknolojileri ile ilgili olarak genel yeterliklerine ilişkin hedefleri; bilgisayar okur-yazarlığı için temel becerilere sahip olma, ders yazılımlarını tanıma ve değerlendirme, ders yazılımlarını derste kullanma, ders yazılımlarını kullanmada öğrencilere rehberlik etme, ders yazılımı geliştiren gruplarla iletişim, ders yazılımı senaryoları geliştirme olarak belirlemiştir (Aktaran: Cüre ve Özdener, 2008).

Tüm profesyonel mesleklerde olduğu gibi hemşirelikte de BİT'nin doğru ve etkin kullanımı büyük önem taşımaktadır. Hemşirelik kuruluşları teknolojiyi, hemşirelik uygulamalarının temel yapı taşı olarak kabul etmekte ve teknolojiyi etkili olarak kullanabilme, bilgi, beceri ve tutuma sahip olmayı hemşirelikte aranan bir nitelik olarak vurgulamaktadır. İngiltere Merkez Konseyi (United Kingdom Central Council-UKCC), hemşirelik eğitiminde özellikle yönetim programına giren öğrencilerde, bilgisayar kullanma gibi bazı teknolojik becerileri aramakta ve teknolojiyi, hemşirenin sahip olması gereken anahtar bir beceri olarak tanımlamaktadır. İngiltere Ulusal Sağlık Hizmeti Bilgi Otoritesi (UK National Health Service Information Authority), kendi bünyesinde çalışan tüm hemşireler için temel yeterlilik olarak Avrupa Bilgisayar Kullanım Lisansı aranmasını önermektedir (Wishart ve Ward, 2002). Bununla birlikte, Amerikan Hemşirelik Yüksekokulları Birliği (1998) (American Association of Colleges of Nursing-AACN), Amerikan Hemşireler Birliği (2001), (American Nurses Association-ANA) ve Pew Sağlık Komisyonu (Pew Health Comission), teknoloji kullanımının 21. yüzyılın en önemli yeterliliği olduğuna ve hemşirelik eğitiminde teknolojinin önemine dikkat çekerek, bu konuda bir kitapçık yayınlamışlardır (Bonnel at all, 2005; McNeil at all, 2003). ANA (2001) hemşirelerin, bilgisayar okur-yazarı olmalarının ve detaylı bilişim yeterliliklerine sahip olmalarının gerekliliğini vurgulamıştır (McNeil at all, 2003). Aynı zamanda, Hemşirelik Hizmetleri Ulusal Birliği (2003) (The National Leaque for Nursing's Task Group), hemşire eğitimcilerin BİT yeterliliklerine ilişkin maddeler geliştirmiş, Tıp Enstitüsü (2001) (Institue of Medicine –IOM), sağlık bakımının daha nitelikli hale getirilmesinde güvenli hasta bakımının sağlanmasına özgü teknolojilerin kullanımı konusunda eğitimin önemini vurgulayarak, bunun sağlanmasına ilişkin öneriler getirmiştir (Bonnel at all, 2005). Hemşirelik Ulusal Birliği (1988) (National Leaque for Nursing), BİT'in, hemşirelik eğitiminin temel bir öğesi olması gerektiğini ifade etmiş ve hemşirelik okullarının eğitim programlarının akredite olmasını önermiştir (Saba, 2001).

ISTE'nin eğitimci standartları, MEB Öğretmenlik Mesleği Genel Yeterlikleri, MEB BDE Projesi Danışma Kurulu Öğretmen Genel Yeterlilikleri ve ilgili hemşirelik kuruluşlarının belirttiği yeterlilikler incelendiğinde, eğitimcilerin/hemşire eğitimcilerin teknolojiyi kullanabilmesi, öğrencilerine teknolojiyi kullanabilecek öğrenme yaşantıları düzenleyebilmesi ve teknoloji kullanımında rol modeli olması gerektiği anlaşılmaktadır. Bu yaklaşımla ele alındığında, hemşirelik eğitim programlarının; ileri teknolojiyi doğru ve etkin kullanabilecek, teknolojinin, hemşireliğin değerlerine ve eğitimine etkilerini sürekli değerlendirip gerekli düzenlemeleri yapabilecek donanımda meslek üyeleri mezun edecek biçimde yapılandırılması büyük önem taşımaktadır. Kuşkusuz, bu niteliklere sahip hemşirelerin yetiştirilmesinde hemşirelik eğitim kurumlarına ve bu kurumda görev alan hemşire eğitimcilere önemli rol ve sorumluluklar düşmektedir (Aştı ve Kaya, 2002; Kaya, 2003; Kısa ve Kaya, 2006). Ulusal ve uluslararası eğitim ve hemşirelik kuruluşlarının da vurguladığı gibi eğitimcilerin bu sorumluluğu yerine getirebilmesi için, teknoloji konusunda gerekli bilgi, beceri, tutum ve davranışa sahip olma, teknolojiyi öğretme-öğrenme sürecine entegre edebilme ve etkin biçimde kullanma ve kullanımının yaygınlık kazanmasında lider olma gibi niteliklere sahip olması gerekmektedir (Altun, 2002; Bonnel at all, 2005; Meral ve ark., 1999; McNeil at all, 2003; Odabaşı, 1999Saba, 2001; Wishart ve Ward, 2002; MEB, 2006; ISTE, 2008). Jung (2005), eğitimde/hemşirelik eğitiminde BİT'in etkin ve verimli bir şekilde kullanılması ve BİT'in eğitim programlarına/hemşirelik eğitim programlarına entegre edilmesi için, eğitimcilerin/hemşire eğitimcilerin teknolojinin gücü, yarattığı fırsat ve olanaklar hakkında vizyon geliştirmesinin bir zorunluluk olduğunu vurgulamaktadır .

Literatürde, BİT'in öğretme-öğrenme sürecine entegrasyonunda, eğitimcilerin temel olarak, eğitsel, teknik ve öğretimsel olmak üzere üç tür rolü olduğu belirtilmektedir (Akpınar, 2005; Erden, 1994; Uyangör, 2005; MEB, 2006; ISTE, 2008). Eğitimcilerin;

**Eğitsel rolü* kapsamında, kendi alanında BİT'in en verimli nasıl kullanılacağı konusunda bilgi sahibi olması, bu alandaki çağdaş gelişmeleri ulusal ve uluslararası kuruluşların yayınları doğrultusunda izlemesi, yönetsel girişimlerde bulunması ve çeşitli projelere katılması, öğrencileri teknolojik araç-gereçleri kullanmaya yöneltmesi, alanı ile ilgili öğretici yazılımların geliştirilmesinde yazılımcılarla iletişim kurması, hazır öğretici yazılımları bireysel ve grup etkinliklerinde kullanması,

* *Teknik rolü* kapsamında, teknolojik araç-gereçlerin çalışma sistemini kavraması ve teknoloji okuryazarı olması, donanım kurabilmesi ve programları yedekleyebilmesi, eğitsel yazılımlar üzerinde yeterli deneyime sahip olması ve bir programlama dilini bilmesi, alanı ile ilgili öğretici yazılımları geliştirebilmesi, var olanları seçebilme ve değerlendirebilmesi,
* *Öğretimsel rolü* kapsamında, ders yazılımlarını belirlemesi, yazılımların hedefleri ile öğretim hedeflerinin tutarlılığını değerlendirmesi, yazılımın içeriği ile dersin içeriğinin tutarlılığını belirlemesi, yazılımların öğrencinin hazırbulunuşluk düzeyine uygunluğunu sağlaması, yazılımın eğitim programındaki yerini belirlemesi, öğrencilerin teknolojik araç-gereçleri nasıl kullanacağına karar vermesi, öğrencilerin hedeflenen davranışlara ulaşma derecelerini saptaması ve öğretim faaliyetlerinin etkililiğini belirlemesi önem taşımaktadır. Sözü edilen tüm bu özellikler hemşire eğitimciler için de dikkate alınması gereken özelliklerdir.

Usluel ve arkadaşları'nın (2007) çalışmasında, hizmet öncesi ve hizmet içi eğitim almış öğretmenlerin BİT'in öğretme-öğrenme sürecine entegrasyonunu, bu konuda eğitim almamış öğretmenlere göre daha iyi gerçekleştirdikleri, öğretmenlerin, sınıf içerisinde bilgisayar ve internet teknolojilerinin olmamasını ve BİT'in öğretimde nasıl kullanılacağının bilinmemesini entegrasyon sürecindeki en önemli engeller arasında sıraladıkları belirlenmiştir. Cüre ve Özdener'in (2008) çalışmasında, öğretmenlerin BİT uygulama başarıları ile BİT'e yönelik tutumları arasında yüksek düzeyde pozitif ilişki bulunmuştur. Ayrıca öğretmenlerin, BİT'in, öğrenmeyi kolaylaştırdığına, öğrenci ve öğretmen başarısını arttırdığına, öğrencilerin ilgisini çektiğine ve öğretimin daha etkili olması için BİT uygulamalarının gerekli olduğuna inandıkları saptanmıştır. Ancak öğretmenlerin, kalabalık sınıflarda BİT'ten yararlanmanın zor olduğunu, BİT'i kullanmanın sorumluluklarını arttırdığını düşündükleri belirlenmiştir. Çağıltay ve ark.'nın (2001) çalışmasında, öğretmenlerin, bilgisayarların ders programı ile bütünleştirilmesinin eğitimin kalitesini arttıracağı ve bu konudaki öncelikli gereksinimin, öğretmenlere verilecek bilgisayar eğitimi olduğu vurgulanmıştır. Ayrıca entegrasyon sürecindeki engellerin; yeterli bilgisayar olmaması, öğretim programının buna uygun olmaması ve öğretmenlerin bu konuda yeterince eğitilmemiş olması şeklinde belirtildiği görülmüştür. Gülbahar'ın (2007) çalışmasında, öğretmenlerin, BİT'in kullanımı konusunda kendilerini yeterli gördükleri fakat BİT'in öğretme-öğrenme sürecine entegrasyonu konusunda onlara rehberlik edecek bir kişinin olmadığına dikkat çekilmektedir. Zepp'in (2005), öğretmenlerin eğitim teknolojilerine yönelik rollerinin algılanışı konulu araştırmasında, öncelikle eğitimcilerin, eğitimin temel amaç ve hedeflerinin ve hangi hedeflere teknolojiyi kullanarak en iyi şekilde ulaşılacağının, teknolojinin eğitimdeki çeşitli rollerinin ve öğretmen-teknoloji sinerjisinin nasıl oluşturulabileceğinin farkında olmaları gerektiği sonucuna ulaşıldığı görülmüştür. Demiraslan ve Usluel'in (2005) araştırmasında, öğretmenlerin çoğunluğunun bilgisayar kullanabilmesine karşın BİT'in öğretme-öğrenme sürecine entegrasyonuyla ilgili herhangi bir etkinlikte bulunmadıkları belirlenmiştir. Ayrıca, BİT'in okullarda uygulanması konusunda yapılan çalışmaların, BİT'in öğretme-öğrenme sürecine etkili entegrasyonu için eğitimcilerin gerekli bilgi ve becerilere sahip olmalarının ön koşul olduğu görüşünde birleştiklerini belirtmişlerdir. Moule'un (2003) araştırmasında, hemşirelik öğrencilerinin, BİT'in hasta kayıtlarını girmek dışında hemşirelik uygulamalarında ne işe yaradığını ve ne için kullanıldığını anlamadıklarını ve öğrenimleri süresince hemşirelik uygulamalarında BİT'i etkin kullanmak konusunda eğitim almadıklarını ifade ettikleri görülmüştür. Kısa ve Kaya'nın (2006) araştırmasında, hemşire öğretim elemanlarının teknolojiyi eğitime entegre etmede olumlu tutuma sahip oldukları ancak kişilerarası ilişkileri azaltacağı konusunda endişe yaşadıkları saptanmıştır. Dicle ve ark.'ının (2001), hemşirelik öğrencilerinde probleme dayalı öğrenim modelinde temel bilgi teknolojileri kullanımını ele aldıkları çalışmada, interneti bilgi edinme amaçlı kullanan ve tarama yapabilen öğrencilerin oranı düşük bulunmuş, öğrencilerin çoğunluğunun temel bilgi teknolojileri dersini tekrar almak istedikleri belirlenmiştir. Şenyuva'nın (2007) hemşirelik eğitiminde web tabanlı öğretim yönteminin kullanılabilirliği ile ilgili araştırmasında, öğrencilerin %59,3'ünün, hemşirelik eğitiminde bazı ders ya da uygulamaların web tabanlı uzaktan eğitim yöntemi ile etkili ve verimli bir şekilde uygulanabileceğini ve %90,4'ünün web tabanlı eğitim yöntemi ile verilen bir derse katılmak istediklerini ifade ettikleri görülmüştür. İlgili çalışmalar, BİT'in eğitim programlarında/hemşirelik eğitim programlarında yer almasının ve eğitimcilerin/hemşire eğitimcilerin teknoloji entegrasyonu konusunda gerekli bilgi ve becerilere sahip olmalarının gerekli olduğunu göstermektedir (Demiraslan ve Usluel 2005; Gülbahar, 2007; Usluel ve ark. 2007; Kısa ve Kaya, 2006; Moule, 2003; Cüre ve Özdener 2008; Çağıltay ve ark., 2008; Zepp, 2005). Bu bağlamda eğitimcilerin/hemşire eğitimcilerin, eğitim sistemide birincil değişim temsilcileri olarak görüldüğü, bu nedenle BİT'in sınıf ortamında kullanımı konusuyla ilgilenenlerin öncelikli olarak eğitimcileri ele aldığı dikkati çekmektedir. Yapılan araştırmalarda; BİT'in öğretme-öğrenme sürecine entegrasyonunun, eğitimcilerin, BİT'in potansiyelinin farkına varmalarına, öğrenci gereksinimlerine uygun araç ve yöntemleri seçmelerine, öğretimi etkin ve verimli bir biçimde tasarlamalarına ve yeni öğretim stratejileri geliştirmelerine, teknoloji destekli öğrenme ortamlarındaki sorunlarla başa çıkmada sınıf yönetimi kurallarını bilip uygulamalarına bağlı olduğu ifade edilmektedir. Dolayısıyla, BİT'nin entegrasyon süreci incelenirken, eğitimcilerin BİT ile ilgili inançlarına, bilgilerine ve mevcut BİT kullanım seviyelerine ilişkin bilgi sahibi olmanın ön koşul olduğu söylenebilir (Demiraslan ve Usluel 2005; Gülbahar, 2007; Usluel ve ark. 2007; Kısa ve Kaya, 2006; Moule, 2003; Cüre ve Özdener 2008; Çağıltay ve ark., 2008; Zepp, 2005).

Hemşirelik öğrencilerini geleceğe hazırlamak, yaşamboyu profesyonel gelişimi desteklemek ve nitelikli hemşirelik bakımı sunulmasını sağlamak için hemşire eğitimcilerin; hemşirelik eğitimi ve uygulamalarında BİT'e ilişkin bilgi, beceri ve olumlu tutuma sahip olmaları ve bunu yaşama geçirmeleri önem taşımaktadır (Bayık, 2001; Kaya, 2003; Kısa ve Kaya, 2006; McNeil at all, 2003; Şenyuva Akçin, 2006). Bu doğrultuda;

- BİT ve BİT kullanımı ile ilgili konulara hemşirelik eğitimi programlarında yer verilmeli,
- Eğitim kurumları ve eğitimciler, BİT kullanımı konusunda gerekli donanıma sahip olmalı,
- Kurum içinde sürekli eğitim etkinlikleri kapsamında BİT ile ilgili eğitim programları düzenlenmeli ve hemşire eğitimcilerin bu programlara katılımları teşvik edilmeli,
- Yüksekokul, fakülte ya da kampüste eğitim teknolojisi merkezleri kurulmalı ve hemşire eğitimcilere teknisyen desteği ile gereksinim duyduğu teknolojik araç-gereçler sağlanmalıdır.

Sonuç olarak, içinde yaşadığımız çağda değişim ve gelişmelerin gerisinde kalmamak için hemşire eğitimcilerin BİT'in, hemşireliğe sağlayacağı katkıları, olanakları, fırsatları temel değerler, etik ilkeler ve mesleki idealler doğrultusunda olumsuz özelliklerini de dikkate alarak eğitim programlarını titizlikle gözden geçirmeleri ve gerekli düzenlemeleri yapmaları gerektiği kaçınılmaz bir gerçektir.

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BİLGİSAYAR DESTEKLİ MATEMATİK ve GEOMETRİ ÖĞRETİMİ İLE İLGİLİ ÇALIŞMALARIN İNCELENMESİ

REVIEW OF COMPUTER ASSISTED MATHS AND GEOMETRY TEACHING STUDIES

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Özet: Tüm alanların öğretiminde kullanılabilen bilgisayar destekli öğretimin özellikle matematik ve geometri derslerinde soyut kavramların somutlaştırılmasını görsel öğelerle destekleyerek kolaylaştırdığından içeriğin aktarımını ve anlaşılmasını kolaylaştırdığı söylenebilir. Bilgisayar destekli öğretimin matematik ve geometri öğretimi üzerindeki etkileri göz önüne alınarak bu çalışmada bilgisayar destekli matematik ve geometri öğretimi ile ilgili yapılan çalışmalar araştırma yöntemi, örnekleme yöntemi, örneklem grubu ve büyüklüğü, veri toplama araçları, vb. ölçütlere göre incelenmiştir. Ancak alanda yapılan çalışma sayısının çokluğu göz önüne alınarak çalışmada Türkiye'de eğitim teknolojisi alanında öncü Uluslararası Eğitim Teknolojileri Konferansı ile Uluslararası Bilgisayar ve Öğretim Teknolojileri Sempozyumunda sunulmuş ve yayınlanmış bilgisayar destekli matematik ve geometri öğretimi konusunda yapılan çalışmalar ele alınmıştır.
Anahtar Sözcükler: Bilgisayar destekli öğretim, matematik öğretimi, geometri öğretimi, bilgisayar destekli matematik öğretimi, bilgisayar destekli geometri öğretimi

Abstract: Computer-assisted instruction can be used in all fields of education but especially in Maths and Geometry. It is posibble to say that computer assisted instruction facilitates transfering and understanding of the content with visual supports which make discrete concepts to concrete. Taking into consideration the impact of computer assisted instruction in Maths and Geometry instruction, in this study, the studies about computer assisted Maths and Geometry instruction analyzed in accordance with the criteria of research method, sampling method and sample size, data collection tools, etc.. Further more, by considering the majority of the studies in the field, studies with respect to the mentioned criterias which are published in proceeding of International Educational Technology Conference and the International Computer and Instructional Technology Symposiums.
Key Words: Computer assisted instruction, maths instruction, geometry instruction, computer assisted maths instruction, computer assisted geometry instruction

GİRİŞ

Teknolojideki gelişmeler sonucu günlük hayatta sıklıkla kullanılan bilgisayarlar beraberinde eğitimde kullanımının da getirmiştir. Bilgisayarların eğitimde kullanılması öğrencilerin dersleri daha eğlenceli görmesini sağlarken, öğretmenlerin de dersi anlatandan çok rehber eden, yönlendiren durumuna geçmesine olanak sağlamıştır. Günümüzde yapılandırmacı eğitimin üzerine vurgu yapan Yeni İlköğretim Eğitim Programı göz önüne alındığında da derslerin, bilgisayar destekli olarak öğretilmesinin, derslerin ezbere dayalı olmaması, kalıcı ve eğlenceli açısından faydalı olacağı düşünülmektedir. Bilgisayarların eğitimde kullanım etkilerinin başında öğrenene tüm derslerde kendi hızıyla öğrenme olanağı sağlamasının geldiği söylenebilir. İlköğretimde korkulan derslerin başında gelen matematik ve özellikle geometri dersleri açısından bakıldığında ise öğrenciler için soyut dersler olarak görülen bu derslerde kullanılan bilgisayar programların öğrencilerin öğrenmelerine olumlu etkilerinin olacağı düşünülebilir. Bu tür bir öğrenme sürecinde öğrencilerin derslerde keşfederek öğrenecekleri ve öğrendiklerini hatırlamalarının daha kolay olacağı söylenebilir.

Alanyazında matematik ve geometri derslerinin bilgisayar kullanılarak daha görsel ve eğlenceli hale getirildiği ve bu derslerde her seviyeden öğrencilerin başarılarında artış görüldüğü belirtilmektedir. Nitekim Mercan, Filiz, Göçer ve Özsoy (2009) tarafından yapılan "Bilgisayar Destekli Eğitim ve Bilgisayar Destekli Öğretimin Dünyada ve Türkiye'de Uygulamaları" başlıklı 166 öğrenciye anket uygulanarak gerçekleştirilen proje çalışmasında bilgisayarla işlenen derslerde başarının arttığı görülmüştür. Aktümen ve Kaçar (2008) tarafından yapılan çalışmada bilgisayar cebiri sistemlerinden biri olan Maple programı kullanımının öğrencilerinin matematiğe olan tutumuna etkisi araştırılmıştır. Araştırmada yer alan iki gruptan birisinde gruplarından biri, sadece yapılandırmacı yaklaşım ilkelerine göre belirli integral kavramını işlerken diğer grup yapılandırmacı yaklaşım ilkelerine ek olarak Maple programı ile araştırmacı tarafından geliştirilen yazılımlardan da yararlanarak belirli integral kavramını işlemiştir. Araştırmada Maple kullanan öğrencilerin matematiğe yönelik tutumlarının daha olumlu olduğunu sonucuna ulaşılmıştır. Olkun (2003) tarafından yapılan çalışmada ise bilgisayarın iki boyutlu geometriyi öğrenmeye etkisi araştırılmıştır. Araştırmada 93 tane 4. ve 5. sınıf öğrencisi, bilgisayar, somut modeller ve kontrol olmak üzere üç gruba ayrılmıştır. Bilgisayar grubu, bilgisayar destekli tangram bulmacasını çözerlerken, somut modeller grubu tahta tangram bulmacasını çözmüşlerdir. Uygulamanın sonunda bilgisayar grubu biraz daha fazla olmak üzere, bilgisayar ve somut modeller grubunda iki boyutlu şekillerle ilgili olarak kontrol grubuna göre daha fazla gelişme görülmüştür. Güven ve Karataş (2003) tarafından yapılan araştırmada dinamik geometri yazılımı Cabri ile oluşturulan bilgisayar destekli öğrenme ortamına yönelik öğrenci görüşleri belirlenmeye çalışılmıştır. Cabri geometri yazılımı ile geliştirilen bilgisayar destekli materyaller, 40 ilköğretim 8. sınıf öğrencisine uygulanmış, öğrencilerin 20'si ile yapılandırılmamış görüşmeler gerçekleştirilmiş ve öğrencilerin dinamik geometri yazılımı ile geometri öğrenme konusundaki görüşleri alınmıştır. Araştırmada öğrencilerin genelde matematiğe özelde ise geometriye yönelik görüşlerinin olumlu yönde değiştiği ve dinamik geometri ortamlarını çok yararlı buldukları sonuçlarına ulaşılmıştır. Ayrıca elde edilen verilerden, hazırlanan keşfetme etkinliklerinin öğrencilere matematiksel güven kazandırdığı belirlenmiştir.

Alanyazındaki makale inceleme ya da meta-analiz çalışmaları incelendiğinde bu çalışmaların belirli dergilerde yayımlanan makalelerin tümünün incelenmesinin yanı sıra belirli bir konu alanında da gerçekleştirildiği de görülmektedir. Alper ve Gülbahar (2009) tarafından yapılan çalışmada konu sınırlamasına gidilmeden Turkish Online Journal of Educational Technology-TOJET dergisinde 2003-2007 yılları arası yayınlanan makaleler konu, yazar sayısı, araştırma teorisi, araştırma modeli, örneklem büyüklüğü, evren örneklem grubu, örneklem seçim yöntemi, veri toplama yöntemleri, kaynaklar, değişken sayıları ve araştırma paradigması boyutları göz önünde alınarak incelenmiştir. Bu çalışmada, bilgisayar destekli ve çevrimiçi teknolojiler ile bunların eğitime entegrasyonu konularının çalışıldığı, araştırmaların çoğunlukla bir yada iki kişi ile yapıldığı, çalışmalardaki katılımcıların çoğunluğunu ilköğretim ve ortaöğretim düzeyinde öğrencilerin oluşturduğu, araştırmalarda en fazla teknolojiyle zenginleştirilmiş öğrenme ortamlarını kullanıldığı, araştırma modeli olarak literatür inceleme ve tarama modelinin diğer modellere göre daha fazla kullanılmış olduğu, örneklem seçiminde yeterli büyüklüğe ulaşıldığı ve genellikle ulaşılabilir örnekleme tercih edildiği, çok çeşitli veri toplama araçlarını kullanıldığı, ulusal kaynakların kullanımını artmasına rağmen, uluslar arası kaynakların fazla olması, bağımlı ve bağımsız değişken sayıları ile ilgili yeterli bilgiye ulaşılamadığı ve nicel ve nitel

yöntemlerin her ikisinin de araştırmacılar tarafından tercih edildiği sonuçlarına ulaşılmıştır. Uzunboylu ve Çınar (2009) tarafından yapılan çalışmada 1990–2008 yılları arasında bilgisayar destekli dil öğrenimi ile ilgili araştırma ve yönelimleri belirlenmeye çalışılmıştır. Bu amaç doğrultusunda bilgisayar destekli dil öğrenme çalışmaları; doküman türü, yayın dili, yayın yılı, yayınlandığı kaynak, yazarlar, sıklıkla kullanılan anahtar kelimeler, yıllara göre atıf durumu dağılımı ve en çok atıf yapılan eserler boyutları açısından incelenmiştir. Çalışmanın sonuçları incelendiğinde, bilimsel makalenin en fazla yayınlanan dokümanlar olduğu ve bu alanda yapılan çalışmaların çoğunluğunun iki veya daha fazla yazarlı olduğu görülmüş ve bilgisayar destekli dil öğrenme ile ilgili dokümanların 1997 yılından sonra belirgin bir artış gösterdiği, 2005 yılında ise en üst noktasına ulaştığı sonucu elde edilmiştir. Ulutaş ve Ubuz (2008) tarafından yapılan çalışmada ise matematik eğitimindeki eğilimi belirlemek için 2000-2006 arasında yayınlanan 129 tane makale incelenmiştir. Araştırmada, çoğu çalışmanın ilköğretim öğrencileri ve öğretmen adayları ile yürütüldüğü, araştırmaların bilişsel, duyuşsal boyutlar ve öğretim yöntemleri konularında yapılan deneysel çalışmaların olduğu, nicel araştırmaların test ve anket kullanılarak yapıldığı, matematiksel konu başlıkları bazında ise en fazla yayının sayılar ve geometri konularında yapıldığı belirlenmiştir. Şimşek, Özdamar, Becit, Kılıçer, Akbulut ve Yıldırım (2008) tarafından yapılan çalışmada ise Türkiye'de eğitim teknolojilerindeki güncel eğilimler belirlenmeye çalışılmıştır. Amaca uygun şekilde Anadolu, Ankara, Ortadoğu Teknik, Marmara ve Hacettepe üniversitelerinden belirlenen 64 tez incelenmiştir. Çalışma sonucunda eğitim teknolojisi araştırmalarının nicelik ve niteliği üniversitelere göre ciddi biçimde farklılaştığı, her üç araştırmadan ikisinin deneysel modelle yapıldığı ve orta düzey istatistiksel yöntemler kullanıldığı, diğer araştırmaların genel tarama modeline dayandığı ve başlangıç düzeyinde istatistiksel teknikler kullanıldığı, araştırmaların tamamına yakın bir bölümü örgün eğitim sisteminde öğrenim görmekte olan denek ya da katılımcılar üzerinde yapıldığı, yalnızca birkaç araştırma örgün eğitim sisteminin dışındaki eğitsel ortamlarda tamamlandığı sonucuna ulaşılmıştır. Bunların yanı sıra çalışmada veri toplama aracı olarak deneysel modeldeki araştırmalarda çoğunlukla başarı testleri ve tutum ölçeklerinin kullanıldığı ve bunlar için genellikle orta düzeyde güvenirlik katsayıları rapor edildiği, tarama araştırmalarında ise anket uygulaması, örnek olay incelemesi ve içerik çözümlemesinin temel alındığı, alt çalışma konusu olarak bilgisayarlı sistemlerde öğrenmenin ağırlıkta olduğu, bunu sırasıyla öğretim tasarımı değişkenleri ve öğrenme yaklaşımlarıyla ilgili çalışmaların izlediği sonuçlarına ulaşılmıştır. Çalışmada ayrıca Türkiye'de eğitim teknolojisi alanıyla ilgili birçok konuda henüz çalışma yapılmadığı, varolan çalışmalarda da özellikle iç ve dış geçerlik bakımından ciddi sorunlar bulunduğu sonuçları elde edilmiştir. Çetin, Şendurur, Şendurur ve Çağıltay (2007) tarafından yapılan çalışmada ise matematik eğitiminde bilgisayarlarla ilgili öğrencilerin performansları incelenmiştir. Bu amaç doğrultusunda 2002-2007 yıllarında çeşitli veri tabanlarında taranan ve belirlenen ölçütlere uygun olan 15 çalışma incelenmiştir. Araştırmada incelenen çalışmaların %62,5'inde bilgisayar gruplarının performanslarında anlamlı bir fark çıktığı görülmüştür ve teknoloji kullanılan sınıfların öğrencilerin matematik performanslarını artırdığı sonucu elde edilmiştir. Lisans düzeyinde bilgisayar gruplarında anlamlı bir fark çıkarken, lise düzeyinde yapılan çalışmalarda anlamlı bir fark görülmediği, ilköğretim seviyesinde ise her iki sonuca da rastlandığı elde edilen sonuçlar arasındadır. Şahin (2005) tarafından yapılan araştırmada internet tabanlı uzaktan eğitimin etkililiği konusunda bir meta analiz çalışması gerçekleştirilmiştir. Çalışmada 1994-2004 yılları arasında internet tabanlı uzaktan eğitimin etkililiğini yüz yüze eğitimle karşılaştıran nicel çalışmalar derlenerek meta analiz yöntemiyle birleştirilmiş, bu kapsamda 58 çalışma incelenmiştir. Araştırmada internet tabanlı uzaktan eğitimin yüz yüze yapılan eğitime göre daha başarılı olduğu sonucu elde edilmiştir.

Alanyazında bilgisayar destekli matematik ve geometri öğretimiyle ilgili çok sayıda araştırma bulunmaktadır. Bu çalışmada bilgisayar destekli matematik ve geometri öğretimiyle ilgili olarak yapılan çalışmalar belirli ölçütlere göre incelenmiştir. Bu incelemenin günümüze kadar ağırlıklı olarak ne tür çalışmalar yapıldığının ve hangi konular üzerinde daha fazla durulduğunun görülmesi açısından önemli olduğu ayrıca çalışmanın ileride yapılacak olan bilgisayar destekli matematik ve geometriyle ilgili çalışmalara da ışık tutacağı düşünülmektedir.

YÖNTEM

Bilgisayar destekli matematik ve geometri öğretimi çalışmalarını belirli ölçütlere göre incelemek amacıyla gerçekleştirilen çalışmada tarama modeli kullanılmıştır. Alanda yapılan çalışma sayısının çokluğu göz önüne alınarak çalışmada Türkiye'de eğitim teknolojisi alanında öncü Uluslararası Eğitim Teknolojileri Konferansı (International Educational Technology Conference - IETC) ve Uluslararası Bilgisayar ve Öğretim Teknolojileri Sempozyumunda (International Computer and Instructional Technologies Symposium - ICITS) sunulmuş olan 117 tane bilgisayar destekli matematik ve geometri öğretimi konusunda yapılan çalışmalar çalışılan konu, yazar sayısı, araştırma türü, araştırma modeli, evren-örneklem (okul seviyesi), örneklem seçim yöntemi, örneklem büyüklüğü ve veri toplam araçları ölçütlerine göre incelenmiştir.

BULGULAR

Çalışılan Konu

Yapılan incelemede, gerçekleştirilen çalışmalarda bilgisayar destekli matematik/geometri öğretiminin özellikle tutuma, algıya, inanca ve başarıya etkisinin ele alındığı görülmüştür. Bu başlıklar temel alınarak ele alınan konularda ise, yazılım incelemesi, bilgisayar destekli öğretimin bir konuya uygulanması, öğretmenlerin derslerinde bilgisayar kullanımı, oyun ile öğretim, simülasyonlar ve matematiksel okuryazarlık gibi konuların öne çıktığı belirlenmiştir.

Yazar Sayısı

Ele alınan çalışmalardaki yazar sayıları yıllar temel alınarak her iki bilimsel etkinlik temelinde incelenmiştir. IETC'de sunulan çalışmalardaki yazar sayılarına ilişkin dağılım Tablo 1A'da, ICITS'de sunulan çalışmalardaki yazar sayılarına ilişkin dağılım Tablo 1B'de yer almaktadır.

Tablo 1A: IETC'de sunulan çalışmalardaki yıllara göre yazar sayısı dağılımı

Yazar Sayısı	2002	2003	2004	2005	2006	2007	2008	2009	Toplam
1	2	1	2	-	1	-	4	1	11
2	4	-	4	6	5	9	10	2	40
3	-	-	1	1	2	2	9	1	16
4	-	1	-	2	1	-	-	-	4
5	-	-	-	-	1	-	-	-	1

Tablo 1B: ICITS'de sunulan çalışmalardaki yıllara göre yazar sayısı dağılımı

Yazar Sayısı	2007	2008	2009	Toplam
1	3	1	2	6
2	3	10	8	21
3	4	3	3	10
4	3	1	4	8
5	-	-	-	-

Tablolardan da görüldüğü gibi ilgili bilimsel etkinliklerde en çok iki yazarlı çalışmaların gerçekleştirildiği, üç yazarlı çalışmaların ise tek yazarlı çalışmalardan fazla olduğu görülmektedir.

Araştırma Türü

Ele alınan çalışmalardaki araştırma türü yıllar temel alınarak her iki bilimsel etkinlik temelinde incelenmiştir. IETC'de sunulan çalışmalardaki araştırma türlerine ilişkin dağılım Tablo 2A'da, ICITS'de sunulan çalışmalardaki araştırma türlerine ilişkin dağılım Tablo 2B'de yer almaktadır.

Tablo 2A: IETC'de sunulan çalışmalardaki yıllara göre araştırma türü dağılımı

Araştırma Türü	2002	2003	2004	2005	2006	2007	2008	2009	Toplam
Nicel	6	2	5	8	7	8	15	3	54
Nitel	-	-	1	1	2	3	8	1	16
Karma	-	-	1	-	1	-	-	-	2

Tablo 2B: ICITS'de sunulan çalışmalardaki yıllara göre araştırma türü dağılımı

Araştırma Türü	2007	2008	2009	Toplam
Nicel	10	7	11	28
Nitel	3	5	5	13
Karma	-	1	1	2

Elde edilen değerlere göre her iki bilimsel etkinlik kapsamında gerçekleştirilen çalışmalarda en çok kullanılan araştırma türünün nicel araştırmalar olduğu bunu sırasıyla nitel araştırmaların izlediği, karma çalışmaların ise çok az sayıda gerçekleştirildiği belirlenmiştir.

Araştırma Modeli

Ele alınan çalışmalardaki araştırma modeli yıllar temel alınarak her iki bilimsel etkinlik temelinde incelenmiştir. IETC'de sunulan çalışmalardaki araştırma modellerine ilişkin dağılım Tablo 3A'da, ICITS'de sunulan çalışmalardaki araştırma modellerine ilişkin dağılım Tablo 3B'de yer almaktadır.

Tablo 3A: IETC'de sunulan çalışmalardaki yıllara göre araştırma modeli dağılımı

Araştırma Türü	Araştırma modeli	2002	2003	2004	2005	2006	2007	2008	2009	Toplam
Nicel	*Tarama*	3	2	4	8	6	3	9	1	36
	Deneysel	3	-	1	-	2	5	6	2	19
Nitel	*Durum Çalışması*	-	-	1	1	-	-	5	1	8
	Eylem araştırması	-	-	-	-	-	2	1	-	3
	Doküman analizi	-	-	-	-	-	-	2	-	2
	Belirtilmemiş	-	-	1	-	3	1	-	-	5

Şekil 3A: IETC'de sunulan çalışmalardaki yıllara göre araştırma modeli dağılımı

Araştırma Türü	Araştırma modeli	2007	2008	2009	Toplam
Nicel	*Tarama*	6	7	6	19
	Deneysel	4	1	6	11
Nitel	*Durum çalışması*	-	2	4	6
	Eylem araştırması	-	1	-	1
	Doküman analizi	-	1	-	1
	Belirtilmemiş	3	3	2	8

Tablolardan da görüldüğü her iki bilimsel etkinlik kapsamında gerçekleştirilen çalışmaların büyük çoğunluğunda nicel araştırma türü temelinde tarama modelinin, nitel araştırma türü temelinde ise durum çalışmalarının daha fazla kullanıldığı görülmektedir. Ayrıca nitel araştırma paradigması temel alınarak gerçekleştirilen araştırmalarda genel olarak bir artışı olduğu göze çarpmaktadır.

Evren-Örneklem

Ele alınan çalışmalardaki evren-örneklem yıllar temel alınarak her iki bilimsel etkinlik temelinde incelenmiştir. IETC'de sunulan çalışmalardaki evren-örnekleme ilişkin dağılım Tablo 4A'da, ICITS'de sunulan çalışmalardaki evren-örnekleme ilişkin dağılım Tablo 4B'de yer almaktadır.

Tablo 4A: IETC'de sunulan çalışmalardaki yıllara göre evren-örneklem dağılımı

Evren-Örneklem Grubu	2002	2003	2004	2005	2006	2007	2008	2009	Toplam
Okulöncesi	-	-	-	-	-	-	1	-	1
İlköğretim	1	-	2	-	2	5	7	2	19
Ortaöğretim	1	-	-	-	-	-	1	-	2
Yükseköğretim	2	1	2	1	3	5	8	-	22
Yetişkin	1	-	-	3	1	1	5	1	12

Tablo 4B: ICITS'de sunulan çalışmalardaki yıllara göre evren-örneklem dağılımı

Evren-Örneklem Grubu	2007	2008	2009	Toplam
Okulöncesi	-	1	-	1
İlköğretim	3	2	5	10
Ortaöğretim	-	-	2	2
Yükseköğretim	4	5	4	13
Yetişkin	-	1	3	4
Belirtilmemiş	2	-	-	2

Çalışılan örneklem grubunda yüksek öğretim öğrencileriyle yapılan çalışma sayısının daha fazla olduğu bunu sırasıyla ilköğretim öğrencilerinin izlediği görülmektedir. Ayrıca evren-örneklem grubu olarak yetişkinlerden sonra sırasıyla ortaöğretim ve okul öncesi öğrencilerinin geldiği belirlenmiştir.

Örneklem Seçim Yöntemi

Ele alınan çalışmalardaki örneklem seçim yöntemi yıllar temel alınarak her iki bilimsel etkinlik temelinde incelenmiştir. IETC'de sunulan çalışmalardaki örnekleme seçim yöntemine ilişkin dağılım Tablo 5A'da, ICITS'de sunulan çalışmalardaki örnekleme seçim yöntemine ilişkin dağılım Tablo 5B'de yer almaktadır.

Tablo 5A: IETC'de sunulan çalışmalardaki yıllara göre örnekleme seçim yöntemi dağılımı

Örneklem Seçim Yöntemi	2002	2003	2004	2005	2006	2007	2008	2009	Toplam
Olasılıklı Örnekleme	1	-	-	2	-	1	1	-	5
Olasılıklı Olmayan Örnekleme	1	1	1	1	2	6	4	1	17
Çalışma Evreni	3	-	3	-	3	11	11	2	33

Tablo 5B: ICITS'de sunulan çalışmalardaki yıllara göre örnekleme seçim yöntemi dağılımı

Örneklem Seçim Yöntemi	2007	2008	2009	Toplam
Olasılıklı Örnekleme	1	-	-	1
Olasılıklı Olmayan Örnekleme	1	3	5	9
Çalışma Evreni	5	6	8	19

Tablolardan da görüldüğü gibi örneklem seçiminde çoğunlukla olasılıklı olan ya da olmayan örneklem seçim yönteminin kullanılmadığı daha çok çalışma evreniyle çalışılmaların gerçekleştirildiği belirlenmiştir.

Örneklem Büyüklüğü

Ele alınan çalışmalardaki örneklem büyüklükleri yıllar temel alınarak her iki bilimsel etkinlik temelinde incelenmiştir. IETC'de sunulan çalışmalardaki örneklem büyüklüklerine ilişkin dağılım Tablo 6A'da, ICITS'de sunulan çalışmalardaki örneklem büyüklüklerine ilişkin dağılım Tablo 6B'de yer almaktadır.

Tablo 6A: IETC'de sunulan çalışmalardaki yıllara göre örneklem büyüklüğü dağılımı

Örneklem Büyüklüğü	2002	2003	2004	2005	2006	2007	2008	2009	Toplam
1-29	-	1	1	2	3	1	7	-	15
30-59	-	-	2	-	-	7	6	1	16
60-89	2	-	1	-	2	1	1	2	9
90-119	2	-	-	-	-	1	-	-	3
120-149	-	-	-	-	-	1	3	-	4
150-179	-	-	-	-	-	-	2	-	2
180 ve üstü	-	-	-	2	-	-	-	-	2
Belirtilmemiş	1	-	-	-	1	-	-	-	2

Tablo 6B: ICITS'de sunulan çalışmalardaki yıllara göre örneklem büyüklüğü dağılımı

Örneklem Büyüklüğü	2007	2008	2009	Toplam
1-29	2	4	3	9
30-59	1	7	2	10
60-89	2	1	2	5
90-119	-	-	1	1
120-149	1	-	-	1
150-179	-	-	1	1
180 ve üstü	1	1	-	2
Belirtilmemiş	2	-	-	2

Tablolardan da görüldüğü gibi örneklem gruplarının büyüklüklerinin çoğunlukla 90 ve daha az olması tercih edilmiştir. Örneklem büyüklükleri 90 ve üstünde olan araştırmaların ise daha az sayıda olduğu belirlenmiştir.

Veri Toplama Araçları

İncelenen çalışmalardaki veri toplama araçları yıllar temel alınarak her iki bilimsel etkinlik temelinde incelenmiştir. IETC'de sunulan çalışmalardaki veri toplama araçlarına ilişkin dağılım Tablo 7A'da, ICITS'de sunulan çalışmalardaki veri toplama araçlarına ilişkin dağılım Tablo 7B'de yer almaktadır.

Tablo 7A: IETC'de sunulan çalışmalardaki yıllara göre veri toplama araçlarının dağılımı

Veri Toplama Araçları	2002	2003	2004	2005	2006	2007	2008	2009	Toplam
Anket	2	1	1	2	1	1	4	-	12
Ölçek	1	-	-	1	1	4	4	1	12
Başarı Testi	2	-	2	-	2	3	4	2	15
Görüşme formu	-	-	2	1	3	4	8	1	19
Gözlem formu	-	-	-	-	1	1	-	-	2
Video kaydı	-	-	-	-	1	-	1	-	2
Özdeğerlendirme formu	-	-	-	-	1	-	1	-	2
Diğer	1	-	-	-	-	2	4	-	7

Tablo 7B: ICITS'de sunulan çalışmalardaki yıllara göre veri toplama araçlarının dağılımı

Veri Toplama Araçları	2007	2008	2009	Toplam
Anket	-	3	-	3
Ölçek	3	1	2	6
Başarı Testi	3	-	6	9
Görüşme formu	1	4	6	11
Gözlem formu	2	1	1	4
Video kaydı	-	1	-	1
Özdeğerlendirme formu	1	-	-	1
Diğer	3	1	4	8

Tablolardan görüldüğü gibi nicel çalışmaların deneysel modellerinde çoğunlukla başarı testinin kullanıldığı tarama modellerinde ise ölçek ve anket kullanımının çoğunlukta olduğu belirlenmiştir. Nitel çalışmalarda ise en çok kullanılan veri toplama aracının görüşme formu olduğu belirlenmiştir.

SONUÇ ve TARTIŞMA

Her iki bilimsel etkinlik kapsamında incelenen çalışmalarda iki yazarlı çalışmaların fazla olduğu, çok yazarlı çalışmaların az sayıda olduğu belirlenmiştir. Benzer şekilde Uzunboylu ve Çınar (2009) tarafından yapılan araştırmada da çalışmaların çoğunluğunun iki veya daha fazla

yazarlı olduğu belirlenmiştir. Bunun nedeni araştırmacıların işbirliğine dayalı çalışmadan çok, bireysel olarak çalışmayı tercih etmeleri ve grup halinde çalışmanın getirdiği zorluklar olabilir. Alper ve Gülbahar (2009) tarafından yapılan çalışmada ise tek yazarlı makalelerin fazla olduğu görülmüştür. Bu sonucun ortaya çıkmasında akademik yükselmelerde tek yazarlı gerçekleştirilen özellikle makale çalışmalarının daha fazla puan getirmesinin etkili olduğu söylenebilir

Çalışmada nicel araştırmaların nitel araştırmalara göre daha fazla tercih edildiği görülmüştür. Bunun nedeni matematiğin özellikle deneysel çalışmalarda işlemsel boyutunun olması nedeniyle nicel araştırma için daha uygun görülmesi olabilir. Ayrıca çalışmada nitel araştırmalara olan ilginin son yıllarda arttığı belirlenmiştir. Alper ve Gülbahar (2009) tarafından yapılan çalışmada da, nitel çalışmaların son yıllarda arttığı sonucuna ulaşılmıştır. Şimşek, Özdamar, Becit, Kılıçer, Akbulut ve Yıldırım (2008) tarafından yapılan araştırmada nicel çalışmaların ağırlıkta olduğu bunu karma çalışmaların izlediği belirlenmiştir. Bu sonucun ortaya çıkmasında araştırmacıların positivizm felsefesine bağlı olarak nicel araştırma paradigmasına dayalı eğitimler almaları ve nitel araştırmanın alanyazında yeni yeni kabul görmesinin etkili olduğu söylenebilir.

Araştırma modelleri temel alındığında nicel araştırmalarda en çok tarama modelinin, nitel araştırmalarda ise durum çalışmasının kullanıldığı görülmüştür. Alper ve Gülbahar (2009) tarafından yapılan çalışmada benzer şekilde tarama modelinin daha fazla kullanıldığı sonucuna ulaşılmıştır. Şimşek, Özdamar, Becit, Kılıçer, Akbulut ve Yıldırım (2008) tarafından yapılan çalışmada ise nitel çalışmalarda durum çalışması fazla olmasına rağmen, nicel çalışmalarda deneysel modelin öne çıktığı belirlenmiştir. Bunun nedeni incelenen konu alanının daha geniş ve farklı olması geniş olması olabilir.

Bir başka ölçüt olan evren-örneklem seçiminde ise, yükseköğretimde okuyan öğrencilerin çalışmalarda daha fazla tercih edildiği görülmektedir. Bunun nedeni araştırmacıların çoğunluğun akademisyen olması nedeniyle en rahat erişebildikleri gurubun yükseköğretim öğrencileri olması olabilir. Ortaöğretim öğrencilerinin evren-örneklem grubu olarak oldukça az kullanıldığı göze çarpmaktadır. Bunun sebebi, o yaş grubundaki öğrencilerin sınav ve ders yüklerinin daha fazla olması bu nedenle araştırmalarda yeterli performans göstermeyebileceklerinin düşünülerek tercih edilmemesi olabilir. Evren-örneklem grubu olarak okulöncesi öğrencilerine az ya da hiç yer verilmemesinin nedeni ise o yaş grubundaki öğrencilerin henüz okuma-yazma sürecinin başlangıcında olmaları, matematik ve geometri ile henüz derinlemesine eğitim görmemiş olmaları olabilir. Şimşek, Özdamar, Becit, Kılıçer, Akbulut ve Yıldırım (2008), Ulutaş ve Ubuz(2008) ile Alper ve Gülbahar(2009) tarafından yapılan çalışmalardan elde edilen bulgularda ortaya çıkan bu sonuçları destekler niteliktedir.

Örneklem seçim yöntemi temel alındığında çalışmaların büyük oranda bir örneklem seçimine gidilmeyip, çalışma evreninde yürütüldüğü görülmektedir. Bunun nedeni evreni tam temsil edebilecek örneklem seçiminin zorluğu olabilir. Örneklem büyüklüğü olarak 90 ve altında örneklemlerle yapılan çalışmaların fazla olduğu araştırmada ulaşılan bir diğer sonuçtur. Benzer şekilde Alper ve Gülbahar (2009) tarafından yapılan çalışmada da 90 ve altında kullanılan örneklem büyüklüğünün fazla olduğu belirlenmiştir. Bunun nedeni büyük gruplarla çalışmanın zorluğu olabilir. Ayrıca, nitel çalışmalar ve deneysel çalışmalar göz önüne alındığında çalışma evrenin daha uygun olması nedeniyle az sayıda katılımcıyla yapılan çalışmalar daha fazla tercih edilmektedir. Ayrı ayrı tüm örneklem büyüklüklerinin oranlarına bakıldığında ise örneklem sayısı olarak 0-29 ve 30-59 aralıklarının öne çıktığı belirlenmiştir. 0-29 aralığının özellikle nitel çalışmalar için, 30-59 aralığının ise deneysel modeller için uygun olabileceği göz önüne alındığında bunun beklenen bir sonuç olduğu söylenebilir.

Veri toplama araçları temel alındığında özellikle tarama modeline göre desenlenen çalışmalarda anket ve ölçeğin deneysel modellere göre desenlenen çalışmalarda ise başarı testlerinin daha fazla kullanıldığı belirlenmiştir. Nitel araştırmalarda ise veri toplama aracı olarak en fazla görüşme formunun kullanıldığı tespit edilmiştir. Ortaya çıkan bu sonuç Şimşek, Özdamar, Becit, Kılıçer, Akbulut ve Yıldırım (2008) ile Alper ve Gülbahar (2009) tarafından yapılan çalışmalardan elde edilen sonuçlarla tutarlıdır.

Genel olarak bakıldığında ise, yapılan incelemede bazı çalışmaların tam metinlerinin bulunmasına rağmen ele alınan ölçütlere ilişkin yeterli bilgiyi kapsamadığı, bazı çalışmaların ise sadece özetleri bulunduğu ancak özetlerinde ele alınan ölçütleri yeterince betimleyemediği görülmüştür. Elde edilen sonuçlara bağlı olarak evren ve örneklem seçiminde rahat ulaşılabilen örneklemler kullanılmakla beraber, farklı şekillerde de örneklem belirleme yoluna gidilmesi gerektiği söylenebilir. Böylelikle evreni daha iyi temsil gücüne sahip sonuçlara ulaşılabilir. Ayrıca ne tür bilimsel etkinlik olursa olsun gerçekleştirilen çalışma özetlerinin araştırma hakkında okuyucuya yeterli düzeyde bilgi verecek olmasına özen gösterilmelidir.

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BİLGİSAYAR DESTEKLİ ÖĞRENMENİN FEN VE TEKNOLOJİ DERSİNDE ÖĞRENCİ BAŞARISINA ETKİSİNİN DEĞERLENDİRİLMESİNE DAİR BİR UYGULAMA

THE EVALUATION OF THE EFFECTS OF COMPUTER-ASSISTED LEARNING ON STUDENT SUCCESSS IN SCIENCE AND TECHNOLOGY LESSONS

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Özet: Bu çalışma ilköğretim düzeyindeki Fen ve Teknoloji Dersinde bilgisayar destekli öğrenme (BDÖ) yönteminin öğrenci başarısına etkisini, geleneksel öğretim yöntemiyle karşılaştırmak amacıyla yapılan bir değerlendirme çalışmasıdır. Bu amaçla akademik başarılarına ve sosyo-ekonomik düzey ölçeği (SED) sonuçlarına göre denk olduğu tespit edilen, ilköğretim II. Kademe 6. sınıf düzeyinde bir sınıf rastgele olarak deney grubu diğeri ise kontrol gurubu olarak seçilmiştir. Dersler kontrol grubunda geleneksel öğretim yöntemiyle, deney grubunda BDÖ yöntemiyle işlenmiştir. Veri toplama aracı olarak, işlenen konu ile ilgili kazanımlar doğrultusunda, araştırmacı tarafından hazırlanan akademik basarı testi, deneysel işlem öncesinde ön test, deneysel işlem sonrasında son test ve uygulamadan dört hafta sonra da kalıcılık testi olarak kullanılmıştır. Testlerden elde edilen verilerin analizinde, deney ve kontrol gruplarının arasındaki farkın anlamlılığını belirlemek amacıyla t testi kullanılmıştır. Elde edilen istatistiksel sonuçlar değerlendirilerek bazı önerilerde bulunulmuştur.
Anahtar sözcükler: Bilgisayar destekli öğrenme; Bilgisayar destekli öğretim; Sosyo-ekonomik düzey ölçeği

Abstract: This study compares student success rates in Science and Technology lessons between the outcomes of the use of computer aided Teaching and traditional teaching method. Subjects of the study were selected among the second step primary students as experimental and control groups after ensuring that their socio- economic background is homogeneous according to Socio Economic Level Scala (SELS). Courses were designed according to the traditional way of teaching in the control group and Computer Assisted Learning (CAL) in the experimental one. Data were collected using four different tests: the first was Academic Achievement test designed by the researcher according to student gains after the subjects covered, the second was a pre-test before the experimental period of teaching, the third one was the post test immediately after the course of study, and the last one was administered four weeks after the study to measure student retention. During the analysis of data, t-test was used to evaluate the difference among scores of tests. After the evaluation of data, some recommendations for future research were also included.
Keywords: Computer assisted learning; Computer aided education; Socio Economic Level Scala

GİRİŞ

Bilimde ve teknolojideki gelişmeler karşısında dünya ülkeleri yaşam koşullarına uyum sağlayabilmek için sürekli olarak bir yarış içine girmektedir. Yeni çağ, "Bilgi Çağı"dır. Günümüzde endüstriyel mal ve hizmet üretmek elbette önemlidir. Ancak bilgi üretmek bunlardan daha da önemli olup, üretilen bilgi doğrudan mal ve hizmet üretimine büyük katkı sağlamaktadır. Yaşadığımız çağda ülkelerin zenginlikleri bilgi ve insan kaynaklarının zenginliği ile ölçülmektedir (Çakırer, 2005).
Eğitimin bir çok amacı vardır. Bunlardan biri de toplumun bugünkü ve gelecekteki gereksinimleri doğrultusunda bireyler yetiştirmektir. İçinde bulunduğumuz "Bilgi Çağı"nda da, elbette bilgi toplumunun özellikleri göz önüne alınarak, bilgi çağına uygun bireyler yetiştirmek zorunluluğu ortaya çıkmaktadır (Şimşek, 1997; Gündüz ve Çuhadar, 2009) .
Koşar, Yüksel, Özkılıç ve diğerleri (2003)'ne göre; "Öğretimde temel ilke, öğrenciye kazandırılmak istenen bilgi, beceri, tutum gibi davranışların aktarımında, öğrencilerin olabildiğince çok duyu organına hitap etmektir. Öğrenme etkinliğine ne kadar çok duyu organı katılırsa, öğrenmenin kalıcılığı artmaktadır". Eğitimde hitap edilen duyu organı sayısını artırmak için eğitim ve öğretimde çeşitli donanımların kullanmanın kaçınılmaz olduğu bir gerçektir. Duyu organlarına en çok hitap eden donanımların de teknolojik araçlar olduğu kabul edilmektedir (Arslan, 2003). Teknoloji denilince, günümüzde ilk akla gelen bilgisayardır (Gündüz ve Çuhadar, 2009). Hemen her alanda kullanılan bilgisayar teknolojisi, eğitimde de yerini almış olup, günümüzde her kademe eğitimde yoğun biçimde kullanmaktadır.
Eğitim-öğretim surecinde özellikle, öğrencilerin zorlandıkları, çok sayıda kavram içeren fen derslerinde, öğrencilerin kavramları anlamlı düzeyde öğrenebilmeleri için bilgisayarın etkili, yaratıcı bir destekleyici boyut olarak rol alabileceği öngörülmektedir (Çömek, 2003).
Bu çalışma, belirtilen nedenlerden dolayı eğitim ve öğretimde geleneksel öğretim yerine uygulanabilecek BDÖ yöntemlerini, ilköğretim 6. sınıf Fen ve teknoloji dersi "Canlılar ve Hayat" ünitesi içinde yer alan "Hücre" konusu ile sınırlayarak tartışmayı amaçlamaktadır.

YÖNTEM

Araştırma Modeli

Bu çalışmada temel araştırma deseni olarak, öntest-sontest kontrol gruplu deneysel desen kullanılmıştır. Deneysel yöntem özellikle fen bilimlerinde yaygın olarak kullanılan bir araştırma yöntemidir. Bu amaçla kontrol ve deney grubu oluşturulur (Karasar, 1999).
Bu bağlamda araştırmanın bağımsız değişkeni bilgisayar destekli fen öğretim yöntemidir. Araştırmanın bağımlı değişkeni ise öğrencilerin fen bilgisi dersine yönelik başarılarıdır. Araştırma deseni Tablo 1'de gösterilmiştir.

Tablo 1 Araştırmanın Deseni

Gruplar	Ön test	Uygulama	Son test	Kalıcılık Testi
DG :Deney Grubu	Başarı Testi	Bilgisayar Destekli Öğrenme	Başarı Testi	Başarı Testi
KG: Kontrol Grubu	Başarı Testi	Geleneksel Öğretim	Başarı Testi	Başarı Testi

Evren ve Örneklem

Bu çalışmanın evreni, İstanbul ilinin 6. sınıf öğrencileridir. Bu çalışmanın örneklemi, 2008–2009 eğitim-öğretim yılında İstanbul Milli Eğitim Müdürlüğü'ne bağlı, Özel Uğur İlköğretim Okulu'nda öğretim gören 40 tane 6. sınıf öğrencisinden oluşmaktadır.
DBÖ yönteminin uygulandığı deneysel grupta da geleneksel öğretim yönteminin uygulandığı kontrol grubunda da 20'şer öğrenci bulunmaktadır.

Veri Toplama Araçları

Bu araştırmanın yürütülmesinde gerekli ölçümlerin yapılabilmesi için Milli Eğitim Bakanlığı (MEB) İlköğretim Genel Müdürlüğü İlköğretim Fen ve Teknoloji Dersi Programında (MEB, 2009) yer alan Fen ve Teknoloji Dersi "Hücre" konusunun kazanımları doğrultusunda 'Başarı Testi' hazırlanmıştır.

Bu araştırmaya başlarken grupların denk olup olmadığına öğrencilerin Fen ve Teknoloji dersi ön test puanları yanı sıra öğrencilerin SED'lerine de bakılarak karar verilmiştir. Bu amaçla okulumuz rehberlik servisi tarafından geliştirilen SED ölçeği kullanılmıştır.

SED, alışılageldiği gibi "bir kişinin ya da bir topluluğun hem toplumsal hem de ekonomik yönden bulunduğu yer" olarak tanımlanırsa, sosyo-kültürel durum için bu tanımdaki "ekonomik" kelimesini "kültürel" olarak değiştirmek gerekmektedir. Burada, genel kullanıma uyularak, "sosyo-ekonomik düzey" kavramı kullanılmış, ancak bu kavram kültürel öğeler de içermiştir (Bacanlı, 1997).

SED ölçeğinde yukarıdaki açıklamalarda göz önüne alınarak; cinsiyet, babanın öğrenim durumu, annenin öğrenim durumu, anne-babanın birlikte olup olmadığı, ailedeki birey sayısı, evdeki oda sayısı, babanın mesleği, annenin mesleği, maddelerini içermektedir.

Veri Çözümleme Teknikleri

Araştırmada elde edilen verileri çözümlemek için çalışmanın amaçları doğrultusunda; "Bağımsız Örneklem t-Test" yapılmıştır. Çalışmada elde edilen bulgular ve yorumlar izleyen paragraflarda verilmiştir.

BULGULAR VE YORUMLAR

I. Alt Problem: Deney ve kontrol grubu öğrencilerinin ön test başarı puanları arasında anlamlı bir fark var mıdır?

H_0 : Deney ve kontrol grubunun ön test sonuçları arasında anlamlı bir fark yoktur.

H_1 : Deney ve kontrol grubunun ön test sonuçları arasında anlamlı bir fark vardır.

İlgili hipotez testine ilişkin sonuçlar SPSS çıktısı olarak Tablo 2'de verilmiştir.

Tablo 2 Bağımsız Örneklem Testi

		Varyansların eşitliği için Levene Testi		Ortalamaların eşitliği için T Testi						
									%95 güven aralığı sınırları	
		F	Sig.	t	df	Sig. (2-tailed)	Ortalamadan farklılığı	St. hata Farklılığı	Alt Sınır	Üst sınır
TEST	Eşit varyanslı	.166	.686	-.729	38	.470	-.80	1.097	-3.020	1.420
	eşit varyanslı değil			-.729	37.927	.470	-.80	1.097	-3.020	1.420

Tablo 2'den görüldüğü gibi, deney ve kontrol gruplarına ait ön test ortalamaları arasındaki fark, "t" testi ile karşılaştırılmış, t = -0,729 ve p=0,470 > 0.05 olduğundan H_0 kabul edilmiştir. Yani deney ve kontrol grupları arasında ortalamalar yönünden farklılık olmadığı, gruplar çalışmaya başlarken denk bilgiye sahip oldukları sonucu elde edilmiştir. Bu sonuç, konu anlatımından önce deney grubu ve kontrol grubu öğrencilerinin konu ile ilgili bilgi düzeyleri arasında anlamlı bir farkın olmadığını göstermektedir.

II. Alt Problem: Deney grubundaki öğrencilerin fen bilgisi son test başarı puanları, ön test puanlarından anlamlı bir şekilde yüksek midir?

H_0 : Deney grubunun ön test-son test sonuçları arasında anlamlı bir fark yoktur.

H_1 : Deney grubunun ön test-son test sonuçları arasında anlamlı bir fark vardır.

İlgili hipotez testine ilişkin sonuçlar SPSS çıktısı olarak Tablo 3'de verilmiştir.

Tablo 3 Bağımlı Örneklem Testi

		Bağımlı farklılıklar					t	df	Sig. (2-tailed)
				Ortalamaların St. Hatası	%95 Güven aralığı sınırları				
		Ortalama	Std. Sapma		Alt sınır	Üst Sınır			
Çift 1	DENOND - DENSOND	-22.30	4.181	.935	-24.26	-20.34	-23.850	19	.000

Tablo 3'te görüldüğü gibi, BDÖ'nün uygulandığı deney grubunun ön test ve son test başarı puanlarını incelendiğinde, deney grubunun ön test ile son test başarı puanı arasında bir artışın olduğu görülmektedir. Ortalamalar arasındaki bu farkın anlamlı olup olmadığına yönelik yapılan t-testi sonucunda bu farkın anlamlı olduğu görülmektedir. (t=--23,850, p=.00<0.01) olduğundan H_0'ı reddederiz. Bu sonuç BDÖ'nin uygulandığı deney grubundaki öğrencilerin başarısında bir artış olduğunu göstermektedir.

III. Alt Problem: Kontrol grubundaki öğrencilerin fen bilgisi son test başarı puanları, ön test puanlarından anlamlı bir şekilde yüksek midir?

H_0 : Kontrol grubunun ön test-son test sonuçları arasında anlamlı bir fark yoktur.

H_1 : Kontrol grubunun ön test-son test sonuçları arasında anlamlı bir fark vardır.

İlgili hipotez testine ilişkin sonuçlar SPSS çıktısı olarak Tablo 4'te verilmiştir.

Tablo 4 Bağımlı Örneklem için T Testi

	Bağımlı Farklılıklar					t	df	Sig. (2-tailed
			Ortalamaların st.Hatası	%95 güvan aralığı sınırları				
	Ortalama	Std.Sapma		Alt sınır	Üst sınır			
Çift1 KONOND-KONSOND	-14.25	4.854	1.085	-16.52	-11.98	-13.128	19	.000

Tablo 4'e göre, geleneksel öğretimin uygulandığı kontrol grubunun ön test ve son test başarı puanları incelendiğinde, kontrol grubunun ön test ile son test başarı puanı arasında bir artışın olduğu görülmektedir. Ortalamalar arasındaki bu farkın anlamlı olup olmadığına yönelik yapılan t-testi sonucunda bu farkın anlamlı olduğu görülmektedir.(t=-13,128, p=.00<0.01) olduğundan H_0'ı reddederiz. Bu sonuç, geleneksel öğretimin uygulandığı deney grubundaki öğrencilerin başarısında bir artış olduğunu göstermektedir.

IV.Alt Problem : Deney ve kontrol grubu öğrencilerinin son test başarı puanları arasında anlamlı bir fark var mıdır?
H_0 : Deney ve kontrol grubunun son test sonuçları arasında anlamlı bir fark yoktur.
H_1 : Deney ve kontrol grubunun son test sonuçları arasında anlamlı bir fark vardır.
İlgili hipotez testine ilişkin sonuçlar SPSS çıktısı olarak Tablo 5'te verilmiştir.

Tablo 5 Bağımsız Örneklemler T Testi

		Varyansların eşitliği için Levene testi		Ortalamaların eşitliği için T testi						
									%95 güven sınırları	
		F	Sig.	t	df	Sig. (2-tailed)	Ortalama farklılığı	St.hata farklılığı	Alt sınır	Upper
TEST	Eşit varyanslı	.138	.712	3.499	38	.001	7.25	2.072	3.056	11.444
	Eşit varyanslı değil			3.499	37.591	.001	7.25	2.072	3.054	11.446

Tablo 5'e göre, deney grubunun puan ortalamasının kontrol grubunun puan ortalamasından daha fazla olduğu görülmektedir. t= 3,499 ve p=0,001 < 0.05 olması nedeniyle H_0'ı reddederiz. Bu sonuca göre, ortalamalar arasındaki bu farkın anlamlı olup olmadığına yönelik yapılan t-testi sonucunda bu farkın anlamlı olduğu görülmektedir. Elde edilen sonuç, BDÖ'nin geleneksel yönteme göre öğrenci başarısını arttırmada daha etkili olduğunu göstermektedir

V. Alt Problem : Deney ve kontrol grubu öğrencilerinin kalıcılık testi başarı puanları arasında anlamlı bir fark var mıdır?
H_0 : Deney ve kontrol grubunun kalıcılık testi sonuçları arasında anlamlı bir fark yoktur.
H_1 : Deney ve kontrol grubunun kalıcılık testi sonuçları arasında anlamlı bir fark vardır.
İlgili hipotez testine ilişkin sonuçlar SPSS çıktısı olarak Tablo 6'da verilmiştir.

Tablo 6 Bağımsız Örneklemler T Testi

		Varyansların eşitliği için Levene testi		Ortalamaların eşitliği için T testi						
									%95 güven sınırları	
		F	Sig.	t	df	Sig. (2-tailed)	Ortalama farklılığı	St.hata farklılığı	Alt sınır	Upper
TEST	Eşit varyanslı	.011	.918	5.150	38	.000	10.75	2.087	6.524	14.976
	Eşit varyanslı değil			5.150	37.667	.000	10.75	2.087	6.523	14.977

Tablo 6'daki verilere göre t = 5,150 ve p = 0,000<0,05 olması, deney ve kontrol grupları arasında kalıcılık düzeyleri arasında deney grubu lehine anlamlı bir fark olduğu sonucunu ortaya çıkarmıştır.
Puanların ortalama değerleri incelendiğinde de kontrol grubu 23,25 ve deney grubu da 34,00 puanla farklılık yine görülmüştür. Bu nedenle BDÖ yönteminin, geleneksel öğretim yöntemine göre daha etkili bir yöntem olduğu söylenebilir. BDÖ yöntemi ile konuları öğrenen öğrencilerin, geleneksel öğretim yöntemi ile konuları öğrenen öğrencilere göre, öğrendiklerini daha iyi hatırlayabildikleri ve kalıcılık düzeylerinin daha yüksek olduğu görülmektedir.

SONUÇ VE ÖNERİLER

Bu çalışmada, "Hücre" konusunun öğretilmesinde geleneksel öğretim yöntemiyle BDÖ yönteminin öğrenci başarısına etkisi deneysel olarak araştırılmıştır.
BDÖ yöntemi ile ders işleyen öğrencilerle, geleneksel öğretim yöntemiyle ders işleyen öğrenciler arasında akademik başarı açısından fark olduğu görülmüştür. Konunun öğretilmesinde BDÖ yönteminin geleneksel öğretim yöntemine göre daha etkili olduğu sonucuna varılabilir.
Bu çalışmada araştırma sonucunda elde edilen bulgulara dayanılarak aşağıdaki öneriler yapılabilir.
1. Canlıların yapıtaşı "Hücre" konusunun öğrenilmesinde etkili bir yöntem olduğu tespit edilen BDÖ yöntemi, diğer fen konularının öğrenilmesinde de uygulanarak, yöntemin etkililiği araştırılabilir.
2. Özellikle Fen Bilgisi Derslerinin içeriğinde bulunan öğrenilmesi güç konuların öğretiminde, yapılması zor, tehlikeli veya imkansız deneylerin gösteriminde BDÖ yönteminden faydalanılabilir. Soyut olan kavramların somutlaştırılması, öğrencinin hayalinde canlandırmakta zorluk çektiği mikroskobik ve moleküler seviyede gerçekleşen olayların anlaşılabilmesi için animasyon ve simülasyonlar kullanılabilir.
3. Araştırmada, hazır bir özel öğretici program kullanılmıştır. Yapılacak çalışmalarda dersin ve öğrencilerin özelliklerine uygun yeni yazılımlar geliştirilerek kullanılabilir.
4. BDE ve internet uygulamaları ile ilgili öğretmen ve öğrenci tutumları ile onların görüşlerine yönelik araştırmalar yapılabilir.
5. Okullarda bulunan fen laboratuarlarında bilgisayar ve internet bağlantısı bulunmalıdır. Böylece BDÖ yöntemi etkili bir şekilde kullanılabilir.

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BİLGİSAYAR DESTEKLİ ÖĞRETİMİN TEKNİK LİSE ÖĞRENCİLERİNİN AKADEMİK BAŞARISINA ETKİSİ

THE EFFECT OF COMPUTER ASSISTED INSTRUCTION ON THE ACADEMIC ACHIEVEMENT OF TECHNICAL HIGH SCHOOL STUDENTS

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Özet
Bu çalışmada, teknik lise bilişim teknolojileri alanı öğrencilerine meslek derslerinin öğretiminde bilgisayar destekli öğretim yönteminin, geleneksel öğretim yöntemine göre öğrenci başarısına etkisini belirlemek hedeflenmiştir. Bu amaçla Niğde ili Bor ilçesi Bor Teknik ve Endüstri Meslek Lisesi'nde bir çalışma yapılmıştır. Araştırma, kontrol gruplu ön test son test deseni kullanılarak yapılmıştır. Araştırmaya okulun Bilişim Teknolojileri alanı 10. sınıfında öğrenim gören 32 öğrenci katılmıştır. Deney grubu öğrencilerine, hazırlanan bilgisayar destekli öğretim yazılımı ile kontrol grubu öğrencilerine ise geleneksel öğretim yöntemi ile dersler anlatılmıştır. Meslek derslerinden olan Bilişim Teknolojilerinin Temelleri dersi için yapılan uygulama süresince öğrenci başarılarını ölçmek üzere geliştirilen başarı testi uygulanmıştır. Araştırmanın sonucu olarak, meslek derslerinde kullanılan bilgisayar destekli öğretim yönteminin, geleneksel öğretim yöntemine göre öğrenci başarısında daha etkili olduğu görülmüştür.
Anahtar Kelimeler: Bilgisayar destekli öğretim, öğretim yazılımı, meslek derslerinin öğretimi

Abstract
In this study, we aim to find out the effects of computer-based teaching activities on the academic achievement in teaching vocational lessons to students of information technologies area in technical high school as compared to the traditional methods. For this reason, this study was conducted in Niğde Bor Technical ve Industrial Vocational High School. Pre-test and post-test research desing with control group was used. 32 students from Information Technologies Area In 10th grade participed to the study. The experimental group was taught by Computer-Aided Teaching software and the control group was taught by traditional method. During the study about Fundamentals of Information Technology that is a vocational lesson, achievement test was administered to students. As a result of this research, the Computer-Based Teaching Activities on vocational lessons was more successful than that of the traditional education program in terms of academic achievement of the students.
Keywords: Computer assisted instruction, instructional software, teaching of vocational lessons

GİRİŞ

Bilim ve teknolojinin hızla geliştiği dünyamızda her alanda olduğu gibi eğitim alanında da bilgisayarların kullanılması kaçınılmaz hale gelmiştir. Bilgisayar öğretiminde geleneksel yöntemlerin kullanılması, öğretimde kalıcılığın sağlanamaması, bireysel öğrenme hızlarındaki farklılıklar nedeniyle, ders içerisindeki öğrenme ve uygulama sürelerinde değişikliklerin oluşması sonucunu doğurmaktadır. Bu nedenle bilgisayar öğretiminde geleneksel yöntemlerin yanı sıra, görsel öğelerin kullanılması, öğretim sürecinin animasyon ve etkileşimli çoklu ortam öğeleriyle desteklenmesi ihtiyacını ortaya çıkarmıştır. Hızla gelişen bilişim teknolojilerinin eğitsel yazılımlar ile derslerin işlenişine dahil edilmesi gerekmektedir. Bilgisayar destekli öğretim, bilgisayarın sistem içine programlanan dersler yoluyla öğrencilere bir konu ya da kavramı öğretmek ya da önceden kazandırılan davranışları pekiştirmek amacıyla kullanılmasıdır (Yalın, 2002). Bilgisayar destekli öğretim, öğrenme sürecini hızlandırmakta, dolayısıyla öğrenciye ve öğretmene daha çok zaman kazandırmaktadır (Halis, 2002). Geleneksel öğretim, yerini bilgisayar destekli öğretimin yapıldığı modern sınıflara bırakmaya başlamıştır. Bilgisayarlar artık bütün dersler için kullanılan bir eğitim materyali halini almıştır.
Akçay, Aydoğdu, Yıldırım ve Şensoy (2005), araştırmalarında, fen eğitiminde bilgisayar destekli öğretim yönteminin, anlatım yöntemine göre öğrenci başarısına etkisini belirlemiştir. Araştırmanın sonucunda, fen eğitiminde bilgisayar destekli öğretim yönteminin klasik öğretim yöntemine göre, öğrenci başarısını arttırmada daha etkili bir yöntem olduğu belirlenmiştir. Aydoğan (2008), yaptığı araştırmasında "Bilişim Teknolojilerinin Temelleri Dersi İnteraktif Eğitim Yazılımı" konulu bir eğitim programı hazırlanmış, bu program deney grubuna izletilmiştir. Kontrol grubuna, "Bilişim Teknolojilerinin Temelleri" dersi anlatım yöntemi kullanılarak verilmiş ve her iki gruba anket formu uygulanmıştır. Hazırlanan yazılımın Öğrenilebilirlik, Tasarım, Memnuniyet ve Motivasyon faktörlerine ilişkin değerlendirmeler incelenmiştir. Sonuçta eğitsel Yazılımda olması gereken hususlar ve çoklu ortam özelliklerinin önemi vurgulanmıştır. Yapılan çeşitli çalışmalarda bilgisayar destekli öğretimin öğrencinin akademik başarısını arttırdığı, çoklu ortam öğelerini barındıran eğitsel yazılımların öğrencilerin motivasyonunu ve derse ilgilerini artırdığı görülmüştür.
Ülkemizde mesleki eğitim veren ortaöğretim kurumlarında 2004 – 2005 Eğitim-Öğretim yılından itibaren MEGEP (Mesleki Eğitim ve Öğretimi Güçlendirme Projesi) adı verilen bir proje kapsamında modüler yapıda eğitim verilmesine başlanmıştır. Millî Eğitim Bakanlığı'na bağlı mesleki eğitim veren okullarda uygulanmaya başlanan MEGEP kapsamında hazırlanan ders modüllerinin, öğrencilerin derslere karşı ilgilerini ve motivasyonunu sağlama noktasında yetersiz kaldığı görülmektedir. Bu modüllerin çoklu ortam öğeleriyle zenginleştirilerek öğrenciye aktarılması zorunluluğu doğmaktadır. Teknolojinin hızla gelişimi, öğretim ortamlarının görsel ve işitsel araçlarla zenginleştirilmesinin önünü de açmaktadır. Kara tahtaların yerini artık elektronik akıllı tahtalar almaktadır.

Araştırmanın Amacı

Araştırmanın amacı, teknik lise bilişim teknolojileri alanı 10. sınıf öğrencilerinin "Bilişim Teknolojilerinin Temelleri" dersindeki "Ana kartlar ve kasalar" ile "Disk sürücüleri" modülleri içerisinde yer alan konuları geleneksel öğretim yönteminden farklı olarak, çoklu ortam öğeleriyle zenginleştirilmiş bir şekilde hazırlanan bilgisayar destekli öğretim materyali ile öğrenciye verilmesinin öğrencilerin akademik başarılarının artmasındaki rolünü araştırmaktır. Çalışmada şu sorulara yanıt aranmıştır;

1. Geleneksel öğretim yönteminin uygulanacağı kontrol grubunun ön test ve son test puanları arasında anlamlı bir farklılık var mıdır?
2. Bilgisayar destekli öğretimin uygulanacağı deney grubunun ön test ve son test puanları arasında anlamlı bir farklılık var mıdır?

Araştırmanın Dayandığı Temeller (Varsayımlar)

Bu çalışmada,

1. Deney ve kontrol grubunu oluşturan öğrencilerin akademik başarıları karşılaştırıldığında anlamlı bir fark bulunmadığı,
2. Deney ve kontrol grubunu oluşturan öğrencilerin başarı testi sorularına çalışmayı önemseyerek tutarlı bir şekilde cevap verdikleri,
3. Başarı testinin kapsam geçerliliği açısından kendilerine başvurulan uzmanların görüşünün yeterli olduğu varsayılmıştır.

Sınırlılıklar

1. Bu araştırma Niğde Bor Teknik ve Endüstri Meslek Lisesi teknik lise kısmı Bilişim Teknolojileri alanında eğitim gören 10. sınıf öğrencilerini kapsamaktadır.
2. Veri toplama ile ilgili çalışmalar 2009 – 2010 eğitim öğretim yılı I. döneminde yapılmıştır.
3. Çalışma Bilişim Teknolojilerinin Temelleri dersine ait seçilen modüllerle ve eğitimci tarafından hazırlanan eğitsel yazılımla sınırlıdır.

YÖNTEM

Bu araştırmada, Teknik Lise bilişim teknolojileri alanı 10. sınıf öğrencilerinin bir alan dersi olan "Bilişim Teknolojilerinin Temelleri" dersindeki "Ana kartlar ve kasalar" ile "Disk sürücüleri" modüllerinin geleneksel öğretim yönteminden farklı olarak, bilgisayar destekli öğretim materyali ile öğrenciye verilmesinin öğrencilerin akademik başarılarının artmasındaki rolü araştırılmıştır. Bu araştırma ön test-son test kontrol gruplu deneme modelinde hazırlanmış olup, Bor Teknik ve Endüstri Meslek Lisesi teknik lise kısmı bilişim teknolojileri alanında öğrenim gören 10. sınıf öğrencilerinden 16'şar öğrenciden oluşan bir deney, bir de kontrol grubu oluşturulup uygulanmıştır. Araştırmada hem deney hem de kontrol grubu aynı okulda öğrenim gören öğrencilerden seçilmiştir. Ön test sonuçları öğrencilerin öğrenme düzeylerini belirlemede kullanılmış ve öğrenme düzeylerinin birbirlerine yakın olduğu görülmüştür. Ön test uygulamasından sonra konular deney grubuna hazırlanan eğitsel yazılım kullanılarak anlatılmış, kontrol grubuna ise geleneksel öğretim metodu ile anlatılmıştır. Anlatımlar sonunda son test uygulanmıştır.

Evren ve Örneklem

Evren: Araştırmanın evrenini 2009 – 2010 eğitim-öğretim yılında Niğde ilinde bulunan Milli Eğitim Bakanlığı'na bağlı Teknik Liseler 10. Sınıf Öğrencileri oluşturmuştur.

Örneklem: Araştırmanın örneklemini 2009–2010 eğitim-öğretim yılında Niğde ili Bor ilçesinde bulunan Milli Eğitim Bakanlığı'na bağlı Bor Teknik ve Endüstri Meslek Lisesi teknik lise kısmında öğrenim gören Bilişim Teknolojileri alanı 10. sınıf öğrencilerinden seçilen iki şube oluşturmuştur.

Verilerin Toplanması

Araştırmanın deneysel kısmında teknik lise 10. sınıfların meslek derslerinden "Bilişim Teknolojilerinin Temelleri" dersine ait "Ana kartlar ve kasalar" ile "Disk sürücüleri" modülleri seçilmiştir. Konuların hazırlanan çoklu ortam destekli eğitsel yazılım ile öğrencilere anlatılmasının etkililiğini belirlemek için 40 sorudan oluşan bir başarı testi geliştirilmiş, bu test ön test ve son test olarak kullanılmıştır. Veriler bu testin uygulanması sonucu elde edilmiştir.

BULGULAR

Deney ve kontrol grubuna ait öğrencilerin ön test puanları arasındaki fark, bağımsız t-testi ile karşılaştırılmıştır. Elde edilen sonuçlar Tablo 1'de sunulmuştur.

Tablo 1. Deney ve kontrol gruplarının ön test puanlarına ait bağımsız t-testi sonuçları

Test	Grup	Ortalama	Öğrenci Sayısı	Standart Sapma	Standart Hata	t	p
ÖN TEST	Deney	22,5000	16	6,39010	1,59752	,388	,701
	Kontrol	21,7188	16	4,89206	1,22302		

p>0.05

Tablo 1'deki sonuçlar incelendiğinde deney ve kontrol gruplarına uygulanan ön test sonuçları arasında anlamlı bir fark olmadığı [p>0,05] görülmektedir. Bu sonuç her iki grubun da seçilen konular üzerindeki başarı düzeylerinin başlangıçta birbirine yakın düzeyde olduğunu göstermektedir.

Tablo 2. Deney grubu ön test - son test puanlarına ait bağımlı t-testi sonuçları

Grup	Test	Ortalama	Öğrenci Sayısı	Standart Sapma	Standart Hata	t	p
DENEY	Ön test	22,5000	16	6,39010	1,59752	-17,685	,000
	Son test	71,0938	16	9,57291	2,39323		

p<0,05

Tablo 2'de görüldüğü gibi deney grubunun ön test ve son test başarı puan ortalamaları sırasıyla 22,50 ve 71,0938 olduğu görülmektedir. Deney grubunun ön test ve son test puanları için yapılan bağımlı t-testi sonucunda son test lehine anlamlı bir fark bulunmuştur [p<0,05]. Bu sonuç, deney grubunda kullanılan bilgisayar destekli öğretim yönteminin öğrencinin akademik başarısını anlamlı bir düzeyde artırdığını göstermektedir.

Tablo 3. Kontrol grubu ön test - son test puanlarına ait bağımlı t-testi sonuçları

Grup	Test	Ortalama	Öğrenci Sayısı	Standart Sapma	Standart Hata	t	p
KONTROL	Ön test	21,7188	16	4,89206	1,22302	-19,225	,000
	Son test	50,7812	16	8,59839	2,14960		

p<0,05

Tablo 3'teki sonuçlar incelendiğinde kontrol grubunun ön test ve son test başarı puan ortalamaları sırasıyla 21,7188 ve 50,7812 olduğu görülmektedir. Kontrol grubunun ön test ve son test puanları için yapılan bağımlı t-testi sonucunda son test lehine anlamlı bir fark bulunmuştur [p<0,05]. Bu sonuç, kontrol grubunda kullanılan geleneksel öğretim yönteminin de öğrencinin akademik başarısını anlamlı bir düzeyde artırdığını göstermektedir. Deney ve kontrol gruplarının her ikisine de konular farklı öğretim teknikleri kullanılarak da olsa anlatıldığından başarı düzeylerinde bir artış olması ve buna bağlı olarak son-test lehine anlamlı bir artışın oluşması beklenen bir sonuçtur. Ancak deney grubunun akademik başarısındaki artış kontrol grubuna göre daha fazladır.

Tablo 4. Deney ve kontrol gruplarının son test puanlarına ait bağımsız t-testi sonuçları

Test	Grup	Ortalama	Öğrenci Sayısı	Standart Sapma	Standart Hata	t	p
SON TEST	Deney	71,0938	16	9,57291	2,39323	6,314	,000
	Kontrol	50,7812	16	8,59839	2,14960		

p<0,05

Tablo 4'te görüldüğü gibi deney ve kontrol gruplarının son test puanları arasında anlamlı düzeyde [p<0,05] bir farklılık saptanmıştır. Son test başarı puanları arasında deney grubu lehine 20,3126 puanlık fark bulunmaktadır. Bu farka öğrencilerin akademik başarılarının artması açısından bakıldığında deney grubunda kullanılan Bilgisayar destekli öğretim yönteminin kontrol grubunda kullanılan geleneksel öğretim yöntemine göre başarıyı anlamlı bir düzeyde arttırdığı görülmektedir.

SONUÇ VE ÖNERİLER

Bu araştırmanın sonucunda Bilişim Teknolojilerinin Temelleri dersine ait "Ana kartlar ve kasalar" modülü ile "Disk sürücüleri" modülünün öğretiminde deney grubuna uygulanan bilgisayar destekli öğretimin, kontrol grubuna uygulanan geleneksel öğretim yöntemine göre öğrencilerin akademik başarılarını artırmada daha etkili olduğu ortaya çıkmıştır. Bilgisayar destekli öğretim uygulamaları öğrencilerin derse katılımını ve ilgilerini artırarak akademik başarılarına olumlu etki etmesi bakımından önemlidir.

Küpçüoğlu (2008), araştırmasında, ortaöğretim 10. sınıf bilişim teknolojileri temelleri dersine ait programlama temelleri modülünün, geleneksel öğretim yöntemlerinden farklı olarak, bilgisayar destekli öğretim materyali ile öğrenciye verilmesinin öğrencilerin başarılarını artırmasındaki rolünü açıklamıştır. Bilgisayar destekli öğretim yönteminin uygulandığı deney grubu ile geleneksel öğretim yönteminin uygulandığı kontrol grubunun bilişim teknolojilerinin temelleri dersine ait programlama temelleri modülünü öğrenme düzeyleri arasında deney grubu lehine anlamlı bir fark olduğu sonucunu bulmuştur. Bu sonuç bizim bulgularımızı desteklemektedir.

Birgin ve Tutak (2008), çalışmasında ilköğretim dördüncü sınıf geometri dersinde bilgisayar destekli öğretimin öğrencilerin geometri dersindeki başarısına etkisini incelemiştir. Bu çalışma sonucunda ilköğretim dördüncü sınıf geometri dersinde bilgisayar destekli öğretimin geleneksel yönteme göre öğrencilerin geometri dersindeki başarılarını anlamlı düzeyde artırdığı saptanmıştır.

Bu araştırma da bilgisayar destekli öğretimin başarıyı artırmada geleneksel öğretim yöntemine göre daha etkili olduğunu destekler niteliktedir.

Bu araştırmanın sonucunda ortaya çıkan verilere dayalı olarak aşağıdaki öneriler sunulmaktadır:

1. MEGEP kapsamında, öğretmenler bilişim teknolojileri alanı içerisinde verilen meslek derslerinde geleneksel öğretim metodu yerine bilgisayar destekli öğretim materyalleri kullanmalıdır.
2. Milli Eğitim Bakanlığı, bu proje kapsamında eğitsel yazılımların derslerin anlatımında kullanılması için gerekli düzenlemeleri yapmalıdır.
3. Bilgisayar destekli öğretim yöntemlerini uygulayacak olan öğretmenlere, bu yöntemleri uygulamaları için gerekli bilgi ve becerilerin kazandırılacağı, hizmet içi eğitimler verilmelidir.
4. Bilgisayar Destekli Öğretim uygulamalarının farklı öğretim metotları ile kıyaslandığı araştırmalar yapılabilir.

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BİLGİSAYAR ÖĞRETMENLERİNİN İŞE GÖNÜLDEN ADANMIŞLIK DÜZEYLERİ VE İŞE İLİŞKİN DUYGUSAL İYİLİK ALGILARI

JOB ENGAGEMENT AND JOB RELATED WELL-BEING OF COMPUTER TEACHERS

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Özet
Bu çalışmanın amacı, Türkiye'nin çeşitli illerinde ilköğretim okulları ve liselerde çalışan bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeyleri (job engagement) ve işe ilişkin duygusal iyilik algıları (job-related well-being) ile demografik özellikleri arasındaki ilişkileri ortaya koymaktır. Veriler Türkiye'nin çeşitli illerinden rastgele seçilen 150 kişilik bir bilgisayar öğretmeni gurubundan iki ölçek kullanılarak toplanmıştır. Bunlardan biri Schaufeli vd. 'nin 2002 yılında geliştirdiği ve Dr. Esra Atilla Bal tarafından Türkçeye çevrilmiş, güvenirliği .96 olan 17 soruluk 2 faktörden oluşan "İşe Gönülden Adanmışlık Ölçeği"dir. Diğeri, Warr'ın 1990'da geliştirdiği güvenirliği . 91 olan 12 soruluk 2 faktörden oluşan "İşe İlişkin Duygusal İyilik Algısı Ölçeği" dir. Araştırmada elde edilen veriler SPSS 15.0 paket programında analiz edilmiş, bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeyleri, işe ilişkin duygusal iyilik algıları ölçülmüş ve demografik özelliklere göre anlamlı bir şekilde farklılaşıp farklılaşmadığı tespit edilmiştir.
Anahtar Kelimeler: İşe Gönülden Adanma, İşe İlişkin Duygusal İyilik Algısı, Bilgisayar Öğretmeni

Abstract
The aim of this research, is to bring up the relationship between job engagement levels and job related well-being of computer teachers who are working at Turkey's different primary and high schools in different provinces depend on demographic variables. Data are collected from 150 computer teachers working at Turkey's different proviences by using two scales. One is Job Engagement Scale was measured 17 items developed by Schaufeli (2002) and Turkish translation was done by Dr. Esra Atilla Bal and consists two sub dimensions, the overal reliabilty of the scale is .96. The other is Job-Related Well-Being Scale was measured 12 items developed by Warr(1990) and Turkish translation was done by Dr. Esra Atilla Bal and consists two sub dimensions, the overal reliabilty of the scale is .91. In this research data are analyzed with SPSS 15.0, computer teachers' job engagement levels and job-related well-being perceptions measured and determined whether these data are significantly different or not depend on demographich variables.
Key Words: Job Engagement, Job-Related Well-Being, Computer Teachers

GİRİŞ

Hızla değişen ve gelişen dünyada medeniyeti takip etmek; değişime ayak uydurmak ve değişimi yönetmekle mümkündür. Günümüzde, medeniyetin yürüttüğü ve kaçınılmaz bir gerçek olan değişim, kendini en çok teknoloji alanında göstermektedir. Hem ekonomik hem de sosyal anlamda gelişmiş düzeyde olmak, teknolojik gelişmişlikle ilişkilidir. Teknolojiyi kullanabilen, geliştirebilen ve üretebilen bir toplum olmanın temeli, teknolojik altyapısı sağlam bireyler yetiştirmektir. İyi bir teknoloji eğitimi görmüş bir toplumla, daha nitelikli iş gücü, daha çok üretim, dünya ile hızlı entegrasyon ve daha refah bir ülke oluşturulacaktır.
Bu noktada teknoloji kabiliyeti ve farkındalığının yerleşmesindeki en önemli rol şüphesiz ki bilgisayar öğretmenlerine düşmektedir. İşine gönülden adanmış ve işine karşı olumlu duygulara sahip olan bilgisayar öğretmenleri, teknolojik altyapısı sağlam ve bu alanda ilerlemeye hevesli nesillerin yetişmesini sağlayarak, ülkelerin teknolojik kalkınmışlığına katkıda bulunacaklardır. Bu sebeple bilgisayar öğretmenlerinin "işe gönülden adanmışlıklarının" ve "işe ilişkin duygusal iyilik algılarının" ölçülmesi anlamlıdır.
Pozitif psikolojinin ürünü olarak ortaya çıkan pozitif örgütsel davranış, kendine güven, umut, çabuk iyileşebilme, iyimserlik, psikolojik ve sosyal anlamda sağlıklı olabilmek için hedeflerden tatmin olma gibi olumlu duygulara sahip olunması yönünde insan yaşamı ve faaliyetlerinin gelişimini desteklemektedir (Seligman ve Csikszentmihalyi, 2000). Pozitif örgütsel davranış ile ilgilenen bilim adamlarının son yıllarda üzerinde yoğun olarak çalıştığı konulardan biri "işe gönülden adanma" kavramıdır. Türkçe literatürde bazı çalışmalarda "işe cezbolma" şeklinde de ele alınan kavramla ilgili ilk çalışmalar 1987'de Kahn tarafından yapılmıştır. Roberts ve Davenport (2002) 'a göre işe gönülden adanma; bireyin kendini işi ile özdeşleştirmesi ve işiyle motive olması olarak tanımlanmaktadır. Literatürdeki bazı çalışmalarda işe gönülden adanma, tükenmişlik sendromunun tam karşıtı bir kavram gibi ele alınmış olsa da González-Romá, Schaufeli, Bakker ve Lloret'in 2006 yılındaki çalışması bu iki kavramın karşıt olmadıklarını, farklı olduklarını ortaya koymuştur. Araştırma sonuçları; işe gönülden adanma ile iş tatmini, örgütsel bağlılık ve performans arasında pozitif bir ilişki; işe gönülden adanma ile işten ayrılma niyeti ve işe geç gelme arasında negatif ilişki olduğunu göstermektedir (Schaufeli, et al.,2002b; Schaufeli & Bakker, 2004; Jones & Harter, 2005). İşe gönülden adanma, fiziksel ve ruhsal sağlığımız üzerinde de olumlu etkilere sahiptir (Koyuncu, Burke, & Fiksenbaum, 2006). Fiziksel ve ruhsal sağlığı iyi, işine gönülden bağlı, örgütsel bağlılığı ve performansı yüksek olan bilgisayar öğretmenlerinin etkinliği çok daha yüksek olacaktır.
İşe gönülden adanma gibi pozitif örgütsel davranışın ürünü olan ve araştırmacıların son yıllarda ilgisini çeken bir başka kavram da "işe ilişkin duygusal iyilik algısıdır". Duygusal iyilik algısı olumlu duyguların sıklıkla yaşanması, olumsuz duyguların ise sık yaşanmaması olarak tanımlanmaktadır (Diener & Diener, 2000). Spector ve Jex'in 1998'de yaptığı araştırmanın sonuçlarına göre işe ilişkin duygusal iyilik algısı; performans, işten ayrılma eğilimi ve örgüt sağlığı gibi kavramlarla da ilişkilidirler. Son yıllarda duygusal iyilik algısı üzerine yapılan çalışmalar olumsuz duyguların uzun süreli yaşanmasının, yüksek tansiyon ve kanser gibi birçok fiziksel rahatsızlıkla sonuçlanabileceğini göstermiştir (Smith, 1992). İş yerinde duygusal iyilik algısının temel bileşenleri de iki boyutta açıklanabilir. Birinci boyut; depresyon ve kaygı, kızgınlık gibi olumsuz duygularla ilgiliyken, diğeri coşku gibi hoş ve uyarılmış, olumlu duygularla ilgilidir (Daniels, 2000). Bütün bu araştırmaların sonuçlarından çıkarılan; olumlu duygulara sahip, işe ilişkin duygusal iyilik algısı yüksek olan bilgisayar öğretmenlerinin görevlerini çok daha iyi yapacaklarıdır.
Günümüz ve geleceğin toplumları; nasıl öğreneceğini bilen, gerçek bilgilere doğru ve etkin bir şekilde ulaşabilen, düşünerek yeni bilgiler üretebilen ve sorun çözen bireylere gereksinim duymaktadır. Bu bireylerin yetişme sürecinde; bilgi teknolojilerinin kullanımı konusunda onlara rehberlik eden, işine gönülden adanmış ve işinde duygusal olarak kendini iyi hisseden bilgisayar öğretmenlerinin rolü giderek daha da önem kazanmaktadır. Bu ihtiyaçtan yola çıkılarak bu çalışmada da bilgisayar öğretmenlerinin işe gönülden adanmışlıkları ve işe ilişkin duygusal iyilik algıları incelenmiştir.

Problem:
Bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeyleri ve işe ilişkin duygusal iyilik algıları ile demografik özellikleri arasındaki ilişki nedir?

Alt Problemler:
Araştırmaya katılan bilgisayar öğretmenlerinin;

1) Demografik özelliklerinin (cinsiyet, yaş) dağılım bilgileri nelerdir?
2) Çalıştıkları okul türü, kademe, öğretmenlik mesleğinde kaçıncı yılı olduğu ve bilgisayarla ilgili herhangi bir kursa / hizmet içi eğitime katılıp katılmadığına dair dağılım bilgileri nelerdir?
3) İşe gönülden adanmışlık düzeylerinin ortalaması nedir?
4) İşe ilişkin duygusal iyilik algısının ortalaması nedir?
5) İşe gönülden adanmışlık düzeyleri;
   a. Cinsiyete,
   b. Yaşa,
   c. Çalıştığı okulun türüne,
   d. Çalıştığı kademeye,

   göre farklılık göstermekte midir?

YÖNTEM

Evren ve Örneklem
Araştırma gurubunu Türkiye'nin çeşitli illerinde devlet ve vakıf okullarında çalışmakta olan 150 bilgisayar öğretmeni oluşturmaktadır.

Veri Toplama Araçları

Bilgi Toplama Anketi
Araştırmacı tarafından geliştirilen anket cinsiyet, yaş, çalışılan okulun türü, hangi kademede çalışıldığı gibi toplam 6 sorudan oluşmaktadır.

İşe Gönülden Adanmışlık Ölçeği
Schaufeli vd 'nin 2002 yılında geliştirdiği ve Dr. Esra Atilla Bal tarafından Türkçeye çevrilmiş olan ölçek 17 sorudan oluşmaktadır. Yapılan analizlerin sonucunda sorular; güvenirlik katsayıları sırasıyla .94 ve .92 olan 2 faktör altında toplanmıştır . Ölçeğin güvenirliği ise .96 dır. Her bir faktörün açıkladığı varyans oranı sırasıyla %37 ve % 31'dir ve toplam varyans %68'dir. Olumlu duygulardan oluşan sorular 7'li likert ölçeğinde "Hiçbir zaman", "Neredeyse hiçbir zaman", "Nadiren", "Bazen", "Sık sık", "Çok sık", "Her zaman" şeklinde derecelendirilmiştir.

İşe İlişkin Duygusal İyilik Algısı
Warr'ın 1990 yılında geliştirdiği ve Dr. Esra Atilla Bal tarafından Türkçeye çevrilmiş olan ölçek 12 sorudan oluşmaktadır. Yapılan analizlerin sonucunda sorular; güvenirlik katsayıları sırasıyla .92 ve .91 olan 2 faktör altında toplanmıştır . Ölçeğin güvenirliği ise .91 dir. Her bir faktörün açıkladığı varyans oranı sırasıyla %36 ve % 34'dür ve toplam varyans %70'dir. 6'sı olumlu 6'sı olumsuz olan sorular 6'lı likert ölçeğinde "Hiçbir zaman" ,"Ara sıra", "Bazen", "Çoğu zaman", "Hemen hemen her zaman", "Her zaman" şeklinde derecelendirilmiştir.

Veri Toplama Yöntemi
Hazırlanan anket www.surveymonkey.com da online olarak yeniden düzenlenmiş ve online anketin linki Türkiye'nin çeşitli illerinde görev yapan bilgisayar öğretmenlerine mail yolu ile iletilmiştir.

Verilerin Analizi
Verilerin analizinde SPSS 15.0 istatistik programı kullanılmıştır.

BULGULAR

Araştırmadan elde edilen veriler, yanıt aranılan sorulara uygun başlıklar altında sırasıyla ele alınmış ve yorumlanmıştır.

Araştırmaya katılan bilgisayar öğretmenlerinin demografik özelliklerinin (cinsiyet, yaş) dağılım bilgileri nelerdir?
Bilgisayar öğretmenlerinin cinsiyete göre dağılımı Tablo 1'de gösterilmiştir.

Tablo 1- Bilgisayar Öğretmenlerinin Cinsiyete Göre Dağılımı

Cinsiyet	N	%
Erkek	103	68,7
Kadın	47	31,3
Toplam	**150**	**100,0**

Araştırmaya katılan bilgisayar öğretmenlerinin cinsiyete göre dağılımı incelendiğinde yaklaşık % 69 unun erkeklerden, % 31'ininin kadınlardan oluştuğu görülmektedir. Erkek öğretmenlerin sayısı kadın öğretmenlerin sayısının 2 katından biraz daha fazladır.
Bilgisayar öğretmenlerinin yaşa göre dağılımı Tablo 2'de gösterilmiştir.

Tablo 2-Bilgisayar Öğretmenlerinin Yaşa Göre Dağılımı

Yaş	N	%
21-30	142	94,7
31-40	7	4,7
41-50	1	,7
Toplam	**150**	**100,0**

Araştırmaya katılan bilgisayar öğretmenlerinin yaşa göre dağılımı incelendiğinde çok büyük bir kısmının (yaklaşık %95'inin) 21-30 yaş arasında olduğu bulunmuştur. Bilgisayar öğretmenlerinin büyük çoğunluğunun genç nüfusun içinde olduğu görülmektedir.

Araştırmaya katılan bilgisayar öğretmenlerinin çalıştıkları okul türü, kademe, öğretmenlik mesleğinde kaçıncı yılı olduğu ve bilgisayarla ilgili herhangi bir kursa / hizmet içi eğitime katılıp katılmadığına dair dağılım bilgileri nelerdir?
Bilgisayar öğretmenlerinin çalıştıkları okul türüne göre dağılımı Tablo 3'te gösterilmiştir.

Tablo 3- Bilgisayar Öğretmenlerinin Çalıştığı Okul Türüne Göre Dağılımı

Okul Türü	N	%
Devlet Okulu	140	93,3
Vakıf Okulu	10	6,7
Toplam	**150**	**100,0**

Araştırmaya katılan bilgisayar öğretmenlerinin okul türüne göre dağılımı incelendiğinde çok büyük bir kısmının (yaklaşık %94'ünün) devlet okullarında çalıştığı görülmektedir.
Bilgisayar öğretmenlerinin çalıştıkları kademeye göre dağılımı Tablo 4'te gösterilmiştir.

Tablo 4- Bilgisayar Öğretmenlerinin Çalıştığı Kademeye Göre Dağılımı

Kademe	N	%
İlköğretim	113	75,3
Lise	37	24,7
Toplam	**150**	**100,0**

Bilgisayar öğretmenlerine çalıştıkları okullarda hangi kademede derse girdikleri sorulmuş ve ilköğretim okullarında ders verenlerin sayısı liselerde derse giren bilgisayar öğretmenlerinin sayısının yaklaşık olarak 3 katı olduğu görülmüştür. Liselerde derse giren öğretmenlerin sayısının oranı % 24,7 ve ilköğretim okullarında derse giren öğretmenlerin oranı %75,3' tür.
Bilgisayar öğretmenlerinin öğretmenlik mesleğindeki yıllara göre dağılımı Tablo 5'te gösterilmiştir.

Tablo 5-Bilgisayar Öğretmenlerinin Mesleğindeki Yıllara Göre Dağılımı

Meslek Yılı	N	%
1'den az	46	30,7
1-5	86	57,3
11-15	1	,7
16-20	1	,7
20 ve üstü	1	,7
6-10	15	10,0
Toplam	**150**	**100,0**

Tablo 5 incelendiğinde araştırmaya katılan 150 bilgisayar öğretmeninden 46'sının (%30,7 sinin) mesleğinin ilk yılı olduğunu; büyük bir çoğunluğun %57,3'lük oranla, 86 öğretmenin meslekteki ilk 5 yılının içinde olduğunu ve 15 öğretmeninde %10'luk bir oranla 6 ila 10 yıl arasında değişen bir mesleki tecrübeye sahip olduğunu görmekteyiz.
Bilgisayar öğretmenlerinin bilgisayarla ilgili herhangi bir kursa / hizmet içi eğitime katılıp katılmadığına göre dağılımı Tablo 6'te gösterilmiştir.

Tablo 6-Bilgisayar Öğretmenlerinin Bilgisayarlarla İlgili Herhangi Bir Kursa / Hizmet İçi Eğitime Katılıp Katılmadığına Göre Dağılımı

Bilgisayarla ilgili Kurs/Hizmet	N	%
Evet	81	54,0
Hayır	69	46,0
Toplam	**150**	**100,0**

Bilgisayar öğretmenlerine bugüne kadar bilgisayarla ilgili herhangi bir kursa yada hizmet içi eğitime katıldınız mı diye sorulmuş ve verilen yanıtlardan öğretmenlerin % 54 'ünün bilgisayarla ilgili bir kurs yada hizmet içi eğitim aldığı görülmüştür.

Araştırmaya katılan bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeylerinin ortalaması nedir?
Bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeylerinin ortalamasına bakılmış ve sonuçlar Tablo 7'de gösterilmiştir.

Tablo 7-Bilgisayar Öğretmenlerinin İşe Gönülden Adanmışlık Düzeylerinin Ortalaması			
İşe Gönülden Adanmışlık Düzeyi	**N**	**$\bar{x}$**	**SS**
	150	3,8486	1,04

Tablo 7'dende görüleceği gibi bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeylerinin ortalaması 3,85'tir. Bu ortalamanın "Bazen=3" ve "Sık sık=4" aralığına düşmekle birlikte, "Sık sık=4" e daha yakındır. En yüksek değerin 6 olduğu ölçekte bu durum, bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeylerinin oldukça yüksek olduğunu göstermektedir.

Araştırmaya katılan bilgisayar öğretmenlerinin işe ilişkin duygusal iyilik algılarının ortalaması nedir?
Bilgisayar öğretmenlerinin işe ilişkin duygusal iyilik algılarının ortalamasına bakılmış ve sonuçlar Tablo 8'de gösterilmiştir.

Tablo 8- Bilgisayar Öğretmenlerinin İşe İlişkin Duygusal İyilik Algılarının Ortalaması			
İşe İlişkin Duygusal İyilik Algısı	**N**	**$\bar{x}$**	**SS**
	150	4,2006	,79

İşe İlişkin Duygusal İyilik Algısı Ölçeğine verilen cevapların analizi sonucunda araştırmaya katılan bilgisayar öğretmenlerinin işe ilişkin duygusal iyilik algılarının ortalamasının 4,2 olduğu görülmektedir. Bu değer "Hemen hemen her zaman=5" ve "Çoğu zaman=4" aralığına düşmekle birlikte "Çoğu zaman=4" e daha yakın bir değerdir ve örneklem gurubundaki bilgisayar öğretmenlerinin işlerine karşı olumlu duygular beslediklerinin, işe ilişkin duygusal iyilik algılarının yüksek olduğunun göstergesidir.

Araştırmaya katılan bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeyleri;
a. Cinsiyete,
b. Yaşa,
c. Çalıştığı okulun türüne,
d. Çalıştığı kademeye
göre farklılık göstermekte midir?
Bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeylerinin cinsiyete göre farklılaşıp farklılaşmadığına t-testi ile bakılmış ve sonuçlar Tablo 9'da gösterilmiştir.

Tablo 9-Bilgisayar Öğretmenlerinin Cinsiyete Göre İşe Gönülden Adanmışlık Ortalamaları Arasındaki Farka İlişkin t-Testi Sonuçları						
	Cinsiyet	**N**	**$\bar{x}$**	**SS**	**t**	**Sig.**
İşe Adanmışlık	Erkek	103	3,8721	1,07483	.405	.686
	Kadın	47	3,7972	,99259		

İşe gönülden adanma ölçeğinden elde edilen ortalamalara cinsiyete göre bakılmıştır; erkek öğretmenlerin ortalamalarının 3,88 ve bayan öğretmenlerin ortalamalarının 3,80 olduğu görülmüştür. Ortalamalar arası farkın anlamlı olup olmadığına t-testi ile bakılmış ve sonuçlar Tablo 9'da gösterilmiştir. Ortalamalar arasındaki fark anlamlı bulunmamıştır ($P < .05$). Başka bir deyişle erkek ve kadın öğretmenlerin işe gönülden adanma ortalamaları arasında anlamlı bir fark yoktur.
Bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeylerinin yaşa göre farklılaşıp farklılaşmadığına tek yönlü varyans analizi (ANOVA) ile bakılmış ve sonuçlar Tablo 10'da gösterilmiştir.

Tablo 10-Bilgisayar Öğretmenlerinin Yaşa Göre İşe Gönülden Adanmışlık Ortalamaları Arasındaki Farka İlişkin ANOVA Testi Sonuçları					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Gruplar Arası	,011	2	,006	,009	,991
Gruplar İçi	94,518	147	,643		
Toplam	94,529	149			

Tablo 10 da görüldüğü üzere tek yönlü varyans analizinin F değeri ,009 ve buna karşılık gelen p değeri ,991 dir. P değeri ,05 den büyük olduğu için bu sonuç bize bilgisayar öğretmenlerinin yaşa göre işe gönülden adanmışlık ortalamaları arasında guruplar arasında bir farkın olmadığını göstermektedir.
Bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeylerinin çalıştığı okulun türüne göre farklılaşıp farklılaşmadığına t-testi ile bakılmış ve sonuçlar Tablo 11'de gösterilmiştir.

Tablo 11- Bilgisayar Öğretmenlerinin Okul Türüne Göre İşe Gönülden Adanmışlık Ortalamaları Arasındaki Farka İlişkin t-Testi Sonuçları						
	Okul Türü	**N**	**$\bar{x}$**	**SS**	**t**	**Sig.**
İşe Adanmışlık	Devlet Okulu	140	3,8252	1,05087	-1,025	,307
	Vakıf Okulu	10	4,1765	,98235		

İşe gönülden adanma ölçeğinden elde edilen ortalamalara okul türüne göre bakılmıştır; devlet okullarında çalışan öğretmenlerin ortalamalarının 3,82 ve vakıf okullarında çalışan öğretmenlerin ortalamalarının 4,17 olduğu görülmüştür. Ortalamalar arası farkın anlamlı olup olmadığına t-testi ile bakılmış ve sonuçlar Tablo 11'de gösterilmiştir. Ortalamalar arasındaki fark anlamlı bulunmamıştır ($P < .05$). Başka bir deyişle devlet okulları ve vakıf okullarında çalışan öğretmenlerin işe gönülden adanma ortalamaları arasında anlamlı bir fark yoktur.
Bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeylerinin çalıştığı kademeye göre farklılaşıp farklılaşmadığına t-testi ile bakılmış ve sonuçlar Tablo 12'de gösterilmiştir.

Tablo 12- Bilgisayar Öğretmenlerinin Çalıştığı Kademeye Göre İşe Gönülden Adanmışlık Ortalamaları Arasındaki Farka İlişkin t-Testi Sonuçları

	Çalıştığı Kademe	N	$\bar{x}$	SS	t	Sig.
İşe Adanmışlık	İlköğretim	113	3,8652	1,07905	,337	,736
	Lise	37	3,7981	,95462		

İşe gönülden adanma ölçeğinden elde edilen ortalamalara çalışılan kademeye göre bakılmıştır; ilköğretim okullarında çalışan öğretmenlerin ortalamalarının 3,87 ve liselerde çalışan öğretmenlerin ortalamalarının 3,80 olduğu görülmüştür. Ortalamalar arası farkın anlamlı olup olmadığına t-testi ile bakılmış ve sonuçlar Tablo 12'de gösterilmiştir. Ortalamalar arasındaki fark ,736 p değeri ,05 den büyük olduğu için ortalamalar arasındaki fark anlamlı bulunmamıştır. Bu sonuca göre ilköğretim okulları ve liselerde çalışan bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeyleri arasında anlamlı bir farkın olmadığı görülmektedir.

SONUÇ VE ÖNERİLER

Araştırmadan elde edilen bulgulara dayalı olarak şu sonuçlara ulaşılmıştır;

- Araştırmaya katılan bilgisayar öğretmenlerinin büyük çoğunluğu erkektir.
- Öğretmenlerin % 95'inin 21 ile 30 yaş arasında olduğu görülmüştür.
- Bilgisayar öğretmenlerinin yaklaşık % 94'ü devlet okullarında çalışmaktadır.
- İlköğretim okullarında çalışan bilgisayar öğretmenlerinin sayısı (yaklaşık %75); liselerde çalışan bilgisayar öğretmenlerinin sayısının (yaklaşık %25) 3 katıdır.
- Araştırmaya katılan bilgisayar öğretmenlerinin % 30,7'sinin meslekte ilk yılı iken; %57,3'ünün mesleki tecrübesi 1 ila 5 yıl arasında değişmektedir.
- Öğretmenlerin yarısından fazlası (%54) bilgisayar ile ilgili bir kursa yada hizmet içi eğitime katılmıştır.
- Bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeylerinin ortalaması 3,85'dir.Bu, bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeylerinin oldukça yüksek olduğunu göstermektedir.
- Öğretmenlerin işe ilişkin duygusal iyilik algılarının ortalaması 4,2'dir. Bilgisayar öğretmenlerinin işlerine karşı çoğu zaman olumlu duygular beslediklerini görülmüştür.
- Araştırmaya katılan bilgisayar öğretmenlerinin işe gönülden adanmışlık düzeyleri cinsiyete, yaşa, çalışılan okulun türüne ve çalışılan kademeye göre farklılık göstermemektedir.

Bilgisayar öğretmenlerinin işlerine gönülden adanmış olmaları ve işlerinde kendilerini duygusal olarak iyi hissetmeleri performans ve etkinlik açısından oldukça önemlidir. Öğretmenin; idare, öğrenci ve veli ile olan ilişkisi, okulun fiziksel koşulları, ders yükü, öğretmenin kişilik özellikleri, yönetmelikler, okul kültürü, adalet algısı ve diğer faktörler işe gönülden adanmışlığı ve işe ilişkin duygusal iyilik algısını etkilemektedir. Gelecek çalışmalarda bu etkilerin dereceleri araştırılabilir.

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BİLGİSAYAR SİMÜLASYONLARININ HÜCRE ÜNİTESİNİN ÖĞRETİLMESİNDE ÖĞRENCİ AKADEMİK BAŞARISINA ETKİSİNİN BLOOM TAKSONOMİSİNE GÖRE DEĞERLENDİRİLMESİ

AN EVALUATION OF THE EFFECTS OF TEACHING CELL UNIT THROUGH COMPUTER SIMULATIONS ON STUDENT ACHIEVEMENT ACCORDING TO BLOOM TAXONOMY

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Özet: Bu çalışmada, bilgisayar destekli öğrenmenin önemli araçlarından birisi olan simülasyon yardımı ile öğrenmenin, öğretmen anlatımını kapsayan, geleneksel yöntemle öğrenmeye göre başarısı Bloom Taksonomisi temel alınarak araştırılmıştır. Araştırma, Diyarbakır Fatih Lisesi 9. sınıfta okuyan 91 (E: 55, K: 36) öğrencinin katılımı ile gerçekleşmiştir. Çalışmada kontrol ve deney grupları rastgele seçilmişlerdir. Kontrol grubunda geleneksel yolla öğretim yapılırken, deney grubunda simülasyon yardımı ile öğretim yapılmıştır. Ön-test ve son- test olarak uygulanan başarı testi, hücre konusuna ait Bloom Taksonomisi'nin, bilgi, kavrama, uygulama, analiz, sentez ve değerlendirme basamaklarından 5'er soru içeren bir ölçme aracıdır. Uygulama sonrası, deney grubuna simülasyon tutum ölçeği uygulanmıştır. Araştırma, simülasyon yardımı ile öğrenmenin, sadece öğretmen anlatımını içeren geleneksel yolla öğrenmeye göre öğrenci başarısına olumlu katkı yaptığını ortaya çıkarmıştır. Bu katkının özellikle Bloom Taksonomisi'nin bilişsel alandaki üst düzey basamaklarında daha belirgin olduğu görülmüştür.
Anahtar kelimeler: Simülasyon, Bloom taksonomisi, Biyoloji eğitimi, Hücre

Abstract: In this study, learning with the aid of simulation as one of important tools of commuter assisted learning is compared with traditional learning involving teacher lecturing by taking Bloom taxonomy as the base. The participants of the study were 91 (M: 55, F: 36) 9th grade students studying in Fatih secondary school in Diyarbakir. Control and experimental groups were selected randomly. Students in the control group were taught through traditional method, while participants in the experimental group were taught by computer simulations. The achievement test that were applied as pre tests and post tests, consisted of five questions each from knowledge, comprehension, application, analysis, synthesis and evaluation of Bloom taxonomy. The study revealed that compared to traditional learning, learning with the help of simulations makes a meaningful contribution to student achievement. The differences in the high levels are more apparent.
Keywords: Simulations, Bloom taxonomy, Biology education, Cell

LİTERATÜR

Eğitim; bireylerin, toplumların ve dolayısıyla toplumların oluşturduğu ülkelerin gelişmesinde çok önemli bir rol oynadığı herkes tarafından kabul edilir. Bilgi-iletişim teknolojileri son dönemde dünyanın mevcut dengelerini önemli derecede etkilemeye ve değiştirmeye başlamıştır. Bu gelişmelere paralel olarak eğitimin önemini her zamankinden daha fazla artmıştır (Loveless & Ellis, 2002). Kaput (1991)'a göre öğretim sürecinde bilginin çeşitli şekillerde sunulmasının gerekliliği, geleneksel öğretim araç – gereçlerinin yerine, yeni bilgi teknolojilerinin kullanılmasını ön plana çıkarmaktadır. Eğitim-öğretimin niteliğinin arttırılabilmesi için, modern öğretim teknolojilerinin kavram öğretiminde etkin kullanımı, gün geçtikçe daha da önemli hale gelmektedir. Bu bağlamda, bilgisayarların öğretim ortamlarında kullanılmasının en önemli avantajlarından biri, çok sayıda duyu organına aynı anda hitap ederek öğrenme düzeyini arttırması ve öğrenilenlerin kalıcılığını sağlamasıdır. Bundan dolayı animasyon, resim, canlandırma ve ses birlikte kullanılarak öğretim ortamlarının geleneksellikten kurtarıldığına ve öğrenme düzeyinin arttırıldığına dikkat çekilmektedir (Clark ve Craik, 1992).

Bilgisayarların eğitim sistemine girmesi; eğitim ve öğretim sürecinde, okul programlarında değişiklikler ve bilgi akışına yeni boyutlar getirmiş, kalıplaşmış bilgi aktarımına dayanan eğitim sistemlerinde köklü değişikliklere yol açmıştır (Numanoğlu, 1992).Bilgisayarların eğitimde kullanımının yaygınlaşmasıyla bilgisayar destekli öğrenme kavramı ortaya çıkmıştır. Bilgisayar destekli öğretim; bilgisayarın öğretimde öğrenmenin meydana geldiği bir ortam olarak kullanıldığı, öğretim sürecini ve öğrenci motivasyonunu güçlendiren, öğrencinin kendi hızına göre yararlanabileceği, kendi kendine öğrenme ilkelerinin bilgisayar teknolojisiyle birleşmesinden oluşmuş bir öğretim yöntemidir (Uşun, 2000). Bilgisayar destekli eğitim, başarıyı artırmanın yanı sıra öğrencilerde üst düzey düşünme becerilerinin gelişmesini sağlamaktadır. Dolayısı ile öğrenciler ezberden kurtulur, öğrenme anlayarak-kavrayarak gerçekleşir (Renshaw ve Taylor, 2000). Ailleo ve Wolfe (1980) Bilgisayar destekli öğretimin, kimya başarısına %52, biyoloji başarısına %36 ve fizik başarısına %23 olmak üzere öğrenci başarısına ortalama %42 oranında olumlu etki ettiğini tespit etmişlerdir.

Bilgisayar destekli öğretimin bir parçası olan simülasyonlar, oldukça çok yönlü ve esnek olmasından dolayı, çok çeşitli eğitimsel amaç ve hedeflere ulaşılabilir (Ellington, Addinall ve Percival, 1981). Simülasyonlarla kullanılan kinetik ve etkili öğrenme modları hissetme, analiz etme ve yansıtmayı sağlayarak, öğrenmeye katkıda bulunur (Cruz ve Patterson, 2005). Bu etkilerinden dolayı simülasyonlar, Bloom'un bilişsel ve duyuşsal alanlarının bütün parçalarında hedeflenen başarıyı sağlar ve psikomotor alanlarda da etkili olarak kullanılabilir (Ellington, Addinall ve Percival, 1981). Wentworth ve Lewis (1973) çalışmalarında, simülasyonla öğretim tekniğinin Bloom taksonomisinin bilişsel alanının analiz, sentez ve değerlendirmeden oluşan üst düzey öğrenmelerinin gerçekleşmesinde, geleneksel yöntemlerden çok daha etkili olduğu belirlemekle beraber duyuşsal alanlarda da başarıyı yakalamışlardır.

Simülasyon; bilgilerin, kombine edilmiş kelimeler ve resimler yardımıyla sunulduğu karmaşık dinamik sistemler hakkında öğrencilerin zihninde model oluşturmaya yardımcı olan (Schnotz ve Bannert, 2003), interaktif animasyonun özel bir çeşididir (Nerdel ve Prechtl, 2004). Simülasyonlar , bir konu alanına ait kavram ve ilişkilerin öğrenilmesinde öğrenciye inisiyatif veren yazılımlardır. Simülasyonlar, gerçek ve güvenilir şekilde eğitim ve ya problemlere çözüm sunan ortamı kuran yazılımlardır. Kişinin doğal koşullar altında, gerçek problemlere karşı sorumluluğunu gerektirir. Öğrenci gerçek durumlardaymış gibi dönüt alır (Issenberg vd., 2005), gerçek dünya tecrübeleriyle etkileşimde bulunarak gözlemleme fırsatı yakalar (Şahin, 2006) ve gerçeğine çok benzeyen diyagramlar çizebilme yeteneği kazanır (Ronen ve Eliahu,

2000). Benzetimlerle doğal ve gerçek ortamlar ve olaylar (gerçek hayattaki), bilgisayar ortamında kontrollü bir şekilde temsil edilir (Demirel, 2004).

Simülasyonların fen öğretiminde kullanılmalarına yönelik birçok çalışmalar yürütüldüğü literatürde belirtilmektedir (Rodrigues, 1997). Yapılan çalışmalarda simülasyonların, düşük sevide ön bilgilere sahip öğrencilerin başarısına anlamlı bir katkı yaptığı (Nerdel ve Prechtl, 2004), öğretimde ve değerlendirmede çok yararlı olmasının yanı sıra öğrencilere bir çok alanda kendilerini geliştirme fırsatı oluşturduğu (Miller, 1987), çalışmaya karşı olan ilgiyi arttırdığı, aktiviteler sırasında öğrencilerin kendileriyle yarıştıkları, zor deneyimlerin kolaylaştığı (Rieber ve Noah, 2008), eğitimsel olarak etkili olduğu ve eğitime tamamlayıcı bir unsur olduğu vurgulanmıştır (Issenberg vd., 2005).

Bu çalışmada, bilgisayar destekli öğrenmenin önemli araçlarından birisi olan simülasyon yardımı ile öğrenmenin, öğretmen anlatımını kapsayan, geleneksel yöntemle öğrenmeye göre başarısı Bloom Taksonomisi temel alınarak araştırılmıştır. Araştırmada şu sorulara cevap aranmıştır:

1. Simülasyon yöntemiyle eğitim verilen öğrencilerle, geleneksel yöntemlerle eğitim verilen öğrencilerin ön testleri arasında anlamlı bir fark var mıdır?
2. Simülasyon yöntemiyle eğitim verilen öğrencilerle, geleneksel yöntemlerle eğitim verilen öğrencilerin son testleri arasında anlamlı bir fark var mıdır?
3. Simülasyon yöntemiyle eğitim verilen öğrencilerle, geleneksel yöntemlerle eğitim verilen öğrencilerin Bloom Taksonomisine göre üst öğrenmeleri arasında anlamlı bir fark var mıdır?
4. Simülasyon yönteminin uygulandığı öğrencilerin ve geleneksel yöntemin uygulandığı öğrencilerin cinsiyetleri ile akademik başarıları arasında anlamlı bir fark var mıdır?

YÖNTEM

Çalışmada yer alan öğrenciler, deneysel grup ve kontrol grubu olmak üzere rastgele iki gruba ayrıldı. Çalışmada ön test-son test kontrol grubu tasarımı kullanıldı. Ders sunumu kontrol grubunda geleneksel anlatım yöntemine göre, deney grubunda ise simülasyon destekli olarak yapıldı. Çalışmanın başlangıcında, Canlılığın Temel Birimi Hücre ünitesiyle ilgili ön bilgileri arasında anlamlı bir fark olup olmadığını belirlemek için bütün öğrencilere Hücre Ünitesi Başarı Testi (HÜBT) uygulandı. İki farklı öğretim metodunun (Geleneksel Anlatım Yöntemi ve Simülasyon Yöntemi) öğrenci başarısı üzerine etkisini belirlemek amacıyla Hücre Ünitesi Başarı Testi (HÜBT) son test olarak uygulandı. Araştırmanın örneklemi, 2008–2009 eğitim öğretim yılında Diyarbakır İli Fatih Lisesi'nde okuyan dokuzuncu sınıf öğrencileridir. Deney grubunda 52, kontrol grubunda 39 olmak üzere toplam 91 öğrenci uygulamaya katılmıştır. Veriler SPSS 15.0 programı ile analiz edilmiştir. Deney ve kontrol grupları arasındaki karşılaştırmalar bağımsız t- testi ile deney ve kontrol gruplarındaki öğrencilerin grup içi ön-test ve son-test başarı karşılaştırmaları bağımlı t-testi ile analiz edilmiştir. Cinsiyet farklılıkları da t- testi kullanılarak analiz edilmiştir.

BULGULAR

Hücre ünitesi başarı testinin deney ve kontrol grubuna ön test olarak uygulanması sonucunda, bilgi, kavrama, uygulama, analiz, sentez ve değerlendirme düzeyindeki sorulara verdikleri cevaplar arasında anlamlı bir fark bulunamamıştır ($p>0.05$). Bu da kontrol ve deney grubundaki öğrencilere konular öğretilmeden önceki konu bilgileri ya da hazır bulunuşluk düzeylerinin birbirlerine yakın veya benzer olduğunu ortaya çıkarmaktadır.

Ön teste katılan deney ve kontrol gruplarındaki öğrencilerin bilgi düzeyindeki sorulara verdikleri cevaplarda cinsiyete bağlı istatistiksel olarak anlamlı bir fark bulunamamıştır ($p>0.05$). Buna rağmen, ortalamalara bakıldığı zaman erkeklerin bilgi basamağındaki sorulara kızlara göre nispeten daha başarılı oldukları görülmektedir. Aynı şekilde, ön test olarak uygulanan başarı testinin kavrama düzeyindeki sorularını yanıtlamada cinsiyete bağlı olarak değişen anlamlı bir fark bulunamamıştır ($p>0.05$). Aradaki fark istatistikî olarak anlamlı olmasa da, kavrama düzeyindeki sorulara kız öğrencilerin daha iyi cevap verdikleri gözlenmektedir. Uygulama düzeyindeki sorulara bakıldığı zaman erkek öğrencilerin kız öğrencilere göre istatistiksel anlamda daha başarılı oldukları görülmektedir ($p<0,05$). Analiz, sentez ve değerlendirmeden oluşan diğer üç basamaktaki sorulara verilen cevaplar arasında cinsiyet temelli bir anlamlı farkın olmadığı görülmektedir ($p>0.05$). Erkekler analiz seviyesindeki sorularda nispeten daha başarılı olurken, kızların değerlendirme sorularında daha başarılı oldukları gözlenmektedir. Sentez sorularına verilen cevapların ortalamaları cinsiyet temelli eşit olduğu gözlenmektedir.

Hücre ünitesi başarı testi deney ve kontrol gruplarında "Canlılığın Temel Birimi Hücre" ünitesinin sonunda son test olarak uygulanmıştır. Verilerin sonuçlarına göre, bilgi düzeyindeki sorulara, 6 haftalık, simülasyon yöntemiyle ders anlatılan deney grubundaki öğrencilerin cevapları ile geleneksel yöntemlerle ders anlatılan kontrol grubundaki öğrencilerin cevapları arasında anlamlı bir fark olduğu belirlenmiştir. Bloom Taksonomisi'ni oluşturan basamaklara tek tek bakıldığında simülasyon yöntemiyle eğitim verilen deney grubundaki öğrenciler bilgi, kavrama, uygulama, analiz, sentez ve değerlendirme basamaklarındaki son test temel alınarak sorulara verilen yanıtlar arasında istatistiki anlamda önemli farkların olduğu görülmektedir ($p<,01$). Sorulara verilen doğru cevap ortalamaları incelendiğinde farkın deney grubu lehine olduğu ortaya çıkmaktadır. Bu sonuç araştırmada bilgisayar simülasyonu yardımıyla eğitim gören öğrencilerin geleneksel yolla konu öğrenen öğrencilere göre her altı basamakta da daha başarılı olduğunu ortaya koymaktadır.

Başarı testinin son test uygulamasında, Bloom Taksonomi'sinin bilgi, kavrama, uygulama, analiz, sentez ve değerlendirme düzeylerindeki sorulara verilen cevaplar arasında cinsiyete göre anlamlı bir fark bulunmamıştır ($p>0.05$). Son-test uygulamasındaki ortalamalara bakıldığında, kız öğrencilerin kavrama, uygulama, analiz, sentez ve değerlendirme basamağındaki sorularda, erkek öğrencilerin ise sadece bilgi düzeyindeki sorularda daha yüksek ortalamaya sahip oldukları görülmektedir.

Kontrol grubunun Bloom Taksonomisi'ne göre ön-test ve son-test sonuçları ele alındığında istatistiksel anlamda sadece uygulama seviyesindeki sorularda anlamlı bir farkın oluştuğu gözlenmektedir ($p<,05$). Ortalamalara bakıldığı zaman bu fark son-test lehine ortaya çıktığı gözlemlenir (Tablo1.). Bu da kontrol grubunda bulunan öğrencilerin uygulama basamağındaki sorulara son-teste istatistiksel anlamda daha iyi cevap verdiklerini göstermektedir. Bilgi, kavrama ve analiz düzeylerinde kontrol grubundaki öğrencilerin istatistiksel anlamda olmasa bile genel olarak ortalamalarının son teste, ön- teste oranla daha yüksek olduğu görülmektedir. Kontrol grubunda bulunan ve hem ön-test hem de son-testi cevaplayan 39 öğrencinin değerlendirilmesinde bu öğrencilerin sentez ve değerlendirme basamaklarındaki cevapları arasında istatistiksel anlamda önemli bir farkın olmadığı görülmektedir ($p>,05$). Fakat bu sonuçlarda ilginç olan öğrencilerin doğru cevap ortalamalarının bu iki düzeyde karşılaştırılmalarında, ön-test ortalamalarının nispeten daha yüksek olduğunun gözlenmesidir. Bu da öğrencilerin bu iki düzeydeki sorularda pozitif bir gelişme sağlayamadıklarını ortaya çıkarmaktadır.

Tablo 1. Bloom Taksonomisi'ne göre kontrol grubu başarı testi ön-test ve son-test karşılaştırılmaları

Bloom taksonomi düzeyi	Test	N	Ort	SS	Sonuç
Bilgi	Ön-test	39	1,3538	,20241	t: -,681
	Son-test	39	1,3846	,19673	Sig:,491 p>0,05
Kavrama	Ön-test	39	1,2667	,16114	t: -,682
	Son-test	39	1,2923	,17073	Sig:,497 p>0,05
Uygulama	Ön-test	39	1,1282	,14133	t: -2,095
	Son-test	39	1,2051	,18057	Sig:,04 p<0,05
Analiz	Ön-test	39	1,1487	,25013	t: -2,315
	Son-test	39	1,2821	,25841	Sig:,023 p>0,05
Sentez	Ön-test	39	,3385	,25196	t: 2,561
	Son-test	39	,2000	,22478	Sig:,012 p>0,05
Değerlendirme	Ön-test	39	,6769	,26204	t: 1,260
	Son-test	39	,6051	,24056	Sig:,211 p>0,05

Kontrol grubunu oluşturan öğrencilerin hem ön-test hem de son test sonuçları göz önünde bulundurulduğunda Bloom Taksonomisi'nin her altı basamağında da cinsiyetler arası anlamlı bir farkın gözlemlenemediği görülmektedir (p>,05). Basamaklar tek tek ele alındığında kontrol grubundaki erkek öğrencilerin bilgi, uygulama ve değerlendirme basamaklarında nispeten daha yüksek ortalamalara sahip olduğu görülürken, kız öğrencilerin, kavrama, analiz ve sentez düzeylerindeki sorulardan daha yüksek ortalamaya sahip oldukları görülmektedir.

Tablo 2. Bloom Taksonomisi'ne göre deney grubu başarı testi ön-test ve son-test karşılaştırılmaları

Bloom Taksonomi düzeyi	Test	N	Ort	SS	Sonuç
Bilgi	Ön-test	52	1,3423	,21083	t: -7,727
	Son-test	52	1,6808	,23518	Sig:,000 P<0,05
Kavrama	Ön-test	52	1,2962	,18783	t: -5,305
	Son-test	52	1,5231	,24464	Sig:,000 P<0,05
Uygulama	Ön-test	52	1,1346	,17588	t: -7,787
	Son-test	52	1,4577	,24201	Sig:,000 P<0,05
Analiz	Ön-test	52	1,1615	,25372	t: -6,700
	Son-test	52	1,5038	,26713	Sig:,000 P<0,05
Sentez	Ön-test	52	,2692	,31407	t: -5,984
	Son-test	52	,7269	,45336	Sig:,000 p<0,05
Değerlendirme	Ön-test	52	,6500	,24375	t: -,760
	Son-test	52	1,0077	,37565	Sig:,000 P<0,05

Araştırmada deney grubunda bulunup hem ön-test hem de son-testteki sorulara cevap veren öğrencilerin (n:52) başarılarının değerlendirilmesinde tüm basamaklarda ön-test ve son-test arasında istatistikî anlamda önemli farkların oluştuğu gözlemlenmektedir (Tablo 2). Bilgi basamağındaki sorulara deney grubundaki öğrencilerin son-teste daha iyi cevap verdikleri ve ön-test ile son-test sonuçları arasında istatistiksel anlamda önemli bir farkın olduğu görülmektedir (p<,01). Deney grubundaki öğrenciler bilgi basamağındaki sorular göz önünde bulundurulduğunda anlamlı bir gelişme göstermişlerdir. Aynı şekilde kavrama düzeyindeki sorularda da öğrencilerin son testte daha başarılı oldukları ve her iki teste verilen cevapların ortalamaları arasında istatistiksel anlamda önemli bir farkın olduğu ortaya çıkmıştır (p<,01). Uygulama düzeyinde de deney grubundaki öğrenciler son-testte daha başarılı olmuşlardır. İki test arasında istatistiksel açıdan anlamlı bir fark tespit edilmiştir (p<,01). Bu temel düzeylerin dışında, yüksek düzeyleri oluşturan analiz, sentez ve değerlendirme basamaklarında bulunan sorulara da deney grubunda bulunan öğrenciler son-teste daha iyi cevap vermişlerdir. Bu üç düzeydeki sorulara verilen cevaplar arasında istatistikî olarak anlamlı bir fark olduğu görülmektedir (p<0,5).

Deney grubundaki öğrencilerin yüksek düzeyleri yansıtan ve anlamlı öğrenmenin olup olmadığını sınan sorular temel alındığında uygulama sonrası önemli gelişme gösterdikleri ortaya çıkmaktadır.

Araştırmanın deney grubunu oluşturan bireylerin, Bloom Taksonomisi'nin altı basamağını oluşturan, bilgi, kavrama, uygulama, analiz, sentez ve değerlendirmeye ait sorulara verilen cevaplar cinsiyet (kız:22, erkek:30) temelinde ele alındığında istatistiksel anlamda önemli bir farkın olmadığı görülmektedir. Erkek öğrenciler bilgi ve analiz basamağındaki sorulara verdikleri doğru cevapların ortalamaları daha yüksek iken kız öğrencilerin kavrama, uygulama, sentez, değerlendirme basamaklarını temsil eden sorulara verdikleri cevapların ortalamalarının daha yüksek olduğu görülmektedir.

SONUÇ VE ÖNERİLER

Bu araştırmada, Canlılığın Temel Birimi Hücre ünitesinin simülasyon yöntemi ile öğretilmesinin, Bloom Taksonomisi'ne göre öğrenci başarısına olan etkisi ve öğrencilerin simülasyon ile öğrenmeye yönelik tutumları araştırılmıştır. Araştırma, simülasyonla öğrenmenin geleneksel yolla öğrenmeye göre, öğrencilerin bilgi, kavrama, uygulama, analiz, sentez ve değerlendirme basamaklarında daha fazla gelişme gösterdiklerini sağladığını ortaya çıkarmıştır. Özellikle alt düzey basamaklarda hem deney hem de kontrol grubunda gelişme olmasına rağmen sentez ve değerlendirme basamaklarında simülasyonla hücre konusunu öğrenen öğrencilerin daha başarılı olduğu görüldü.

Araştırmada ayrıca farklı basamaklardaki öğrenmenin cinsiyete bağlı değişim göstermediği görülmüştür. Hem erkek hem de kızların tüm basamaklarda benzer gelişme gösterdikleri yapılan bağımsız gruplar t-testi ile ortaya konuldu. Araştırmada elde edilen bulgular ışığında şu öneriler yapılabilir:

- Özellikle anlamlı öğrenme ve Bloom Taksonomisi'nin üst düzey bilişsel öğrenmeleri hedeflenmiş ise simülasyon kullanılabilir.
- Öğretmen adaylarına eğitim teknolojileri ile ilgili bilgiler verilirken bilgisayar simülasyonları konusu üzerinde özellikle durulmalıdır.
- Özel öğretim yöntemleri dersinde alanla ilgili simülasyon örnekleri verilerek öğretmen adayları bilgilendirilmelidir.
- Sınıflarda gerekli alt yapının olması sağlanmalıdır.
- Mevcut simülasyonların temin edilip, öğretmenlerin kullanmaları teşvik edilmelidir.
- Müfredatın simülasyon uygulamasına yönelik etkinliklerle desteklenmesi gerekir.
- Okullarda mutlaka bilgisayar odaları ve bilgisayarlı laboratuarlar kurulmalıdır.
- Ders kitaplarının simülasyon CD'si olacak şekilde hazırlanması sağlanmalıdır.

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BİLGİSAYAR VE ÖĞRETİM TEKNOLOJİLERİ EĞİTİMİ (BÖTE) BÖLÜMÜ ÖĞRETMEN ADAYLARININ BÖLÜM İSMİNE İLİŞKİN GÖRÜŞLERİ

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Eğitim fakültelerinin yeniden yapılanma sürecinde ilk kez 1998 yılında Yüksek Öğretim Kurumu tarafından Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) programı açılmıştır. BÖTE bölümün temel amacı, bilgisayar ve diğer bilgi teknolojileri konusunda lisans eğitimi vererek ilk ve orta öğretim kurumlarına bilişim teknolojileri öğretmeni yetiştirmektir. Bu araştırmanın amacı; BÖTE bölümü isminin bu bölümde öğrenim gören öğretmen adayları tarafından nasıl algılandığını incelemektir.
Bu çalışma tarama türü araştırma modeli ile desenlenmiştir. Çalışmanın örneklemini 2009-2010 öğretim yılı bahar döneminde Anadolu Üniversitesi Eğitim Fakültesi Bilgisayar ve Öğretim Teknolojileri Öğretmenliği Ana Bilim Dalı 1., 2., 3., ve 4. sınıflarında öğrenim gören toplam 148 öğretmen adayı oluşturmaktadır. Bu çalışmada hem nicel hem nitel veri toplama yöntemleri kullanılmıştır. Veri toplama aracı olarak ise araştırmacı tarafından geliştirilen anket kullanılmıştır. Geliştirilen anket, kapalı ve açık uçlu sorulardan oluşmaktadır.
Bu çalışmanın sonucunda, BÖTE bölümü öğretmen adaylarının bölüm ismine yönelik algıları incelenmiş ve bu bölümün ismine yönelik öğrenci algısının etkileyebileceği değişkenler ele alınmıştır. Ulaşılan bulgulara dayalı olarak öğretmen adaylarının bölüm ismine ilişkin önerilerine de yer verilmiştir.
Anahtar Sözcükler: Bilgisayar ve Öğretim Teknolojileri Eğitimi, BÖTE, BÖTE bölümü ismine ilişkin öğrenci görüşleri

COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGY (CEIT) THE VIEWS OF CANDIDATE TEACHERS RELATED TO THE NAME OF DEPARTMENT

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In the process of reconstruction of education faculties, Computer Education and Instructional Technology Programme was first opended by Turkish Council of Higher Education in 1998. The main aim of this programme was getting informatics teachers in primary and high schools by educating them about computer and other science Technologies . On the other hand, the aim of this research was to analyse how CEIT was perceived by candidate teachers studying in this department.
The kind of this survey was designed with research design. Samples of the study were 148 candidate teachers educated in Anadolu University Education Faculty and Teaching Technology Department in 1. 2 .3. 4. classes in 2009-2010 spring-term . Both quantitative and qualititative methods of data collection were used for the study. The means of data collection was a questionnaire developed by researcher . The questionnaire included open-ended and closed-ended questions.
At the end of this study, perceptions of candidate teachers in CEIT were examined and how changeable factors effected student teachers' perceptions about the name of the department was taken up. In addition , suggestions of student teachers were placed in this study.
Keywords: Computer Education And Instructional Technology, CEIT, The Views of Students Related To The name Of CEIT Department

GİRİŞ

Teknoloji, bilimdeki gelişmeleri insanın pratik yaşamına uygular. Teknolojideki yenilik ve gelişmeler birçok alanda olduğu gibi eğitim alanında da kullanılmaktadır. Kaliteli ve verimli bir eğitim için teknolojinin bu eğitim ortamlarına entegrasyonu sağlanmalıdır. Bunun yanında, eğitim alanındaki sorunların çözüm ihtiyacı "eğitim teknolojisi" disiplinini doğurmuştur. Eğitim teknolojisindeki "eğitim" sözcüğü; öğrenciye öğrenmeyi kolaylaştırmak için sunulan tüm etkinlik ve olanakları ifade etmektedir. Alkan (1998) eğitim teknolojisi kavramını, "öğrenme-öğretme süreçlerinin tasarımlanması, uygulanması, değerlendirilmesi ve geliştirilmesi işi" olarak ifade etmiştir. Eğitim teknolojisi, teknolojiden eğitim alanında çeşitli hizmetler açısından fayda sağlanması olarak da ifade edilebilir. Eğitim teknolojisi öğrenme-öğretme süreçleri ile ilgili özgün bir disiplinken, öğretim teknolojileri bir konunun öğretimi ile ilgili öğrenmenin klavuzlanması etkinliğini ifade etmektedir. Öğretim teknolojisi belirli bir disiplinin kendine özgü yönlerini dikkate alarak düzenlenmiş teknolojiyle ilgili bir kavramdır. Öğretim teknolojisine örnek olarak; "fen öğretimi teknolojisi", "dil öğretimi teknolojisi" vb. farklı disiplinler gösterilebilir (Alkan, 1998). Hem diğer disiplinlerin öğretim teknolojileri ile olan ilişkisini sağlamak hem de okullardaki teknoloji geliştirme ve kullanma ihtiyacını karşılama amacıyla eğitim fakültelerinin yeniden yapılanma sürecinde ilk kez 1998 yılında Yüksek Öğretim Kurumu tarafından Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) bölümü açılmıştır. BÖTE bölümün temel amacı, "bilgisayar ve diğer bilgi teknolojileri konusunda lisans eğitimi vererek ilk ve orta öğretime bilgisayar ve öğretim teknolojileri öğretmeni yetiştirmektir. BÖTE bölümü öğrencileri 4 yıllık lisans programı çerçevesinde fen, matematik vb. kültür dersleri, alan dersleri ve pedagojik formasyon derslerini almaktadırlar. BÖTE bölümü mezunları T.C. Milli Eğitim Bakanlığı'na bağlı devlet ve özel statülü okullarda öğretmen, öğretim teknoloğu ve üniversitelerin ilgili bölümlerinde akademisyen olarak çalışabilmektedir" (Anadolu Üniversitesi, 2009). Bunun haricinde, özellikle kendini daha fazla geliştirebilen bazı BÖTE bölümü mezunlarının özel sirketlerde yazılımcı olarak da görev yapabildikleri gözlenmektedir. Ancak BÖTE bölümü mezunlarının çoğu devletin resmi ilköğretim ya da ortaöğretim kurumlarında öğretmen olarak istihdam edilmektedir.
Alanyazında, BÖTE bölümü öğretmen adaylarının bölüm ve mesleklerine ilişkin düşüncelerine başvurulmuştur. Karataş (2010) BÖTE öğretmen adaylarının düsüncelerini incelemiş; zihinlerinin çok net olmadığını, kavram kargasası yasadıklarını, gelecekleri için bir yol haritasını çesitli nedenlerle belirleyemediklerini gözlemlemiştir. Bununla birlikte; Erdoğan (2008) BÖTE bölümü öğretmen adayları üzerinde yaptığı çalışmada öğrencilerin mesleki beklentilerini incelemiş ve araştırma sonuçlarına göre BÖTE bölümü öğrencilerinin büyük çoğunluğunun (%88.2) öğretmenlik yapmak istediklerini ve %95.2'sinin BÖTE bölümünde öğrenimlerine devam etmek istediklerini belirlemiştir.
BÖTE bölümünün henüz 12 yıllık bir geçmişi bulunmaktadır. Bu bölümde öğrenim gören öğretmen adaylarının BÖTE bölümünün ismine ilişkin nasıl bir algı geliştirdikleri merak edilmektedir. Öğrencilerin bu bölümün vizyonu ve misyonu paralelinde ismine ilişkin beklenen algılar geliştirmesi ve bu yönde bu bölümü tercih etmeleri bu bölümün daha başarılı mezunlar vermesine yol açabilecektir. Bu yönüyle bu çalışma, bölüm isminin farklı ya da yanlış algılanması sonucunda hangi değişkenler üzerinde olumsuz etkiler doğurabileceğinin belirlenmesi ve bu yönde tedbirlerin alınması ya da değişikliklerin yapılması anlamında önem taşımaktadır.

YÖNTEM

Araştırmanın Modeli
Bu çalışma tarama türü araştırma modeli ile desenlenmiştir.

Örneklem
Çalışmanın örneklemini 2009-2010 öğretim yılı bahar döneminde Anadolu Üniversitesi Eğitim Fakültesi Bilgisayar ve Öğretim Teknolojileri Öğretmenliği Ana Bilim Dalı 1., 2., 3., ve 4. sınıflarında öğrenim gören toplam 148 öğretmen adayı oluşturmaktadır. 148 öğretmen adayının cinsiyete göre dağılımı 51 (%34,5) kız 97 (%65,5) erkek birey şeklindedir. 148 öğretmen adayı sınıflara göre; 1. sınıftan 38 (% 26), 2. sınıftan 37 (%25), 3. sınıftan 30 (%20) ve 4. sınıftan 43 (%29) birey şeklinde dağılım göstermiştir.

Veri Toplama Aracı
Bu çalışmada hem nicel hem nitel veri toplama yöntemleri kullanılmıştır. Veri toplama aracı olarak araştırmacı tarafından geliştirilen anket kullanılmıştır. Anketin son haline uzman görüşleri alınarak ve gerekli düzeltmeler yapılarak karar verilmiştir. Geliştirilen ankette; cinsiyet, sınıf ve mezun olunan lise türü demografik değişkenlerini içeren 3 soru, 7 adet kapalı uçlu soru ve 2 adet de açık uçlu soru olmak üzere toplam 12 soru bulunmaktadır. Açık uçlu sorulardan biri "Bölüm adının ne olmasını isterdiniz?" sorusu iken bir diğeri ise "Başka bir bölüme geçme olanağınız olsa bu bölümü bırakır mıydınız? Evet ise neden?" sorularından oluşmaktadır. Anketteki diğer sorular; bölümü tercih etme nedenlerini, mezun olunca hangi alanda çalışmak istediklerini, bölümün ismine ilişkin alıgılarının ne olduğunu vb. 7 kapalı uçlu soruyu içermektedir.

Verilerin Analizi
Nicel ve nitel olarak toplanan verilerin analizinde nicel veriler için yüzde, frekans analizleri ve çapraz tablo sorgulaması yapılmıştır. Nitel verilerin analizi için ise öncelikle öğrencilerin verdiği açık uçlu soruların yanıtları kategorize edilmiş ve bu veriler üzerinden yüzde ve frekans analizleri yapılmıştır. Analizler sonucunda bulgular tablolaştırılmış ve dikkat çekici bulgular yorumlanmıştır. Örneklemden toplanan verilerin analizi için SPSS programı kullanılmıştır.

BULGULAR

Bu çalışmada geliştirilen ankette ilk 3 soru demografik değişkenlere ilişkin cinsiyet, sınıf ve mezun olunan lise türü bilgilerini içermektedir. Örneklemdeki BÖTE bölümü öğretmen adaylarının 80'i (%54) meslek lisesi mezunudur. Bu oranı 33 (%22) birey ile anadolu lisesi ve 30 (%20) birey ile düz lise mezunu takip etmektedir. Meslek lisesi mezunlarının bu bölüme gelmesinde; meslek lisesi mezunlarının bu bölümü seçerken üniversiteye giriş sınavında ek puan almaları ve alan dışı tercihlerinde puanlarının kırılması bir etken olarak gösterilebilir.

Nicel ve Nitel Verilere İlişkin Bulgular
Araştırmacı tarafından geliştirilen anketin 12 sorusundan 7'si kapalı uçlu ve 2'si açık uçlu sorulardan oluşmaktadır. Nicel ve nitel olarak elde edilen bu soruların yanıtları üzerinden yüzde ve frekans dağılımları bulunmuş ve bazı değişkenler için çapraz tablo (crosstab) sorgulaması yapılmıştır.
Öğretmen adaylarına bölümün ismi ile program içeriğinin tutarlı olup olmadığı sorulmuş 72 (%49) birey "hayır tutarlı değil", 40 (%27) birey "evet tutarlı" ve 35 (%24) birey "kararsızım" yanıtını vermiştir. "Evet" diyen 40 bireyin 18'i gibi önemli bir çoğunluğu 1. sınıf öğrencilerinden oluşmaktadır. 4. sınıfa doğru bölüm ismi ile içeriğin tutarlı olduğunu düşünenlerin sayısının azaldığı ve tutarlı olmadığını düşünenlerin sayısının arttığı yapılan çapraz tablo sorgulamasında görülmektedir. Bu soruya paralel olarak alınan derslerin beklentileri karşılayıp karşılamadığı sorulmuş 105 (%71) gibi önemli bir çoğunluk "hayır karşılamıyor", 18 (%12) birey "evet karşılıyor" ve 25 (%17) birey "kararsızım" yanıtını vermiştir. Aynı şekilde yapılan çapraz tablo sorgulamasında; program içeriğinin beklentileri karşılamadığını düşünen öğrencilerin sayısı 4. sınıfa doğru artmaktadır. Bu iki sorunun bulgusuyla; öğretmen adaylarının önemli bir çoğunluğunun program içeriğinin bölüm ismiyle paralellik göstermediğini düşündükleri sonucuna varılabilir.

Tablo 1. Öğretmen adaylarının bölümü tercih etme nedenlerinin frekans ve yüzde dağılımları

Bu bölümü tercih etme nedeni	Frekans (f)	Yüzde (%)
Bilgisayarı sevdiğim için	30	20,3
Öğretmenlik mesleğini sevdiğim için	22	14,9
Tesadüfi	16	10,8
Mecburiyet (meslek lisesi çıkışlı olmak vb.)	51	34,5
Atamasının kolay olması	11	7,4
Diğer (popüler_meslek, ailem istedi gibi)	12	8,1
Kayıp veri	6	4,1
Toplam	148	100

Tablo 1 incelendiğinde öğretmen adaylarının bu bölümü tercih etmelerinde en önemli neden olarak 51 (%35) birey "mecburiyet" olarak yanıt vermiştir. Öğrencilerin bu bölümü mecburiyetten tercih etmeleri bölüm dışı tercihlerinde üniversite giriş sınavında puan kırılmasıyla ilişkilendirilebilir. Öyle ki, örneklemdeki bireylerin çoğunun meslek lisesi çıkışlı olduğu görülmektedir. Diğer bir önemli neden olarak öğretmen adaylarından 30'u (%20) "bilgisayarı sevdiğim için" yanıtını vermiştir.

Tablo 2. Öğretmen adaylarının mezun olunca çalışmak istedikleri alanların frekans ve yüzde dağılımları

mezun olunca çalışmak istediğiniz alan	Frekans (f)	Yüzde (%)
Öğretmenlik	75	51
Özel sektör	24	16
Üniversitede öğretim elemanı	20	14
Kendimi işimi kurma	11	7
Bölümlü ilgili bir iş yapmak istemiyorum	13	9
Kayıp veri	5	3
Toplam	148	100

Tablo 2 incelendiğinde 75 (%51) öğretmen adayının mezun olunca öğretmenlik yapmak istediği görülmektedir. Ancak bunun aksine 13 (%9) öğretmen adayının mezun olunca bu alanla ilgili bir işte çalışmak istemediklerini belirtmeleri dikkat çekicidir. Özellikle 64 (%43) öğretmen adayının öğretmenlik mesleği dışında bir alanda çalışmak istemeleri öğretmen adaylarının birçoğunun bu bölüme mecburi olarak gelmeleri ile açıklanabilir. Ayrıca öğretmen adaylarının 24'ü (%16) ise özel sektörde çalışmak istemektedir. Çalışılmak istenilen alan ile sınıf arasında yapılan çapraz tablo sorgulamasında özel sektörde çalışmak isteyen 24 öğretmen adayından 11'i 1. sınıf öğrencilerinden oluşmaktadır. Özel sektörde çalışmak isteyen öğretmen adaylarının sayısı birinci sınıftan sonra azalmakta ve bu sayının öğretmenlik mesleği lehine arttığı gözlenmektedir. Bu sonuç, öğretmen adaylarının birinci sınıftan sonra bu bölümün amacının özel sektöre eleman yetiştirmek olmadığını ya da bu bölümün amacı ile özel sektörün taleplerinin paralellik göstermediğini daha iyi anlamaları ile yorumlanabilir.

Tablo 3. Bölümü tercih etme nedeninde etkili olan kavramın frekans ve yüzde dağılımları

Bölüm ismindeki hangi kavram tercihinizde etkili olmuştur	Frekans (f)	Yüzde (%)
Bilgisayar	54	37
Teknoloji	15	10
Öğretim teknolojisi	4	2,7
Öğretmenlik	26	17,6
Bilgisayar ve öğretim teknolojileri	24	16,2
Tercihimde bölüm ismi etkisi yok	25	16,9
Toplam	148	100

Tablo 3 incelendiğinde, öğretmen adaylarının 54'ünün (%37) bu bölümü tercih etmesinde bölüm ismindeki "bilgisayar" sözcüğünün etkili olduğu gözlenmiştir. "Bilgisayar" sözcüğünün bu kadar etkili olmasına karşın bölüm isminde yer alan "öğretim teknolojileri" sözcüğünün sadece 4 (%3) kişinin tercihinde etkili olması dikkat çekicidir.

Tablo 4. Öğretmen adaylarının bölüm isminden memnun olma durumlarının frekans ve yüzde dağılımları

Bölümün isminden memnun musunuz?	Frekans (f)	Yüzde (%)
Evet	85	57,4
Hayır	39	26,4
Kararsızım	24	16,2
Toplam	148	100

Tablo 4 incelendiğinde, öğretmen adaylarının 85'inin (%57) bölüm isminden memnun olduğu, 39'unun (%26) bölüm isminden memnun olmadığı ve 24'ünün (%16) bölüm ismine yönelik memnuniyetlerinde kararsız olduğu bulgusuna varılmıştır. Bölüm isminden memnun olmayan 39 (%26) öğretmen adayına bu sorunun ardından açık uçlu soru şeklinde bölüm ismine ilişkin önerileri istenmiştir. Toplanan bu nitel veriler katagorize edilmiş frekans ve yüzde dağılımları bulunmuştur. Bu analizler sonucunda; bölüm isminden memnun olmayan 39 bireyden 17'si (%74) bölüm isminin "Bilgisayar Öğretmenliği" ve 7'si (%26) ise "Bilgisayar Teknolojileri Öğretmenliği"olması yönünde görüş bildirmişlerdir. Geriye kalan 15 öğretmen adayının önerileri arasında ise "Bilgi ve Teknoloji Öğretmenliği", "Bilgisayar Eğitimi", "Bilişim Uzmanlığı", "Teknoloji Öğretmenliği", "Öğretim Teknolojileri Öğretmenliği", "Bilgisayar Formatörlüğü" gibi bölüm isimleri bulunmaktadır.

Tablo 5. Öğretmen adaylarının başka bir bölüme geçmek istemelerinin nedenlerine göre frekans dağılımları

Bölümü değiştirme nedeni	Frekans
Bilgisayar mühendisliğini istiyorum	7
Öğretmenliği sevmiyorum	13
mecburen	4
başka meslek	15
Bilgisayarı sevmemek	2
Bölümümü sevmemek/memnun olmamak	20
Toplam	61

Öğretmen adaylarının "başka bir bölüme geçme olanağınız olsa bu bölümü bırakır mıydınız?" sorusuna 82 (%55) birey "evet geçmek isterdim" ve 65 (%44) birey "hayır geçmek istemezdim" yanıtını vermiştir. "Evet" yanıtını veren bireylere bu yanıtın nedenini yazmaları istenmiş ve veriler nitel olarak analiz edilmiştir. Kategorize edilen yanıtlar sonucunda Tablo 5'deki seçenekler bulunmuştur. Tablo 5'e göre öğretmen adaylarından 7'si bilgisayar mühendisliğini istediği için, 13'ü öğretmenlik mesleğini sevmediği için, 4'ü meslek çıkışlı olup mecburiyetten geldiği için, 15'i başka bir meslekte okumak istediği için, 2'si bilgisayarı sevmediği için ve 20'si bu bölümü sevmediği ya da bu bölümden memnun olmadığı için bölümü bırakmak istemektedir. Bu bulgularla; bu bölümün tercih edilmeden önce farklı algılandığı ve bu bölüme ilişkin farklı beklentiler oluştuğu ya da bu bölüme istenmeden mecburi olarak gelindiği sonucu çıkarılabilir.

Tablo 6. Bölümü tercih etme nedeninde etkili olan kavramının mezun olunca çalışmak istenilen alanlara göre dağılımları

Bölüm ismindeki hangi kavram	Öğretmenlik	Özel sektör	Üniversitede Öğretim elemanı	Kendimi işimi kurma	Bölümle ilgili bir iş istemiyorum	Toplam
Bilgisayar	15	13	9	7	10	54
Teknoloji	7	3	2	0	0	12
Öğretim teknolojisi	2	0	2	0	0	4
Öğretmenlik	21	1	3	1	0	26
Bilgisayar ve öğretim teknolojileri	18	2	3	1	0	24
Tercihimde bölüm ismi etkisi yok	12	5	1	2	3	23

Toplam	75	24	20	11	13	143

Tablo 6'dan da anlaşıldığı üzere, bölümü tercih etme nedeninde etkili olan kavramın mezun olunca çalışmak istenilen alanlar ile çapraz tablo sorgulaması yapılmış ve frekans dağılımları sunulmuştur. Buna göre; bu bölümü tercih etmede öğretmenlik kavramının etkili olduğu toplam 26 bireyden 21 birey gibi büyük çoğunluğu mezun olunca çalışmak istediği alanın öğretmenlik mesleği olduğunu belirtmiştir. Aynı paralellikte; bu bölümle ilgili bir iş yapmak istemeyen ya da öğretmenlik yapmak istemeyen toplam 13 bireyden 10 birey gibi büyük çoğunluğu bu bölümü tercih etmede bilgisayar kavramının etkili olduğunu belirtmektedir. Mezun olunca özel sektörde çalışmak isteyen toplam 24 bireyden 13'ü bu bölümü tercih etmede bilgisayar kavramının etkili olduğunu belirtmektedir. Bu bulgular sonucunda öğrencilerin bölüm ismine yönelik algılarının mezun olunca çalışmak istedikleri alanlarla ilişkili olduğu yorumu yapılabilir.

Tablo 7. Bölümü tercih etme nedeninde etkili olan kavramının bölümü tercih etme nedenlerine göre dağılımları

Bölüm ismindeki hangi kavram	bilgisayarı sevdigim icin	ögretmenligi sevdigim için	tesaduf	atamasının kolay olması	Mecburiyet (meslek çıkışlı)	diger (populer meslek, ailem istedi)	Toplam
Bilgisayar	19	2	7	6	13	4	51
Teknoloji	1	3	0	1	4	3	12
Öğretim teknolojisi	2	0	1	0	0	1	4
Öğretmenlik	2	12	4	1	6	1	26
Bilgisayar ve öğretim teknolojileri	5	5	0	3	9	1	23
Tercihimde bölüm ismi etkisi yok	1	0	3	0	18	2	24
Toplam	30	22	15	11	50	12	140

Tablo 7'da görüldüğü üzere öğretmen adaylarının bölümü tercih etme nedeninde etkili olan kavramın bölümü tercih etme nedenlerine göre dağılımları çapraz tablo sorgulaması ile gösterilmiştir. Buna göre; bilgisayarı sevdiği için bu bölümü tercih eden 30 bireyden 19'u bölüm ismindeki bilgisayar kavramından dolayı bu bölümü tercih ettiğini belirtmiştir. Öğretmenlik mesleğini sevdiği için bu bölümü tercih eden 22 bireyden 12'si bu bölümün ismindeki öğretmenlik kavramından dolayı bölümü tercih ettiğini belirtmiştir. Meslek lisesi çıkışlı olan ve bu bölüme mecburiyetten gelen 50 bireyden 18'i bu bölümü tercih ederken bölüm isminin bir etkisinin olmadığını belirtmiştir. Bu bulgular ile sonucunda öğretmen adaylarının bölümü tercih etme nedenlerinde bölüm isminde yer alan kavrama yönelik algısının etkili olduğu söylenebilir.

SONUÇ

Bu çalışmada; öğrencilerin Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) bölümünün ismine ilişkin algıları ve bu algının başka değişkenler ile ilişkisi incelenmek istenmiştir. Bu amaçla; 148 BÖTE bölümü öğretmen adayına araştırmacı tarafından geliştirilen 12 soruluk anket uygulanmıştır. Uygulanan anket sonucunda nicel ve nitel veriler toplanmıştır. Hem nicel hem de nitel veriler üzerinden yüzde, frekans ve çapraz tablo analizleri yapılmış ve elde edilen bulgulara dayalı yorumlar yapılmıştır.

Bu çalışmanın sonucunda; birinci sınıftaki öğretmen adaylarının mezun olunca özel sektörde çalışmak istedikleri gözlenmektedir. Özel sektörde çalışmak isteyen öğretmen adaylarının sayısı birinci sınıftan sonra azalmakta ve öğretmenlik mesleğine yöneldikleri görülmektedir. Bu bulgu, öğretmen adaylarının birinci sınıftan sonra bu bölümün amacının özel sektöre eleman yetiştirmek olmadığını ya da bu bölümün amacı ile özel sektörün taleplerinin paralellik göstermediğini daha iyi anlamaları ile yorumlanabilir.

Öğretmen adaylarının önemli bir çoğunluğu BÖTE bölümünü tercih etmelerinde bölüm ismindeki "bilgisayar" kavramının etkili olduğunu belirtmişlerdir. Ayrıca öğretmen adaylarının bir kısmının bölüm isminden memnun olmadığı gözlenmiştir. Bölüm isminden memnun olmayan öğretmen adaylarının büyük bölümü bölüm isminin "Bilgisayar Öğretmenliği" ya da "Bilgisayar Teknolojileri Öğretmenliği" olması yönünde görüş bildirmişlerdir. Geriye kalan öğretmen adayları ise; "Bilgi ve Teknoloji Öğretmenliği", "Bilgisayar Eğitimi", "Bilişim Uzmanlığı", "Teknoloji Öğretmenliği", "Öğretim Teknolojileri Öğretmenliği", "Bilgisayar Formatörlüğü" gibi önerilerde bulunmuşlardır.

Öğretmen adaylarının büyük bir çoğunluğu olanağı olduğu takdirde bu bölümü bırakmayı ve başka bir bölüme geçmeyi düşünmektedir. Aynı zamanda; Öğretmen adaylarının yarısından fazlasının bu bölümü meslek lisesi mezunu olduğu ya da bilgisayarı sevdiği için tercih ettiği gözlenmiştir. Öğretmen adaylarının BÖTE bölümünü mecburiyetten tercih etmeleri meslek lisesi mezunu bireylerin üniversiteye giriş sınavında alan dışı tercih yapmaları halinde puanlarının kırılmasıyla ilişkilendirilrbilir.

Öğretmen adaylarının bölüm ismine yönelik algılarının mezun olunca çalışmak istedikleri alanlarla ilişkili olduğu görülmektedir. Bununla birlikte; bireylerin bu bölümü tercih etme nedenine bölüm isminde yer alan kavramların özellikle de bilgisayar kavramının etkisi olduğu söylenebilir. "Bilgisayar" sözcüğünün bölüm isminde ayrı bir şekilde yer alması, öğrencide bu bölümün bilgisayar ağırlıklı ya da bilgisayar mühendisliği paralelinde bir bölüm olduğu algısını geliştirebilmektedir.

Bu bulgular sonucunda öğretmen adaylarının BÖTE bölümünü tercih ederken daha çok bölüm isminde yer alan "bilgisayar" sözcüğüne odaklandıkları ve bu yönde bölümle ilgili beklentilerinin şekillendiği söylenebilir. Aynı zamanda öğretmen adaylarının bölüm ismi ve program içeriği ile ilgili farklı algılara sahip oldukları söylenebilir. Öyle ki Öğretmen adaylarının çoğu program içeriğinin bölüm ismiyle paralellik göstermediğini düşünmekte ve bu bölümle ilgili farklı beklentiler içerisinde oldukları gözlenmektedir. Öğrencilerin bu bölüme gelmeden önce bölümü farklı algılaması öğrenim sürecinde ve mezuniyet sonrasında olumsuz durumların oluşmasına sebep olabilecektir. Bu nedenle; Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümünün misyon ve vizyonu dikkate alınarak hem bu bölümün öğrencilerinden hem de öğretim elemanlarından toplanacak verilerle farklı algılara yol açmayacak yeni bir bölüm isminin getirilmesi önerisinde bulunulabilir.

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BİLGİSAYAR VE ÖĞRETİM TEKNOLOJİLERİ EĞİTİMİ BÖLÜMÜ (BÖTE) ÖĞRENCİLERİNİN MESLEKLERİ İLE İLGİLİ ÖNYARGILARI

PREJUDICES OF COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGY DEPARTMENT (CEIT) STUDENTS ABOUT THEIR PROFESSIONAL

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Özet: Günümüzde bilgi yapısının ve toplumun gelişimine paralel olarak teknoloji alanında da hızlı gelişmeler yaşanmaktadır. Bu gelişmeler öğrenme ve öğretme sürecini de etkilemektedir. Bu bağlamda BÖTE bölümünün önemi de artmaktadır. Ancak BÖTE bölümünde okuyan öğrencilerin geleceğe yönelik mesleki kaygıları, dolayısıyla ön yargıları da değişmekte ve artmaktadır. Bu araştırma, Eğitim Fakülteleri'nde yer alan Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) Bölümü son sınıf öğrencilerinin meslekleri ile ilgili önyargılarını ve bu önyargılara yönelik çözüm önerileri belirlemek amacıyla yapılmıştır. Araştırmaya Ankara ilindeki 4 devlet ve 1 vakıf üniversitesinden 15 kız ve 15 erkek olmak üzere toplam 30 öğrenci katılmıştır. Veriler 30 öğrenciye uygulanan anket ve her üniversiteden birer öğrenci olmak üzere 5 öğrenciyle yapılan görüşme yoluyla toplanmıştır. Edinilen bulgular arasında, BÖTE öğrencilerinin mesleki önyargılarının başında; MEB'in öğretim programı ile ilgili uygulamaları, öğretmen adaylarının atanacakları okulların koşulları, bilgisayarların oyun aracı olarak görülmesi, öğretmenin aylık maaşının ve ders ücretlerinin yetersizliği ile öğretmen adaylarının görevlendirilme biçimleri dikkat çekmektedir.
Anahtar sözcükler: Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü, mesleki önyargı, kaygı

Abstract: Nowadays, in parallel with the improvements of knowledge and society structure, there are rapidly developments in technology. As a result of this, the importance given to CEIT department is increasing. However, the anxieties of the students of CEIT department about their careers with their prejudices have been changing and increasing. This study has been conducted to determine the prejudices of Computer Education and Instructional Technology (CEIT) department senior students and to provide suggestions to overcome these prejudices. 30 students (15 females & 15 males) have attended the study from 4 state and 1 private universities in Ankara. The data has been collected by a questionnaire administered to 30 students and interviews conducted with 5 learners from each university. The results have shown that the curriculum implementations of MEB, the facilities of the schools where the teacher candidates will be appointed, the perception of computers as tools for games, the insufficiency of teachers' salaries and wages, the ways of appointing teacher candidates are CEIT students' major prejudices about their professional.
Keywords: Computer Education and Instructional Technology Department, professional prejudice, anxiety

GİRİŞ

Günümüzde bilgi yapısının ve toplumun gelişimine paralel olarak teknoloji alanında da hızlı gelişmeler yaşanmaktadır. Teknoloji hayatımızın her alanına yayılmakta ve yaşantımızı, alışkanlıklarımızı, öğrenme-öğretme biçimlerimizi etkilemektedir.
Öğrenme-öğretme sürecinde kullanılan materyallerin hazırlanmasından değerlendirilmesine kadar geçen süreçte teknolojinin özellikle de bilgisayara dayalı teknolojilerin kullanılır olması eğitimcileri yeni uygulama geliştirme yollarına itmektedir. Bu amaçla, öğretme ve öğrenme teknolojileri, teknolojinin gelişmesi ile birlikte varlığını oluşturmaya başlamıştır. Bu gelişme ve oluşan ihtiyaçlara cevap verebilmek için Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü kurulmuştur. Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü' nün temel amacı; Türkiye'deki eğitim kurumlarının ihtiyacı olan bilgisayar ve farklı öğretim teknolojilerini kullanarak yeni yöntem ve teknikleri ortaya çıkaran öğretmenleri yetiştirmektir.
Bu araştırmada, Eğitim Fakülteleri'nde yer alan Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü(BÖTE) son sınıf öğrencilerinin meslekleri ile ilgili önyargıları ele alınmaktadır.

Alan Yazın Çalışması

Alan yazın incelendiğinde, BÖTE bölümü öğrencilerinin mesleki ön yargılarıyla ilgili daha önce farklı araştırmalar yapıldığı görülmektedir. Bilişim Teknolojileri Öğretmenleri, alanlarıyla ilgili yetersiz eğitim gördüklerini ya da eğitim aldıkları konulara uygun biçimde görevlendirilmediklerini düşünmektedirler. Yapılan çalışmalarda Bilgisayar Öğretmenleri'nin mesleklerine ait önyargılarının öğrenimlerinin ilk yıllarında başlayıp öğrenim hayatlarının son yıllarında daha fazla artış göstererek devam ettiği görülmüştür. Bunun sebepleri olarak; öğrenim gördükleri müfredatın yetersizliği, öğretmen adaylarının kendilerinde buldukları yetersizlikler, öğretmen aylık maaşının ve ders ücretlerinin yetersizliği, Bilişim Teknolojileri dersinin seçmeli oluşu ve bunun getirdiği eksiklikler, meslek yaşamında karşılaşılacakları zorluklar (bina ve sınıfların fiziksel yetersizliği, sınıf mevcutları, donanım ve yazılım eksikliği vb.) gibi geniş bir yelpazeye yayılan başlıklar gösterilmiştir. Ayrıca mesleki önyargıların; cinsiyet, mesleki ve kişisel özellikler, kişisel algı, hizmet süresi, ders yükü, okul türü gibi değişkenlerle de farklılık gösterdiği belirtilmiştir. İncelenen araştırmaların birçoğunun bu çalışmanın konusuyla ilişkili olduğunu ve benzer sonuçlar elde edildiği görülmüştür.

Problem Durumu

Bilgi ve iletişim teknolojilerinin her alanda yaygın kullanımına paralel olarak, bilgi ve iletişim teknolojilerinin öğretimini ve eğitim amaçlı kullanımını gerçekleştirmek için yetişmiş insan gücü kaynağına gereksinim duyulmaya başlanmıştır. Türkiye'de bu insan gücü gereksinimini karşılamaya yönelik ilk olarak, hizmet içi eğitim etkinlikleri ile Bilgisayar Formatör Öğretmenleri'nin yetiştirilmesi yoluna gidilmiş, daha sonra Bilgisayar Öğretmenliği bölümleri açılarak Bilişim Teknolojileri Öğretmenleri yetiştirilmeye başlanmıştır. İlk olarak 1998 yılında Yüksek Öğretim Kurulu'nun eğitim fakültelerinin yeniden yapılandırılması programı çerçevesinde 15 eğitim fakültesinde öğretime başlayan Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) programı günümüzde örgün ve ikinci öğretim olarak toplam 49 fakültede yürütülmektedir (ÖSYM, 2009).
BÖTE mezunları MEB bünyesinde Bilişim Teknolojileri Öğretmeni olarak görev yapmaktadırlar. Bu adaylar, Bilişim Teknolojileri Öğretmeni olarak atandıkları okullarda birçok sıkıntı ile karşılaşabilmektedirler. Bilişim Teknolojileri Öğretmenleri' nin çalıştıkları ortamın fiziksel, kültürel, çevresel etkisi, meslektaşlarının ve yöneticilerinin yaklaşımları, mesleğin getirdiği sorumluluklar, maddi ve manevi

sıkıntılar vb. birçok unsur belirlenen görevlerini gerçekleştirmelerine engel olmaktadır. Bu engelleri araştırmaya yönelik çeşitli araştırmalar yapılmıştır.
Bilgisayar ve Öğretim Teknolojileri Eğitimi öğretmen adaylarının mesleklerine yönelik görüşlerini belirlemeyi amaçlayan araştırmalardan birinde öğretmen adaylarının; mesleki yaşam önyargısı olarak en çok karışılabilecekleri sıkıntıyı yüksek beklenti ve tanımlanmamış görevler olduğunu bulunmuştur (Demirli ve Kerimgil, 2008).
Bilgisayar Öğretmenleri'nin algıladığı sorunları tespit etmek amacı ile yapılan çalışmada; öğretmenlerin görevlerini yerine getirmede yeterince desteklenmediklerini, yönetim kaynaklı sorunların bilgisayar öğretmenlerinin işlerini oldukça zorlaştırdığını ve bilgisayar öğretmenlerinin görev tanımlarının daha net ve açık biçimde yapılması gerektiği sonuçları elde edilmiştir (Kabakçı, Akbulut ve Özoğul, 2009).
Bilgisayar ve Öğretim Teknolojileri öğretmen adaylarının sorunları ve geleceğe yönelik kaygılarını belirlemeye yönelik çalışmada; öğrencilerin sayısının bilgisayar sayısından çok fazla olması, öğretmenin aylık maaşının ve ders ücretlerinin yetersizliği, bilgisayar dersinin seçmeli ders olması, ilköğretimde bilgisayar dersinin karne notunun olmaması, bilgisayar ders saatinin yetersizliği, bilgisayarın daha çok oyun aracı olarak görülmesi konuları tespit edilmiştir (Altun ve Ateş, 2008).
Bu durumun BÖTE bölümlerindeki Bilişim Teknolojileri öğretmen adaylarının da mesleklerine karşı ön yargılarını etkilediği düşünülmüştür. Belirlenen bu noktaların bu kapsamda incelenmesi gerekli görülmüştür.

Araştırmanın Amacı ve Önemi
Teknolojinin öğretim etkinlikleri ile entegrasyonunda Bilişim Teknolojileri Öğretmenleri'ne önemli roller düşmektedir. Ancak Türkiye'de Bilişim Teknolojileri Öğretmenleri'nin görev tanımında yaşanan belirsizlikler, teknik eleman konusunda yaşanan sıkıntılar ve idarecilerin teknoloji entegrasyonu kavramını yeterince benimsememiş olmaları gibi nedenlerden ötürü Bilişim Teknolojileri Öğretmenleri'ne, birincil görevlerinin yanı sıra öğretmen ve öğrencilere danışmanlık hizmeti vermekten laboratuvarların bakımını yapmaya, okulun veri tabanı ve teknik hizmetlerini örgütlemekten teknik donanım için gerekli teknik desteği sağlamaya kadar çeşitli sorumluluklar yüklenmektedir. Bunların dışında öğretmen adaylarının; maaşlarının yetersizliği, hayatına normal standartlarda sürdürme isteği, okulun fiziksel şartlarının yetersizliği gibi sebeplerden dolayı mezun adayları mesleklerine yönelik önyargılara sahip olmaktadırlar. Bu çalışma kapsamında belirtilen bu ön yargıları ortaya çıkartmak amaçlanmaktadır.

YÖNTEM

Bu araştırma var olan bir durumun/olayın nedenlerini ya da olayları etkileyen değişkenleri belirlemeye yönelik çalışmalar yapıldığı için nedensel araştırma yöntemi kullanılmıştır.

Araştırmanın Problemi ve Alt Problemler:
Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencilerinin meslekleri ile ilgili önyargıları nelerdir?
1. Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencileri görevlendirilme biçimlerinden etkilenmekte midirler?
2. Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencileri mesleğe başladıkları okullardaki fiziksel eksikliklerden etkilenmekte midirler?
3. Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencileri kişisel yetersizliklerinden etkilenmekte midirler?
4. Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencileri Bilişim Teknolojileri dersinin müfredat eksikliğinden etkilenmekte midirler?
5. Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencileri mesleğe başladıklarında sahip olacakları yaşam kalitelerinin düşmesinden etkilenmekte midirler?

Örneklem
Bu araştırmanın örneklemini; Ankara ilindeki 4 devlet ve 1 vakıf üniversitesinin Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü 4.sınıfında öğrenim gören toplam 30 öğrenci oluşturmaktadır. Örneklemin % 50'si bayan (n=15), % 50'si ise erkek (n=15) öğrencidir.

Veri Toplama Araçları
Araştırmada nitel ve nicel veri toplama araçları kullanılmıştır. Nicel veri toplama aracı olarak; öğrencilerin kişisel bilgiler ve mesleki önyargıları ile ilgili bilgileri almak için mesleki ön yargıları belirleme anketi kullanılmıştır. Anketin kişisel bilgiler bölümünde 3, mesleki görüşler bölümünde ise 20 ifade bulunmaktadır. Nitel veri toplama aracı olarak; öğrencilere yapılandırılmış görüşme formu kullanılmıştır. Görüşme formunda; yaş, cinsiyet ve sınıf bilgilerinin alındığı ifadeler ile kişisel görüşlerin alındığı 5 açık uçlu soru ifadesi bulunmaktadır.

İşlem
Araştırmada kullanılan anket formu, öğrencilere internet üzerinden elektronik posta yoluyla ve yüz yüze dağıtım yapılarak uygulanmıştır. Araştırmada kullanılan görüşme formu, anket uygulanan üniversitelerin her birinden birer öğrenci ile internet üzerinden elektronik posta yoluyla ve önceden randevu alınarak yüz yüze gerçekleştirilmiştir.

Veri Analizi
Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencilerinin meslekleri ile ilgili önyargıları ile ilgili toplanan nicel verilerin analizinde frekans ve yüzde teknikleri, nitel verilerin analizinde tematik kodlama kullanılmıştır.

BULGULAR ve YORUMLAR

Bu bölümde, 4 devlet ve 1 vakıf üniversitesinde yapılan görüşme ve anket formları aracılığı ile toplanan verilerin analizine yer verilmiştir.

Tablo 1. *Öğrencilerin geleceğe yönelik ön yargılarının görülme sıklıkları ve yüzde dağılımları*

MESLEKİ KAYGILAR	Görülme Sıklığı		
	Hayır Katılmıyorum	Kısmen Katılıyorum	Evet Katılıyorum
	f %	f %	f %
Okul yöneticileriyle sorun yaşama düşüncesi	14 %47	11 **%37**	5 %16
Lisans öğreniminde öğrenilen öğretmenlik mesleği derslerinin uygulayamama düşüncesi	7 %23	12 **%40**	11 %37
İlköğretimde kendisini öğretmen gibi hissedememe inancı	21 **%70**	4 %13	5 %17
Öğretmenliğin zamanla tekdüze olacağı inancı	4 %13	9 %30	17 **%57**
Öğretmen maaşının ve ders ücretlerinin yetersizliği	4 %13	9 **%30**	17 **%57**
Atandıktan sonra sosyal yaşamın sınırlanacağı korkusu	12 **%40**	9 %30	9 %30
Okulun gerekli maddi desteği sağlayacağı inancı	19 **%63**	9 %30	2 %7
Okullardaki bilgisayar laboratuvarlarının öğrenci gereksinimlerini karşılayabileceği düşüncesi	17 **%57**	10 **%33**	3 %10
Bilişim Teknolojileri dersi öğretim programının yeterli olduğu düşüncesi	16 **%54**	10 %33	4 %13
Bilişim Teknolojileri ders saatinin yeterli olduğu düşüncesi	24 **%80**	4 %13	2 %7
Okullarda teknolojik altyapının yetersiz olduğu düşüncesi	18 **%60**	11 %37	1 %3
Teknik bilgi eksikliği yüzünden bilgisayar laboratuvarındaki teknik sorunları giderememe düşüncesi	11 **%37**	8 %26	11 **%37**
Bilişim Teknolojileri dersinde farklı öğretim teknikleri ve yöntemleri kullanamama düşüncesi	17 **%57**	7 %23	6 %20
Teknik servis elemanı gibi görülme kaygısı	1 %3	15 **%50**	14 **%47**
Bilgisayarın oyun aracı olarak görülme düşüncesini değiştirememe kaygısı	10 %33	14 **%47**	6 %20
İlköğretimde Bilişim Teknolojileri dersinin seçmeli olması ve karne notunun olmamasından dolayı derse olan ilginin az olacağı inancı	3 %10	5 %17	22 **%74**
Sınıf yönetememe düşüncesi	17 **%57**	10 %33	3 %10
Atanılan okullardaki meslektaşlarla uyumsuzluk yaşama düşüncesi	8 %27	15 **%50**	7 %23
Görevinin akademik kariyer yapmaya engel olacağı düşüncesi	13 **%43**	12 **%40**	5 %17
Mesleğe başladıktan sonar alanla ilgili gelişmeleri izleyememe kaygısı	11 **%37**	11 **%37**	8 %26

Tablo 1'e göre bilgisayar ve öğretim teknolojileri öğretmenliği adaylarının mesleki ön yargılarının başında; görev yapacakları okulun fiziksel şartları ve mesleki ortamı ile MEB'in bazı uygulamaları gelmemektedir. Öğretmen adaylarının; %57'si öğretmen maaşı ve ders ücretlerinin yetersiz olması, %63'ü okulun gerekli maddi desteği sağlamayacağı, %57'si okuldaki bilgisayar laboratuarlarının öğrenci gereksinimlerini karşılayamayacağı, %54'ü Bilişim Teknolojileri dersi öğretim programının yeterli olmadığı, %80'i Bilişim Teknolojileri dersinin ders saatinin yeterli olmadığı, %60'ı okullardaki teknolojik alt yapının yeterli olmadığı, %74'ü Bilişim Teknolojileri dersinin seçmeli olması ve karne notu olmamasından dolayı derse ilgilinin az olması,%57'si öğretmenlik mesleğinin zamanla tek düze olacağı, %50'i de teknik servis elemanı gibi görülme önyargısını taşımaktadırlar.

Ayrıca görüşmeye katılan öğretmen adaylarına yöneltilen "Meslek yaşamında karşılaşabileceğinizi düşündüğünüz güçlükler nelerdir?" sorusuna; laboratuar ve bilgisayar eksikliği, öğretmen maaşlarının yetersizliği, teorik bilgiyi pratiğe dönüştürememe güçlüğü, kalabalık sınıfların öğretim hızını yavaşlatması, Bilişim Teknolojileri dersinin karne notu olmamasından dolayı öğrenciler tarafından dersin önemsenmemesi, bilgisayarın öğrenciler tarafından sadece bir oyun aracı olarak görülmesi ve okul yönetimi tarafından teknik destek elemanı gibi görülme ön yarışlarının yaygın olduğu tespit edilmiştir.

SONUÇLAR ve ÖNERİLER

Araştırma bulguları doğrultusunda varılan sonuçlar ve ortaya çıkan sorunlara yönelik çözüm önerileri şu şekildedir:

Araştırmaya katılan Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencilerinin meslekleri ile ilgili ön yargılarının başında MEB' in öğretim programı ile ilgili uygulamaları gelmektedir. MEB'in uygulamaları arasında, Bilişim Teknoloji dersinin farklı derslere yer açmak amacıyla haftalık ders saatinin tek bir ders saatine düşürülmesi, İlköğretimde Bilişim Teknolojileri dersinin karne notunun olmaması, Bilişim Teknolojileri dersinin seçmeli olması ve Bilişim Teknolojileri dersi öğretim programının yetersiz olması konuları gelmektedir.

MEB'in kendisine bağlı okullardaki Bilişim Teknolojileri dersinin haftalık saatini artırarak, notu karneye işlenen ve zorunlu bir ders olmasını sağlaması ve Bilişim Teknolojileri dersi müfredatını günümüz teknolojilerine uygun olarak gereksinimleri karşılayan ve yeniliklere açık olan bir öğretim program haline getirmesi beklenmektedir.

Araştırmaya katılan Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencilerinin meslekleri ile ilgili ikinci sırada yer alan ön yargıları, atanacakları okullarla ilgilidir. Okullarda yaşanacak problemler; okulların teknolojik altyapı konusunda yetersizliği, okula gereken teknolojik

desteğin sağlanamaması ve bilgisayar laboratuarlarının yeterli sayıda ve teknik özellikte olmaması sebebiyle okullarda bulunan bilgisayar laboratuarlarının öğrenci gereksinimini karşılayacak düzeyde olmamasıdır.

MEB'in kendisine bağlı okullardaki bilgisayarları teknik açıdan, laboratuvarları ise fiziksel açıdan iyileştirmesi beklenmektedir. Ayrıca okullara yeterli sayıda ve uygun teknik özelliklere sahip bilgisayar laboratuvarlarının kurulması ve bu laboratuvarların öğrenci ihtiyaçlarına uygun şekilde gereksinimlerinin sağlanması beklenmektedir. Laboratuvarların geliştirilmesi ve iyileştirilmesi, öğrencilerin ve öğretmenlerin daha verimli ve istekli ders işlemelerini sağlayacaktır.

Araştırmaya katılan Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencilerinin meslekleri ile ilgili diğer bir ön yargıları öğretmenlik mesleği ve görevlendirilme biçimleri ile ilgilidir. Bunlar; öğretmenlere verilen maaş ve ek ders ücretlerinin yetersizliği, öğretmenlik mesleğinin zamanla tekdüze bir meslek olacağı inancı ve okul yöneticileri tarafından ders dışı teknik işler verilmesinden dolayı BÖTE mezunu Bilişim Teknolojileri Öğretmenleri' nin öğretmen olarak değil de teknik servis elemanı gibi görülme düşüncesidir.

MEB, öğretmenlerin maaş ve ders ücretlerini artırarak öğretmenlerin yaşam kalitelerini yükseltmeli, BÖTE mezunlarının aldıkları eğitim içeriğine uygun bir biçimde görevlendirilmeleri ve okullara atanan BÖTE mezunu Bilişim Teknolojileri Öğretmenleri' nin okul yöneticileri tarafından teknik servis elemanı olarak görülmeyip okulda ders vermekle sorumlu bir öğretmen olarak görevli olduğunun unutulmamasını sağlamalıdır.

Sonuç olarak, 21.yüzyılda yaşadığımız ve teknolojinin hızla geliştiği dünyada bilişim teknolojileri alanında nitelikli ve uzman öğretmenlere olan ihtiyacın gün geçtikçe arttığı unutulmamalıdır. Eğitim ve öğretim alanındaki yenilikleri ve gelişmeleri takip etmek, geleceğe yönelik yapılan yatırımları iyi bir şekilde değerlendirebilmek, gelişmekte olan ve eğitimde ekonomik açıdan sıkıntı yaşadığımız ülkemizde daha fazla önem taşımaktadır. Zor koşullarda yetiştirdiğimiz ve günümüzde elimizde sayıca fazla olup eğitim sistemimizin gelişmesi için gerçekten fayda sağlayacak olan Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü'nde yetişmiş öğretmen adaylarından istenen anlamda faydalanamamamız eğitimde birçok sorunu da beraberinde getirmektedir. Tüm bunların önüne geçmek için gerekli önlemleri almalı ve eğitim sistemimiz için gerekli olan koşulları sağlamalıyız.

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BİLGİSAYAR VE ÖĞRETİM TEKNOLOJİLERİ EĞİTİMİ BÖLÜMÜ(BÖTE) LİSANS PROGRAMINDA BULUNAN "PROJE YÖNETİMİ I" DERSİNİN KARŞILAŞTIRILMASI

COMPARISON OF "PROJECT MANAGEMENT I" COURSE AVAILABLE ON GRADUATE PROGRAMS IN THE DEPARTMENT OF COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGY (CEIT)

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Ozet: Günümüzde hem bilgi kapsamı, hem de teknolojik gelişmeler büyük bir hızla değişmekte ve yayılmaktadır. Bilgi teknolojilerinin kullanımı öğrenme-öğretme süreçlerini derinden etkilemektedir. Teknolojik gelişmelerin ve öğretim teknolojileri alanındaki yetişmiş insan gücüne duyulan gereksinimin bir sonucu olarak Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümleri açılmıştır. BÖTE lisans programının incelenmesi, değerlendirilmesi, çalışan ve aksayan yanlarının belirlenmesi, hem bu bölümlerin daha etkili duruma getirilmesine hem de yeni açılan BÖTE bölümleri için daha iyi bir program hazırlanmasına önemli bir katkı sağlayacaktır. Bu bağlamda, bu çalışmada iki devlet ve iki vakıf üniversitesinin BÖTE bölümünde lisans dördüncü sınıf öğrencilerine verilen "Proje Yönetimi I" dersinin eğitim programı incelenmiştir. Araştırmanın örneklemini Ankara ilindeki 2 devlet ve 2 vakıf üniversitesinin, Eğitim Fakültesi BÖTE lisans programında yer alan "Proje Yönetimi-I" dersini alan 4. Sınıf öğrencileri ve bu dersi veren öğretim elemanları oluşturmaktadır. Çalışmanın verileri öğrencilere uygulanan anket ve öğretim elemanlarına uygulanan görüşme soruları ile toplanmıştır. Dersin değerlendirilmesine yönelik elde edilen bulgulara göre devlet ve vakıf üniversitelerinde sınıf ortamının tasarımı, öğretim elemanının etkinliği ve dersle ilgili dokümanların paylaşıldığı, ödevlerin verildiği öğretim yönetim sistemleri bakımından farklılıklar ortaya çıkmıştır.
Anahtar sözcükler: Bilgi Teknolojileri, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü, Lisans Programı

Abstract: Nowadays, both the scope of information and technological advances are changing and spreading rapidly. The use of information technologies affects learning-teaching processes deeply. As a result of technological developments and necessity of qualified manpower in the field instruction technologies, Computer Education and Instructional Technology Departments were opened. Examining, evaluating and designating of running and failing sides of CEIT undergraduate programs will make a significant contribution to both make these programs more effective and prepare better programs for newly opened CEIT departments. In this study, "Project Development and Management I" course's training program which is given to fourth-grade students in CEIT Departments was examined in two state and private universities. The sample (exemplary) of this research comprises the fourth-grade students of Computer Education and Instructional Technology Departments situated in two state and private universities in Turkey, Ankara and the instructors who give "Project Development and Management I" course in these universities. The datas in this study were collected through the "The Course Evaluation Survey" which was applied to students and "Interview Form" which was applied to instructors of "Project Development and Management I" course. According to the course evaluation, findings indicate that there are some differences between state and private universities.
Key words; Information technology, Department of Computer Education and Instructional Technology, Undergraduate Program

GİRİŞ

Günümüzde hem bilgi kapsamı, hem de teknolojik gelişmeler büyük bir hızla değişmekte ve yayılmaktadır (Sefereoğlu,2006). Bilginin bu kadar hızlı bir şekilde çoğalmasının arkasında bilgi teknolojileri alanında gerçekleşen yenilikler bulunmaktadır. Bilgi teknolojilerinin kullanımı öğrenme-öğretme süreçlerini derinden etkilemektedir. Bilgi teknolojilerinde gerçekleşen yeniliklerin farklı alanlarda çeşitli yansımaları olmaktadır. Eğitim alanında da bunun yansımaları eğitim programlarında farklı düzeylerde kendisini göstermiştir.
Son yıllarda bilgi teknolojilerini temele alan öğretim programlarında önemli ölçüde artış gözlenmektedir. Örneğin, teknolojik gelişmelere paralel olarak öğretim teknolojileri alanındaki yetişmiş insan gücüne duyulan gereksinimin bir sonucu olarak Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) Bölümleri açılmıştır. Yeni bilgi ve iletişim teknolojilerinin eğitim öğretim ortamlarında etkili kullanımı BÖTE öğrencilerinin çalışma alanını oluşturmaktadır.

Problem Durumu

Farklı üniversitelerdeki BÖTE eğitim programları aynı olmasına rağmen, derslerin işlenişi, uygulanışı, değerlendirilmesi farklılık göstermektedir. Dünyada pek fazla örneği olmayan BÖTE lisans programının incelenmesi, değerlendirilmesi ve programın çalışan ve aksayan yanlarının belirlenmesi, hem bu bölümlerin daha etkili duruma getirilmesine hem de yeni açılan BÖTE bölümleri için daha iyi bir program hazırlanmasına önemli bir katkı sağlayacaktır. Bu bağlamda, bu çalışmada iki devlet ve iki vakıf üniversitesinin BÖTE bölümünde lisans dördüncü sınıf öğrencilerine verilen "Proje Yönetimi I" dersinin eğitim programı incelenecektir.

Bilgisayar ve Öğretim Teknolojileri ile İlgili Araştırmalar

Aşağıda verilen çalışmalar, BÖTE Bölümü ile ilgili daha önce yapılan araştırmaların genel bir kapsamını oluşturmaktadır.
Akkoyunlu ve Orhan (2003) tarafından yapılan araştırmada, BÖTE Bölümüne gelen öğrencilerin bilgisayar kullanma öz yeterlik inancı ile cinsiyetleri, yaşları gibi demografik özellikleri ile mezun oldukları lise ve tercih sıraları arasındaki ilişki incelenmiştir. Araştırmada, BÖTE bölümü son sınıf öğrencilerinin bilgisayar konusunda kendi becerilerine olan inançlarının yüksek olduğu ortaya çıkmıştır.
Durdu ve Yıldırım (2005) tarafından yapılan araştırmada, Ankara, Gazi, Hacettepe ve Orta Doğu Teknik Üniversitelerindeki BÖTE Bölümlerinin öğrenci özelliklerini, amaçlarını, müfredatını, niteliğim ve öğretim elemanlarını, kaynaklarını, kullanılan öğretim ve değerlendirme yöntemlerini, güçlü ve zayıf yönlerini öğrenci ve öğretim elemanları algıları açısından incelenmektedir. Araştırma sonucunda, BOTE Bölümlerinde hem öğretini elemanlarının hem de öğrencilerin müfredatla ilgili sorunları olduğu ortaya konmuştur.
Araştırma alanı ile ilgili incelenen çalışmalar dikkate alındığında, araştırma problemimin kapsamının belirlenmesinde, örneklemin seçilmesinde, alt amaçların net bir şekilde ortaya konmasında literatür araştırmalarının büyük rolü olmuştur.
Sınırlı bir alan yazın incelemesi sonucunda, Türkiye'deki farklı üniversitelerin Bilgisayar ve Öğretim Teknolojileri Bölümlerinde verilen derslerin, yapılan uygulamaların, öğretmenlerin tutumlarının ve alan bilgilerinin, bölümlerdeki teknolojik yeterliliklerin bire bir karşılaştırması yönelik herhangi bir araştırmanın yapılmadığı görülmüştür. Türkiye genelindeki tüm BÖTE bölümlerinde lisans eğitimi programları aynı olsa da, farklı üniversitelerdeki ders içeriklerinde, uygulamalarında ve değerlendirmelerinde birtakım farklılıklar ortaya

çıkabilmektedir. Bölümlerde yer alan sınıfların tasarımı ve teknolojik altyapılarının da farklı üniversitelerde değişkenlik gösterebileceği düşünülmüştür.
BÖTE lisans öğrencilerinin lisans döneminde aldıkları eğitimlerde ne gibi sorunlarla karşılaştıkları, bu sorunların vakıf ve devlet üniversitelerinde ne tür farklılıklar gösterebildiği belirlenmeye çalışılacaktır. Araştırma sonucunda elde edilecek bulguların, BÖTE'lerdeki öğrenme-öğretme etkinliklerinin daha etkin olabilmesi için ne gibi değişikliklerin yapılabileceği konusunda BÖTE'lerin gelişimine ışık tutması beklenmektedir.

Araştırmanın Amacı ve Önemi

Araştırmanın Amacı
Farklı üniversitelerdeki BÖTE yer alan eğitim programları aynı olmasına rağmen, derslerin işlenişi, uygulanışı, değerlendirilmesi üniversitelere göre farklılık göstermektedir.
Bu araştırmada; Türkiye'deki farklı üniversitelerdeki BÖTE bölümlerinin karşılaştırmalı olarak incelenmesi amaçlanmaktadır.

Araştırmanın Önemi
Vakıf ve devlet üniversitelerinin ne gibi farklılıkları olabileceğini araştırmak, BÖTE gelişimi açısından son derece önemlidir. Farklılıkların tespit edilmesi, BÖTE bölümünde verilen eğitimlerin, öğrencilerin daha iyi yetişmesinde ne gibi farklılıklar yarattığının anlaşılmasını sağlayacaktır.
Araştırmanın sonucunda, herhangi bir farklılık saptanması durumda bu yöndeki değişikliklerin BÖTE ders içeriklerine yansıtılması ve BÖTE devlet ve vakıf üniversitelerinin geliştirilmesine ışık tutması bakımından önem taşımaktadır.

YÖNTEM

Farklı üniversitelerin BÖTE lisans eğitimi programlarında yer alan derslerin üniversitelerde ne derece farklılık yarattığını tespit edebilmek amacıyla, iki devlet ve iki vakıf üniversitesinin dördüncü sınıf lisans programında bulunan "Proje Yönetimi I" adlı dersin eğitim programı incelenmiştir.

Araştırma Modeli (Deseni)
Bu çalışmada araştırma modeli olarak; nedensel karşılaştırmalı araştırma modeli kullanılmıştır. Araştırma farklı devlet ve vakıf üniversitelerinin BÖTE lisans programında yer alan"Proje Yönetimi-I dersi temelinde farklılıklarının saptanmaya çalışılması ve bu farklılıkların nedenlerine yönelik bir analiz yapılmasını gerekli kılmaktadır. Örneklemin belirlenmesinde, nedensel araştırma modelinde araştırmadan doğrudan etkilenen bireyler belirlenmeye çalışılmıştır. Bu nedenle BÖTE bölümü "Proje Yönetimi-I" dersini almakta olan 4.Sınıf öğrencileri ve bu dersi veren öğretim elemanları üzerinde çalışmalar yürütülmüştür.

Örneklem
Araştırmanın evrenini Türkiye'deki tüm BÖTE Bölümleri oluşturmaktadır. Fakat araştırmanın kısa süreli olması, tüm BÖTE Bölümlerine ulaşılmasında iş-gücü, zaman ve mesafe bakımından güçlükler yaşanacak olmasından dolayı örneklem olarak Ankara ilinde bulunan 2 devlet ve 2 vakıf üniversitesindeki BÖTE Bölümü 4. Sınıf öğrencileri seçilmiştir. Araştırmanın katılımcılarını belirlemede, farklı örnekleme yöntemleri kullanılmıştır. Bu yöntemler; amaçsal örneklemenin aykırı durum örnekleme yöntemi ve maksimum çeşitlilik örnekleme yöntemidir. Maksimum çeşitlilik örnekleme yönteminde ise; problem ile ilgili farklı durumların örnekleme alınması nedeni ile evren değerleri hakkında önemli ipuçları ve araştırma problemi hakkında önemli bulgular elde edinilmesi sağlanmıştır.

Veri Toplama Araçları
Araştırmada nitel ve nicel veri toplama araçları kullanılmıştır. Bunlardan ilki, 4.sınıf BÖTE öğrencilerinin "Proje Yönetimi-I " dersini değerlendirmelerine yönelik "Ders Değerlendirme" ölçeğidir. İkincisi ise BÖTE bölümü öğretim elemanlarının "Proje Yönetimi-I " dersine yönelik görüşlerinin alındığı yarı yapılandırılmış "Görüşme Soruları"ndan oluşmaktadır.

İşlem

Ders Değerlendirme Anketi
Araştırma problemi kapsamında verilerin toplanmasına yönelik olarak hazırlanan anket araştırmacılar tarafından kullanılmıştır. Öğrencilerin "Proje Yönetimi-I" dersini değerlendirmeye yönelik yapılan bu anket, dört bölümden oluşmaktadır. Ankette "Sınıf Tasarımı", "Öğretim Elemanı", "Ders İçeriği" ve "Ölçme-Değerlendirme" bölümleri yer almaktadır
Anketin öğrencilere uygulanması; yüz yüze ve elektronik ortamda gerçekleştirilecektir. Anket "KATILMIYORUM", "KISMEN KATILIYORUM", "KATILIYORUM" şeklinde 3'lü likert tipine uygun olarak hazırlanmıştır. Toplam 20 sorudan oluşmaktadır. Değerlendirme ölçeği 30 kişiye uygulanacaktır.

Ders Değerlendirme Görüşme Formu
Araştırma problemi kapsamında verilerin toplanmasına yönelik olarak hazırlanan görüşme soruları öğretim elemanlarına uygulanacaktır. Görüşme soruları 3 öğretim elemanına uygulanacaktır. Toplam 5 sorudan oluşmaktadır. Ve her bir soru minimum 5'er dakika ile sınırlandırılacaktır.
Görüşme soruları, dersin değerlendirilmesinde öğretim elemanlarından daha detaylı bilgiler alabilmek amacı ile yarı-yapılandırılmış olarak tasarlanmıştır.

Veri Analizi

Nicel verilerin analizi
İlgili literatür taraması ve uzman görüşlerinden faydalanılarak, anket sorularının gerekli değerlendirmesi yapılmış ve uzman görüşlerinden faydalanıldıktan sonra, anketlerin uygulanacağı üniversitelerdeki öğretim elemanlarından gerekli izin alınarak, bir ders saatinde 10 dakika ayrılarak, anket öğrencilere uygulanmıştır. Oluşturulan anketin veri analizinde frekans ve yüzde gibi istatistiklerden faydalanılmıştır.

Nitel verilerin analizi
Öğretim elemanları ile yapılan görüşmeler sonucu elde edilen nitel veriler, içerik analiz yöntemi uygulanarak analiz edilmiştir. Görüşme esnasında öğretim elemanlarından izin alınarak ses kaydı ve video çekimleri yapılmış ve bu görüşme sonrası alınan ses ve video kayıtları öncelikle metne dökülmüştür. Verilerden genel anlam öbekleri ve temalar çıkartılarak, tematik kodlama yapılmış ve bu temaların görüşmeler içerisindeki sıklığına bakılmıştır.

BULGULAR ve YORUMLAR

Araştırmanın bu bölümünde, öğrencilere uygulanan anketler sonucu elde edinilen nicel verilerin ve öğretim elemanları ile yapılan görüşmeler sonucunda elde edilen nitel verilerin, anket ve görüşme formu maddeleri doğrultusunda istatistiksel tekniklerle yapılan çözümlemeleri sonucu elde edilen bulgularına ve bulgularla ilgili yorumlarına yer verilmiştir.

Nicel Bulgular

" Proje Yönetimi-I" dersinin değerlendirilmesine ve devlet ile vakıf üniversitelerinin bu bağlamda karşılaştırılmasına yönelik "Ders Değerlendirme Anketi" 2 özel 2 devlet üniversitesi olmak üzere toplam 40 kişiye anket uygulanmıştır. Anket genel olarak 4 ana başlıktan oluşmaktadır. Bunlar "Proje Yönetimi-I" dersinin değerlendirilmesine yönelik "Sınıfın Tasarımı", "Öğretim Elemanı", "Dersin İçeriği" ve "Ölçe ve Değerlendirme" başlıklarıdır. Maddeler bu başlıklar altında ayrı ayrı oluşturulmuştur. Anket maddelerinden elde edilen sonuçlar, Microsoft Excel programına geçirilmiştir ve maddelere verilen yanıtlar katılım yüzdesi ve kişi sayısı belirlenerek hesaplanmıştır. Ankete sorularına verilen cevaplar, **Tablo 1** de yansıtılmıştır. **Tablo 1** 'e göre; Sınıfın tasarımı, öğretim elemanı, dersin içeriği ve ölçme ve değerlendirme bakımından ele alındığında, Devlet üniversitelerinin fiziksel olanaklarının (sınıfın tasarımı), eğitim ve öğretim ortamında kullanılması gereken materyallerin yeterliliği, öğretim elemanının bu ders kapsamındaki iletişimi gibi konularda vakıf üniversitelerine nazaran vasat durumda olabileceği anket sonuçlarında ortaya çıkmıştır.

Tablo 1= Anket verileri

Madde	Üniversite	Katılmıyorum		Kısmen Katılıyorum		Katılıyorum	
		N	%	N	%	N	%
Sınıfın Tasarımı(Fiziksel Olanaklar)							
1-Sınıfın oturma düzeni, öğretim elemanını rahatça takip edilebilecek şekilde tasarlanmıştır.	Devlet	8	40	4	20	8	40
	Vakıf	2	10	6	30	12	60
2-Sınıfın oturma düzeni, öğrencilerin birbirleri ile kolayca etkileşimde bulunabileceği şekilde tasarlanmıştır.	Devlet	8	40	5	25	7	35
	Vakıf	1	5	4	20	15	75
3-Ders; teknoloji açısından zengin öğretim ortamlarında işlenmektedir.	Devlet	6	30	12	60	2	10
	Vakıf	3	15	8	40	9	45
4-Sınıflar öğrencilerin grup çalışması yapmasına olanak sağlayacak şekilde tasarlanmıştır.	Devlet	9	45	9	45	2	10
	Vakıf	4	20	4	20	12	60
5- Öğretim elemanına ders esnasında rahatça soru sorulabilmektedir.	Devlet	5	25	7	35	8	40
	Vakıf	1	5	3	15	16	80
Öğretim Elemanı							
6- Öğretim elemanı sorulara net yanıtlar vermektedir.	Devlet	5	25	10	50	5	25
	Vakıf	4	20	3	15	13	65
7- Öğretim elemanı konuya tam olarak hâkimdir.	Devlet	1	5	8	40	11	55
	Vakıf	4	20	6	30	10	50
8- Öğretim elemanı açık ve anlaşılır bir dil kullanmaktadır.	Devlet	2	10	12	60	6	30
	Vakıf	5	25	5	25	10	50
9-Öğretim elemanı dikkati konuya yeterince toplamaktadır.	Devlet	4	20	10	50	6	30
	Vakıf	4	20	9	45	7	35
10-Öğretim elemanı, derse destek amacıyla bir öğretim yönetim sistemi kullanmaktadır.	Devlet	3	15	10	50	7	35
	Vakıf	2	10	3	15	15	75
11-Öğretim elemanı, dersin içeriğini öğrencilerin ihtiyaçlarını göz önünde bulundurarak hazırlamıştır.	Devlet	1	5	15	75	4	20
	Vakıf	7	35	5	25	8	40
12-Ders esnasında beyin fırtınası, tartışma vb. aktif öğrenme yöntemlerinden etkin bir şekilde yararlanılmaktadır.	Devlet	6	30	12	60	2	10
	Vakıf	4	20	8	40	8	40
Ders İçeriği							
13- Dönem başında ayrıntılı olarak özetlenmiştir.	Devlet	3	15	5	25	8	40
	Vakıf	3	15	6	30	11	55
14- Ders ile ilgili kaynaklar ve dokümanlar yeterince belirtilmiştir.	Devlet	5	25	10	50	5	25
	Vakıf	4	20	7	35	9	45
15- Ders içeriklerine, bir web sitesi veya öğretim yönetim sistemi aracılığı ile erişilebilmektedir.	Devlet	6	30	5	25	9	45
	Vakıf	3	15	3	15	14	70
16- Dersin anlatımında konu ile ilgili örneklere yeterince yer verilmektedir.	Devlet	4	20	13	65	3	15
	Vakıf	3	15	8	40	9	45
17- Ders ile ilgili uygulanacak olan ödevler öğretim yönetim sistemine yüklenerek değerlendirilmektedir.	Devlet	9	45	4	20	7	35
	Vakıf	-	-	6	30	14	70
18- Öğretim yönetim sistemine yüklenen ödevlerin geri bildirimleri, öğretim elemanı tarafından sistem üzerinden verilmektedir.	Devlet	10	50	8	40	2	10
	Vakıf	1	5	7	35	12	60
Ölçme ve Değerlendirme							
19- Proje yönetimi dersinde öğrenilen bilgi ve becerilerin ölçülme işlemi klasik yöntemler aracılığı ile gerçekleştirilmektedir.	Devlet	3	15	12	60	5	25
	Vakıf	4	20	7	35	9	45
20- Öğrencilerin değerlendirmesinde alternatif yöntemlerden (performans ödevleri, projeler, sunular vb.) yararlanılmaktadır.	Devlet	1	5	4	25	15	70
	Vakıf	1	5	4	20	15	75

Nitel Bulgular

Araştırmada nitel verilerin toplanması adına, 3 öğretim görevlisi ile ses kaydı ve video sistemi ile görüşmeler yapılmıştır. Toplanan nitel veriler Strauss ve Corbin'in (1998) içerik analizi tekniği kullanılarak analiz edilmiştir.

Görüşme soruları yolu ile öğretim elemanlarından alınan ve analiz edilen verilere bakıldığında bazı benzer bulgulara rastlamak mümkündür. Proje yönetimi dersinin BÖTE Bölümlerinde verilmesi gereken bir ders olduğu, öğrencilerin proje yürütmenin amacını, proje geliştirme süreçlerini öğrenerek edindikleri bilgileri ileriki yaşamlarında yaptıkları projelerinde de kullanarak daha planlı ve programlı olabildikleri belirtilmiştir.

Proje Yönetimi dersinin analiz edilmesi aşamasında, derslerde yaşanılan zorluklara değinildiğinde, görüşme sorularının analizi sonucu bazı farklı bulgular ortaya çıkmıştır. Özel üniversitelerdeki öğretim elemanları herhangi bir zorluk yaşamadıklarını belirtirken, devlet

üniversitelerinde Proje Yönetimi dersinin içerik açısından önceki dönemlerde öğrenilen bilgilerin üzerine temel oluşturduğundan, öğrencilerin eski bilgileriyle yeni bilgilerini harmanlamada zorluk çektikleri belirtilmiştir. Dersin işlenişi hakkında verilen yanıtlar sonucu ortaya çıkan bulgularda özel ve devlet üniversitelerinde öncelikle içerikle ilgili teorik bilgiler verilmeye çalışılmıştır daha sonra proje aşamalarının uygulamalı olarak öğretilmesi sağlanmıştır.

SONUÇLAR ve ÖNERİLER

Sonuçlar

Bu bölümde, BÖTE Bölümü 4. Sınıf lisans programında yer alan "Proje Yönetimi I" dersi kapsamında iki vakıf ve iki devlet üniversitesinde 40 kişiye uygulanan anket ve 3 öğretim görevlisi ile yapılan görüşmelere dayalı bazı sonuçlar ve bu sonuçlara dayalı olarak geliştirilen önerilere yer verilmiştir.

Dersin değerlendirilmesine yönelik, sınıfın oturma düzeni ile ilgili olarak öğrencilerin verdiği yanıtlarda, vakıf üniversiteleri ve devlet üniversiteleri arasında anlamlı bir fark gözlenmiştir. Vakıf üniversitelerinde "Proje Yönetimi-I" dersi kapsamında sınıf tasarımının devlet üniversitelerinden daha iyi olduğu, öğrencilerin ihtiyaçlarını giderebilecek düzeyde olduğu, öğrenciler tarafından yanıtlarda belirtilmiştir. Öğrenciler sınıfın oturma düzeninden teknoloji kullanımının zenginliğine kadar her şeyin olduğu düşünmektedir. Fakat bu durum devlet üniversiteleri için geçerli değildir. Devlet üniversitelerinde, sınıfın oturma düzeninin önemsenmediği, teknoloji kullanımının zengin olmadığı ortaya çıkmıştır.

Öğretim elemanı yönünden bakılırsa, devlet üniversitelerinin öğretim elemanları öğrencileriyle olan iletişimlerinde vakıf üniversitelerindeki öğretim elemanlarına göre daha az etkili olduğu ve derslerde yeterli aktif öğrenmeyi sağlayamadığı tespit edilmiştir. Hem devlet üniversitelerinde hem de vakıf üniversitelerde öğretim elemanına ders süresince rahatlıkla soru sorulabilmektedir. Devlet üniversitelerinde öğrenciler, öğretim elemanının konuya hâkim olduğunu belirtmişlerdir. Vakıf üniversitelerinde de durum aynı olmakla birlikte, öğretim elemanının hâkimiyetine yönelik soruda daha çok katılım göstermişlerdir. Vakıf üniversitelerinde öğrencilerin sürekli öğretmenleri ile etkileşimde olduğu öğrenci yönetim sistemi kullanılırken, devlet üniversiteleri böyle sistemi kullandıkları fakat yeterli düzeyde kullanmadıkları ortaya çıkmıştır.

Dersin içeriği yönünden vakıf üniversiteleri devlet üniversitelerine göre daha başarılı olduğu öğrenciler tarafından belirtilmiştir. Devlet üniversitelerinde de dersin içeriği dönem başında verilmesine rağmen ders dokümanları ve kaynaklar yeterince belirtilmemiş ve ders ile ilgili kaynaklar bir öğretim yönetim sistemi üzerinden öğrencilere sunulmuştur. Bununla birlikte devlet üniversiteleri, öğrencilerini öğrenci yönetim sistemi üzerinden takip etmeyip herhangi bir dönüt vermezken, vakıf üniversitelerinde derslerin öğrenci yönetim sistemi üzerinden takip edildiği ve bu yolla dönütlerin verildiği ortaya çıkmıştır. Böylece anında dönütler verilerek zaman kaybı ortadan kalkabilir.

Ölçme ve değerlendirme yöntemleri bakımından ele alınırsa, vakıf üniversiteleri devlet üniversitelerinden farklı düşünmektedir. Vakıf üniversiteleri değerlendirme işlemini klasik yöntemler (1 vize 1 final) yerine süreci değerlendirerek gerçekleştirmektedir.

Öğretim elemanları ile yapılan görüşmelere dayanan sonuçlara bakılırsa; BÖTE bölümlerine Proje Yönetimi I dersi verilmelidir. Öğrencilere plan ve programın nasıl olduğu öğretilmesi faydalı olabilir. Microsoft Project programını kullanarak süreç şeklinde ders işlenilmektedir. Böylece tek vize, tek final şeklinde değerlendirmektense her hafta performansını değerlendirmek iyi olabilir.

Öneriler

Eğitimin daha iyi ve zengin ortamlarda derslerin işlenilmesi, öğrencilerin ihtiyaçları giderilmesi bakımından çıkan sonuçlara bakılarak aşağıdaki öneriler yer almaktadır.

- Sınıfın oturma düzeni öğretim elemanını iyi görmek adına "U sistemi" ile ayarlanabilir.
- Öğretim elemanları ile öğrencilerinin etkileşimi daha iyi olabilmesi için, öğretim elemanının iletişim derslerini alabilir.
- Sınıfın düzeni grup çalışmalarına imkân vermiyorsa, grup çalışmalarını destekleyen sınıflara yer verilebilir.
- Devlet üniversitelerin öğretim elemanlarına öğrenci yönetim sistemi öğretilerek derslerde daha etkin kullanılması sağlanılabilir.
- Devlet üniversitelerinde ve Vakıf üniversitelerinde öğretim elemanlarının öğrencileri derse dikkatlerini çekebilmek için, zengin öğretim tekniklerinden yararlanarak öğrenci merkezli ders anlatımı yapılabilir.

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BİLİMSEL SÜREÇ BECERİLERİNİN KAZANDIRILMASINDA YENİ BİR ARAÇ: AKILLI SİSTEMLER

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Özet:
Bu araştırmada, belirli bir olgu ve olay karşısında kararlar alabilme yeteneğine sahip akıllı sistemlerin, modern Fen ve Teknoloji öğretiminde özellikle temel bilimsel süreç ve becerilerinin kazanılmasında sunabilecekleri katkılar tartışılmaktadır. Bu hedef doğrultusunda erkek-kadın ses ayrımını yapabilen Yapay Kulak yazılımı ile renk tanımlaması yapabilen Renk Tanıma Robotu bir eğitsel kit olarak geliştirilmiştir. Bu kitin fen eğitimine entegrasyonu farklı kuramsal çerçevelerde incelenerek doğada en basit organizmadan en karmaşık yapılara kadar görme, duyma ve karar verme süreçlerinin nasıl oluştuğuna dair interaktif eğitim süreçleri tasarlanmıştır. Bu sistemler kullanılarak gerçekleştirilen bir çalışma lise birinci sınıf seviyesindeki 16 öğrencinin katılımı ile gerçekleştirilmiştir. Toplanılan veriler betimsel bir yaklaşımla analiz edilmiştir. Elde edilen ilk bulgular, öğrencilere aktif olarak stratejiler geliştirebilecekleri öğrenim ortamları sunan akıllı sistemlerin, günlük hayatta karşılaştıkları olgu ve olayları bilimsel kavram ve olgularla ifade etmeye, model ve modelleme etkinliğinin doğasını kavramaya olanak sağlayabileceğini göstermektedir.

Anahtar Kelimeler: Fen Eğitimi, Akıllı Sistemler, Bilimsel Süreç Becerileri, Model ve Modelleme

BİLİŞİM TEKNOLOJİLERİ FORMATÖR ÖĞRETMENLERİNİN BAKIŞ AÇISI İLE OKULLARDAKİ BİLGİ TEKNOLOJİSİ SINIFLARI

THE INFORMATION TECHNOLOGY CLASSES IN THE SCHOOLS FROM THE VIEWPOINT OF FORMATOR TEACHERS

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Özet
Bilim ve teknolojinin hızla gelişmesine bağlı olarak değişen beklentileri karşılayabilmek için eğitim-öğretim ortamlarında yeniden yapılandırmalara gidilmiş, okullarda Bilgi Teknolojileri Sınıfları (BTS) kurulmuştur. Bilişim Teknolojileri Formatör Öğretmenlerinin (BİTEFO) kontrolündeki bu sınıflar sayesinde teknolojinin eğitimde en iyi şekilde kullanılması hedeflenmiştir. Bu çalışmada amaç, BİTEFO'ların görev yaptıkları okullarda kullandıkları BTS'lerine ilişkin değerlendirmelerini almak ve bu değerlendirmeler ışığında BTS'lerin genel durumunu ortaya koymaktır. Tarama modelinin kullanıldığı çalışmada BİTEFO'lar tarafından cevaplanan sorular, araştırmanın amacına göre nitel veri analizine tabi tutulmuştur. Araştırma verilerinden BİTEFO'ların sınıflarını; kullanmakta oldukları bilgisayarların donanımsal özellikleri, performansları ve sayıları açısından değerlendirdiklerinde yeterli görmedikleri sonucuna ulaşılmıştır. Ayrıca öğretmenler, okullarındaki internet bağlantısının yetersiz olduğunu; MEB tarafından kullanılması istenilen eğitim portallarının bu nedenle kullanılamadığını belirtmişlerdir. Sonuçlar doğrultusunda; bilgisayarlara gerekli donanımsal destek sağlanmalı, bilgisayar sayıları öğrenci sayısını karşılayacak şekilde artırılmalı ve internet bağlantı hızı gerekli uygulamaların yürütülmesine imkân verecek düzeye getirilmelidir.
Anahtar Kelimeler: Bilgi Teknolojisi Sınıfı, BİTEFO, Bilgi Teknolojisi.

Abstract
Depending on the rapid developments in the science and technology, the reconfiguration was done in the educational environment and information technology classes were set up in the schools to meet the changing expectations. It is aimed to use the technology ideally in the field of education with the help of these classes which are under control of formator teachers. The aim of the study is to learn about the evaluation of the formator teachers related to the information technology classes they use in their schools and in the light of these evaluations to reveal the general situation of these classes. The survey method was used in the study and the questions answered by the formator teachers were subjected to qualitative data analysis. According to the results of the study, it is founded that the information technology classes were evaluated as insufficient in terms of hardware qualifications of computers, performances, and numbers by formator teachers. Besides, the teachers found internet connection in the schools deficient, they also stated that why they could not use educational portals which are required by the Ministry of National Education. In the direction of these results, the required hardware support should be provided for the computers, the numbers of computers should be increased in proportion of the numbers of students, and the internet connection speed should be maximized to perform the required applications.
Key Words: Information Technology Classes, Formator Teacher, Information Technology.

GİRİŞ

Son yıllarda teknolojide yaşanan hızlı değişimler yaşadığımız dünyayı yeniden şekillendirerek, toplumları bilgi toplumuna dönüştürmüş (Şahinkayası ve Şahinkayası, 2004; Çelik ve Kahyaoğlu, 2007) ve bu değişim eğitim anlayışına farklı bir bakış açısı kazandırmıştır (Cüre ve Özdener 2008; Çelik ve Bindak, 2005; Yeşilyurt ve Gül, 2007). Bu bağlamda eğitim sistemi içerisinde özellikle bilgisayarlar, çeşitli amaçlar için kullanılmaya başlanmış, eğitim ortamlarında türlü yapılanmalara gidilmiştir (Akkoyunlu, 1998; Orhan ve Akkoyunlu, 2003). Ülkemizde ortaya çıkan bu yapılanmalardan birisi de "Bilgi Teknolojisi Sınıfları (BTS)"dır.
Bilgi Teknolojisi Sınıfları (BTS), bilişim teknolojisine yönelik eğitim programlarının yürütülmesini ve bilişim teknolojisi araçlarının eğitim etkinliklerine entegrasyonunu sağlamak amacıyla MEB tarafından bilişim teknolojisi araçlarıyla donatılan sınıflar olarak tanımlanmaktadır (MEB, 2007). Ayrıca BTS'ler öğretmenlerin rehberlik ettiği ve teknoloji konusunda uzman oldukları, öğrencilerin kendi kendilerine yaşayıp aktif olarak öğrenmelerine olanak sağlayan öğrenme-öğretme ortamları şeklinde de tanımlanabilir (Gillespie, 2006). Başlangıçta "bilgisayar sınıfı" ve "bilgisayar laboratuarı" şeklinde adlandırılan bu sınıflar, 1997 yılında yürürlüğe giren 4306 sayılı yasadan sonra "Bilgi Teknolojisi Sınıfı" olarak ifade edilmeye başlanmıştır (Dirisağlık ve Kabakçı, 2008).
Bilgi teknolojilerinin kullanılması ve öğretilmesi amacıyla okullardaki BTS'ler kullanılarak bilgi teknolojilerinin yaygınlaştırılması görevi, 2378 sayılı yönergeyle bilgisayar formatör öğretmenlerine verilmiştir (MEB, 1993; Dirisağlık ve Kabakçı, 2008). Bilişim teknolojileri formatör öğretmenleri, BTS'lerin amacına uygun kullanımının sağlanması, düzenlenmesi, okuldaki yönetimi ve sorumluluğunun alınması görevlerinin yanı sıra 4.,5.,6.,7. ve 8. sınıfların Bilişim Teknolojileri dersini işleme göreviyle de yükümlüdür.
BTS'ler, 1998 yılından itibaren kurulmaya başlanmıştır ve günümüzde birçok okulda bulunmaktadır. Bilgi teknolojisi sınıflarının olmadığı okullarda ise sınıfların kurulumuna yönelik çalışmalar devam etmektedir (İşman ve Canan, 2009). Acaba yıllardır büyük bir titizlikle kurulmuş olan ve kurulumlarına devam edilen "Mevcut BTS'ler, kuruluşlarındaki amaçlarının gerçekleştirilmesi için yeterli midir?, MEB tarafından kurulan BTS'lerin genel durumları nasıldır?" Alanyazına bakıldığında bilgi teknolojileri sınıfları ile ilgili çeşitli çalışmaların yapıldığı görülmektedir. Ancak sayı ve içerik olarak bu tür çalışmalara çok sık rastlanmamaktadır. Yapılan çalışmalarda BTS'lerin kullanım amaçlarına uygun şekilde kullanılıp kullanılamadığı (İşman ve Canan 2009); yapısalcı yaklaşıma göre BTS'lerdeki sınıf yerleşim düzeni (Ersoy, 2005); BTS'lerin kullanımına ilişkin görüşler (Dirisağlık ve Kabakçı, 2008); BTS'lerin; bilgisayar eğitimi, bilgisayar destekli eğitim ve ders dışı etkinlikler açısından durumlarının değerlendirilmesi (Tezel ve Karademir,2009) konularının incelendiği görülmektedir. Buna rağmen BTS'lerin amacına uygun olarak kullanılmaya çalışıldıkları süreçlerde karşılaşılan eksiklikler, sınıfların donanımsal yeterliliği ve sınıfların verimli şekilde kullanılmalarının önündeki engellerin araştırıldığı çalışma sayısı azdır. Yapılan bu araştırma; okullarda bilgi teknolojilerinden yararlanılması amacıyla kurulan BTS'lerin, bu amaç doğrultusunda karşılaştıkları ihtiyaçlarının ve mevcut eksikliklerinin belirlenmesine odaklanmıştır. Çalışmada BTS'ler hakkındaki değerlendirmeler, bu sınıfların sorumlusu konumundaki kişiler olan BİTEFO'lardan alınmıştır. Ayrıca bu çalışma, kurulacak olan BTS'lerde ortaya çıkabilecek aksaklıkların önceden tespit edilerek engellenmesi için atılmış bir adım niteliği taşımaktadır.

AMAÇ

Bu araştırmanın amacı; Bilişim Teknolojileri Formatör Öğretmenlerinin (BİTEFO) görev yaptıkları okullarda kullandıkları Bilgi Teknolojileri Sınıflarına (BTS) ilişkin değerlendirmelerini almak ve kurulu olan BTS'lerin genel durumunu bu değerlendirmeler ışığında ortaya koymaktır. Amaç doğrultusunda şu sorulara yanıt aranmıştır;

- BİTEFO'ların, okullarındaki BTS'lerin genel durumu (bilgisayarların donanımsal özellikleri, sınıf yerleşim düzeni, internet bağlantısı, vb.) hakkındaki düşünceleri nelerdir?
- BİTEFO'ların, BTS'lerde gözlemledikleri eksiklikler nelerdir?
- BTS'ler, Milli Eğitim Bakanlığı tarafından kullanılması istenilen eğitim portallarının (Dyned, MEB Vitamin, Thinkquest) uygulanabilirliği için gerekli imkânlara sahip midir?

YÖNTEM

Araştırma 2009–2010 eğitim-öğretim yılında Trabzon ilinde gerçekleştirilmiştir. Araştırma evreni Trabzon ilindeki tüm BİTEFO'lardan oluşurken; örneklem, çalışmaya katılan 45 BİTEFO'dan (18 bayan–25 bay) meydana gelmiştir. Örneklemi oluşturan öğretmenler Trabzon il merkezi, ilçeleri, beldeleri ve köylerinde görev yapmaktadır ve tümü Bilgisayar ve Öğretim Teknolojileri Öğretmenliği bölümü mezunudur.

Bu çalışma, tarama modelinde gerçekleştirilmiş betimsel bir araştırmadır. Betimsel araştırmalar, genelde verilen bir durumu aydınlatmak, standartlar doğrultusunda değerlendirmeler yapmak ve bunun yanı sıra mevcut olaylar arasındaki olası ilişkileri ortaya çıkarmak için yürütülür. Betimsel araştırmalarda asıl amaç; incelenen durumu etraflıca tanımlamak ve açıklamaktır (Çepni, 2007, s.34). BİTEFO'ların sınıflarını değerlendirmelerinin amaçlandığı bu çalışmada veri toplama aracı olarak kullanılmak üzere, 8 açık uçlu sorudan oluşan bir anket hazırlanmıştır. Anket hazırlanırken; Bilişim Teknolojileri ders müfredatındaki konuların gerektirdiği donanımlar, MEB tarafından kullanılması istenilen eğitim portallarının gerektirdiği çevre donanım birimleri, internet alt yapı ihtiyaçları ve çalışmada sebep teşkil eden alt problemler dikkate alınmıştır. Çalışma için hazırlanan anket, internet üzerinden il genelindeki BİTEFO'lara gönderilmiştir ve veriler iki haftalık süreçte toplanmıştır. Ayrıca çalışmadan elde edilen verilerin çözümlenmesi ve yorumlanması nitel analiz yöntemiyle gerçekleştirilmiştir. BİTEFO'ların cevapları, aynı fikirde oldukları veya olmadıkları noktalar tespit edilerek kategorileştirilmiştir. Kategoriler oluşturulduktan sonra ilişkili olan ifadeler aynı başlık altında toplanarak araştırma sorusu etrafında; benzerliklerine göre gruplandırılmış ve analiz edilmiştir. Ayrıca betimsel istatistik tekniklerinden yararlanılarak sayı ve yüzdeler hesaplanmış, böylece oranlama yoluyla sonuçlar yorumlanabilmiştir.

BULGULAR

Çalışmanın bu kısmında; BİTEFO'ların görev yaptıkları okullarda kullandıkları BTS'lerine ilişkin değerlendirmelerini almak ve bu değerlendirmeler ışığında BTS'lerin genel durumunu ortaya koymak için oluşturulmuş 8 açık uçlu anket sorusunun nitel analizi yapılmıştır. Araştırmaya BİTEFO'ların, BTS'lerinde kullanmakta oldukları bilgisayarların mevcut durumlarını nasıl buldukları sorusuyla başlanmıştır ve verilen cevaplardan elde edilen sonuçlar Tablo 1'de sunulmuştur. Öğretmenlerin cevaplarında birden fazla neden belirttikleri dikkate alınmış, yüzde ve frekans analizlerine bunlar da dahil edilmiştir

Tablo1. BİTEFO'ların, BTS'lerindeki bilgisayarların mevcut durumları hakkındaki görüşleri

Soru: Bilişim Teknolojileri sınıfınızın kullanmakta olduğunuz bilgisayarlar yönünden mevcut durumu sizce nasıldır?

Cevap	f	%	Cevap	f	%
Yeterli	12	27	Yetersiz	33	73
Bilgisayar sayısı yeterli	5	42	Bilgisayar sayısı az	14	42
Bilgisayarlar yeni	5	42	Kalabalık sınıflar	9	27
Yüksek performans	9	75	Teknik yetersizlik	15	45
			Eski bilgisayarlar	12	36
			Düşük performans	13	39

Tablo 1 incelendiğinde; BİTEFO'ların 33'ünün (%73) BTS'lerini; kullanmakta oldukları bilgisayarların donanımsal özellikleri, performansları ve sayıları açısından değerlendirdiklerinde yeterli görmedikleri sonucuna ulaşılmıştır. Ayrıca BİTEFO'lar bu yetersizlik nedenleri arasına, sınıfların kalabalık ve bilgisayarların eski olduğunu da eklemişlerdir. *"PC sayıları öğrenci mevcudundan az olduğu için derslerde sıkıntı yaşanmaktadır.", "Bilgisayar sistemleri eski, yeni güncel uygulamaları çalıştırmakta zorlanıyoruz", "Eski kurulmuş laboratuarlarımız, sürekli gelişen teknolojiye ayak uyduramamaktadır...","... Hala 4 GB Harddiski olan 288 MB Ram' a yükselttiğimiz 1999 yılının düşük performanslı bilgisayarlarıyla eğitim vermeye çalışıyoruz..."* ifadeleri olumsuz görüş belirten BİTEFO'lar tarafından ortaya koyulmuştur. 12 (%27) BİTEFO ise BTS'leri için; *"... yeterli sayıda, çalışır durumda ve günümüz programlarına yetebilecek düzeyde", "bilgisayarlarımız yeni ve performansları iyi"," performansları gerekli programları çalıştırıyor ve bilgisayarlarımız da yeni.."* şeklindeki ifadeleriyle sınıflarını yeterli bulduklarını belirtmişlerdir.

BTS'lerdeki mevcut yerleşim düzenleri ve bu düzenlerin ders işlenişine etkisini incelemek için ankette yer alan 2. sorunun bulgularına göre; araştırmaya katılan BİTEFO'ların 28'inin (%62) BTS'sindeki mevcut yerleşim düzeni "U" şeklindeyken; 7'sinin ise (%16) klasik sıra düzeni şeklindedir. Örneklemdeki diğer 10 (%22) BİTEFO ise sınıf yerleşim düzeni için doğrudan bilgi vermezken, sınıflarının küçüklüğünden bahsederek bu sorunun sınıflar için uygun yerleşim düzeni oluşturulmasını engellediğini belirtmişlerdir. Sınıflarında "U" düzenini kullanan öğretmenlerin 24'ü (%86) bu düzenden memnun olduklarını; "*Yerleşim düzeni "U" olarak ayarlanmış durumda, kablolar tamamen arka tarafta kaldığı için de çok kullanışlı. Ayrıca monitörlerin de görünmesi güzel* " ve "*… Sınıf düzeni "U" şeklinde olduğu için ders işlenirken rahat oluyor. Oturma düzeni de ona göre ayarlanmış olduğundan derste öğrenci kontrolü ve öğrencilerin derse aktif olarak katılması kolay oluyor.*"… şeklindeki cümleleriyle belirtmişlerdir. Ayrıca 4'ü (%14) kalabalık sınıflarda "U" düzeninin uygulanmasının zor olması ve öğrencilerin, öğretmene arkalarını dönerek oturmak zorunda olmalarından dolayı bu düzenden memnun olmadıklarını dile getirmişlerdir ve bu konudaki olumsuz düşüncelerini "*Mevcut yerleşim düzeni U şeklidir. Öğrencilerin tahtayı görmeleri için arkalarını dönmeleri gerekmektedir bu yüzden mevcut düzen yetersizdir"* ve*" U düzeni kullanılıyor. Düzenleme ders işlemeye uygun değil. Öğrenciler perdeye ve ana bilgisayara sırtı dönük oturuyor."* şeklindeki ifadeleriyle belirtmişlerdir.

Anketin 3. sorusunda öğretmenlere BTS'lerin okullarının kaçıncı katında olduğu ve buna ek olarak kaçıncı katta olmasının daha uygun olacağı soruları yöneltilmiştir. Buna göre BTS'lerin 13'ünün (%29) 1. katta; 23'ünün (%51) 2. katta ve 9'unun (%20) 3. katta olduğu sonuçlarına ulaşılmıştır. BİTEFO'ların, sorunun ikinci kısmına vermiş oldukları yanıtlar neticesinde ise öğretmenlerin 16'sının (%36) sınıflarının; öğrencilerin kontrolünün daha iyi sağlanabileceği, her kattan ulaşımın rahat olacağı ve fiziksel olarak daha kullanışlı olduğunu düşündükleri orta katlarda olmasını istedikleri görülmüştür. Öğretmenlerin bu konudaki görüşlerden bazıları şöyledir; *"... öğrenciler hem üst kattan hem de alt kattan gelerek orta katta toplanmaktadır. Orta kat daha uygundur.."*, "*Orta katlarda olması uygundur. Kullanmak isteyen her öğretmenin rahatça ulaşabilmesi ve öğrencilerin daha kısa sürede sınıfa yerleşebilmeleri açısından*", "*…Herkesin kolaylıkla ulaşabileceği bir yerde olması gerekir. Bu nedenle de orta katlar uygundur.*", " *2. katta (orta katta) olması güvenlik ve ulaşılabilirlik için idealdir.*" Öğretmenlerin 9'u (%20) ise daha sakin olması yönünden ve sadece ilgili öğrencilerin geleceğini düşündükleri için sınıfların en

üst katta olmasını uygun bulmuştur. 6 öğretmen (%13) ise sınıfların giriş katında olmasının öğrencilerin hemen sınıfa girebilmeleri açısından uygun olacağı yönünde görüş belirtmişlerdir.

Anketteki 4. soruda BİTEFO'lara, sınıflarındaki internet bağlantısı hakkındaki düşünceleri sorulmuş ve öğretmenlerin bu konuda büyük ölçüde ortak düşüncelere sahip olduğu görülmüştür. BİTEFO'ların 43'ü (%96) internet bağlantısını yetersiz olduğunu belirtirken; 2'si (%4) internet bağlantısın yeterli olduğunu söylemiştir. Olumsuz yanıt veren BİTEFO'lar bunu; *"... hız yavaş yeterli olmuyor. Bazı programlara bağlanmada internet hızının yavaş olması sıkıntılara neden oluyor. Şu anda internet bağlantısı çok kötü", "Çünkü 15 öğrenci bilgisayarı, 7 öğretmen-idare bilgisayarının tamamının bu bağlantıyı kullanmaktadır. Şu an sitelerin ana sayfasını açamayacak kadar yavaş.", "Bağlantımız oldukça yavaş bu sebepten dolayı internetle ilgili derslerimizde de çok fazla zaman kaybediyoruz. Okul için gerekli olan işlemleri de internet bağlantımızdaki aksaklık nedeniyle yeterince yerine getiremiyoruz.*" şeklinde belirtmişlerdir. Yeterli olduğu yönünde fikir belirten iki öğretmen ise neye dayanarak bu cevabı verdiklerini açıklamamıştır.

Anketin 5. sorusunda BİTEFO'lara öğrencilerin BTS'lerden eşit derecede yararlanıp yararlanamadıkları sorulmuştur. 23 (%51) BİTEFO, yararlanamadıkları yönünde görüş belirtirken bunu; *"Hayır, Çünkü, sınıf mevcutlarından az olan pc sayısı her ne kadar eşit kullandırılmaya çalışılsa da bu mümkün olamamaktadır.", "Çünkü bilgisayarların hızı ve sayısı okuldaki tüm öğrencilerin eşit ve yeterince kullanabilmesine imkân tanımıyor. BTS'ler, öğrenciler tarafından teneffüslerde ya da öğle araları kullanılsalar bile, öğrenci sayısı açısından bakıldığından 20 bilgisayar hiçbir zaman öğrenciler için yeterli olamaz",* şeklinde açıklamışladır. 22 (%49) BİTEFO ise öğrencilerin sınıflardan eşit derecede yararlanabildiklerini belirtmişlerdir. Açıklama olarak da okullarındaki öğrenci sayısının az oluşunu, BTS için kullanım planının oluşturulmuş olmasını ve bu plana uygun hareket ettiklerini, sınıfın sürekli açık tutulduğunu sunmuşlardır. *"Evet. Çünkü, bilgisayar sınıfı için oluşturulmuş olan plana göre hareket ediyoruz", ".. Çünkü, 4–8 arası her sınıfa bir gün verilerek o günlerde o sınıfın öğrencileri bilgisayar odasını öğlen aralarında kullanabiliyorlar. Her öğrenciye bir bilgisayar düştüğünden dolayı eşit derecede yararlanmaları mümkün oluyor."* ifadeleri öğretmenlerin açıklamalarından bazılarıdır.

Anketin 6. sorusunda BİTEFO'lara sınıflarında karşılaşmış oldukları en büyük eksikliklerin neler olduğu sorulmuştur. Öğretmenler bu soruya oldukça kısa yanıtlar vermişlerdir. Buna göre; 13 (%29) BİTEFO, bilgisayar sayısının ve bilgisayarların performanslarının yetersiz olduğunu; 5 (%11) BİTEFO, bilgisayarların eski olmasının sorunlara neden olduğunu belirtmiştir. 25 (%56) BİTEFO, sınıflarındaki çevre donanım birimleri (kulaklık, mikrofon, klima..) ile ilgili çok sık sorunlar yaşadıklarını ifade etmiştir. 14 (%31) BİTEFO, internet bağlantı hızının yavaş olmasının büyük bir eksiklik olduğunu belirtirken, 4 (%9) BİTEFO buna bağlantının sürekli kopuyor olması sorununu da eklemiştir. Öğretmenlerin karşılaşmış oldukları sorunlar arasında BTS'lerin havalandırma ve ısıtma sistemleri ile ilgili sorunlar olduğu kadar; sınıfların küçük olması ve temizlik gibi konulardaki eksiklikleri de mevcuttur.

Anketin 7. sorusunda BİTEFO'lara, BTS'lerin daha ideal bir ortama dönüştürülmesi için sınıflarında hangi değişikliklerin yapılmasının uygun olacağı sorulmuştur. BİTEFO'ların bu soruya verdikleri cevaplardan elde edilen bulgular Tablo 2'de sunulmuştur. Öğretmenlerin cevaplarında birden fazla değişikliği belirttikleri dikkate alınmış, yüzde ve frekans analizlerine bunlar da dahil edilmiştir.

Tablo 2. BİTEFO'ların ideal bir sınıf ortamından beklentileri

Sizce Bilişim Teknolojileri sınıfınızda hangi değişikliklerin yapılması ile sınıfınız daha ideal bir ortama dönüşebilir?														
Bilgisayar	f	%	İnternet	f	%	Sınıf	f	%	Donanım	f	%	Çevre Birim	f	%
Yeni Bilgisayar	9	20	Hızlı internet	16	36	Daha geniş sınıf	17	38	Akıllı tahta	3	7	Klima	2	4
Hızlı bilgisayar	2	4	Ağ tesisatı	3	7	Yeni zemin	2	4	Projeksiyon	3	7	Masa	5	11
Daha fazla bilgisayar	19	42	Alt yapı	8	18	Havalandırma	6	13	Monitör	2	4	Sandalye	7	16
Uzun garanti	1	2				Oturma düzeni	6	13	Kulaklık	3	7			
Güncel yazılım	8	18				Temizlik	1	2	Mikrofon	3	7			

Tablo 2 incelendiğinde 19 (%42) BİTEFO, ideale ulaşmak için sınıflarındaki bilgisayar sayısının arttırılması gerektiğini belirtmiştir. Ayrıca yeni, hızlı ve güncel yazılıma sahip bilgisayarların temin edilmesini de bazı öğretmenler tarafından gerekli bulmaktadırlar. 16 (%36) BİTEFO, daha ideal sınıflar için internet bağlantısının daha hızlı olması gerektiğinden bahsetmiştir. Öğretmenler bunu; "*Internet hızının arttırılması…", "…internet hızının yükseltilmesi de iyi olur.."* şeklindeki benzer ifadeleriyle dile getirmişlerdir. Daha ideal bir sınıf ortamı için öğretmenlerin 17'si (%38*) ".. Alanın genişletilmesi..","Daha geniş bir mekanın olması.."* şeklindeki ifadeleriyle sınıflar daha geniş olmalı yönünde fikir belirtmişledir. Bunun yanında sınıf zeminlerinin yenilenmesinin, havalandırma sistemlerinin yeniden oluşturulmasının ve sınıftaki oturma düzeninin değiştirilmesinin de sınıf için daha uygun olacağını eklemişlerdir. BİTEFO'ların 3'ü (%7) ideal sınıfları için akıllı tahta, projeksiyon, kulaklık ve mikrofon ihtiyaçlarının giderilmesi gerekliliğini dile getirmişlerdir. Ayrıca sınıflarına klima takılmasını, sandalye ve masaların değiştirilmesi gerektiğini söyleyen BİTEFO'lar da olmuştur.

BİTEFO'lara; BTS'lerinin, MEB'in okullarda kullanılmasını istediği DYNED, THINKQUEST ve MEB VİTAMİN uygulamaları için yeterli alt yapı ve donanım durumları sorulduğunda ise; 23 (%51) BİTEFO, *"Dyned ile ilgili sunucu alt yapısı tam yapılmamış çünkü bağlanmada sorunlar oluyor. Ayrıca kulaklık mikrofon alt yapısı da çok zayıf ve bozulan kulaklığın yerine yenisi alınamıyor. Thinkquest ve vitamin için normal bir internet bağlantısı olması gerekiyor. Ama okullardaki bağlantı aşırı yavaş", "Bu tür uygulamaları daha verimli kullanabilmek için iyi bir internet alt yapısına sahip olmak gerekir. MEB okullara vermiş olduğu internet hatlarını güçlendirmelidir. Donanım açısından okulumuz yeterli değildir. Bilgisayar sayılarımız az.", "BT sınıfındaki bilgisayarlar donanım açısından yetersiz. Bu tür yazılımları kaldıracak düzeyde değil. İnternet bağlantısı hızımız da düşük Bu tür uygulamalar için sınıfımızın donamım açısından yeterli hale getirilmesi gerekmektedir."* şeklindeki görüşleriyle yeterli alt yapı ve donanıma sahip olmadıklarını belirtmiştir. 19 (%42) BİTEFO ise sınıflarının bu uygulamalar için yeterli olduğunu ifade etmiş, örneklemi oluşturan diğer BİTEFO'lar ise bu soruyu cevaplamamıştır.

TARTIŞMA

Trabzon ilindeki BİTEFO'larla gerçekleştirilmiş olan bu çalışmada; 33 (%73) BİTEFO'nun BTS'lerini; bilgisayarların donanımsal özellikleri, performansları ve sayıları açısından yeterli görmedikleri sonucuna ulaşılmıştır. BİTEFO'lar bu yetersizlik nedenlerini; sınıfların kalabalık, bilgisayarların eski ve sayıca az olmasıyla açıklamışlardır. Oysaki 1993 yılında yürürlüğe giren 2378 sayılı yönergede, "okullara kurulacak olan BTS'lerin kurulumu sırasında, okullardaki öğrenci sayısı dikkate alınacaktır" şeklinde bir açıklamaya yer verilmiştir (PMKB, 2007). Bu açıklamada da belirtildiği gibi sınıflardaki bilgisayar sayıları öğrenci sayılarına paralel olarak alınmalıdır. Ancak yapılmış olan bu çalışmanın bulgularına göre 14 (%31) BİTEFO sınıflarındaki bilgisayar sayısının öğrenciler için yeterli olmadığını belirtmiştir. Bilgisayar sayısı yeterli olmadığı için de bir bilgisayarı birden fazla öğrenci kullanmak zorunda kalmaktadır. Yine bu nedenle öğrencilerin, bilgisayarları bireysel olarak özgürce kullanamadıkları sonucu alanyazındaki çalışmalarla da desteklenmektedir (Ersoy, 2005; Altun, 2003) Bilgisayar sayısı yeterli olmadığı için de BTS'lerde gerçekleştirilen uygulamalardan verimli sonuçlar elde edilmesi zorlaşmaktadır.

Bunun yanında MEB; Dyned, Thinkquest ve MEB Vitamin gibi çeşitli eğitim portallarının okullarda kullanılmasını istemektedir. Zaten BTS'lerin kullanım amaçlarından biri de, yabancı dil alanı derslerinin (İngilizce, Almanca, Fransızca, vb.) uygulamalarında kullanılmalarıdır (Dirisağlık ve Kabakçı, 2008). Ancak bu çalışmada okullardaki yetersiz internet bağlantısından dolayı bu portalların amacına uygun olarak kullanılamadığı sonucu ortaya çıkmıştır. Bu da BTS'lerin kuruluş amacına hizmet edecek donanıma sahip olmadıklarını göstermektedir.

Çalışmada öğretmenlere BTS'lerin okullarının kaçıncı katında olmasının daha uygun olacağı sorusu da yöneltilmiştir. Dirisağlık ve Kabakçı, 2008 yılında yaptıkları çalışmada BTS'lerin giriş katında olmasının ders dışı kullanımda kontrol kolaylığı sağladığı için iyi olacağını belirtmişlerdir. Bu görüşün aksine bu çalışmada 23 (%51) BİTEFO'nun, sınıflarının; öğrencilerin kontrolünün daha iyi sağlanabileceği, her kattan ulaşımın rahat olacağı ve fiziksel olarak daha kullanışlı olduğunu düşündükleri orta katlarda olmasını istedikleri görülmüştür. Ayrıca çalışmada BİTEFO'ların, 28'inin (%62) sınıflarındaki yerleşim düzeninin U şeklinde olduğu ve 24'ünün de bu düzenden memnun olduğu sonucuna ulaşılmıştır. Öğretmenlerin düzen hakkındaki olumlu görüşlerini; McKenzei (1997)'nin yapmış olduğu çalışmasındaki bilgisayar dersi için U yerleşim düzeni daha uygundur ve bu düzen öğrenciler arasındaki etkileşimi arttırır şeklindeki ifadesi desteklemiştir. Buna rağmen, sınıfında U düzenini kullanan ama mevcut düzenden memnun olmayan 4 (%14) BİTEFO'nun bu konudaki düşünceleri Ersoy (2005) tarafından da desteklenmektedir. Ersoy (2005) çalışmasında, U düzeninin öğretmenin, öğrencileri kontrolü açısından iyi olduğunu ancak öğrencilerin birbirleriyle etkileşimde bulunamaması açısından da yetersiz olduğunu dile getirmiştir. Çalışmada ayrıca, BİTEFO'ların, BTS'lerde karşılaşmış oldukları eksikliklerden biri de sınıfların çok küçük olmasıdır şeklinde bir sonuca ulaşılmıştır. Bu sorun, öğrencilerin sınıf içerisinde rahat hareket etmesini ve sınıf için daha uygun bir yerleşim düzeni oluşturulmasını engellemektedir. Altun (2002) da, yapmış olduğu çalışmasında sınıfın fiziki olarak yeterli büyüklükte olmamasının BTS'ler için sorun olduğunu belirtmiştir.

Bu çalışmanın sonucunda BİTEFO'ların, BTS'ler hakkındaki değerlendirme sonuçlarına paralel sonuçların alanyazındaki diğer çalışmalarda da ortaya çıktığı görülmektedir. Mevcut olan bu sorunlar MEB tarafından, bilgi çağına uygun bireyler yetiştirilmesine yardımcı olması amacıyla kurulmuş olan BTS'lerin gerçekleştirmeye çalıştıkları amaç yolunda çeşitli eksikliklerinin olduğunu ortaya koymaktadır.

SONUÇ ve ÖNERİLER

Bilişim teknolojileri formatör öğretmenlerin (BİTEFO) bakış açısı ile okullardaki bilgi teknolojisi sınıflarının (BTS) değerlendirilmesine yönelik yapılan çalışmada; BİTEFO'ların, BTS'leri; kullanmakta oldukları bilgisayarların donanımsal özellikleri açısından değerlendirdiklerinde yeterli görmedikleri sonucuna ulaşılmıştır. BİTEFO'lar, bilgisayarların, sınıf içi uygulamalarda yeterli performansı gösteremediklerini ve yeni teknolojilere uyum sağlayamadıklarını da eklemişlerdir. Bunun yanında BİTEFO'lar; kalabalık sınıflar için bilgisayar sayılarının, ihtiyacı karşılayamayacak kadar az olduğunu belirtmişlerdir. Ayrıca okullarındaki internet bağlantısının yetersiz olduğunu; MEB tarafından kullanılması istenilen Dyned, MEB Vitamin, Thinkquest gibi eğitim portallarının bu nedenle amacına uygun olarak kullanılamadığını ve yine bu nedenlerden dolayı öğrencilerin BTS'lerden eşit derecede yararlanamadıklarını da eklemişlerdir. Öğretmenlerin sınıflarındaki mevcut yerleşim düzeni konusunda çeşitli fikirler sunmuş olması da çalışmanın bir diğer sonucudur. Bu sonuca göre; öğretmenlerin büyük çoğunluğu sınıflarında U düzenini kullanmaktadır. Ancak öğrencilerin öğretmene arkası dönük şekilde oturması, sınıfların bu düzen için yeterli büyüklükte olmamasını da bu düzenin yetersiz olma nedenleri olarak belirtmişlerdir. Bu tür sorunların BTS'lerin etkin kullanımını azalttığı düşünülürse; BTS'lerden daha verimli bir şekilde yararlanabilmek için, aşağıda belirtilen önerilerin göz önüne alınmasının faydalı olacağı düşünülmektedir.

- BTS'lerin oluşturulması sürecinde okullardaki öğrenci sayısının dikkate alınması konusunda daha titiz davranılabilir. Öğrenci sayısını karşılayamayacak kadar az bilgisayara sahip olan okulların bilgisayar ihtiyacı giderilmelidir.
- BTS'ler için; geliştirilen eğitim yazılımlarını kullanabilecek performansa sahip bilgisayarlar seçilmelidir. Böylece bilgisayarların güncellenmesi gereken durumlarda meydana gelebilecek olası aksaklıklar ortadan kaldırılabilir.
- BTS'ler oluşturulurken belirlenen sınıf yerleşim düzeninin; öğretmenin, öğrencilerin bilgisayarları rahatlıkla görebilecekleri şekilde olmasına dikkat edilmelidir. Sınıflar küçük olmamalı, rahatlıkla havalandırılabilmeli ve okuldaki tüm öğrencilerin kolaylıkla erişebilecekleri bir katta olmalıdır.
- BTS'lerden tüm öğrencilerin eşit derecede faydalanabilmesi için sınıfların mevcut kullanım planlarında gereken düzenlemeler yapılmalı, planı olmayan BTS'ler için kullanım planı oluşturulmalı ve sınıfın bu plana uyularak kullanılması sağlanmalıdır.
- İnternet bağlantısındaki yetersizliklerden kaynaklanan sorunların ortadan kaldırılabilmesi için, mevcut bağlantılar ve alt yapı gözden geçirilmelidir. MEB tarafından sağlanan internet bağlantısının sınıflardaki ihtiyaçlara cevap vermediği de yetkililere bildirilebilir ve gereken düzenlemelerin yapılması istenilebilir.
- Okullarda kullanılması istenilen Dyned, MEB Vitamin, Thinkquest gibi eğitim portalları için gerekli olan çevre donanım birimleri (kulaklık, mikrofon,..) okullara sağlanmalıdır. Bu birimlerde meydana gelen aksaklıklar da MEB tarafından ayrılabilecek bir bütçe ile giderilmeye çalışılabilir.
- BTS'lerde ortaya çıkan aksaklıkları yerinde belirlemek ve giderebilmek için MEB tarafından teknik elemanlar görevlendirilebilir. Bu elemanların sınıflardaki donanımsal sorunların çözümünde öğretmenlere rehberlik edebilecek donanıma sahip olması sağlanabilir.
- Okulların projeksiyon, yazıcı gibi eksikliklerinin ilgili birimlere rapor edilmesi ve bu ihtiyaçlara en kısa sürede cevap verilebilmesi sürecinde online sistemlerin kullanılması konusunda daha titiz davranılmaya çalışılabilir.
- Bu araştırmaya benzer başka araştırmalar daha geniş örneklem grupları ile gerçekleştirilerek BTS'ler için daha ayrıntılı değerlendirmeler yapılabilir.

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BİLİŞİM TEKNOLOJİLERİ ÖĞRENCİLERİNİN KULLANDIKLARI ÇEVRİMİÇİ BİLGİ KAYNAKLARI: ANADOLU ÜNİVERSİTESİ ÖRNEĞİ

ONLINE INFORMATION SOURCES OF INFORMATION TECHNOLOGY STUDENTS: CASE OF ANADOLU UNIVERSITY

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Özet
Bilgisayarların bilgi depolama kapasitesi, veri işleme hızı ve İnternet teknolojilerindeki gelişmeler bilginin elektronik ortamda oluşturulması, yayınlanması ve güncellenmesini hızlandırmıştır. Geniş bant aralığı ve büyük veritabanlarıyla desteklenen İnternet, artık sınırsız bilgi erişimiyle birlikte bilgilerin depolanmasında da sınırsız hizmet vermeye başlamıştır. Bu çalışmanın amacı Bilişim Teknolojisi öğrencilerinin eğitim amaçlı kullandıkları çevrimiçi bilgi kaynaklarını belirlemektir. Genel tarama modeli türlerinden ilişkisel ve tekil tarama modelinde desenlenmiş bu araştırmada Bilişim teknolojileri öğrencilerinin dersleriyle ilgili verilen görevleri yerine getirirken kullandıkları çevrimiçi bilgi kaynakları sınıf, cinsiyet ve İnternet kullanım sıklıklarına göre incelenmiştir. Araştırma sonucunda elde edilen bulgulara göre Bilişim Teknolojileri öğrencilerinin eğitim amaçlı çevrimiçi bilgi kaynağı olarak en fazla Web sitelerinden faydalandıkları daha sonra sırasıyla başvuru kaynakları, arama motorları, süreli yayınlar ve veri tabanlarından faydalandıkları görülmüştür.
Anahtar Kelimeler: eğitimde Internet, çevrimiçi bilgi kaynakları, Bilişim Teknolojileri öğrencileri

Abstract
Information storage capacities of computers, data processing speed and the developments in Internet technologies have accelerated the creation, publication and update of information in electronic form. Wide bandwidth and large databases supported Internet now serves not only for unlimited access to information but also serves for unlimited storage of information. The main purpose of this study is to determine the online information sources Information Technology students use for educational purposes. In the research, relational and single survey models were employed among the general survey models. In accordance with these models, online information sources used by students for educational propose investigated considering class, gender and Internet use frequencies. According to the findings of the research, Information Technology students mostly use Web sites, respectively, then the search engines, periodicals and databases.
Key Words: Internet in education, online information sources, Information Technology students

GİRİŞ

İnternet teknolojilerindeki gelişmelerle birlikte bilgisayarların veri depolama kapasitesi ve veri işleme hızındaki artış bilginin elektronik ortamda oluşturulması, paylaşılması ve güncellenmesini kolaylaştırmıştır. Bununla birlikte geniş bant aralığı ve büyük veritabanlarıyla desteklenen İnternet, artık sınırsız bilgi erişimiyle birlikte bilgilerin depolanmasında da sınırsız hizmet verebilmektedir. Önceleri sadece metin tabanlı bilgi paylaşımına olanak tanıyan İnternet, günümüzde eğitim amaçlı metin, grafik, ses ve video formatlarında, çoklu ortam destekli bilgilerin paylaşıldığı bilgi kaynaklarını barındıran yeni bir platform olarak kullanılmaktadır. Böylece İnternet üzerinden ulaşılabilen bilgi kaynakları çağdaş eğitim bağlamında heyecan verici yeni imkânlar sağlayan önemli bir özellik olarak görülmeye başlanmıştır (McDowell, 2002).

Çevrimiçi bilgi kaynaklarının hızlı artış, eğitimde yeni bir değişim fırsatı olarak görülebileceği gibi öğrenenin öğrenme etkinliklerinde giderek daha bağımsız olması olarak da görülebilir. Günümüz yükseköğretiminde sıklıkla vurgulanan "Yaşamboyu Öğrenme", "Kendi Kendine Öğrenme" ve "e-Öğrenme" kavramlarının temelinde de bu bağımsızlaşmanın yattığını görebiliriz.

Dünya genelinde ülkelerin 1990'lardan itibaren eğitim programlarının içine Internet kullanımı, veri tabanları, elektronik posta, arama motorları ve kullanımları gibi konuları dahil etmeye başladıkları görülmektedir (Yenikurtuluş, 2005). Böylece çevrimiçi bilgi kaynakları hem eğitim programlarıyla formal hem de öğrenenin program dışı etkinlikleriyle informal öğrenmeyi destekleyen bir bilgi kaynağı tipi haline gelmiştir. Artık üniversite öğrencileri sosyal ve boş zaman uğraşlarıyla birlikte akademik çalışmalarıyla ilgili bilgi kaynaklarına ulaşmak için İnternet'ten artan bir hızla faydalanmaktadırlar (Kirkwood, 2007).

Internet'in yaygın olarak kullanılmaya başlanmasıyla birlikte İnternet üzerinden erişilebilen bilgi kaynaklarının sayısında büyük bir artış görülmüştür. Buna paralel olarak çevrimiçi ders veya kursların dışında(dışsal) öğrenenlerin sıklıkla kullandıkları yeni çevrimiçi bilgi kaynakları ortaya çıkmıştır.

İnternet'in büyüme hızı dolayısıyla çevrimiçi bilgi kaynaklarıyla ilgili yapılan sınıflandırmalar da sürekli bir güncelleme sürecine girmiştir. İnternet ortamında erişilebilen bilgi kaynakları farklı çalışmalarda farklı şekillerde sınıflandırılsa da (Henke, Lawrence, Miller, Perciali & Nasatir, 2006; UCD Library, 2008), genel olarak 5 farklı dışsal çevrimiçi bilgi kaynağı kategorisinden bahsetmek mümkündür. Bunlar; başvuru kaynakları, veritabanları, arama motorları, süreli yayınlar, web siteleridir.

Çevrimiçi ders veya kursların dışında İnternet ortamında ulaşılabilen bilgi kaynakları tabi ki bunlarla sınırlı değildir. Ancak öğrenme amacıyla en yaygın kullanılan dışsal çevrimiçi bilgi kaynaklarını beş başlık altında incelemek mümkündür. Bununla birlikte özel bir konu alanı olan forumlar, çoklu ortam ve dosya paylaşım platformları, anlık ileti uygulamaları ve diğer güncel İnternet uygulamaları eğitim amaçlı kullanılabilecek alternatif çevrimiçi bilgi kaynakları arasında sıralanabilir.

Alanyazında çevrimiçi bilgi kaynaklarının eğitim amaçlı kullanımıyla ilgili çeşitli çalışmalar mevcuttur. Üniversite öğrencilerinin elektronik bilgi kaynaklarından faydalanma durumlarını belirlemeyi amaçladıkları çalışmalarında Malone ve Videon, (1997) Philadelphia bölgesindeki on üniversitenin 291 öğrencisiyle çalışmışlardır. Bu öğrencilerin derslerinde sundukları kaynakçalar incelenerek nicel bir analiz gerçekleştirilmiştir. Elde edilen bulgulara göre kaynakçalardaki referansların sadece %7'isinin elektronik kaynaklara olduğu ve kaynakça gösteriminde büyük sorunlar yaşadıkları tespit edilmiştir. Bununla birlikte elektronik bilgi kaynaklarının kullanımıyla ilgili verilen eğitim ile bu kaynakları kullanma sıklığı arasında anlamlı bir ilişki bulunmamıştır.

Selwyn (2008) tarafından gerçekleştirilen bir çalışmada üniversite öğrencilerinin akademik bilgi kaynağı olarak İnternet kullanımlarının İnternet kullanım sıklıkları, erişim ve uzmanlıkları, sınıfları, yaşları, cinsiyetleri ve eğitsel altyapılarına göre farklılaşıp farklılaşmadığı incelenmiştir. İngiltere üniversitelerinde okuyan 1222 öğrenciye anket uygulanmasıyla gerçekleştirilen çalışma sonunda diğer karakteristik özelliklere göre akademik bilgi kaynağı olarak İnternet kullanımı, cinsiyet ve konu alanına göre çok daha güçlü farklılıklar gösterdiği görülmüştür. Akademik bilgi kaynağı olarak İnternet kullanımıyla ilgili Bayan öğrenciler erkek öğrencilere göre daha yüksek eğilim gösterirken tıp, sosyal bilimler ve hukuk öğrencileri güzel sanatlar, mimarlık ve beşeri bilimlerde okuyan öğrencilere daha yüksek eğilim göstermişlerdir. Ayrıca çalışmada bundan sonra yapılacak araştırmalarda öğrencilerin hangi bilgi kaynaklarını ne sıklıkta kullandıklarının belirlenmesi gerektiği vurgulanmıştır.

Baljinder ve Rama, (2009) tarafından üniversitede elektronik bilgi kaynaklarının kullanımı, bu kaynaklarla ilgili farkındalık ve bu kaynaklara nerelerden ulaşıldığıyla ilgili yapılan bir çalışmada Thapar üniversitesinden lisans, lisansüstü öğrenciler ve öğretim üyelerinden 504 kişiye anket uygulanmıştır. Elde edilen bulgular tüm bu kategorideki kişilerin elektronik bilgi kaynaklarını kullandıkları, bu kaynaklarla ilgili farkındalıktan dolayı kullanımın yüksek olduğu ve bu kaynaklara ulaşmak için en çok bilgisayar merkezleri ve yurtların kullanıldı göstermiştir. Ayrıca çalışmada elektronik bilgi kaynaklarının hızla basılı materyallerin yerini aldıkları vurgulanmıştır.

Başka bir çalışmada Kirkwood, (2007) üniversite öğrencilerinin normal ders çalışmalarında çevrimiçi bilgi kaynaklarını neden ve nasıl kullandıklarını araştırmıştır. 5'i bayan 5'i erkek 10 üniversite öğrencisi, biri çevrimiçi ders dahilinde içsel çevrimiçi bilgi kaynaklarına erişecek, diğeri çevrimiçi ders haricinde dışsal çevrimiçi bilgi kaynaklarına ulaşacak şekilde iki gruba ayrılmıştır. Öğrencilerle yapılan görüşme sonunda elde edilen bilgilere göre öğrencilerin çevrimiçi bilgi kaynaklarını sadece teknolojinin belirlemediği, çeşitli içsel faktörlerin de etkili olduğu sonucuna varılmıştır. Bu faktörler arasında değer verme, gereksinimler ve pedagojik yaklaşım sayılmıştır.

Alanyazın taramasında üniversite öğrencilerinin İnternet kullanımı ve bu kullanımda etkili olan faktörlerle birlikte çevrimiçi bilgi kaynaklarının neden, nasıl ve nerelerden erişilerek kullanıldığıyla ilgili yapılmış araştırmaların olduğu görülmüştür. Ancak üniversite öğrencilerinin derslerine yönelik kullandıkları dışsal çevrimiçi bilgi kaynaklarının belirlenmesiyle doğrudan ilgili yapılmış herhangi bir çalışmayla karşılaşılmamıştır. Böylece alanyazındaki bu boşluğa getireceği katkı açısından çalışmanın önem taşıdığı düşünülmektedir. Öğrencilerin hangi çevrimiçi bilgi kaynaklarını kullandıklarının belirlenmesiyle ilgili araştırma gereksinimi bazı çalışmalarda da vurgulanmıştır (Selwyn, 2008; Baljinder ve Rama, 2009).

Günümüzde büyük ilgi gören ve eğitim sisteminin hemen her aşamasında kullanılan çevrimiçi bilgi kaynaklarının daha iyi kullanılması özellikle üniversite öğrencilerinden beklenmektedir (Ray ve Day, 1998). Böylece üniversitelerin eğitim programlarından öğrenenlerin her geçen gün erişilebilirlikleri artan bilgi bolluğuyla başa çıkabilmeleri için kazanılması gereken geliştirilmiş becerileri sağlaması beklenmektedir. Bu noktada karşımıza bilgiyi etkili bir şekilde arayıp kullanmak için gerekli entelektüel ve operasyonel becerileri vurgulayan "bilgi okuryazarlığı" kavramı çıkmaktadır. Bilgi okuryazarı olabilmek içinse kişinin bilginin ne zaman gerekli olduğunu fark etmesi ve bu gerekli bilgiyi etkili bir şekilde bulup, değerlendirip kullanabilmesi gerekir (ALA, 1989).

Meslekleri gereği BT (Bilişim Teknolojileri) öğretmen adayları hem bilgi okuryazarlığı hem de bilgi okuryazarlığının kapsadığı etkinliklerle doğrudan ilgili kişilerdir. Günümüzde bilgi okuryazarlığına en belirgin şekilde gereksinim duyulduğu platformlardan biri ise şüphesiz İnternet ve İnternet ortamında erişilebilen bilgi kaynaklarıdır. Bu nedenle BT öğretmen adaylarının kullandıkları çevrimiçi dışsal bilgi kaynaklarının belirlenmesi ve kullanılan bu kaynakların çeşitli değişkenler bağlamında incelenmesi büyük önem taşımaktadır.

Amaç

Bu çalışmanın amacı Bilişim Teknolojisi öğrencilerinin eğitim amaçlı kullandıkları çevrimiçi bilgi kaynaklarını belirlemektir. Araştırmada cevabı aranan sorular ise şunlardır: BT öğrencilerinin,

1. eğitim amaçlı kullandıkları çevrimiçi bilgi kaynakları nelerdir?
2. eğitim amaçlı kullandıkları çevrimiçi bilgi kaynakları cinsiyetleri, sınıfları ve İnternet kullanım sıklıklarına göre nasıl değişmektedir?

YÖNTEM

Bu betimsel çalışma genel tarama modeli türlerinden ilişkisel ve tekil tarama modelinde desenlenmiştir. Tekil tarama modelleri, değişkenlerin tek tek, tür ya da miktar olarak oluşumlarının belirlenmesini amaçlarken ilişkisel tarama modelleri iki veya daha çok değişken arasındaki birlikte değişimin varlığını ve/veya derecesini belirlemeyi amaçlarlar (Karasar, 2006).

Katılımcılar

Bu çalışmanın katılımcılarını Anadolu Üniversitesi Eğitim Fakültesi Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) Bölümü 1. Sınıf Eğitimde Bilgi Teknolojileri II dersini alan 12 öğrenci, 2. Sınıf Eğitimde Grafik ve Canlandırma derslerini alan 20 öğrenci ve 3. Sınıf Eğitimde Grafik ve Canlandırma dersini alan 4 öğrenci oluşturmaktadır. Bilgisayar ve Öğretim Teknolojileri Öğretmenliği Bölümü'nün seçilmesinin sebebi bu bölümde çevrimiçi bilgi kaynaklarından sıklıkla yararlanılması ve meslekleri gereği çevrimiçi bilgi kaynaklarını en etkili şekilde kullanılması beklenen kişilerin BT öğretmenleri olmasıdır.

Veri Toplama Araçları

Öncelikle öğrencilerin İnternet kullanım sıklıkları, sınıfları ve cinsiyetlerini belirlemek için araştırmacılar tarafından bir anket formu hazırlanmıştır. Bu anket formu uygulamadan hemen önce öğrenciler tarafından doldurulmuştur. Öğrencilerin eğitim amaçlı kullandıkları çevrimiçi bilgi kaynaklarını belirlemek için de laboratuar sunucusundan ağdaki bilgisayarların eriştiği çevrimiçi bilgi kaynaklarının kayıtlarını tutan özel bir İnternet güvenlik programı kullanılmıştır. Böylece her öğrencinin verilen görevleri yerine getirirken ulaştığı çevrimiçi bilgi kaynağı kayıt altına alınmıştır.

Veri Toplama Süreci

Araştırma kapsamında uygulamanın yapılacağı her bir ders için öğrencilere çevrimiçi bilgi kaynaklarından araştırılmak üzere dersin o hafta işlenen konusuna uygun olarak bir araştırma görevi verilmiştir. Öğrencilere verilen görevleri araştırmaya başlamadan önce araştırmacılar tarafından hazırlanan anket formlarını doldurmaları istenmiştir. Böylece her bir öğrenci için sınıf, İnternet kullanım sıklığı ve cinsiyet özellikleri kayıt altına alınmıştır. Anket formu doldurulduktan sonra öğrencilerden bireysel olarak verilen görevleri araştırmaları istenmiştir. Her bir öğrenci için verilen görevleri yerine getirirken gezdiği çevrimiçi bilgi kaynakları İnternet güvenlik programı sayesinde sunucuda kayıt altına alınmıştır. Öğrencilerden verilen görevi yerine getirdikten sonra sorgulamayı bırakmaları istenmiştir. Böylece verilen görev dışında öğrencilerin İnternet kullanımı engellenerek gezinilen çevrimiçi bilgi kaynaklarıyla ilgili olası bir karışıklık engellenmeye çalışılmıştır.

Veri Analizi

BT öğretmen adaylarının demografik özellikleri ve kullandıkları çevrimiçi bilgi kaynaklarını belirlemek amacıyla kullanılan anket formu ve bilgisayar loglarından elde edilen veriler çözümlemelere olanak tanıyacak şekilde sembolleştirilmiştir. BT öğrencilerinin eğitim amaçlı girdikleri çevrimiçi bilgi kaynaklarının her biri ait olduğu kategorinin ilk harfiyle (B,W,A,S,V) işaretlenmiştir. Daha sonra BT öğrencilerinin farklı özelliklerine göre bu kodlar sayılarak frekans ve yüzde değerleri hesaplanmıştır.

Öğretmen adaylarının kullandıkları çevrimiçi bilgi kaynakları tekil tarama modeline, kullanılan çevrimiçi bilgi kaynakları ile sınıf, İnternet kullanım sıklığı ve cinsiyet arasındaki birlikte değişim ise ilişkisel tarama modeline uygun olarak analiz edilmiştir.

BULGULAR

Öğretmen adaylarının kullandıkları çevrimiçi bilgi kaynaklarını belirlemeden önce hazırlanan 3 maddelik anket formuyla demografik özellikler toplanmıştır. Araştırmaya katılan 32 öğretmen adayının demografik özellikleri aşağıda Tablo 1'de verilmiştir.

Tablo 1. BT öğretmen adaylarının demografik özellikleri

Özellik		Frekans (*f*)	Yüzde (%)
Cinsiyet			
Erkek		16	50
Kadın		16	50
Sınıf			
1.	1. Sınıf	12	37,5
2.	2. Sınıf	16	50,0
3.	3. Sınıf	4	12,5
İnternet Kullanım Sıklığı			
0-2 Saat Arası		8	25,0
2-4 Saat Arası		9	28,1
4-6 Saat Arası		11	34,4
6-8 Saat Arası		3	9,4
8 Saat ve Üzeri		1	3,1

Tablo 1'de görüldüğü gibi katılımcıların %50'si 2. Sınıftandır. Ayrıca öğrencilerin %34,4'ünün günde ortalama 4-6 saat arasında İnternet kullandıkları görülmektedir. Bu da katılımcıların orta düzeyde İnternet kullanıcısı oldukları şeklinde yorumlanabilir.

BT öğrencilerinin eğitim amaçlı kullandıkları çevrimiçi bilgi kaynakları

BT öğretmen adaylarının kullandıkları çevrimiçi bilgi kaynakları başvuru kaynakları, veritabanları, arama motorları, süreli yayınlar ve Web siteleri olmak üzere 5 kategoride incelenmiştir. Bu kotegarilere giren bilgi kaynaklarının kullanım sıklıkları ve yüzdeleri aşağıda Tablo 2'de verilmiştir.

Tablo 2. Faydalanılan çevrimiçi bilgi kaynakları

Çevrimiçi bilgi kaynakları	Yüzde (%)	Frekans (*f*)
Web siteleri	49.57	59
Başvuru kaynakları	28.57	34
Arama motorları	15.12	18
Süreli yayınlar	5.04	6
Veritabanları	1.68	2
Toplam	100	119

Tablo 2'de görüldüğü gibi BT öğrencilerinin en sık kullandıkları çevrimiçi bilgi kaynakları % 49.57'lik oranlarla Web siteleridir. Bu da BT öğrencilerinin eğitim kullandıkları çevrimiçi bilgi kaynaklarının yarısının Web siteleri olduğunu göstermektedir. Bununla birlikte BT öğrencilerinin en az kullandıkları çevrimiçi bilgi kaynakları ise % 1,68'lik bir oranla veritabanlarıdır. Girilen çevrimiçi bilgi kaynakları tek tek incelendiğinde ise BT öğrencilerinin çevrimiçi bilgi kaynağı olarak en fazla www.google.com arama motorunu kullandıkları görülmüştür. Uygulamaya katılan 32 öğrencinin 19'u bu arama motorundan yararlanmıştır.

BT öğrencilerinin eğitim amaçlı kullandıkları çevrimiçi bilgi kaynaklarının cinsiyetleri, sınıfları ve İnternet kullanım sıklıklarına göre değişimi

BT öğrencilerinin eğitim amaçlı kullandıkları çevrimiçi bilgi kaynaklarının sınıf cinsiyet ve İnternet kullanım sıklıklarına göre incelemek amacıyla beş farklı çevrimiçi bilgi kaynağı kategorisine göre frekanslar ve yüzdeleri hesaplanmıştır. BT öğrencilerinin cinsiyetlerine göre kullandıkları çevrimiçi bilgi kaynakları Tablo 3'de verilmiştir.

Tablo 3. Cinsiyete göre çevrimiçi bilgi kaynakları kullanılanımı

	Kız		Erkek	
Çevrimiçi bilgi kaynakları	%	*f*	%	*f*
Web siteleri	50.87	30	46.77	29
Başvuru kaynakları	28.07	16	29.03	18
Arama motorları	10.52	6	19.35	12
Süreli yayınlar	8.77	5	1.61	1
Veritabanları	0	0	3.22	2
Toplam	100	57	100	62

Araştırmaya katılan kız ve erkek öğrencilerinin sayıları eşit olduğundan tabloda yüzdelerle birlikte frekanslar da karşılaştırılabilir. Tablo 3'de görüldüğü gibi BT öğrencilerinin eğitim amaçlı kullandıkları çevrimiçi bilgi kaynakları cinsiyetlerine göre büyük bir farklılık göstermemektedir. Bununla birlikte erkek öğrencilerin daha fazla arama motoru ve veri tabanı kaynaklarını kullanmaları, kız öğrencilerin ise daha fazla süreli yayınlardan faydalanmaları dikkat çekicidir.

BT öğrencilerinin sınıflarına göre kullandıkları çevrimiçi bilgi kaynakları Tablo 4'te verilmiştir.

Tablo 4. Sınıfa göre çevrimiçi bilgi kaynakları kullanımı

	1.Sınıf		2. Sınıf		3. Sınıf	
Çevrimiçi bilgi kaynakları*Sınıf	%	*f*	%	*f*	%	*f*
Web siteleri	36.11	13	55.38	36	55.55	10
Başvuru kaynakları	38.88	14	29.23	19	5.55	1
Arama motorları	22.22	8	10.76	7	16.66	3
Süreli yayınlar	2.77	1	3.07	2	16.66	3
Veritabanları	0	0	1.53	1	1.53	1
Toplam	100	36	100	65	100	18

Araştırmaya farklı sınıflardan katılan BT öğrencilerinin sayıları eşit olmadığı için Tablo 4'de yüzdeler dikkate alınmalıdır. Tablo 4'te görüldüğü gibi 1. Sınıf öğrencileri çevrimiçi bilgi kaynağı olarak başvuru kaynaklarından en fazla yararlanırken 3. Sınıflar en az yararlanmaktadırlar. Bununla birlikte süreli yayınları en fazla 3. Sınıfların kullanması dikkat çekicidir. Ayrıca sınıfların kişi başına çevrimiçi bilgi kaynağı kullanma sıklıkları 1. Sınıflar için 3, ikinci sınıflar için 4.06 üçüncü sınıflar için 4.5 çıkmıştır. Bu da eğitim düzeyi arttıkça çevrimiçi bilgi kaynaklarını kullanma sıklıklarının arttığı şeklinde yorumlanabilir.

BT öğrencilerinin İnternet kullanım sıklıklarına göre kullandıkları çevrimiçi bilgi kaynakları Tablo 5'te verilmiştir.

5. İnternet kullanım sıklıklarına göre çevrimiçi bilgi kaynakları kullanımı

	2'den az		2-4 saat		4-6 saat		6-8 saat		8 ve üzeri	
Çevrimiçi bilgi kaynakları	%	*f*	%	*f*	%	*f*	%	*f*	%	*f*
Web siteleri	57.14	20	51.51	17	45.71	16	36.36	4	60	3
Başvuru kaynakları	22.85	8	18.18	6	37.14	13	45.45	5	20	1
Arama motorları	14.28	5	21.21	7	11.42	4	9.09	1	20	1
Süreli yayınlar	2.85	1	6.06	2	5.71	2	9.09	1	0	0
Veritabanları	2.85	1	3.03	1	0	0	0	0	0	0
Toplam	100	35	100	33	100	35	100	11	100	5

Günde ortalama İnternet kullanım sıklıklarına BT öğrencileri eşit dağılmadıkları için yukarıdaki tabloda her bir sıklığın kendi içerisindeki değerlendirmesini gösteren yüzde hesaplarına bakılmalıdır. Tablo 5'te görüldüğü gibi İnternet kullanım sıklıklarına göre kullanılan çevrimiçi bilgi kaynaklarının düzenli bir değişim göstermedikleri görülmektedir. Bununla birlikte günde ortalama en az ve en çok İnternet kullanan BT öğrencilerinin Web sitelerinden daha fazla yararlanmaları, günde ortalama 4-8 saat arası İnternet kullanan BT öğrencilerinin başvuru kaynaklarından daha fazla yararlanmaları dikkat çekicidir.

TARTIŞMA

Araştırma kapsamında BT öğrencilerinin eğitim amaçlı çevrimiçi bilgi kaynaklarından faydalanma durumlarına ilişkin bazı önemli bulgulara ulaşılmıştır. Öncelikle araştırmanın ilk sorusu olan BT öğrencilerinin eğitim amaçlı kullandıkları çevrimiçi bilgi kaynakları için öğrencilerin en sık kullandıkları çevrimiçi bilgi kaynaklarının Web siteleri, en az kullandıkları çevrimiçi bilgi kaynaklarının ise veritabanları olduğu görülmüştür. Bununla birlikte BT öğrencilerinin çevrimiçi bilgi kaynağı olarak en fazla www.google.com arama motorunu kullandıkları görülmüştür.

Araştırmanın ikinci sorusu olan BT öğrencilerinin cinsiyet, sınıf ve İnternet kullanım sıklıklarına göre eğitim amaçlı kullandıkları çevrimiçi bilgi kaynakları için bazı önemli bulgulara ulaşılmıştır. BT öğrencilerinin cinsiyetlerine göre kullandıkları çevrimiçi bilgi kaynakları incelendiğinde erkek öğrencilerin arama motoru ve veri tabanlarından, kız öğrencilerin ise süreli yayınlardan daha fazla faydalandıkları görülmüştür. Bu bulgunun erkek öğrencilerin istedikleri bilgiye dolaylı yoldan ve çeşitli kaynaklar içerisinden seçerek ulaşma eğiliminde oldukları, kız öğrencilerin ise istedikleri konuya doğrudan ilgili kaynağa ulaşma eğiliminde oldukları şeklinde yorumlanabilir.

BT öğrencilerinin sınıflarına göre eğitim amaçlı çevrimiçi bilgi kaynaklarından faydalanma durumları incelendiğinde 1. Sınıf öğrencilerinin wiki, blog ve sözlük gibi başvuru kaynaklarından diğer sınıflara göre daha fazla yararlandıkları, 3. Sınıfların ise süreli yayınlardan daha fazla yararlandıkları görülmüştür. Bu durum İnternet deneyimi daha fazla olan öğrencilerin veri kaynaklarının güvenirliğine daha çok dikkat ettikleri şeklinde yorumlanabilir. Ayrıca eğitim düzeyi arttıkça BT öğrencilerinin çevrimiçi bilgi kaynaklarını kullanma sıklıklarının arttığı görülmüştür. BT öğrencilerinin kullandıkları çevrimiçi bilgi kaynaklarının İnternet kullanım sıklıklarına göre düzenli bir değişim göstermedikleri bulgulanmıştır.

SONUÇ ve ÖNERİLER

Araştırmanın sınırlılıkları dahilinde elde edilen sonuçlara bakıldığında BT öğrencilerinin eğitim amaçlı kullandıkları çevrimiçi bilgi kaynaklarının en fazla Web siteleri olduğu daha sonra sırasıyla başvuru kaynakları, arama motorları, süreli yayınlar ve veri tabanlarının geldiği görülmüştür. Güvenilir bilgi kaynakları olarak bilinen veri süreli yayınlar ve veri tabanlarının BT öğrencileri tarafından eğitim amaçlı az kullanılması önemli bir sorun olarak görülmektedir. Bu sorunun aşılması için BT öğrencilerinin ULAKBİM gibi ulusal ve ERIC gibi uluslararası veri tabanlarıyla birlikte alanla ilgili süreli yayınlara yönlendirilmeleri gerektiği düşünülmektedir.

BT öğrencilerinin cinsiyet, sınıf ve İnternet kullanım sıklıklarına göre eğitim amaçlı kullandıkları çevrimiçi bilgi kaynakları incelendiğinde erkek öğrencilerin arama motoru ve veri tabanlarından, kız öğrencilerin ise süreli yayınlardan daha fazla faydalandıkları görülmüştür. Alt sınıflardaki öğrencilerin wiki, blogg ve sözlük gibi başvuru kaynaklarından diğer sınıflara göre daha fazla yararlandıkları, üst sınıfların ise süreli yayınlardan daha fazla yararlandıkları görülmüştür. Dahası öğrencilerin sınıf düzeyleri arttıkça çevrimiçi bilgi kaynaklarından ortalama faydalanma sıklıklarının önemli ölçüde arttığı görülmüştür. Bu sonuç Malone ve Videon'un (1997) alınan eğitim ile bilgi kaynaklarından faydalanma sıklıkları arasında bir ilişki olmadığı savından farklılık göstermektedir.

Günde ortalama en az ve en çok İnternet kullanan öğrencilerin Web sitelerinden daha fazla yararlandıkları, günde ortalama 4-8 saat arası İnternet kullanan öğrencilerin başvuru kaynaklarından daha fazla yararlandıkları görülmüştür. Bu durumun İnternet'ten en az faydalanan öğrencilerin öğrendikleri ilk çevrimiçi bilgi kaynaklarının üniversite Web sitesi gibi kaynaklar olmasından, İnternet'ten en fazla yararlananların ise araştırmak istedikleri konuyla ilgili Web sitelerine doğrudan ulaşabilme yeterliliklerinden kaynaklandığı sonucuna varılmıştır. BT öğrencilerinin demografik özelliklerine göre eğitim amaçlı çevrimiçi bilgi kaynağı kullanma durumlarına ilişkin bu sonuçlar, eğitim amaçlı çevrimiçi bilgi kaynaklarının kullanılması sürecinde yararlanılabilecek önemli göstergeler olarak görülmektedir.

Bundan sonra yapılacak çalışmalarda daha fazla katılımcıyla BT öğrencilerinin demografik özelliklerine göre çevrimiçi bilgi kaynaklarından faydalanma durumları ilişkisel araştırma desenleriyle sorgulanabilir. Bununla birlikte farklı disiplinlerdeki lisans öğrencilerinin çevrimiçi bilgi kaynaklarından faydalanma durumları çeşitli faktörlere göre karşılaştırılarak sorgulanabilir.

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BİLİŞİM TEKNOLOJİLERİ ÖĞRETMEN ADAYLARININ EPİSTEMOLOJİK İNANÇLARININ İNCELENMESİ

AN INVESTIGATION OF COMPUTER TECHNOLOGIES PRESERVICE TEACHERS' EPISTEMOLOGICAL BELIEFS

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Özet
Bu araştırmada, bilişim teknolojileri öğretmen adaylarının epistemolojik inançları bazı demografik değişkenler açısından incelenmiştir. Araştırma, tarama modelinde olup, betimsel bir nitelik arz etmektedir. Çalışma grubu, Fırat Üniversitesi Eğitim Fakültesi BÖTE Bölümü ve Teknik Eğitim Fakültesi Bilgisayar Öğretmenliği programında öğrenim gören 1. ve 4. Sınıflardaki toplam 230 öğrenciden oluşmaktadır. Araştırmada veri toplama aracı olarak, Schommer (1990) tarafından geliştirilen ve Deryakulu ve Büyüköztürk (2005) tarafından Türkçe'ye uyarlanan "Epistemolojik İnanç Ölçeği" kullanılmıştır. Araştırmadan elde edilen verileri çözümlemede aritmetik ortalama, yüzde ve frekans kullanılmış; öğretmen adaylarının görüşlerinin, demografik verilere dayalı değişkenlerden etkilenme derecesi de bağımsız gruplar t testi ve F testi ile analiz edilmiştir. Bunun yanı sıra gruplar arasındaki farkın anlamlı çıkması durumunda etki büyüklüğü (Cohen d) incelenmiştir. Kadın bilişim teknolojileri öğretmen adaylarının, erkek bilişim teknolojileri öğretmen adaylarına göre öğrenmenin çabaya daha çok bağlı olduğu yönünde inanca sahip oldukları tespit edilmiştir. Ayrıca son sınıfta öğrenim gören öğretmen adaylarının birden fazla doğrunun olabileceğine yönelik inancının birinci sınıf öğrencilerine göre önemli düzeyde yüksek olduğu ortaya çıkmıştır. Buna bağlı olarak bilişim teknolojileri öğretmen adaylarının üniversite yaşamlarının sonuna doğru yapılandırmacı bir anlayışa sahip oldukları sonucuna varılmıştır.
Anahtar Kelimeler: Bilişim teknolojileri, öğretmen adayı, epistemolojik inanç, teknik eğitim fakültesi, eğitim fakültesi

Abstract
In this study, epistemological beliefs of teacher candidates of computer technologies were examined in terms of several variables related to participants' demographic information. This study, in which a descriptive study was adopted as a research model, contains 230 participants of all freshman and senior students from both Department of Computer Education and Instructional Technology in college of education and Department of Computer Science and Teaching in College of Technical Education. As a research instrument, the Epistemological Belief Questionnaire developed by Schommer (1990) was used. The instrument was previously translated into Turkish, whose validity and reliability was tested by Deryakulu and Büyüköztürk (2005). In data analysis process; while means, percentages and frequencies were calculated, an independent sample t-test and analysis of variance were conducted. In addition, the values of Cohen's for the effect-size correlation were examined when the differences between groups were significant. The findings revealed important issues. One finding is related to gender differences in terms of teacher candidates' beliefs towards learning. Particularly, comparing with the male candidates, the female candidates believed that learning is associated with effort. Also, the results of the study showed significant differences between senior and junior students in terms of their beliefs towards the truths. More specifically, senior students believed that there might be more than one truth, opposite to junior students. As a result of such finding, it may be concluded that teacher candidates of computer technologies become more constructivist as they get to the end in their college education.
Keywords: Computer technologies, preservice teachers, epistemological beliefs, college of technical education, college of education

GİRİŞ

Epistemoloji, felsefenin bilgi nedir, bilginin doğası, kaynağı, sınırları nelerdir gibi sorulara cevap arayan disiplini olarak adlandırılırken (Deryakulu, 2004; Cevizci, 2005), inanç sözlük anlamı olarak iman, itikat, inanılan şey gibi kavramlarla ifade edilir. Epistemolojik inanç ise bireylerin bilginin varlığını ve ne olduğunu öğrenmenin bu bağlamda nasıl gerçekleştiğine yönelik kişisel inançları olarak tanımlanabilir. Bu inançlar insanın yaşantılarının yanı sıra elde edeceği bilgileri zihninde anlamlandıran ve yorumlayan bir filtre görevi görür (Demir, 2009).
Epistemolojik inançlar, bireye özgü olup, bireyin bilginin ne olduğuna ve öğrenmenin nasıl meydana geldiğine yönelik inançlarını kapsamaktadır. Bilginin değişmez, basit bir yapıda, bir konunun belli bir anda öğrenilmezse bir daha öğrenilmesinin zor olabileceğine yönelik inançlar olgunlaşmamış/gelişmemiş inançlar olarak nitelendirilir. Benzer şekilde bilginin mutlak bir kesinlik ifade etmeyeceği, birbiriyle ilişkili karmaşık bileşenlerden meydana geldiği, öğrenme yeteneğinin öğrenci çabasına bağlı olarak geliştirilebileceği yönünde düşünen bireylerin ise olgunlaşmış/gelişmiş inançlara sahip olduğu kabul edilir (Deryakulu, 2002; Schommer, 1990).
Bu kapsamda önemli araştırmaları olan Schommer (1990), epistemolojik inançların genellikle bilgi, zeka veya öğrenme gibi tek ve sınırlı bir boyut aracılığıyla incelenmesinin yetersiz olduğu düşüncesiyle farklı boyutlara sahip Epistemolojik İnanç Ölçeği (EİÖ) geliştirmiştir. Schommer'e (1990) göre, bireylerin ailelerine ait özellikler, aldıkları eğitim ve sosyal hayatta yüklenilen sorumluluklar gibi değişkenlerin bireylerin bilgi kavramını ve öğrenme olgusunu sorgulamalarında, dolayısıyla bireylerin epistemolojik inançları üzerinde belirli bir etkisi vardır. Benzer şekilde bir diğer araştırmada erkek öğrencilerin kadın öğrencilere göre öğrenme yeteneğinin doğuştan olduğu ve öğrenmenin hemen gerçekleşmesi gerektiğine inancın daha güçlü olduğu tespit edilmiştir. Aynı araştırma liseye yeni başlayan öğrencilerin son sınıftakilere; düşük zeka düzeyine sahip olanların ise normal ve yüksek zeka düzeyindeki öğrencilere nazaran daha gelişmemiş epistemolojik inanca sahip olduklarını göstermiştir (Schommer, 1993'den akt: Deryakulu ve Büyüköztürk, 2002).
Bilginin doğruluğu, kesinliği, varlığı gibi bileşenler, özellikle bilgisayar ve internet teknolojileriyle ilgili alanlarda çalışan bireylerin bilgi okuryazarlığı, bilgiye dayalı problemlerle başa çıkma yolları noktasında önemli ipuçları verebilir (Erdem, Yılmaz ve Akkoyunlu, 2008). Özellikle bilişim alanında yetişen ve gelecekte bu ve benzer alanlarda öğrenci yetiştirecek olan öğretmen adaylarının, başta bilginin yapısına ve varlığına yönelik sahip oldukları epistemolojik inançlarının ne düzeyde olduğu ve bu inançların öğrenim dönemi süreci içerisinde bir değişiklik gösterip göstermediği önemli bir araştırma konusu olarak dikkat çekmektedir. Bu yönde yapılacak bir araştırma, Schommer'in (1990) belirttiği bireylerin akademik başarıları ile epistemolojik inançları arasında pozitif ilişki ile tutum ve davranışların temelinde sahip olunan epistemolojik inançların bulunduğu gerçeğinden yola çıkarak, öğretim programlarında ihtiyaç duyulan dönüşüm için bir kaynak niteliği taşıyabilir. Chan (2003'den akt: Meral ve Çolak, 2009) öğrenmenin etkililiğine, değerlere ve bilginin kazanımına yönelik öğretmenin sahip olduğu inançların 'öğretmen' kavramını açıklamakta yardımcı olmasının yanı sıra öğretmenin öğretim yöntemlerini hatta sınıf yönetimini tercihlerini (Chan ve Elliot, 2000'den akt: Meral ve Çolak, 2009) ve dolayısıyla bu öğretmenlerin öğrencilerinin bilime bakış açısını da etkileyebileceği konusuna dikkat çekmiştir (Meral ve Çolak, 2009). Bilgiye dayalı problemlerin çözümüne yönelik öz-yeterlik inancı ile bireyin davranışlarının arkasında yatan nedenleri açıklamada önemi sıklıkla dile getirilen epistemolojik inançların ilişkisinin irdelendiği bir çalışmada, Erdem, Yılmaz ve Akkoyunlu (2008) her iki değişkenin ayrıca yaşam boyu öğrenme olgusu üzerindeki kritik etkisini ifade etmiştir.

YÖNTEM

Bu başlık altında araştırmanın modeli, evren-örneklemi, veri toplanması ve analizi ile ilgili bilgiler verilmiştir.

Araştırmanın Modeli

Bu araştırma, bilişim teknolojileri öğretmenlerinin sahip oldukları epistemolojik inançlarını incelemek amacıyla yapılmıştır. Araştırma, tarama modelinde olup, betimsel bir nitelik arz etmektedir.

Evren ve Örneklem

Araştırmanın evrenini, bilişim teknolojileri öğretmen adayları oluşturmaktadır. Çalışma evrenini Fırat Üniversitesi'nde öğrenim gören Teknik Eğitim Fakültesi Bilgisayar Öğretmenliği ve Eğitim Fakültesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü öğrencileri oluşturmaktadır. Araştırmanın örneklemi ise 2009-2010 Öğretim Yılında Teknik Eğitim Fakültesi Bilgisayar Öğretmenliği ve Eğitim Fakültesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü 1. ve 4. Sınıflarda öğrenim gören toplam 230 öğretmen adayından oluşturmaktadır.

Verilerin Toplanması ve Analizi

Bilişim teknolojileri öğretmenlerinin epistemolojik inançlarını incelemek amacıyla yapılan bu araştırmada kullanılan ölçek üzerine yapılan güvenirlik ve geçerlik çalışması sonucunda ölçek maddeleri üç faktör altında toplanmıştır. Bunlar; Faktör 1: "Öğrenmenin Çabaya Bağlı Olduğuna İnanç", Faktör 2: "Öğrenmenin Yeteneğe Bağlı Olduğuna İnanç" ve Faktör 3: "Tek Bir Doğrunun Var Olduğuna İnanç" olarak tanımlandırılmıştır. Bu faktörlerden birinci faktör olan "Öğrenmenin Çabaya Bağlı Olduğuna İnanç" boyutuna ilişkin maddelerin tümü olumsuz önermeler olduğundan dolayı bulgular ters yönde değerlendirilip yorumlanmıştır. Diğer iki faktöre ilişkin maddelerin tümü ise olumlu önermeler halindedir. Bu araştırma da söz konusu üç faktör üzerinden araştırma grubunun demografik verileri dikkate alınarak gerçekleştirilmiştir. Araştırmada verilerin analizinde istatistik paket programından faydalanılmıştır. Araştırmadan elde edilen verileri çözümlemede aritmetik ortalama, yüzde ve frekans kullanılmış; öğretmen adaylarının görüşlerinin, demografik verilere dayalı değişkenlerden etkilenme derecesi de bağımsız gruplar t testi ve F testi ile analiz edilmiştir. Bunun yanı sıra gruplar arasındaki farkın anlamlı çıkması durumunda etki büyüklüğü (Cohen d) incelenmiştir.

BULGULAR ve YORUMLAR

Bu başlık altında araştırmadan elde edilen bulgular tablolar halinde sunulmuş ve değerlendirilmiştir.

Araştırmaya Katılanların Demografik Verilerine Göre Elde Edilen Bulgular

Araştırmaya katılanların demografik verilerine göre elde edilen bulgular Tablo 1'de verilmiştir.

Tablo 1. Araştırmaya Katılanların Demografik Verilerine Göre Elde Edilen Bulgular

Değişken	Tür	Frekans	Yüzde
Fakülte	Eğitim	140	60,9
	Teknik Eğitim	90	39,1
	Toplam	**230**	**100,0**
Öğrenim Görülen Sınıf	1. Sınıf	150	65,2
	4. Sınıf	80	34,8
	Toplam	**230**	**100,0**
Cinsiyet	Kadın	94	40,9
	Erkek	136	59,1
	Toplam	**230**	**100,0**
Öğretim Türü	I.Öğretim	122	53,0
	II. Öğretim	108	47,0
	Toplam	**230**	**100,0**
Mezun Olunan Lise Türü	Genel	144	62,6
	Mesleki ve Teknik	88	37,4
	Toplam	**230**	**100,0**
Yaş	19 ve altı	67	29,1
	20-21	81	35,2
	22-23	61	26,5
	24 ve üstü	21	9,1
	Toplam	**230**	**100,0**
Akademik Ortalama	2.01 – 2.50	51	22,2
	2.51 – 3.00	104	45,2
	3.01 – 3.50	62	27,0
	3.51 – 4.00	13	5,7
	Toplam	**230**	**100,0**

Tablo 1 incelendiğinde araştırmaya katılanların yüzde 60,9'nun Eğitim Fakültesi, 39,1'nin de Teknik Eğitim Fakültesi öğrencisi olduğu görülmektedir. Bununla birlikte demografik özelliklere bakıldığında araştırmaya katılanların yüzde 40,9'u kadın ve yüzde 59,1'i de erkek öğrencilerden oluşmaktadır.

Tablo 1'e göre araştırmaya katılanların öğrenim gördükleri sınıf düzeyi değişkenine göre yüzde 65,2'sinin 1. Sınıf, yüzde 34,8'nin de son sınıf öğrencisi olduğu tespit edilmiştir. Ayrıca araştırmaya katılanların mezun oldukları lise türü değişkenine göre dağılımın yüzde 62,6'sı Genel Lise, yüzde 37,4'ü de Mesleki ve Teknik Lise mezunu olduğu da görülmektedir.

Bilişim Teknolojileri Öğretmen Adaylarının Epistemolojik İnançlarının Cinsiyet Değişkenine Göre Karşılaştırılması

Araştırmaya katılan bilişim teknolojileri öğretmen adaylarının epistemolojik inançlarının cinsiyet değişkenine göre yapılan t-testi sonucuna ilişkin veriler Tablo 2'de verilmiştir.

Tablo 2. Bilişim Teknolojileri Öğretmen Adaylarının Epistemolojik İnançlarının Cinsiyet Değişkenine Göre Karşılaştırılması

	Cinsiyet	N	Ort.	SS	t	p
Faktör 1	Kadın	94	2,01	,501	-2,341*	,020
	Erkek	136	2,19	,645		
Faktör 2	Kadın	94	2,41	,717	-1,334	,183
	Erkek	136	2,54	,714		
Faktör 3	Kadın	94	3,06	,646	,935	,351
	Erkek	136	2,98	,623		

***p<.05**

Tablo 2 incelendiğinde öğretmen adaylarının epistemolojik inançlarının cinsiyet değişkenine göre karşılaştırılması sonucunda sadece "Öğrenmenin Çabaya Bağlı Olduğuna İnanç" (Faktör 1) boyutunda anlamlı fark vardır [t=-2,341; p<.05; p=0,020]. Bu fark kadın öğretmen adayları lehinedir. Bu durum kadın bilişim teknolojileri öğretmen adaylarının ($\overline{X}$=2,01), erkek bilişim teknolojileri öğretmen adaylarına göre ($\overline{X}$=2,19) öğrenmenin çabaya daha çok bağlı olduğu yönünde inanca sahip oldukları sonucunu ortaya çıkarmıştır. Ancak bu ortalamalar arasındaki farkın etki büyüklüğü 0,31 (Cohen d) olduğundan kadın bilişim teknolojileri öğretmen adaylarının çalışarak başarının elde edilebileceğine kuvvetli olmamakla beraber daha çok inandıkları söylenebilir. Eroğlu ve Güven (2006) ise sadece "Öğrenmenin Yeteneğe Bağlı Olduğuna İnanç" (Faktör 2) boyutunda erkek öğrencilerin daha güçlü bir inanca sahip olmasına rağmen diğer iki faktörde cinsiyet açısından bir fark bulunmadığını ileri sürmüştür.

Bilişim Teknolojileri Öğretmen Adaylarının Epistemolojik İnançlarının Fakülte Değişkenine Göre Karşılaştırılması

Araştırmaya katılan bilişim teknolojileri öğretmen adaylarının epistemolojik inançlarının fakülte değişkenine göre yapılan t-testi sonucuna ilişkin veriler Tablo 3'de verilmiştir.

Tablo 3. Bilişim Teknolojileri Öğretmen Adaylarının Epistemolojik İnançlarının Fakülte Değişkenine Göre Karşılaştırılması

	Fakülte	N	Ort.	SS	t	p
Faktör 1	Eğitim	140	2,08	,563	-1,286	,200
	Teknik Eğitim	90	2,18	,642		
Faktör 2	Eğitim	140	2,55	,753	1,658	,099
	Teknik Eğitim	90	2,39	,649		
Faktör 3	Eğitim	140	3,02	,609	,038	,969
	Teknik Eğitim	90	3,01	,670		

Tablo 3 incelendiğinde öğretmen adaylarının epistemolojik inançlarının fakülte değişkenine göre karşılaştırılmasına yönelik yapılan t testi sonucunda hiçbir faktör boyutunda p 0,05 düzeyinde anlamlı fark bulunmamıştır. Bu durum bilişim teknolojileri öğretmen adaylarının öğrenim gördükleri fakülte türüne göre epistemolojik inançlarında farklılığın olmadığı sonucunu ortaya çıkarmıştır.

Bilişim Teknolojileri Öğretmen Adaylarının Epistemolojik İnançlarının Mezun Olunan Lise Türü Değişkenine Göre Karşılaştırılması

Araştırmaya katılan bilişim teknolojileri öğretmen adaylarının epistemolojik inançlarının mezun olunan lise türü değişkenine göre yapılan t-testi sonucuna ilişkin veriler Tablo 4'de verilmiştir.

Tablo 4. Bilişim Teknolojileri Öğretmen Adaylarının Epistemolojik İnançlarının Mezun Olunan Lise Türü Değişkenine Göre Karşılaştırılması

	Lise Türü	N	Ort	SS	t	p
Faktör 1	Genel	144	2,10	,611	-,705	,481
	Mesleki ve Teknik	85	2,15	,576		
Faktör 2	Genel	144	2,48	,698	,029	,977
	Mesleki ve Teknik	85	2,48	,752		
Faktör 3	Genel	144	2,99	,642	-,753	,452
	Mesleki ve Teknik	85	3,06	,619		

Tablo 4 incelendiğinde öğretmen adaylarının epistemolojik inançlarının mezun olunan lise türü değişkenine göre karşılaştırılmasına yönelik yapılan t testi sonucunda hiçbir faktör boyutunda p 0,05 düzeyinde anlamlı fark bulunmamıştır. Bu durum bilişim teknolojileri öğretmen adaylarının mezun oldukları lise türüne göre de epistemolojik inançlarında farklılığın olmadığı sonucunu ortaya çıkarmıştır.

Bilişim Teknolojileri Öğretmen Adaylarının Epistemolojik İnançlarının Öğrenim Gördükleri Sınıfa Göre Karşılaştırılması

Araştırmaya katılan bilişim teknolojileri öğretmen adaylarının epistemolojik inançlarının öğrenim gördükleri sınıfa göre yapılan t-testi sonucuna ilişkin veriler Tablo 5'te verilmiştir.

Tablo 5. Bilişim Teknolojileri Öğretmen Adaylarının Epistemolojik İnançlarının Öğrenim Gördükleri Sınıfa Göre Karşılaştırılması

	Fakülte	N	Ort	SS	t	p
Faktör 1	1.Sınıf	150	2,12	,612	,194	,847
	4.Sınıf	80	2,11	,569		
Faktör 2	1.Sınıf	150	2,52	,707	1,064	,288
	4.Sınıf	80	2,42	,735		
Faktör 3	1.Sınıf	150	3,14	,580	4,180*	,000
	4.Sınıf	80	2,79	,665		

***p<.05**

Tablo 5 incelendiğinde öğretmen adaylarının epistemolojik inançlarının öğrenim gördükleri sınıfa göre karşılaştırılması sonucunda sadece "Tek Bir Doğrunun Var Olduğuna İnanç" (Faktör 3) boyutunda anlamlı fark vardır [t=4,180; p<.05; p=0,000]. Bu fark 1. Sınıfta öğrenim gören öğretmen adayları lehinedir. Bu durum 1. Sınıfta öğrenim gören bilişim teknolojileri öğretmen adaylarının ($\overline{X}$=3,14), son sınıfta

öğrenim gören bilişim teknolojileri öğretmen adaylarına göre ($\overline{X}$=2,79) tek bir doğrunun var olduğuna yönelik inançlarının daha çok olduğu sonucunu ortaya çıkarmıştır. Bu sonuç bu ortalamalar arasındaki farkın etki büyüklüğü 0,56 (Cohen d) olduğu da dikkate alınarak üniversite yaşamına yeni başlayan 1. Sınıf bilişim teknolojileri öğretmen adaylarının bilgiye daha çok pozitivist açıdan baktıkları ve son sınıf öğrencilerinin de üniversite yaşamından edindiği bilgi, deneyim ve tecrübeler sonrasında bilgiye daha çok yapısalcı bir yaklaşımla baktıkları ve görüşler arasındaki farkın etki büyüklüğü dikkate alındığında önemli olduğu söylenebilir. Nitekim üniversite yaşamına dâhil olan bireylerin birden fazla doğrunun olabileceğine yönelik inanca sahip olmaları beklenen bir durumdur. Ancak, Meral ve Çolak (2009) çalışmalarında, 1. ve 4. sınıf öğrencileri arasında bilimsel epistemolojik inançlar bağlamında herhangi bir anlamlı fark bulunmadığını belirtmişlerdir. Bu durumun fakültelerin öğrenim süreçlerini yapılandırmalarıyla ilgili olduğu şeklinde yorumlanabilir.

Bilişim Teknolojileri Öğretmen Adaylarının Epistemolojik İnançlarının Akademik Başarı Düzeylerine Göre Karşılaştırılması

Araştırmaya katılan bilişim teknolojileri öğretmen adaylarının epistemolojik inançlarının akademik başarı düzeylerine göre yapılan F testi sonucuna ilişkin veriler Tablo 6'da verilmiştir. Bu bölümde sağlıklı bir varyans analizi yapılabilmesi için akademik başarı düzeyi 3.01-3.50 olan grup ile 3.51-4.00 olan grup birleştirilerek analiz yapılmış ve değerlendirilmiştir.

Tablo 6. Bilişim Teknolojileri Öğretmen Adaylarının Epistemolojik İnançlarının Akademik Başarı Düzeylerine Göre Karşılaştırılması

Faktör		Kareler Top.	Sd	Kare Ort.	F	p	Anlamlı Fark (LSD)
Faktör 1	Gruplar arası	4,162	3	1,387			
	Gruplar içi	77,228	226	,342	4,060*	,008	(2.01-2.50)-(3.01-4.00)
	Toplam	81,390	229				

***p<.05**

Tablo 6 incelendiğinde bilişim teknolojileri öğretmen adaylarının epistemolojik inançlarının akademik başarı düzeylerine göre karşılaştırılması sonucunda sadece "Öğrenmenin Çabaya Bağlı Olduğuna İnanç" (Faktör 1) boyutunda anlamlı fark vardır [F=4,060; p<.05; p=0,008]. Bu farkın yapılan LSD testi sonucunda başarı düzeyi 2.01-2.50 ile 3.01-4.00 akademik başarı düzeyine sahip öğrenciler arasında olduğu tespit edilmiştir. Bu fark 3.01-4.00 akademik başarı düzeyine sahip öğretmen adayları lehinedir. Bu durum 3.01-4.00 akademik başarı düzeyine sahip öğretmen adaylarının, 2.01-2.50 akademik başarı düzeyine sahip öğretmen adaylarına göre öğrenmenin çabaya daha çok bağlı olduğu yönünde inanca sahip oldukları sonucunu ortaya çıkarmıştır. Bu sonucun, etki büyüklüğü değeri 0,23 (Cohen d) olduğu göz önüne alındığında önemi orta düzeyde değerlendirilmekle birlikte, üniversite yaşamında akademik başarı düzeyi yüksek olan öğrencilerin akademik başarı düzeyi düşük olanlara göre öğrenmenin gerçekleşmesinde çalışmanın gerekli olduğu inancına sahip oldukları ve bunun doğal bir sonucu olarak ta akademik başarı düzeylerinin yüksek olduğu şeklinde yorumlanabilir.

SONUÇ

Bireylerin bilginin doğruluğuna, kesinliğine, varlığına ve oluşumuna yönelik sahip olduğu inançları, problemleri nasıl çözdüklerine ve kendilerini nasıl yetiştirdiklerine yönelik önemli ipuçları sunar. Özellikle bilişim alanında yetişen ve gelecekte bu ve benzer alanlarda öğrenci yetiştirecek olan bilişim teknolojileri öğretmen adaylarının, başta bilginin yapısına ve varlığına yönelik sahip oldukları epistemolojik inançlarının ne olduğu ve bu inançların öğrenim dönemi süreci içerisinde bir değişiklik gösterip göstermediği önem arz etmektedir.

Bu çerçevede gerçekleştirilen bu çalışmada bilişim teknolojileri öğretmen adaylarının öğrenim gördükleri fakülte türüne ve mezun oldukları lise türüne göre epistemolojik inançlarında fark olmadığı görülmüştür. Buna karşın kadın bilişim teknolojileri öğretmen adaylarının, erkek bilişim teknolojileri öğretmen adaylarına göre öğrenmenin çabaya daha çok bağlı olduğu yönünde inanca sahip oldukları tespit edilmiştir. Ek olarak 3.01-4.00 akademik başarı düzeyine sahip öğretmen adaylarının, 2.01-2.50 akademik başarı düzeyine sahip olanlara göre öğrenmenin çabaya daha çok bağlı olduğu yönünde bir inanca sahip oldukları ortaya çıkmıştır. Ayrıca 1. Sınıfta öğrenim gören bilişim teknolojileri öğretmen adaylarının, son sınıfta öğrenim görenlere göre tek bir doğrunun var olduğuna yönelik inançlarının daha çok olması ve bu sonucun etki büyüklüğünün dikkate alınması gereken bir değerde çıkmış olması manidardır. Nitekim bilişim teknolojileri öğretmen adaylarının üniversite yaşamlarının sonuna doğru yapılandırmacı bir anlayışa sahip oldukları sonucuna varılmıştır.

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BİLİŞSEL STİLLERİN TASARIM ÖĞRENCİLERİNİN SANAL ORTAMLARDAN MEKÂNSAL BİLGİ EDİNİMLERİNE ETKİSİ

THE IMPACT OF COGNITIVE STYLES ON DESIGN STUDENTS' SPATIAL KNOWLEDGE FROM VIRTUAL ENVIRONMENTS

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Özet: Teknolojik gelişmelere paralel olarak bilim ve eğitim alanlarında dijital araçların kullanımındaki artış, bilginin de yeni yollarla aktarımına neden olmuştur. Tasarım disiplinine de bu döngünün içindeki aktif rolü dolayısıyla gerek pratik gerekse eğitim alanında yansımaları farklı derecelerde görülmektedir. Tasarım öğrencilerinin eğitim süreçlerinde, teknolojik araçlar ve dijital ortamlardan mekânsal bilgi düzeylerini arttırıcı yönde bilgilendirilmeleri, meslek hayatlarındaki başarılarını pozitif yönde etkilemektedir. Geleneksel tasarım eğitiminde yer alan eğitim yöntemlerinin tamamen göz ardı edilmesi ile aynı yönde olmayan bu düşünce, kişilerin algısal biçimlerinin tanımlanarak buna en uygun öğrenme şeklinin belirlenmesi gerekliliğine işaret etme çabasındadır. Sözü edilen algısal stiller, kişilerin bilgiyi algılayış ve işleyiş biçimlerine göre sınıflandırılmalarıdır. Bu anlamda, çalışmanın örneklemini oluşturan tasarım öğrencilerinin alandan bağımlı ve alandan bağımsız olmak üzere algısal stilleri tanımlanmış, daha sonra dijital ortamdan edindikleri bilgiler ile algısal stilleri arasındaki ilişki gözlemlenmiştir. Eğitimde dijital araçlar tanımlanırken bilişsel stillere bağlı farklılıkların göz önünde bulundurulmasının gerekliliği; dijital ortamlardan mekânsal bilgi edinme sürecinin algısal stillere bağlı olarak tasarım öğrencilerinin farklı ölçeklerdeki mekân bilgisini arttırdığı yönündeki verilerle desteklenmiştir.
Anahtar Kelimeler: Bilişsel stil, tasarım eğitimi, sanal ortam, mekânsal bilgi.

Abstract: In parallel with the technological developments dominating usage of digital tools in science and education, caused the transform of knowledge in new ways. The reflection of these integration is seen in design discipline as its active role in this circle whether in practice or in the era of education, Benefit from the capabilities of new technologies in the education process for increasing design students' spatial knowledge, benefit from them digital tools also effect their carrier life in positive direction. By noticing the traditional education methods which are still using in many design school, the endevaour indicates that determine the appropriate learning method by considering individuals different cognitive style. The cognitive styles mean classify individuals according the way of perceive information and process it. Through this way, as subjects of the study, students categorized in respect to their cognitive styles whether field dependence or field independence, and then the relation between their cognitive style and spatial knowledge acquisition from virtual environment was observed. While defining digital tools in design education, the need of differences related to cognitive styles should be considered, this is supported by the data from this study which are indicating the increase of students' spatial knowledge in different scale of virtual environments.
Keywords: Cognitive style, design education, virtual environments, spatial knowledge.

GİRİŞ

Gerçekleştirilmeleri imkânsız görülen tasarım ve tasarım ürünlerini olanaklı kılan bilgisayarın kullanımı, tüm meslek alanlarında olduğu gibi mimarlık uygulamaları ve eğitiminde de yepyeni ufuklar açmış, iki boyutlu çizimlerde yardımcı araç olarak kullanılan bilgisayar programları yeni yazılımların ve iletişim teknolojilerinin geliştirilmesine bağlı olarak tasarımın her safhasında daha yaygın kullanım alanları bulmuştur. Tasarımlar sanal ortamlarda canlandırılabilmekte, dolayısıyla deneyimlenebilmekte, ülkeler arası fikir alışverişine olanak sağlayan platformlarda paylaşılabilmektedir. Bilgisayar programlarıyla yaratılan dijital mekânlardan edinilen bilgilerin gerçek mekân tasarım çalışmalarına girdi olması yönündeki geçerlilikleri ve bu yöndeki çalışmaların oluşumuyla, sanal ortamlarda mekânsal bilginin algılanışı konusu daha da önem kazanmıştır (Çubukçu, 2005). Bilgi çağının yeniliklerine paralel yönde çalışma ortamlarının yaratılmasında izlenebilecek uygun stratejilerin, öğrenmedeki bireysel farklılıklar göz önünde bulundurularak belirlenmesinin amaçlandığı çalışmada; bireysel algı farklılıkları ile tasarım öğrencilerinin sanal ortamlardan edindikleri mekânsal bilgi düzeylerinin bilişsel stillere bağlı olarak ortaya konması oluşturmaktadır.

Bilişsel stil ya da öğrenme stili terimleri eğitim kuramcıları tarafından son altmış yıldır sıkça üzerinde durulmuş ve ifadelerinde farklı terminolojilerin kullanıldığına şahit olunmuştur (e.g. Witkin et al, 1971; Goldstein and Blackman, 1978; Tennant, 1988; Biggs & Moore, 1993; Riding & Pearson, 1994). Ortak yaklaşımların kesişimi olarak bilişsel stil terimi, öğrenme sürecinde bireyin bilgiyi organize etme, işleme ve yaklaşımındaki tutumu olarak tanımlanabilmekte ve bireyin zekâsından bağımsız olduğunu altı çizilmektedir (Messick, 1984). Çevremiz ile ilgili bilgiye nasıl dikkat ettiğimiz ve onu nasıl edindiğimiz, bu bilginin beyin tarafından nasıl işlendiği ve depolandığı, problemleri çözmedeki yaklaşımlarımız bilişsel düşüncemiz ile bağlantılıdır (Solso, 2007). Bireyin performansı üzerindeki etkisi ise verilen görevin türüne bağlı olarak negatif ya da pozitif yönde değişebilmekte, belirli stillerin belirli görevlere daha iyi uyum sağlayarak daha iyi sonuçlara ulaştıkları görülmektedir (Riding, 1996). Örneğin alan bağımlı (holistik)bilişsel stile sahip kişiler, yeni bilgiyi bileşenlerine ayırarak analiz etmede zorluk çekebilir, fakat genel perspektifi akıllarında tutma yetenekleri daha yüksektir. Bu biçim onlara bütünsel resmi görmede ustalık kazandırmaktadır. Alandan bağımsız (analitik) bilişe sahip kişiler ise, yeni aldıkları bilgiyi bileşenlerine ayırarak hali hazırda depoladıkları bilgilerle ilişkilendirmeye yatkındırlar. Geniş çaplı görmek yerine parçacı düşünmeye eğilimleri yüksektir.(Riding, 1997).

Günümüzde bilişsel stillerin belirlenmesinde kullanılan birçok test olmasına rağmen, diğerlerine temel oluşturması ve güvenilirlik değerlerinin yüksek olmasından dolayı Alan Bağımlılık -Alan Bağımsızlığı bir başka deyişle Analitik düşünme yeteneğini ortaya çıkarmayı amaçlayan Witkin'e ait Grup Saklı Figürler Testi tercih edilmiştir (Witkin, 1971). Karmaşık alanda saklı basit geometrileri bulmalarındaki performansa göre Alan bağımsızlıkları ya da analitik bilişsel stile sahip oldukları sonucuna varılan bireyleri ve saklı geometrileri bulmada aynı performansı gösteremeyen Alan bağımlı biliş stiline sahip bireyleri; kısaca bir orman resmine bakarak gördüğü ağaçları işaretleyen ve resimde sadece ormanı gören bireyler olarak nitelendirmek mümkündür (Parkinson, 2002).

Yapılan çalışmalar, alan bağımsızların bilgisayar destekli ve internet etkileşimli çevrelerde alan bağımlı bireylere oranla daha iyi performans sergilediklerini işaret etmektedir. Post (1987) çalışmasında Alan bağımsızlığı ile bilgisayar destekli çevrelerde başarı arasında pozitif bir ilişki bulmuştur. Waugh (1993) de sadece metne dayalı süreçlerde alan bağımsız bireylerin daha iyi olduğunu, buna karşın alan bağımlılar için görsel grafiksel çevrelerin daha verimli olabileceği üzerinde durmuştur (Parkinson, 2002). Bu çalışmada ise; metinlere ve sabit görsellere göre daha fazla algısal yük içeren (Strehler, 2008) kurgulardan, hareketli animasyonlardan oluşan bir sanal çevrede alan bağımlı ve

alan bağımsız bireylerin çıkarımları irdelenmektedir. Bunun yanı sıra, bilişsel stillere bağlı olarak sanal çevrelerden bilgi aktarımı, özellikle tasarım eğitimi alan ve üç boyutlu düşünme yetisi ile mekândan edinilen bilginin başarılarında etkisinin olduğu öğrencilere ne tür girdiler kazandırdığı üzerinde durulmaktadır. Öğrenmedeki bilişsel stillere bağlı olarak dijital ortamlardan edinilen çevre bilgisinin sorgulanması ve mekânsal bilgi kaynağı olarak dijital araçların tasarım eğitimine uygun olarak kullanılabilirliğinin artırılması amaçlanmaktadır.

YÖNTEM

Örneklem

Araştırmanın örneklemini İzmir Ekonomi Üniversitesi Güzel Sanatlar Fakültesi İç Mimarlık ve Çevre Tasarımı Bölümünde okumakta olan üçüncü sınıf lisans öğrencileri arasından basit rasgele yöntem ile seçilen 36 iç mimar adayı oluşturmaktadır (n=36). Öğrenciler üniversite sınavında Türkçe-Matematik alanlarındaki puanlarına göre bölümlerine girmeye hak kazanmışlardır. Katılımcıların 14'ü erkek ve 22'si kız öğrencilerden oluşmaktadır. Öğrencilere öncelikle bilişsel stil testi (Grup Saklı Figürler Testi) araştırmacılar tarafından uygulanmış daha sonra öğrencilere sanal mekânlardan edindikleri bilgi düzeylerini tespit amacıyla araştırmacıların hazırladığı dokuz soruluk test uygulanmıştır.

Katılımcıların Bilişsel Stillerinin Ölçümlenmesi

Bütün katılımcıların bilişsel stillerinin belirlenmesinde, geçerlilik ve güvenirlik çalışması yapılmış standart bir araç olan Witkin' in Grup Saklı Figürler Testi (Group Embedded Fıgures Test) uygulanmıştır. Witkin' in (1971) geliştirdiği "Grup Saklı Figürler Testi" nin Spearman-Brown testi güvenirliği. 82 olarak bulunmuştur. Grup Saklı Figürler Testi yedi, dokuz ve dokuz soruluk üç bölümden oluşmakta ve toplam 25 madde bulunmaktadır. Sırasıyla her bölüm için verilen iki, beş ve beş dakikalık süre içinde testi yanıtlamaları beklenmektedir. Yedi soruluk ilk bölüm bir tür alıştırma evresi niteliğinde olup değerlendirmeye alınmamakta, dokuzar sorudan oluşan ikinci ve üçüncü bölümlerde verilen karmaşık şekiller içinde gizli basit şekilleri bulmadaki becerilerine göre öğrencilerin alan bağımlılık ve alan bağımsızlık sınıflandırmaları yapılmıştır. Başka bir deyişle, buldukları basit şekil sayısı, bireylerin "alan bağımlılık" derecelerini yansıtmaktadır.

Sanal Mekândan Edinilen Bilgi Düzeyinin Belirlenmesi

Bilişsel stillerine göre gruplandırılmış iç mimarlık üçüncü sınıf öğrencilerinin, sanal çevrelerden edindikleri bilgiler tanımlanıp, istatistiksel analizler yapılarak bu veriler ile bilişsel stiller arasındaki bağlantı/bağlantısızlık ortaya konmaktadır. Çalışmada mekânsal bilginin sorgulanacağı söz konusu alan farklı karmaşıklık düzeylerindeki iç ve dış mekânlarda geçen dört boyutlu bir animasyon filmidir (Resim 1). Triotech firması tarafından üretilmiş animasyon bir öğrencinin ev ile okul arasındaki yolculuğu süresince geçtiği iç mekânlar ve farklı yoğunluktaki sokak, cadde gibi dış mekânlardan oluşmaktadır.

Katılımcılara öncelikle beş dakika süren dört boyutlu animasyon filmi deneyimi yaşatılmıştır. Bilgisayar ekranından farklı olarak bireylerin sanal ortamı gözlemleme esnasında gerçeklik hissini algılamaları için zaman zaman hareket ve rüzgâr efektlerini kullanılmıştır. Öğrencilerin dikkatlerinin dağılmaması amacıyla dörder kişilik gruplar halinde deneyimledikleri sanal ortam sonrasında, mekânsal bilgi düzeylerini ölçmeye yönelik testleri bireysel olarak yanıtlamaları istenmiştir. Animasyonu izleyen öğrenciler, birkaç dakikalık dinlenmenin hemen ardından rota bilgisini, harita bilgisini, uzaklık tahminlerini ve çevreye ait skeçlerini sınayan mekânsal bilgi testi yapılmaktadır.

Verilerin Çözümlenmesi

Öğrencilerin test uygulamalarından elde edilen veriler, sayım verileri için Windows Excel programı; istatistiksel veriler için ise Windows SPSS programı kullanılarak çözümlenecektir. Öğrenci beyanları ve test uygulamasıyla elde edilen veriler, Pearson Ki-kare ve tek yönlü varyans analizi (ANOVA) gibi teknikler kullanılarak çözümlenip, yorumlanmıştır.

Resim 1. Animasyon da gözlenen iç ve dış mekân örnekleri

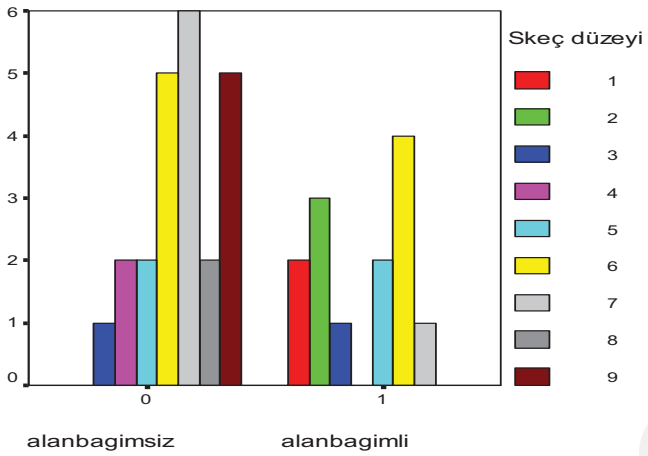
BULGULAR

Aşağıdaki tablodan görüleceği çalışmada yer alan 22'si kadın 14'ü erkek olmak üzere 36 öğrenciden 13'ü alan bağımlı ve 23'ü alan bağımsız olarak değerlendirilmiştir (Tablo 1). Verilerin analizi sonucunda cinsiyet ve alan bağımlılık arasında bir ilişki gözlemlenmemiştir.

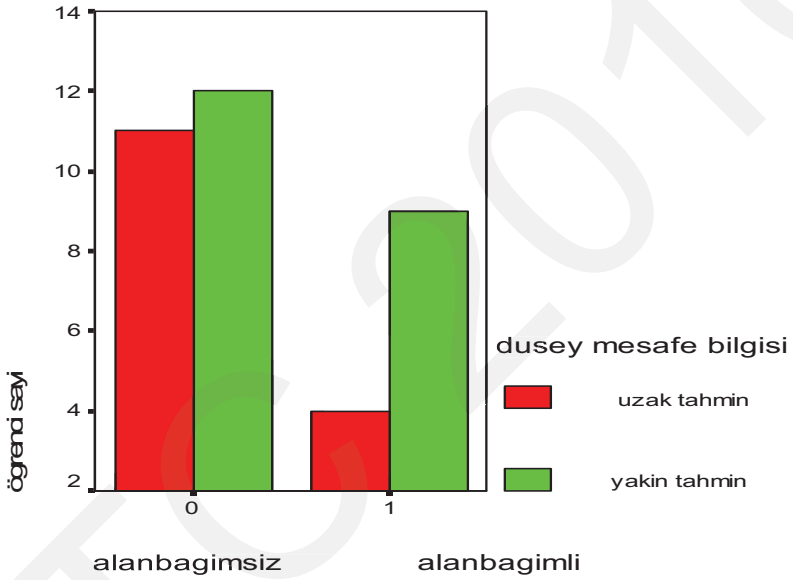
	KADIN	ERKEK	Toplam
Alan bagimli	7	6	13
Alan bağımsız	15	8	23
Toplam	22	14	36

Tablo 1. Katılımcıların bilişsel stillerinin dağılımı

Bilişsel stillerine göre gruplandırılmış iç mimarlık üçüncü sınıf öğrencilerinin, sanal çevrelerden edindikleri bilgiyi ölçmek amacıyla, deneyimledikleri mekânlara ait farklı nitelikteki bilgilerini sınayan bir test yapılmıştır. Öğrencilerden ilk ve son gördükleri mekanı skeç olarak çizmeleri istenmiş, sonuçta bu çizim ile bilişsel stil arasındaki ilişkiye bakılmış tır. Öğrencilerin skeç çizimlerindeki başarı ile alan bağımsızlıkları arasında diğerlerine göre pozitif bir ilişki gözlemlenmiştir ($p<0.05$).

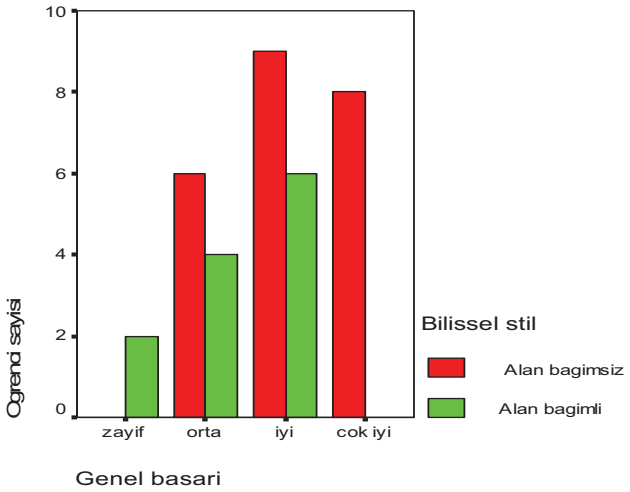


Tablo 2. Bilişsel stiller ile skeç çizmedeki başarılar arasındaki ilişki

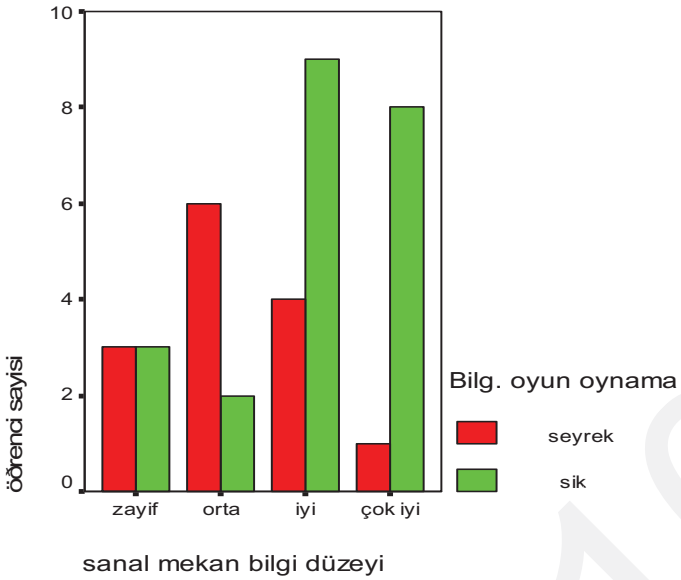


Tablo 3. Bilişsel stiller ile düşey mesafe tahmini arasındaki ilişki

Öğrencilerin düşey yöndeki mesafe ya da yükseklik bilgisi sorularına yakın yanıtlar verdikleri dolayısıyla, dikeyin algılanmasında iki bilişsel stilin de bir birinden üstünlüğü söz konusu olmamaktadır. Genel başarı ile bilişsel stiller karşılaştırıldığında, alandan bağımsız öğrencilerin mekânsal bilgi edinme düzeylerinin daha yüksek olduğu söylenebilmektedir. Bunun yanı sıra bütün bilişsel stillerin genel olarak edindikleri mekânsal bilgi seviyesinin düzeyi olumlu olarak nitelendirilebilmektedir. Dolayısıyla bu çalışmada bütün katılımcıların anlamlı mekânsal bilgiler elde ettikleri görülmüştür.



Tablo 4. Bilişsel stiller ile genel başarı düzeyi arasındaki ilişki



Tablo 5. Sanal mekân bilgi düzeyi (Genel Başarı) bilgisayar oyunu oynama sıklığı arasındaki ilişki

Çalışma kapsamında bağımlı değişken bilişsel stiller olmak üzere birçok analiz yapılmıştır. Bu analizler kimi zaman belli değişkenler arasında anlamlı ilişkiler olduğunu göstermiş, kimi zaman ise ilişkilerin birbirlerinden bağımsız olduğu ortaya çıkmıştır. Bilişsel stiller ve bilgisayar oyunu oynama arasında bağlantı kurulmamakla beraber, sıklıkla bilgisayar oyunu oynayan öğrencilerin sanal mekândan bilgi ediniminde daha başarılı oldukları gözlemlenmiştir ($p<0.05$). Bilgisayar oynama sıklığı belirlenirken, öğrencilerin anketlere verdikleri yanıtlar gruplandırılarak haftada üç ve üstü sık olarak kabul edilmiş, haftada üç kereden az olarak verilen yanıtlar seyrek olarak kabul edilmiştir.

SONUÇLAR

Tasarım öğrencilerinin öğrenme biçimlerinin sanal mekândan edindikleri bilgi derecesini değerlendiren bu çalışmada; bilişsel stillerin belli gruplarındaki kişilerin diğerlerine göre sanal ortamdan farklı mekânsal bilgi edindikleri görülmektedir. Öğrencilerin bilişsel stilleri ile sanal mekân bilgi edinme başarıları (genel başarı) arasında anlamlı bir ilişki bulunmuştur. Ancak burada belirtilmesi gereken bir nokta da, sanal mekânın gerçeğe yakın efektler içermesi ile ilişkili olarak genel anlamda bütün öğrencilerin mekânsal bilgi düzeylerinin artışına olan olumlu etkisidir. Tasarım öğrencilerinin bilgisayar kullanımına olan yaklaşımlarının da pozitif yönde olduğuna dair yapılan çalışmaları destekler nitelikte, bilgisayar oyunu oynama sıklıkları ile genel başarı arasındaki anlamlı ilişkinin de göz ardı edilmemesi gerektiği düşünülmektedir.
Beklenenin aksi bir durum ise alandan bağımsız öğrencilerin bilgisayar ortamlarındaki çizim ve tasarıma daha yatkın oldukları konusu ile ilgilidir. Bu çalışmadaki bulgular, bilişsel stiller ile bilgisayar kullanma arasında bir bağlantı kurulmadığını göstermekte olan çalışmaları destekler niteliktedir (Pektaş, Erkip 2006). Alandan bağımsız öğrencilerin, mekânı tanımlamada üç boyutlu objeleri referans alan çizimleri de, onların parçacı düşünme eğilimlerini yansıtmaktadır (Riding, 1997). Goldstein and Blackman 1978, Macleod Jackson and Palmer 1988 çalışmalarında bilişsel stiller ile mekânsal beceri arasındaki ilişkileri incelemişler ve alan bağımsızlık ölçeği ile mekânsal beceri arasında bağlantılardan bahsetmişlerdir. Genel başarı verilerinin analizindeki sonuçların bu yönde çıkması, çalışmanın bu düşüncelerle paralel sonuçlar verdiğini kanıtlamaktadır.
Bilişsel yaklaşımın üzerinde durduğu bireysel farklılıklar ile her bir öğrencinin kendine özgü ihtiyaçları, beklentileri, algılama şekilleri ve öğrenme tercihleri dikkate alınmaya değer görülmektedir. Dijital çağın tasarımcılarını yetiştirmeyi amaçlayan bir eğitim anlayışının, kültürel öz ile beslenmiş ve teknolojik olanaklarla etkileşim içinde zenginleşmiş olması beklenmektedir. Öğrencilerin sanal ortamlardan kazandığı mekânsal bilginin elde edilişinde bilişsel stillerin etkisinin daha ileri derecede önemi hak ettiğini ve tasarım eğitiminde sanal ortamlardan mekânsal bilgi edinme süreçlerinin geliştirilmesinde fayda sağlayabileceği öngörülmektedir. Çünkü bireysel farklılıklar, bilgiyi alma ve işleme süreçlerinde kullanılan yol ve yöntemleri etkilemekte, öğrenme ortamından beklentilerde değişikliklere yol açmaktadır. Bu bağlamda Tasarım alanında Sanal Eğitim Çevreleri tanımlanırken kullanıcının bilişsel stiline bağlı farklılıklar göz önünde bulundurulmalıdır.

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BİLİŞÜSTÜ YÖNLENDİRMELER EĞİTİM YAZILIMINA NASIL ENTEGRE EDİLEBİLİR?

HOW TO INTEGRATE METACOGNITIVE PROMPTS INTO EDUCATIONAL SOFTWARE

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Özet
Bilgisayar destekli öğretimin öğrenme ortamına sunduğu birçok katkı bulunmaktadır. Bu katkılardan biri öğrencilerin bilişüstü becerilerini geliştirmeye olanak sağlamasıdır. Bilgisayar destekli kullanılan yazılımlar kavramsal öğrenmeyi desteklerken, bilişüstü becerilerin entegre edildiği yazılımlar bilişüstü becerileri geliştirecek şekilde öğrenenin kendi bilişsel yapısını fark etmesine, kendini izlemesine, kendini değerlendirmesine yardımcı olur. Bu çalışmada, araştırmacılar tarafından hazırlanan bilişüstü yönlendirmelerin entegre edildiği bir eğitim yazılımı tanıtılmaktadır. Eğitim yazılımını geliştirme süreci, bilişüstü becerilerin eğitim yazılımına nasıl entegre edilebileceği altıncı ve yedinci sınıflardaki Yaşamımızdaki Elektrik ünitesi ele alınarak örneklerle açıklanmaya çalışılmıştır. Yazılımda yapılandırmacı anlayışa dayalı öğrenme etkinliklerinin yanı sıra, öğrenenlerin bilişüstü farkındalığını artıran ve planlama, izleme, kontrol etme, değerlendirme becerilerini destekleyen yönlendirmeler yer almaktadır. Ayrıca geliştirilen eğitim yazılımı iki ilköğretim okulunda uygulanarak öğrencilerin yazılımda en çok neyi beğendikleri/beğenmedikleri, yazılımın öğrenmelerine katkısının olup olmadığı, yazılım robotunun yaptığı yönlendirmeler ve yazılım üzerinde yapılmasını istedikleri önerilerle ilgili görüşleri alınmıştır.

Abstract
Computer-based instruction makes many contributions in the learning setting. One of these contributions is that it provides opportunities for students to develop their metacognitive skills. While the computer-aided software supports conceptual learning, the software into which metacognitive skills are integrated enable learners to realize their own cognitive structure, to make self-monitoring and to make self-assessment, in such way to develop metacognitive skills of the learners. This study presents educational software which is developed by the researchers and into which meta-cognitive prompts are integrated. Development process of the educational software and the methods to integrate meta-cognitive skills into educational software are explained in the scope of Electricity on Our Lives Chapter taught in the sixth and seventh grades. In addition to learning activities based on constructivist approach, the software includes prompts which increase meta-cognitive awareness as well as planning, monitoring, controlling and assessment skills of the learners. In addition, developed educational software has been applied in two primary schools. After then, students have been asked for their opinions on what they have liked/disliked most; whether the software has contributed in their learning or not; what suggestions they would make in relation to the prompts made by the software robot or in relation to the software itself.

GİRİŞ

Türkiye'de Milli Eğitim Bakanlığı tarafından 2004–2005 öğretim yılının başında ilköğretim programı değiştirilerek Fen Bilgisi dersinin adı Fen ve Teknoloji dersi olmuş; 2005–2006 öğretim yılında da yeni ilköğretim müfredatı, resmi olarak bütün okullarda uygulanmaya başlanmıştır (Dindar ve Yangın, 2007; Kırıkkaya, 2009). Fen ve Teknoloji dersi programında, yapılandırmacı öğrenme yaklaşımı ağırlık kazanmış, öğrenmenin her bireyin zihninde, çoğu zaman o bireye özgü bir süreç sonunda gerçekleştiği görüşüne ağırlık verilmiştir (MEB, 2005). Yapılandırmacı anlayışa göre öğrencilerin sahip olduğu önceki bilgiler bilimsel olarak kabul edilen görüşlerle uyumlu olmayabilir (Duit ve Treagust, 2003; Gunstone ve Champagne, 1990:165). Dolayısıyla hem öğretim öncesi hem de öğretim süreci sonunda öğrencilerde bazı konu ve kavramlarla ilgili birçok kavram yanılgısı olabilir. Araştırma konusu olan "Yaşamımızdaki Elektrik" ünitesine yönelik yapılan araştırmalarda ilköğretimden üniversiteye kadar öğrencilerde kavram yanılgılarının olduğu (Büyükkasap, Samancı ve Dikel, 2002; Chambers & Andre, 1997; Lee ve Law, 2001; Sönmez, Geban ve Ertepınar, 2001) öğrencilerin elektrik akımı konusunu anlamakta zorlandıkları ifade edilmektedir (Shepardson, 1999). Ayrıca elektrik akımı, elektron, direnç, potansiyel fark vb. gibi kavramların soyut olması nedeniyle öğrenilmesinde zorluklar yaşanmaktadır. Pine, Messer ve John'un (2001) çalışmasında, fen öğretmenlerinin görüşlerine göre, elektrik ile ilgili konuların öğrenilmesinde ilköğretim öğrencilerinin zorlandıkları belirtilmektedir. Bu noktada öğretmenlerin ve öğretmen adaylarının kavramsal öğrenmenin gerçekleşmesinde yararlanabileceği öğretim materyallerine ihtiyacın olduğu görülmektedir. Öte yandan elektrik ünitesinde yer alan soyut kavramların her zaman yaparak-yaşayarak (ilk elden deneyimlerle/ deneylerle) öğrenilmesi mümkün olmayabilir. Bu nedenle, özellikle bu tür kavramların öğretilmesinde, etkileşimli animasyon, benzetişim ve modelleme yardımcı araç olarak kullanılabilir. Öğrenciler hareketli ve doğrudan grafik animasyonları ile iç içe olmaktan hoşlanırlar. Elektronik oyunlar bunun en iyi kanıtıdır. Bilgisayar destekli öğretim simülasyonları, öğrencileri aktif kılarak, onların kolaylıkla fark edecekleri problem durumları oluşturmakta ve bu şekilde problem çözme becerilerinin geliştirilmesini sağlamaktadır (Carin ve Sund, 1989:317).

Bilgisayar destekli öğretimde kullanılan yazılımların, öğrenciler açısından yukarıda belirtilen yararları dışında, bilişüstü becerilerin geliştirilmesi açısından da yararı olabilir. Bilişüstü becerilerini kullanan öğrenciler ön bilgilerini kontrol eder, konu ya da kavramla ilgili kendi anlayışlarıyla öğretimde geçen anlayışlar arasında karşılaştırmalar yapar, öğretilen kavramların birbiriyle olan bağlantılarını ve aralarındaki ilişkileri keşfederler (Georghiades, 2004). Çoklu öğrenme ortamına bilişüstü becerilerin entegre edildiği araştırmalar öğrencilerin öz düzenleme becerilerinde, öz yeterliklerinde, problem çözme becerilerinde anlamlı düzeyde ilerlemeler olduğunu ve sınav kaygılarında azalmalar olduğunu göstermiştir (Hartley, 2001; Lee, 1997; Ross, 1999; Vovides, 2005). Ülkemizde okullarda giderek artan sayıda bilgisayar ve bilgisayar laboratuvarlarının olması bu alandaki eğitim yazılımlarının gerekliliğini ortaya koymaktadır. Bu noktadan yola çıkarak, bu çalışmada ilköğretim Fen ve Teknoloji dersinde yer alan ve soyut olgu ve kavramlar içeren "Yaşamımızdaki Elektrik" ünitesindeki kavramların (elektrik akımı, direnç, atom vb.) öğrenilmesine yardımcı olacak ve bilişüstü yönlendirmelerin entegre edildiği etkileşimli eğitim yazılımının hazırlanması amaçlanmıştır.

Projeye Genel Bakış

İlköğretimde Bilişüstü Yönlendirmelerin Entegre Edildiği Eğitim Yazılımının Hazırlanması ve Etkililiğinin Araştırılması başlıklı, TÜBİTAK tarafından 01.02.2007 ve 01.08.2010 tarihleri arasında desteklenen proje iki üniversitede görev yapan dört araştırmacı tarafından yürütülmektedir. İlk aşamada Fen ve Teknoloji dersi kapsamında Yaşamımızdaki Elektrik ünitesi için bilişüstü yönlendirmelerin entegre edildiği bir eğitim yazılımı hazırlanmıştır. Yazılım geliştirmede Flash CS3, PHP, MySql, ASP, AppServ, Photoshop vb. programları kullanılmıştır. Hazırlanan yazılımın ilk hali hakkında öğretmenlerin, öğrencilerin, alan uzmanlarının katıldığı bir panel gerçekleştirilerek, yazılımın bilişsel ve bilişüstü boyutları için görüş ve öneriler alınmıştır. Proje için kullanılacak ölçme araçlarının geliştirilmesinden sonra

2008–2009 öğretim yılında pilot çalışma gerçekleştirilmiştir. 2009–2010 öğretim yılında ise asıl çalışma gerçekleştirilmiştir. Proje kapsamında birçok bağımlı değişken (fen başarısı, fen ve teknoloji dersine yönelik tutum, bilgisayar yönelik tutum, bilişüstü becerileri vb.) ele alınmış ve bağımsız değişkenlerin (bilişüstü yönlendirmelerin entegre edildiği eğitim yazılımının ve normal öğretimin) etkileri araştırılmıştır. Ancak, bu çalışmada bilişüstü yönlendirmelerin eğitim yazılımına nasıl entegre edildiği anlatılmış ve ayrıca yazılıma yönelik öğrenci görüşleri ortaya konulmuştur.

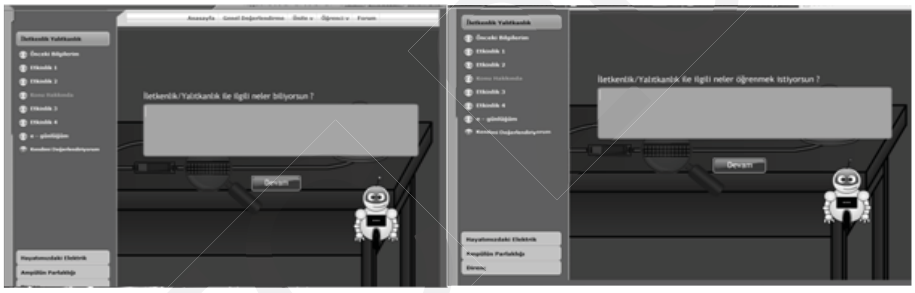
Yazılıma Genel Bakış

Yazılımda öğrencilerin kullanacağı etkinlikler bilişsel, bilişüstü ve duyuşsal olmak üzere üç boyutludur. Etkinlikler hazırlanırken Fen ve Teknoloji ders programının sarmal yapısı dikkate alınmıştır. Yazılımın boyutlarının öğretimsel işleyişte nasıl ilerlediği aşağıda açıklanmaktadır.

1. Ön bilgilerin Gözden Geçirilmesi: Bir konuya başlamadan önce öğrencinin yapması gereken ilk görev, önceki yıllarda öğrendiği bilgileri hatırlamasına yardımcı olacak soruları cevaplamaktır. Konuya hazır bulunuşluğunun ölçüldüğü bu sorular sonunda, öğrenciye cevabının doğru ya da yanlış olduğu dönütü verilmektedir. Daha sonra konu anlatımına yönlendirilen öğrenci, yeni bir etkinliğe hazır hale gelmektedir.

Resim 1 Ön bilgileri hatırlatma ekranından bir görüntü

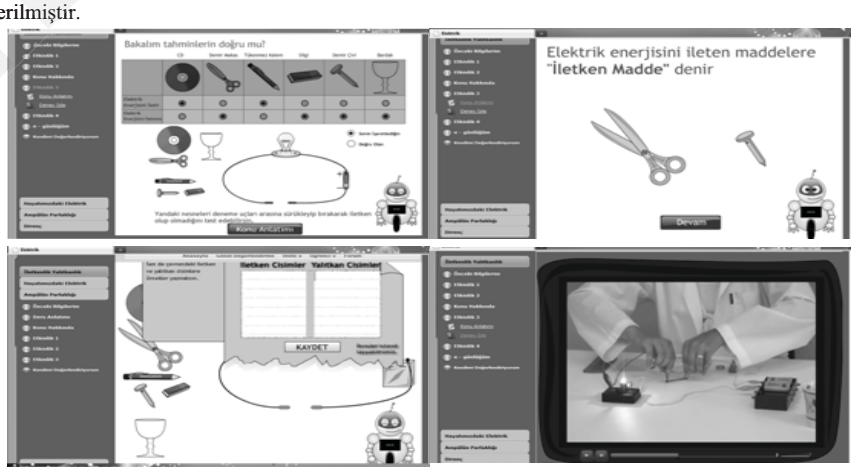
2. Planlama: Etkinliğe başlamadan önce öğrencinin planlama becerisini kullanması gereklidir. Bilindiği gibi planlama, amaç belirleme, işin tamamlanmasında kullanılacak bilgi ve stratejilerin belirlenmesi, konuyla ilgili bilinenlerin ortaya çıkarılmasıdır. Yazılımda bu işlemler öğrencinin karşısına bir metin kutusu aracılığıyla çıkarılmıştır. Yeni bir etkinliğe başlamadan önce, sınıf tartışması yapılarak, "Bu derste neler öğrenmek istiyoruz?" sorusuna cevap aranmıştır. Daha sonra öğrenci metin kutusuna belirlediği amacı yazarak kaydetmiştir. Bu aşamadan sonra öğrenci o konuyla ilgili neler bildiğini metin kutusuna yazarak kaydetmiştir.



Resim 2 Planlama ekranından bir görüntü

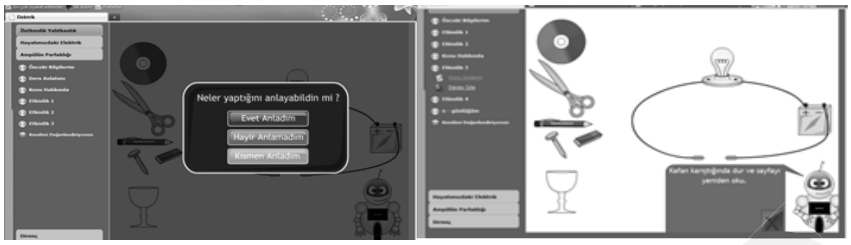
Eğitim yazılımlarında dikkate alınması gereken bir nokta, öğrencilerin bilişsel-bilişüstü becerilerinin geliştirilmesinin yanı sıra, duyuşsal unsurların dikkate alınması gerektiğidir. Öğrenci derse gelmeden önce neler hissetmektedir? Bu durum, öğrencinin ders öncesi kendini uygun hale getirmesi için duyuşsal anlamda bir farkındalığı gerektirmektedir. Yazılımda planlama aşamasının en son basamağında öğrenciye "Derse başlamadan önce neler hissediyorsun?" sorusu metin kutusu aracılığıyla sorulmuştur.

3. Yazılım Etkinliklerinin Gerçekleştirilmesi: Öğrenilecek yeni konuyla ilgili animasyonlar, konu anlatımı, deneyler ve videolar bu bölümde yer almaktadır. Etkinliklerde bilişsel çatışma stratejisi ve tahmin gözlem açıklama metodu kullanılmıştır. Öğrenci etkinlikleri gerçekleştirirken sadece izleyici değildir, metin kutularını doldurma, deney düzeneğini kurma gibi işlemler nedeniyle bütün etkinliklerde aktif olması gereklidir. Deneyler sırasında tahmin, hipotez kurma, değişkenleri belirleme, karşılaştırma-sınıflama, gözlem, veri kaydetme, sonuç çıkarma ve yorum yapma becerilerinin kullanılması gereklidir. Ayrıca öğrencinin öğrendiklerine günlük hayattan örnekler vererek bilgisini genişletmesi istenmiştir. Etkinlikler gerçekleştirilirken araştırmacılar ve öğretmen gruplar arasında gezerek öğrenciye dönütler vermiştir. Ayrıca, yazılıma öğretmen girişi yapıldığında, öğrencilerin metin kutularına yazdıkları ifadeler incelenerek, öğrencilere bu ifadeler üzerinden de dönütler verilmiştir.



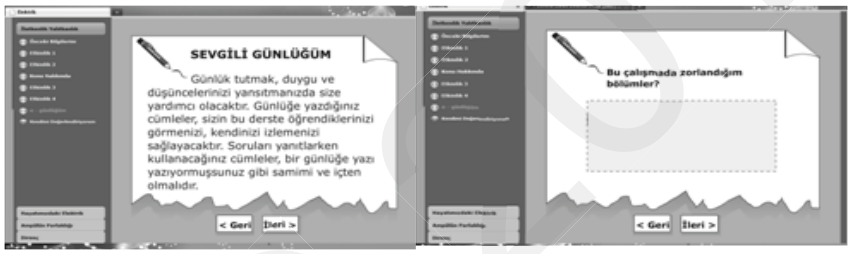
Resim 3 Yazılım etkinliklerinden bazı görüntüler

4. Kendini İzleme: Öğrenme etkinlikleri devam ederken, öğrenci belirlediği amaca ulaşıp ulaşmadığını veya yapılanları anlayıp anlamadığını kendine sormalıdır. Bu sayede, amaçlarına ulaşmak için dikkatini yoğunlaştırabilir, kullandığı bilişsel stratejileri değiştirebilir. Yazılımda etkinliğin içinde veya bir etkinlikten diğerine geçerken öğrenciye "Neler yaptığını anlayabildin mi, buraya kadar yapılanları anladın mı" şeklinde sorular sorulmuş, cevabı için üç seçenek sunulmuştur: evet anladım, hayır anlamadım, kısmen anladım. Bu cevaplardan evet anladım işaretlendiğinde, öğrenci kaldığı yerden etkinliğe devam ederken, diğer seçenekleri işaretlediğinde yazılım robotu öğrenciye önerilerde bulunmaktadır.



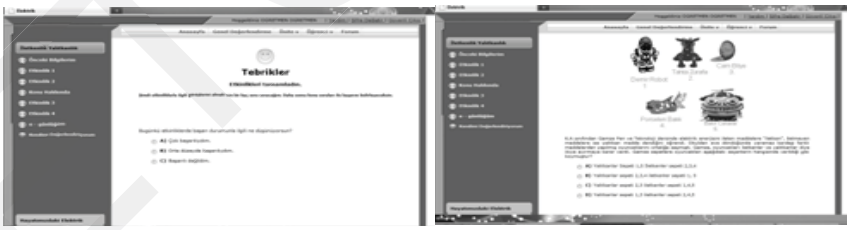
Resim 4 Kendini izleme ekranından bir görüntü

5. E-günlüğüm: Ünitenin içindeki konular tamamlandıkça, öğrenci bir günlük doldurmaktadır. Günlük öğrencinin bilişsel ve duyuşsal alandaki farkındalığını ilerletmeyi amaçlamıştır. Bu bölümde öğrencinin öğrendiklerini gözden geçirmesini, etkinlikler sırasında güçlü ve zayıf yönlerini değerlendirmesini sağlayan başlıklar yer almaktadır. Ayrıca, etkinlikten önce, etkinlikte geçen kavramla ilgili alternatif veya yanlış görüşü olan öğrencilerin, görüşlerinde ne tür değişiklikler olduğunu gösterebilmesini sağlayan bir başlık da yer almıştır. Bu amaçla "Bu çalışmada neler yaptım?, Çalışmadan önce düşüncem neydi ve düşüncelerimde neler değişti?, Bu çalışmada neler öğrendim?, Bu çalışmada zorlandığım bölümler neler?, Bu çalışmada başarılı olduğum bölümler neler?" soruları sorulmuş ve öğrenciden cevaplarını metin kutularına yazarak kaydetmesi istenmiştir.



Resim 5 E-günlüğüm

6. Kendimi Değerlendiriyorum: Bu bölümde, öğrenci bilişsel alanda yazılımda uğraştığı etkinlikleri anlayıp anlamadığını kendisine sorulan soruları cevaplayarak değerlendirmektedir. Öğrencinin etkinlikler boyunca kendi performansını değerlendirmesi için yönlendirmelerle birlikte gelen soruları cevaplaması gerekmektedir. Bu aşamadan sonra, öğrenci ünite sonu değerlendirme sorularına geçmektedir. Öğrenci sorulara geçmeden önce, kendisine az sonra cevaplayacağı testle ilgili performansını değerlendirmesi istenmektedir. Daha sonra öğrenci soruları cevaplamaktadır. Cevaplama işleminin ardından, öğrenci sınav öncesi performansıyla ilgili değerlendirmesini ve sınavdan aldığı sonucu karşılaştırmaktadır.



Resim 6 Kendimi değerlendiriyorum ekranından bir görüntü

YÖNTEM

Araştırma 2009-2010 öğretim yılında İzmir ve Sivas İllerinde yürütülmektedir. Sivas'ta yapılan uygulama tamamlanmış olup, İzmir'de yapılan uygulama halen devam etmektedir. Bu nedenle örneklem grubu Sivas'ta öğrenim gören altıncı sınıftan 28, yedinci sınıftan 23 ilköğretim öğrencisidir. Araştırmada deney ve kontrol grupları oluşturulmuş ve deney grubu öğrencileri Yaşamımızdaki Elektrik Ünitesi konularını, geliştirilen yazılımı kullanarak öğrenmişlerdir. Kontrol grubunda ise normal öğretim yapılmıştır. Daha önce de belirtildiği gibi proje kapsamında birçok bağımlı değişken ele alınmış ve bağımsız değişkenlerin bu bağımlı değişkenlere etkileri araştırılmıştır. Ancak, bu çalışmada bilişüstü yönlendirmelerin eğitim yazılımına nasıl entegre edildiği anlatılmış ve yazılıma yönelik öğrenci görüşleri ortaya konulmuştur. Eğitim yazılımıyla ilgili öğrenci görüşlerinin belirlenmesi için cevapların yazılı olarak verileceği bir form hazırlanmıştır. Öğrencilere yazılımda en çok neyi beğendikleri/beğenmedikleri, yazılımın öğrenmelerine katkısının olup olmadığı, yazılım robotunun yaptığı yönlendirmeler ve yazılım üzerinde yapılmasını istedikleri önerilerle ilgili açık uçlu sorular sorulmuştur. Öğrencilerin verdikleri cevaplar içerik analizine göre iki araştırmacı tarafından incelenmiş, her bir soru için kategoriler belirlenerek hesaplamalar yapılmıştır. Sayfa sınırlılığı nedeniyle öğrenci görüşlerine ayrıntılı bir şekilde yer verilememiştir.

BULGULAR

Öğrencilere ilk olarak yazılımda en çok neyi beğendikleri sorulmuştur. Altıncı sınıf öğrencilerinin büyük bir çoğunluğunun yazılımdaki deneyleri ve öğrencilere yönerge ve açıklamalar sunan robotu (N=16) beğendikleri ortaya çıkmıştır. Araştırmacıların konu ile ilgili deneyleri laboratuvarda yapıp, video şeklinde yazılıma ekledikleri deneyler, öğrencilerin ilgisini çekmiştir. Yedinci sınıf öğrencileri de altıncı sınıf öğrencileri ile benzer şekilde deneyleri (N=17) beğendiklerini ifade etmişlerdir. Yazılımı genel olarak beğenen öğrenciler (N=7) ikinci sırada yer almaktadır. Eğitim yazılımını keyif alarak kullandıklarını ve bütün üniteleri zevkle öğrendiklerini belirtmişlerdir.

Öğrencilere yazılımda neyi beğenmedikleri sorulduğunda altıncı sınıf öğrencilerinin eğitim yazılımında sorulan sorulara cevap yazmaktan sıkıldıkları anlaşılmaktadır (N=6). Eğitim yazılımında öğrencilerin ön bilgilerini, etkinlikle ilgili tahminlerini, deneydeki değişkenlerini, deney sonuçlarını, varsa hatalarını, etkinlikler sonunda öğrendikleri ile ilgili günlüklerini yazmaları için açık uçlu sorular sorulmuştur. Eğer öğrenciler bu sorulara hiçbir şey yazmaz ya da detaylı olmayan bilgiler sunarlarsa yazılımda bir sonraki etkinliğe geçememektedirler. Bu da öğrencilerin cevaplarını detaylı açıklamalarını gerektirmektedir. Bazı öğrencilerin sorulan bu sorulara cevap yazarken zorlandıkları görülmüştür. Bu da bazı öğrencilerin sıkılmasına neden olmuştur. Buna neden olan bir diğer faktörde, öğrencilerin okullarda kullanılan F tipi klavyeye alışkın olmamalarıdır. Evlerinde genellikle Q tipi klavyeler kullandıklarını belirten öğrenciler okulda bu klavyeyi kullanırken zorluklar yaşamışlardır. Yedinci sınıf öğrencilerinin cevapları da benzerdir. Günlük yazmaktan hoşlanmayan öğrencileri (N=4), robot anlatımından hoşlanmayan (N=3) öğrenciler takip etmektedir. Robotun anlatımlarını beğenmeyen öğrenciler derste daha fazla konu anlatımı olması gerektiğini düşünmektedirler.

"Yazılım öğrenmenize katkıda bulundu mu?" sorusuna altıncı sınıf öğrencilerin büyük çoğunluğu evet şeklinde (N=26) cevap vermişlerdir. Öğrencilerden iki tanesi bu soruya olumsuz cevap vermişlerdir. Bunlardan ilki öğrenci merkezli uygulanan yöntemden memnun olmadığını, kavram ya da olguyu hep kendisinin bulmaya çalıştığı derste öğrenemediğini ifade etmiştir. Diğer öğrenci ise, eğitim yazılımının karışık olduğunu ve öğrenmesine yardımcı olmadığını belirtmiş ancak üniteyi öğrendiğini de ifade etmiştir. Yedinci sınıf öğrencilerinin büyük çoğunluğu eğitim yazılımının öğrenmelerinde etkili olduğunu ifade etmişlerdir. Eğitim yazılımının öğrenmelerine katkıda bulunmadığını belirten öğrencilerin cevapları 6. sınıf öğrencilerinin cevapları ile benzerdir. Biraz ve Hayır diyen öğrencilerin cevapları incelendiğinde, öğrencilerin kendilerinin yaptıkları, kavramları kendilerinin keşfettikleri derslere alışık olmadıkları görülmektedir. Son olarak öğrencilerin eğitim yazılımına ilişkin önerileri alınmıştır. Önerilerinin başında bilgisayarların daha hızlı çalışması (N=4) gelmektedir. Bu durum eğitim yazılımının özelliğinden kaynaklanmamaktadır. Öğrencilerin diğer bir önerileri ise eğitim yazılımında beğenmedikleri bölüm olarak belirttikleri günlüklerin kaldırılması (N=3) yönündedir.

SONUÇ ve ÖNERİLER

Bu çalışmada bilişüstü yönlendirmelerin entegre edildiği eğitim yazılımı tanıtılmış ve altıncı ve yedinci sınıf öğrencilerinin yazılım hakkındaki görüşleri alınmıştır.

Öğrencilerin görüşlerine göre; hazırlanan eğitim yazılımında en beğendikleri bölüm deneyler olmuştur. Deneyleri izlediklerinde konuyu daha iyi anladıklarını belirten öğrenciler, fen ve teknoloji dersini öğrenmede görselliğin ve somutlaştırmanın ne kadar önemli olduğunu bir kez daha ortaya koymuştur. Öğrencilerin uzun cevaplar yazmaları yazılımda beğenmedikleri bir durumdur. Ayrıca bazı öğrenciler derste daha fazla konu anlatımı olması gerektiğini düşünmektedirler. Öğretmen merkezli yöntemlere (düz anlatım, soru-cevap) alışan öğrencilerin, sürekli öğretmen anlatımı (dinleme) ve not tutma alışkanlıkları vardır. Bu da zaman zaman zorluk yaşamalarına neden olmuştur. Bilgiyi kendilerinin yapılandırmalarını isteyen etkinliklerde güçlük çekmişlerdir. Bu eğitim yazılımı, öğretmenin konu anlatımı olmadan öğrenemeyeceklerini düşünen öğrencilerin öğrenme biçimlerinde değişikliğe neden olmuş ve bu değişim bazılarını huzursuz etmiş, uyum sağlamada güçlük yaşamışlardır. Öğrencilerin büyük bir çoğunluğu yazılımın öğrenmelerinde etkili olduğunu düşünmektedirler. Öğrenmelerinde etkili olmadığını düşünen öğrenciler öğretmen tarafından konu anlatımı yapılan, not tutturulan ve bol soru çözülen derslerden hoşlanmakta ve bu derslerde daha iyi öğrendiklerini düşünmektedirler. Yazılımın geliştirilmesine yönelik olarak öğrencilerin önerileri günlüklerin kaldırılması şeklinde olmuştur. Bu çalışmanın sonuçlarına dayalı olarak şu önerilerde bulunulmaktadır:

1. Bu çalışmada kullanılan yazılım "Yaşamımızdaki Elektrik" ünitesi için hazırlanmıştır. Farklı konularda farklı içerikli eğitim yazılımları hazırlanmalıdır.
2. Hazırlanan eğitim yazılımı daha fazla sayıda öğrenci grubuna uygulanarak programın etkililiği değerlendirilmeli ve yazılım geliştirilmelidir.
3. Bilişüstü becerilerin ve diğer üst düzey düşünme becerilerinin entegre edildiği eğitim yazılımlarının sayısı artırılmalıdır.
4. Öğretmenlere bilgisayar destekli öğretim hakkında bilgi verilmeli, okullarda bilgisayar laboratuvarlarının kullanılma ve eğitim yazılımlarının uygulanması artırılmalıdır.

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BİR ÖĞRETİM TEKNOLOJİSİ OLARAK ÇALIŞMA YAPRAKLARININ KİMYASAL REAKSİYONLARIN HIZI KONUSUNDA ÖĞRENCİ BAŞARISINA ETKİSİ

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Özet: Bu çalışmada, kimyasal reaksiyonların hızı konusunda hazırlanan çalışma yapraklarının öğrenci başarısına etkisinin belirlenmesi amaçlanmıştır. Yarı deneysel yöntem kapsamında yürütülen çalışmada veri toplama araçları olarak Kavramsal Anlama Testi (KAT), yarı yapılandırılmış mülakat ve yapılandırılmamış gözlem kullanılmıştır. Çalışma 2008–2009 güz döneminde Rize ilindeki bir lisedeki 41, onbirinci sınıf öğrencisiyle yürütülmüştür. Örneklem deney ve kontrol grubu olmak üzere rasgele ikiye ayrılmıştır. Deney grubunda konunun öğretimi esnasında çalışma yaprakları ile öğretim etkinlikleri yürütülmüştür. Kontrol grubunda ise ders öğretmeni kendi yöntemlerine göre dersleri yürütmüştür. KAT her iki gruba ön-son test olarak uygulanmıştır. Konunun öğretiminden sonra deney grubundan 6, kontrol grubundan 7 öğrenci ile mülakatlar yürütülmüştür. Mülakat verileri betimsel bir yolla analiz edilmiştir. KAT'den elde edilen veriler SPSS paket programı kullanılarak analiz edilirken gözlem verileri ise doğrudan verilmiştir. Çalışma sonunda, çalışma yapraklarıyla öğretim yapılan deney grubu öğrencilerinin kontrol grubundaki öğrencilerine göre daha başarılı oldukları belirlenmiştir. Çalışma yapraklarının geliştirilmesi ve uygulanmasına yönelik bazı önerilerle çalışma sonlandırılmıştır.
Anahtar Kelimeler: kimyasal reaksiyonların hızı, çalışma yaprağı, öğrenci başarısı

THE EFFECT OF WORKSHEETS AS AN INSTRUCTIONAL TECHNOLOGY ON STUDENT ACHIVEMENT IN REACTION RATE CONCEPT

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Abstract: In present study, it is aimed to determine effects of worksheets on students' achievement on chemical reaction rate subject. Study was carried on with quasi-experimental design and conceptual comprehension test (CCT) , semi structured interviews and unstructured observations were used for gathering data. Study was carried on with 41, twelfth grade students attending to a secondary school in Rize in the fall term of the 2008-2009 academic years. Sample was separated to experiment and control groups randomly. During the teaching the subject, worksheets were used for experiment group. In control group classroom teacher carried out the lessons according to her own methods. CCT was carried out as pre and post test to both groups. After teaching activities semi-structured interviews were conducted with 6 students from experiment group and 7 students from control group. Interview data were analysed with descriptive analysis method. Data from getting CCT were analysed by using SPSS statistical programme. On the other hand observations data were given directly. At the end of the study, it is determined that experiment group students were more successful compared to control group students. Study was finalized with some suggestions of using and developing worksheets.
Key Words: chemical reaction rate, worksheets, student achivement

GİRİŞ

Kimya eğitimindeki kavramların anlaşılmasına yönelik yapılan çalışmalar öğrencilerin kimya kavramlarını anlamakta zorlandıklarını ve zihinlerinde bilimsel açıdan uygun olmayan yapılar oluşturduklarını göstermektedir. (Ayas, 1995; Köseoğlu vd., 2002). Öğrencilerin bu anlama zorlukları ve kavram yanılgılarının ise fen öğretiminin hedeflenen amaçlarına ulaşmasında bir engel teşkil edeceği düşünülmektedir (Aydoğan, Güneş ve Gülçiçek, 2003; Coştu, Ünal, 2005).Öğrencilerin kimya konuları içinde zor olarak gördüğü ve anlamakta güçlük çektiği konulardan biri de Kimyasal Reaksiyonların Hızı konusudur. Hız konusu içinde, kimyasal reaksiyonların oluşumu, çarpışma teorisi, aktifleşme enerjisi, aktifleşmiş kompleks gibi öğrencilerin gözle göremediği tanecik boyutundaki süreçleri anlamayı gerektiren soyut kavramlar bulunmaktadır. Bu kavramlar anlaşılabildiğinde bir kimyasal reaksiyonun hızına etki eden; sıcaklık, derişim, temas yüzeyi, katalizör gibi faktörlerin etkileri de daha iyi anlaşılabilmektedir. Öğrencilerin hız konusundaki kavramları anlamakta güçlük çektiği ve konu ile ilgili zihinlerinde yanlış kavramsal yapılar oluşturduğu yapılan araştırmalarla da ortaya konmuştur (Nakiboğlu vd., 2002; Çakmakçı vd., 2003; Alkan, Benlikaya, 2004). Bu noktada geleneksel öğretim ortamlarının yerine kavramların öğrenci deneyimleriyle aktif olarak yapılandırıldığı, soyut kavramların olabildiğince somutlaştırıldığı, öğrencinin ilgisini canlı tutacak farklı materyallerin ve öğretim teknolojilerinin kullanıldığı öğrenci merkezli öğrenme ortamlarının oluşturulması fen kavramlarının anlamlı bir şekilde öğrenilmesine katkıda bulunacaktır. Son zamanlarda bu amaçla kullanılan ve öğrenmeye olumlu katkıları tespit edilen materyallerden biri de çalışma yapraklarıdır. (Saka ve diğ., 2002; Coştu vd., 2003; Demircioğlu vd., 2004; Kurt ve Akdeniz, 2002; Saka ve Yılmaz, 2005). Çalışma yaprakları, öğrencilerin yapacağı işlem basamaklarını içeren, bilgilerini kendi zihinlerinde kendilerinin kurmalarına yardım eden ve aynı anda bütün sınıfın verilen etkinliğe katılımını sağlayan önemli araçlardır (Sands ve Özçelik, 1997; YÖK, 1998).
Etkili bir şekilde hazırlanmış ve uygulanmış çalışma yapraklarıyla kavram öğretiminde istenilen sonuçlar alınabileceği bildirilmektedir (Saka ve diğ., 2002; Demircioğlu vd. 2004). Bu çalışmada kimyasal reaksiyonların hızı konusuna yönelik geliştirilen çalışma yapraklarının öğrenci başarısına etkisinin ortaya çıkarılması amaçlanmıştır.

YÖNTEM

Çalışmada yarı deneysel yöntem kullanılmıştır. Bu kapsamda veri toplama araçları olarak, Kavramsal Anlama Testi (KAT), yarı yapılandırılmış mülakat ve yapılandırılmamış gözlem kullanılmıştır. Çalışma 2008–2009 güz döneminde Rize ilindeki bir lisedeki 41, on birinci sınıf öğrencisiyle yürütülmüştür. Örneklem deney ve kontrol grubu olmak üzere rasgele ikiye ayrılmıştır. Her iki grupta konunun öğretimi aynı ders öğretmeni tarafından gerçekleştirilmiştir. Ancak deney grubunda konunun öğretimi esnasında araştırmacılar tarafından geliştirilen çalışma yaprakları ile öğretim etkinlikleri yürütülmüştür. Bu amaçla Kimyasal Reaksiyonların oluşumu ve çarpışma teorisi, hıza etki eden faktörler konularında 5 çalışma yaprağı hazırlanmıştır. Bu şekilde deney grubunda toplam 6 ders saati süresince dersler yürütülmüştür. Kontrol grubunda ise ders öğretmeni kendi yöntemlerine göre dersleri yürütmüştür. Hem kontrol grubundaki hem de deney grubundaki dersler yapılandırılmamış bir şekilde gözlenmiş ve oluşturulan öğrenme ortamlarının özellikleri belirlenmeye çalışılmıştır. Konunun öğretimi öncesinde ve sonrasında 12 sorudan oluşan KAT her iki gruba ön-son test olarak uygulanmıştır. Uygulamalar sonunda ise deney grubundan 6, kontrol grubundan 7 öğrenci ile yarı yapılandırılmış mülakatlar yürütülmüştür. Mülakatlarda öğrencilere hız konusu ile ilgili aktifleşme enerjisi, sıcaklık etkisi ve katalizör etkisi ile ilgili günlük hayattan 3 soru sorulmuştur. Mülakat verileri betimsel bir yolla analiz edilmiştir. Öncelikle görüşme verileri yazılı hale getirilmiş sonrasında sadeleştirilmiştir. Anlamını bozmayacak şekilde veriler

özetlenmiş ve bazı öğrencilerin ifadelerinden doğrudan alıntılar yapılarak görüşme verileri sunulmuştur. Mülakata karılan deney ve kontrol grubun öğrencileri D1,D2…ve K1,K2…şeklinde kodlanmıştır. KAT'den elde edilen veriler SPSS paket programı kullanılarak analiz edilmiştir. Her iki gruba ait yapılandırılmamış gözlem verileri ise özetlenerek verilmiştir.

BULGULAR

Bulgular sırasıyla Kavramsal Anlama Testi'nden (KAT) elde edilen bulgular, mülakatlardan elde edilen bulgular ve gözlemlerden elde edilen bulgular şeklinde verilmiştir.

1. KAT'den Elde Edilen Bulgular

Bu başlık altında deney ve kontrol gurubuna ön-son test olarak uygulanan KAT'e ait puanların grup içi ve gruplar arasındaki karşılaştırılmasına ait bulgular verilmiştir. Grup içindeki karşılaştırmalar Wilcoxon İşaretli Sıralar Testi ile, gruplar arasındaki karşılaştırmalar ise Mann Whitney U testi kullanılarak yapılmıştır. Analiz sonuçlarına ait bulgular tablolar halinde aşağıda verilmiştir.

Grup İçi Karşılaştırmalar

Grupların KAT ön-son test puanlarının kendi içinde karşılaştırılmasına ait bulgular aşağıda verildiği gibi olmuştur.

Tablo 1. Deney grubunun KAT ön-son test puanlarına ait Wilcoxon İşaretli Sıralar Testi Sonuçları

Son test-ön test	n	Sıra ort	Sıra top	z	p
Negatif Sıra	0	.00	.00		
Pozitif Sıra	21	11	231	4.01*	0.00
Eşit	0				

*Negatif sıralar temeline dayalı

Tablo 1'de verilen analiz sonuçları incelendiğinde deney grubunun KAT ön-son test puanları arasında anlamlı bir farklılığın olduğu görülmektedir (z=4.01, p< .05). Fark puanlarının sıra ortalaması ve toplamları dikkate alındığında gözlenen bu farkın pozitif sıralar, yani son test puanı lehine olduğu görülmektedir.

Tablo 2. Kontrol grubunun KAT ön-son test puanlarına ait Wilcoxon İşaretli Sıralar Testi Sonuçları

Son test-ön test	n	Sıra ort	Sıra top	z	p
Negatif Sıra	0	.00	.00		
Pozitif Sıra	20	10,50	210	3,92*	0,00
Eşit	0				

*Negatif sıralar temeline dayalı

Tablo 2'de verilen analiz sonuçları ise kontrol grubunun KAT ön-son test puanları arasında da anlamlı bir farklılığın olduğunu göstermektedir (z=3.92, p< .05). Fark puanlarının sıra ortalaması ve toplamları dikkate alındığında gözlenen bu farkın pozitif sıralar, yani son test puanı lehine olduğu görülmektedir.

Gruplar Arası Karşılaştırmalar

Deney ve kontrol grubuna ait ön ve son test puanlarına ilişkin yapılan Mann Whitney U test sonuçlarına ait bulgular aşağıdaki tablolarda gösterilmiştir.

Tablo 3. Kavramsal Anlama Ön Test Puanlarının (KAÖT) Mann Whitney 'U' Testi Sonuçları

Gruplar	n	$\bar{X}$	Sıra Ort	Sıra Top	U	p
Kontrol	20	57.60	21.75	435.00		
Deney	21	57.95	20.29	426.00	195.00	0.695

Tablo 3 incelendiğinde deney ve kontrol grubu öğrencilerinin kavramsal anlama ön testinden aldıkları puanlar arasında anlamlı bir farklılık gözlenmemektedir (U=195.00; p>.05). Kavramsal anlama son test (KAST) puanları için yapılan Mann Whitney U testi sonuçlarına ait bulgular ise Tablo 4'de verilmiştir.

Tablo 4. Kavramsal Anlama Son Test Puanlarının (KAST) Mann Whitney 'U' Testi Sonuçları

Gruplar	n	$\bar{X}$	Sıra Ort	Sıra Top	U	p
Kontrol	20	81.80	11.52	230.50		
Deney	21	114.95	30.02	630.50	20.50	0.000

Tablo 4' de verilen analiz sonuçlarına bakıldığında deney ve kontrol grubu öğrencilerinin son test puanları arasında anlamlı bir farklılık gözlenmektedir (U=20.50; p< .05). Bu fark deney grubunun lehinedir. Deney grubunun aritmetik ortalaması 114,95 iken kontrol grubunun aritmetik ortalaması 81.80'dir.

2. Mülakatlardan Elde Edilen Bulgular

Bu bölümde mülakatlarda öğrencilere sorulan 3 soruya ilişkin öğrencilerin verdiği cevaplardan elde edilen bulgular verilmektedir. Öğrencilere sorulan ilk soru aktifleşme enerjisi ile ilgilidir. Soru şöyledir; "*Yanma tepkimelerinin genellikle ekzotermik tepkimeler olduğu, ekzotermik tepkimelerinse kendiliğinden gerçekleşen tepkimeler olduğu düşünülürse oda şartlarında bir mumun biz tutuşturmadığımız sürece yanmamasını nasıl açıklayabilirsiniz?*

Kontrol grubu öğrencilerinden 4'ü cevabı bilmediklerini ifade etmiştir. 1 öğrenci soruyu kısmen doğru açıklamış diğer iki öğrenci ise kavram yanılgısı içeren ifadelerle açıklama yapmıştır. Bu öğrencilerin cevapları kendi ifadelerinden aşağıdaki gibi olmuştur.

K3: Mumun yanması için bir enerjiye ihtiyacı var onu yaktıktan sonra katalizör bu görevi gerçekleştiriyor, bu sefer hızlanmasını sağlıyor öyle yani.

K5: Mumun kendiliğinden yanmaması hani bir maddenin tepkime vermesi için gerekli olan şiddete eşik enerjisi diyoruz. Bir tepkime durup dururken başlamaz gerekli olan bir enerji gerekir. Mesela mumu önce siz yakmakla ona gereken enerjiyi verirsiniz ondan sonra kendiliğinden mum bitene kadar yanar ve bir zaman sonra söner.

Deney grubundaki öğrencilerin ise biri hariç diğerleri cevabı doğru olarak açıklamış ve tutuşturmanın gerekli enerjiyi sağladığını ifade etmiştir. Bir öğrenci ise gerekli bir enerjiden bahsetmiş ancak adını söyleyememiştir. Deney grubundaki öğrenci cevaplarına örnekler aşağıda verilmiştir.

D1: "Oradaki kıvılcım çakmakla filan yakıyorduk işte o tepkimeyi başlatıyordu daha sonra tepkime kendiliğinden devam ediyordu. Kıvılcım belli bir aktivasyon enerjisi gerekiyor onu sağlıyor."
D5: "Tepkimenin başlaması için bir enerji gerekiyor, onu sağlıyor."
Mülakatta öğrencilere sorulan ikinci soru ise kimyasal reaksiyonların hızına sıcaklığın etkisi ile ilgilidir. Soru şöyledir; "*Hamurun mayalanmasında gerçekleşen tepkimenin denklemi* $C_6H_{12}O_6 \rightarrow 2C_2CH_5OH +$ *ısı şeklindedir. Bu tepkimede sıcaklık artırıldığında tepkimenin hızında ne gibi bir değişiklik meydana gelir? Nedenini açıklayınız."*
Kontrol grubu öğrencilerinden dördü hızın artacağını belirtmiş ancak sebebini bilmediklerini veya açıklayamayacaklarını ifade etmiştir.İki öğrenci soruyu denge kanunlarıyla açıklamaya çalışmış bir diğeri ise ekzotermik olması ile ilişkilendirerek açıklama yapmıştır. Bu öğrencilerin cevaplarından örnekler aşağıda verilmiştir.
K1: Hız artar ama neden diye sorarsanız, hımm, sıcaklığın artırılması reaktifler yönüne kaydıracak yani ne olabilir?
A: Tepkime hızını düşünerek denge ile ilişkilendirmeden açıklayabilir misin?
K1: Evet denge düşünüyorum şu an denge düşünüyorum hız hıımm. Tepkime hızı artar diye düşündüm ben. Onu nasıl açıklayacağım. Hız artar sıcaklıkla ama nasıl bilmiyorum.

K3: Hız artar sıcaklıkla çünkü ısı vermesiyle ya da ısı almasıyla alakası yok, hız artar sonuçta. Ama nasıl artırır sıcaklık nasıl açıklayayım bilmiyorum. Çok mu ezber yapmışım acaba hocam bilmiyorum ki.

K2: Hocam onu o kadar derinlemesine bilmiyorum sadece sıcaklığın hızı artırdığını biliyorum açıklamasını bilmiyorum.

Deney grubu öğrencileri ise cevaplarında aktifleşme enerjisinden, kinetik enerjiden ve etkin çarpışmalardan söz ederek soruyu yanıtlamıştır. Öğrencilerden biri ise herhangi bir değişiklik olmayacağını ifade etmiştir. Deney grubundan öğrenci cevaplarına örnekler aşağıdadır.

D1: Hem endotermik hem de ekzotermik olsun, sıcaklık tepkimenin hızını artırıyor.
A: Peki, neden artırıyor sıcaklığın nasıl bir etkisi var burada?
D1: Sıcaklık aktifleşme enerjisini geçen tanecik sayısını artırıyordu.
D4: Kinetik enerjilerini artırır moleküllerin, birbiriyle daha çok çarpışırlar daha hızlanırlar. Daha sonrada ürünlerin oluşma hızını da artırıyor tabi. Yani kinetik enerjileri artmıştır, daha hızlı ürün elde edilir , hızlı ve etkin çarpışırlar.
D5: Sıcaklık arttığında taneciklerin kinetik enerjisi arttığı için çarpışma sayıları artar. Daha hızlı gerçekleşir. Bu nedenle de aktifleşme enerjisini aşan daha çok tanecik oluyor.

Mülakatta üçüncü soruda öğrencilere *"evde annelerimiz yoğurt yaptığında tekrar kullanmak için küçük bir miktar ayırır. Ayrılan yoğurt parçasının tekrar yoğurt yapmakta etkisi ne olabilir?"* şeklinde bir soru sorulmuştur. Kontrol grubunda bu soruyu üç öğrenci doğru cevaplamış ve ayrılan yoğurtun katalizör olarak kullanıldığını ifade etmiştir. 2 öğrenci ise ara ürün olarak davrandığını belirtmiştir. Bu gruptaki bazı öğrenci açıklamalarına örnekler aşağıda verilmiştir.

K3: Oradaki ayrılan yoğurt ara ürün gibi önce bir tepkimede bulunuyor sonra diğerinde meydana geliyor bu da onun gibi bir olay diye düşündüm.
K4: 1 kilo süte mesela bir çay bardağı yoğurt koyarlar onun kimyasal yapısıyla onun kimyasal yapısını benzetmek için yoğurta benzesin diye konmuş olabilir bilmiyorum yani.
K5: Sütle maya reaksiyona girer, uygun sıcaklık sağlandığında hani bir de yoğurt yaptıktan sonra böyle etrafı filan kapatılır dışarıdan hava girmesin temas etmesin filan. Özellikle de sütün sıcak olmasına özen gösterilir mayayı tutsun diye. Hani bir tepkimeyi başlatır gibi. Tekrar yoğurtun oluşmasını sağlayan madde gibi bir şey.
A: Peki maya olmazsa hiçbir şekilde olmaz mı bu tepkime?
K5: Yok olmaz.

Deney grubu öğrencilerinin ise 4'ü ayrılan yoğurt parçasının katalizör etkisi yaparak mayalanma tepkimesini hızlandıracağını ifade etmiş, iki öğrenci ise yorum yapamamıştır. Öğrenci cevaplarına örnekler aşağıda verilmiştir.

D1: Katalizör zaten tepkimeyi hızlandırır. Başlatamaz ama hızlandırır. Sütü o şekilde bıraksak belki çok daha uzun sürede mayalanacaktı ama mayalanmayacaktı diyemeyiz çünkü katalizör başlatmıyor ama daha uzun sürede olacaktı bunun içinde biraz yoğurt koyuyorlar o da katalizör görevi görüyor. Aktifleşme enerjisini düşürüyor o yüzden hızlanıyor.
D3: Katalizör etkisi yapar.
A: Katalizörün etkisini açıklar mısın?
D3:Tepkimenin hızını artırıyordu daha çabuk ürün oluşmasını sağlıyordu, o olmasaydı yine tepkime gerçekleşirdi ancak daha uzun sürerdi. Aktivasyon enerjisini düşürüyordu.

3. Gözlemlerden Elde Edilen Bulgular

Kontrol grubundaki derslerde genellikle ders öğretmeni tarafından konunun teorik olarak öğrencilere anlatıldığı ve derslerin soru cevap şeklinde ilerlediği gözlenmiştir. Ders öğretmeni tüm derslerde ders kitabındaki konu sonu sorularını ve/veya özel yayınlardaki testleri ödev olarak vermiştir. Ünite sonunda ise ünitede geçen tüm kavramlarla ilgili öğretmenin hazırladığı karma sorular ve öğrencilerin çeşitli kaynaklardan çözemediği sorular sınıf ortamında birlikte çözülmüştür.
Deney grubundaki derslerde ise öğrenciler gruplar halinde çalışma yapraklarındaki etkinlikleri gerçekleştirmişlerdir. Öğrencilerin genellikle bu derslerde ilgili ve meraklı oldukları grup arkadaşları ile yardımlaştıkları gözlenmiştir. Bunun yanı sıra uygulamaların sonuna doğru öğrencilerin çalışma yapraklarındaki doldurulması gereken yerleri doldurmakta isteksiz davrandığı gözlenmiştir.

SONUÇ VE TARTIŞMA

Bu çalışmada kimyasal reaksiyonların hızı konusuna yönelik çalışma yaprakları geliştirilmiş ve öğrenci başarısına etkisi araştırılmıştır. Bu amaçla deney ve kontrol grubundaki öğrencilere KAT ön test olarak uygulanmıştır. Ön test puanları için yapılan Mann Whitney U Testi sonuçları gruplar arasında anlamlı bir farklılığın olmadığını göstermektedir ($U=195.00$; $p>.05$). Bu sonuç uygulamalardan önce her iki grubun kimyasal reaksiyonların hızı konusundaki ön bilgilerinin benzer olduğunu göstermektedir. Grupların kendi içindeki ön test-son test puanlarının karşılaştırılması için Wilcoxon İşaretli Sıralar Testi yapılmış ve test sonuçları her iki grubun öğretim sonrasında kavramsal başarısının anlamlı bir şekilde arttığını göstermiştir (Tablo 1 ve 2). Bu sonuç öğrencilerin kimyasal reaksiyonların hızı konusundaki çarpışma teorisi, reaksiyon hızı, aktifleşme enerjisi, mertebeli reaksiyonlar gibi kavramlarla ilk defa bu sınıf seviyesinde karşılaşmış olmaları ve her iki gruptaki öğretimin sonucu gerçekleşen öğrenmenin bir sonucu olarak düşünülebilir. Bu noktada her iki grubun birbirine göre KAT son test puanlarının karşılaştırılması daha anlamlı olacaktır. Bu amaçla son test puanları için yapılan Mann Whitney U testi sonuçları son testte deney grubunun lehine anlamlı bir farklılığın olduğunu göstermektedir ($U=20.50$; $p< .05$, Tablo 4). Bu durum çalışma yapraklarıyla öğretim yapılan deney grubundaki öğrencilerin kontrol grubundaki öğrencilere göre kimyasal reaksiyonların hızı konusundaki kavramları daha iyi öğrendiklerini göstermektedir. Yapılan gözlemler kontrol grubundaki derslerin daha çok öğretmen merkezli olduğunu ortaya koymuştur. Literatürde de çalışma yaprakları ile yürütülen öğretim etkinliklerinin geleneksel öğretime göre daha etkili olduğu ve bu materyallerin kullanıldığı öğrenme ortamlarında öğrencilerin zor olarak gördükleri kavramları daha kolay öğrenebildikleri belirtilmektedir (Kurt ve Akdeniz 2002; Coştu vd., 2003; Demircioğlu vd., 2004). Her iki gruptaki öğrencilerle yapılan mülakatlarda da bu durum açık bir şekilde görülmektedir. Deney grubundaki öğrencilerin çoğu hız kavramlarıyla ilgili günlük yaşam sorularını tatmin edici düzeyde açıklayabilirken

kontrol grubundaki öğrenciler genellikle verdikleri cevaplardan emin olamamış veya ezberi ifadelerle soruları açıklamıştır. Örneğin sıcaklığın hızı artırdığını ifade etmiş ancak sebebini açıklayamamıştır. Bunun yanı sıra kontrol grubundaki öğrencilerin ekzotermik bir tepkimeye sıcaklık etkisini denge kanunlarıyla açıklamaya çalıştıkları, katalizörü ara ürün olarak tarif ettikleri ve tepkimenin olabilmesi için katalizörün şart olduğunu düşündükleri tespit edilmiştir. Öğrencilerin benzer yanılgılarının olduğu literatürde de belirtilmiştir (Nakiboğlu vd., 2002; Çakmakçı ve Leach 2005). Çalışmada ayrıca aktifleşme enerjisi ile ilgili olarak K3 kodlu kontrol grubu öğrencisinin mumun yanma reaksiyonunun devam etmesinde katalizörün rolü olduğunu ve tepkimeyi hızlandırdığını ifade ettiği görülmüştür. K5 kodlu öğrenci ise eşik enerjisi için "bir maddenin tepkime vermesi için gerekli olan şiddet" şeklinde bir tanımlama yapmıştır. Muhtemelen kontrol grubundaki öğrencilerin bu düşünceleri kimyasal bir reaksiyon gerçekleşirken tanecik boyutunda neler olduğunu anlayamamalarından kaynaklanan bir durumdur. Gerçekten de kimyada öğrencilerin gözle göremeyecekleri atom, iyon, kimyasal bağ gibi pek çok soyut kavram vardır ve öğrencilere bu kavramların anlaşılmasının oldukça zor geldiği yapılan çalışmalarla da tespit edilmiştir (Ayas, 1995; Ahtee&Varjola, 1998; Solsona vd., 2003).

Bu noktada öğrencilerin zor olarak gördüğü bu soyut kavramların somutlaştırıldığı ve öğrencilerin aktif olarak katılabileceği öğrenme ortamlarının oluşturulması oldukça önemlidir. Çalışma yaprakları bu yönüyle öğretmen ve öğrencilere faydalı olabilecek kullanışlı bir materyaldir.

Bu çalışmada kimyasal reaksiyonların hızı konusundaki kavramların öğrenilmesinde çalışma yapraklarının öğrenmeyi olumlu etkilediği belirlenmiştir. Öğrenciler tarafından anlaşılması zor olan diğer kimya kavramları için de çalışma yaprakları geliştirilip etkilikleri incelenebilir. Ayrıca fakülte-okul işbirliği çerçevesinde öğretmenlere derslerinde çalışma yaprakları gibi farklı öğretim teknolojilerinin kullanılmasına yönelik uygulamalı seminerler verilmesi yararlı olabilir.

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BİR WEB SİTESİNİN KULLANILABİLİRLİK ÇALIŞMASI-HACETTEPE ÜNİVERSİTESİ ÖĞRENCİ İŞLERİ DAİRE BAŞKANLIĞI WEB SİTESİ ÖRNEĞİ

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Özet
Gelişen bilişim teknolojilerinin en önemlilerinden olan internet teknolojilerinin hayatımızın her alanını etkilemesi ve hayatımızda hızla yer alması diğer pek çok kurum gibi üniversitelerinde çeşitli hizmetlerini internet üzerinden sunmasını zorunlu kılmıştır. İnternet üzerinden sunulan uygulamalarda karşılaşılan en büyük sorun ise web sitelerinin kullanılabilirliği olmuştur. Üniversitelerde en çok kullanılan web sitelerinden olan, web siteleri içinde öğrencilerin en çok kullandığı ve ihtiyaç duyduğu site olarak düşünülen öğrenci işleri daire başkanlığı sitesinin önemi oldukça fazladır.
Bu araştırmanın amacı Hacettepe Üniversitesi Öğrenci İşleri Daire Başkanlığı (HÜÖİDB) web sitesinin öğrencilerin kullanımı açısından kullanılabilirliği incelemektir. Bu amaçla, araştırmacılar tarafından öğrencilerin her zaman kullanma durumunda kalacakları otantik görevler belirlenmiştir. Veriler araştırmacılar tarafından hazırlanan veri toplama araçları yoluyla toplanmıştır. Otantik kullanıcılarla otantik ortamlarda gerçekleştiren uygulamalar sonucunda web sitesinin kullanılabilirlik problemleri ortaya konulmuştur.
Anahtar Kelimeler: Kullanılabilirlik, kullanılabilirlik testi, web siteleri.

Abstract
Internet which is one of the most important information technologies, affects every side of our lifes and take place rapidly in our lifes. Like other institutions, universities are using internet technologies and every university has a website. By the help of their own web sites, universities inform their old and new students, staffs, academicians, alumni and the different parts of public in a short time.
The purpose of this study is to investigate, usability of HÜÖİDB web site according to students. For this aim, authentic tasks were determined by researchers. These tasks are usually used by students. Data collecting instruments were developed by the reseacher. After the application with authentic users in authentic environment, potential problems about usability of the web site are revealed.
Keywords: Usability, usability test, web sites.

GİRİŞ

İnternetin yaygınlaşması ile birlikte kurumlar için web sitelerinin önemi her geçen gün artmaktadır. Web siteleri kurumların dünyaya açılan penceresini oluşturmakta ve bu sayede kurumlar bütün kullanıcılarına çok kısa sürede ulaşmayı ve kurum kimliğine uygun şekilde grafiksel ara yüz yardımı ile geniş kitlelere gerekli bilginin iletilmesini sağlayabilmektedirler (Ateş ve Karacan, 2009). Web teknolojilerini kullanarak yeniliklere ayak uyduran bir kurum da üniversitelerdir. Üniversiteler sahip oldukları internet siteleri sayesinde kısa sürede eski ve yeni öğrencilerine, çalışanlarına, akademisyenlerine, mezunlarına ve toplumun değişik kitlelerine yer ve zaman fark etmeksizin kolaylıkla ulaşabilmektedirler. Bu kullanıcılar içinde en kalabalık kitle şüphesiz ki o üniversitede eğitim hayatına devam etmekte olan ya da mezun olan öğrencilerdir. Kullandıkları web sitesi sayesinde öğrenciler ders programlarını öğrenebilmekte, kendileri ile ilgili duyuruları, etkinlikleri ve aktiviteleri takip edebilmekte, kütüphane ve benzeri çevrimiçi hizmetleri kullanabilmekte, ayrıca bölümler, verilen dersler ve öğretim elemanları hakkında bilgiye kolaylıkla ulaşabilmektedirler.
Bütün web sitesi içerisinde, öğrencilerin kayıt ve kabul işlemlerinden mezuniyetlerine kadar geçen süre içindeki tüm özlük işlemlerinin yürütüldüğü ve bu anlamda denetim görevi yaparak, ilgili birimlerle eşgüdüm içinde çalışıp hizmet veren bölüm öğrenci işleri daire başkanlığıdır. Yüzüncü Yıl Üniversitesi (2008) öğrenci işleri ile ilgili hazırladığı raporda üniversiteler bünyesinde kurulan bu başkanlıkların yukarıdaki görevler dışında öğrencilerle ilgili olarak;

- Öğrenci kayıtlarının yapılması,
- Gerekli duyuruların hazırlanıp, duyurulması
- Öğrenci belgesi düzenlenmesi,
- Çeşitli kurumlara ait burs belgelerinin incelenmesi ve onaylanması,
- Öğrenci kimliği verilmesi,
- Yatay ve dikey geçiş belgelerinin hazırlanması,
- Transkript verilmesi,
- Öğrenci istatistiklerinin yapılması,
- Öğrencilerin askerlik işlemlerinin takibi,
- Öğrencilerin Emekli Sandığı, Bağ-kur ve SSK ile ilgili işlemleri,
- Diplomaların düzenlenmesi,
- Mezuniyet işlemleri,
- ÖSS, ALES müracaat formlarının onaylanması,
- Mezuniyet ile ilgili ilişik kesme işlemleri

gibi diğer işlemlerinde yapıldığını belirtmiştir.
Üniversiteler web sitelerinin kullanıcılarına bir yandan güzel imkânlar sunarken, bir yandan da kullanıcılar site içerisinde sayfalar arasında gezinim açısından, tasarım açısından ve güncellik açısından birtakım problemlerle karşılaşabilmektedirler. Patterson ve Alles (2009), kullanıcıların kullanılabilirlik düzeyi yüksek, önemli bilgi ve servislere erişimi kolay olan web sitelerini sunan üniversiteleri diğerlerine göre daha yeterli bulduğu ve tercihlerini yaparken bu kriterleri de göz önünde bulundurabileceklerini belirtmektedirler (Akt: Ateş ve Karacan, 2009). Ayrıca kullanıcılar gezinme ve tasarım problemleri yüzünden memnuniyet sorunları yaşayabilmektedirler. Kullanıcıların, kullanılabilirlik düzeyi yüksek, bilgi ve servise erişimi daha kolay olan siteleri tercih ettikleri göz önünde bulundurulduğunda yaşanan sorunları en aza indirmek için bilimsel çalışmaların ışığında elde edilen bulguların önemi daha da artmaktadır (Özçelik ve diğerleri, 2006).
Kullanılabilirlik testi yapılmasındaki amaç; ortamı kullanıcı açısından değerlendirmek, kullanımı daha kolay ortam geliştirmek, kullanıcıların memnuniyet düzeyi arttırmak ve sistemi iyileştirmektir. Bu amaçlar doğrultusunda da ortamın kullanımında ortaya çıkan problemler tespit edilerek oluşturulacak olan tasarım kullanıma uygun hale getirilmeye çalışılır (Rubin, 1994). Ayrıca kullanılabilirlik testi ile kullanıcıların amaçlanan işleri etkili ve verimli bir şekilde yapıp yapamadığına da bakılır (Ersoy, 2006). Kullanılabilirlik çalışmasında süreç, istenen arayüzün belirlenen hedef kitlede belirlenen görevlerin yaptırılması ve bu süreçte kullanıcıdan verimlilik, etkililik ve memnuniyet değerlerinin alınması ve değerlendirilmesi şeklinde gerçekleştirilir (Alaçam ve Erson, 2008).

Kullanılabilirlik testi herhangi bir bilgi sisteminin bir kullanıcısının o sistemi ne kadar etkin, etkili ve tatminkâr kullandığını anlamak amacıyla kullanılan araştırma yöntemidir (Akıncı ve Çağıltay,2005). Kullanılabilirlik testi gerçek kullanıcılar ve gerçek görevler ile yapılan ve arayüzlerin değerlendirilmesinde kullanılan en yaygın ve en temel kullanılabilirlik mühendisliği metodudur (Kılıç ve Güngör, 2006).
Nielsen (2003), web uygulamaları için kullanılabilirliğin büyük önem taşıdığını, çünkü eğer bir web sitesini kullanmak zor ise, bir web sitesi amaçlarını ve onunla yapılabilecekleri açıkça göstermiyorsa, bir web sitesi içinde kaybolunuyorsa, bir web sitesindeki bilgileri okumak zorsa ve bir web sitesi önemli sorulara cevap vermiyorsa insanların bu web sitesini kullanmayacağını ifade etmiştir (Özdemir ve diğ.,2007).
Bu çalışmada, üniversite öğrencilerinin kayıt ve kabul işlerinden mezuniyete kadar geçen sürede tüm özlük işlemlerini çevrimiçi olarak yürüttükleri elektronik ortam olan HÜÖİDB web sitesinin, kullanıcıların bakış açısına göre kullanılabilirlik sorunlarının belirlenmesi, yaşanan sorunların ortaya çıkarılması, daha etkili, verimli ve kolay kullanılması için nelerin yapılabileceğini ortaya çıkarmak amaçlanmıştır.

YÖNTEM

Veri Toplama Araçları

Veri toplama aracı olarak araştırmacılar tarafından geliştirilen ve dört bölümden oluşan "Kullanılabilirlik Memnuniyet Formu" kullanılmıştır. Formda, birinci bölümde kullanıcılara bu çalışmanın niçin yapıldığı ve süreçte nasıl bir yol izleneceği ile ilgili bilgiler verilmiştir. İkinci bölümde öğrencilerin demografik özelliklerini, bu siteyi kullanım amaçlarını ve sıklıklarını, bilgisayar ve internet kullanım düzeylerini öğrenmeye yönelik sorular bulunmaktadır. Üçüncü bölüm katılımcıların gerçekleştireceği görevlerin listesinden oluşmaktadır. Dördüncü bölüm öğrencilerin görüşlerini almak için hazırlanan yarı yapılandırılmış görüşme sorularından oluşan bölümdür. Dördüncü bölümdeki görüşme soruları, öğrencilerin sitenin kullanılabilirliği ile ilgili görüşlerini ve önerilerini almaya yönelik dört tane sorudan oluşmaktadır.

Katılımcılar

Katılımcılar belirlenmeden önce, yapılan araştırmalar sonucunda HÜÖİDB web sitesinin en fazla lisans öğrencileri tarafından kullanıldığı belirlenmiştir ve katılımcı olarak Hacettepe Üniversitesinde eğitime devam etmekte olan lisans öğrencileri seçilmiştir. Katılımcılar seçilirken farklı fakültelerden ve farklı bölümlerden seçilmesine dikkat edilmiştir. Katılımcı bilgileri Tablo 1'de verilmiştir.

Tablo:1 Katılımcıların Bilgileri

Katılımcılar	Fakülte	Bölüm	Sınıf	Cinsiyet
Katılımcı-1	Eğitim	İngilizce Öğretmenliği	2.sınıf	Kız
Katılımcı-2	Eğitim	İngilizce Öğretmenliği	2.sınıf	Kız
Katılımcı-3	Eğitim	BÖTE	2.sınıf	Erkek
Katılımcı-4	Eğitim	BÖTE	3.sınıf	Erkek
Katılımcı-5	Mühendislik	Elektrik-Elektronik	1.sınıf	Erkek
Katılımcı-6	Eğitim	BÖTE	2.sınıf	Erkek
Katılımcı-7	Sağlık YO	Hemşirelik Y.O.	4.sınıf	Kız

Görev Tasarımı

İlk olarak Öğrenci İşleri Daire Başkanlığının web sitesi incelenmiştir. Katılımcıların tamamlaması gereken görevler belirlenirken uzmanlar tarafından site üzerindeki her bir alt menüyle ve sitedeki duyurularla ilgili görevlerin seçilmesine dikkat edilmiştir. Ayrıca görevler seçilirken bunların otantik olmasına ve günlük kullanımları doğrultusunda seçilmesine özen gösterilmiştir. Bu çerçevede 10 tane görev belirlenmiştir. Belirlenen bu görevler Tablo 2'de gösterilmiştir.

Tablo2: Görevler

Görev1	Öğrenci işleri ile iletişime geçmek için gerekli bilgileri bulunuz.
Görev2	2010 Bahar döneminde ders döneminin hangi tarihte başladığını bulunuz.
Görev3	2009-2010 öğretim yılı güz dönemi sonunda yabancı diller yüksekokulu tarafından yapılacak olan yabancı dil yeterlik sınavına girmek için gerekli olan dilekçe örneğini bilgisayarınıza indiriniz.
Görev4	Bir ders için puanı 67 olan öğrencinin harf notu ve katsayı karşılığını yönetmelikten bulunuz.
Görev5	Öğrenci işleri sayfasından online işlem yapmak için kullandığınız şifrenizi unuttuğunuzda yeni şifre başvurusunu nereden yapabileceğinizi bulunuz.
Görev6	Bu dönem toplam kaç kredi ders aldığınızı bulunuz.
Görev7	Duyuru arşivinde yer alan en eski duyurunun ilan tarihini bulunuz.
Görev8	Kimlik kartınızın kaybolması durumunda yenisini alabilmeniz için neler yapılması gerektiğini bulunuz.
Görev9	Üniversitemizin Beytepe Yerleşke haritasını açınız.
Görev10	Ders değerlendirme anketi sayfasını açınız.

Testin Uygulanışı

Uygulama aşamasına geçildiğinde görevlerin otantik ortamlarda yapılmasına dikkat edilmiştir. Katılımcılarla imkân dâhilinde, web sitesini kullandıkları ortamlarda çalışmalar yapılmıştır(Bölüm Laboratuarları, evleri vb.). Ortamın uygun olmadığı durumlarda ise, araştırmacılar tarafından kullanıcıya uygun olan bir ortam seçilmiştir. Kullanıcıların ses ve ekran kayıtlarını kaydedebilmek için Captivate programı uygulama yapılan ve donanımsal olarak yeterli olan bilgisayarlara kurulmuştur. Kurulamayanların ise ses kaydını alabilmeleri için gerekli yazılım ve donamları kontrol edilmiştir.
Süreç izin belgesinin okunmasıyla başlamıştır. Kullanıcılara çalışmanın amacı ve içeriği hakkında bilgi verilmiş, onlardan elde edilen bilgilerin ve ses kayıtlarının kullanılabilmesi için izin istenmiştir. Daha sonra katılımcılar kendilerine dağıtılan Demografik Bilgi formunu doldurmuştur. Bu işlemin ardından katılımcılara, araştırmacılar tarafından hazırlanan görevlerinin yazılı olduğu bir kâğıt verilmiştir. Ayrıca her bir görev uygulamayı yapan araştırmacı tarafından kullanıcıya sesli olarak okunmuştur. Kullanıcılar görevi tamamlamada zorluk çektiklerinde ya da diğer soruya geçmek istediklerinden bunu belirtmeleri istenmiş ve tüm görevleri sırasıyla gerçekleştirmek için ses kaydıyla birlikte görevlere başlanmıştır. Bu süreçte katılımcılardan sesli düşünmeleri ve adım adım neyi yaptıklarını söylemeleri istenmiştir. Bunu unutan kullanıcılara sesli düşünmeleri gerektiği süreç içinde hatırlatılmıştır. Sadece katılımcıların ses kayıtları alınmakla kalmamış, araştırmacılar katılımcıların davranışlarını, yorumlarını ellerindeki gözlem formuna kaydetmişlerdir. Görevlerin tamamlanmasının ardından görüşme sorularına geçilmiştir. Bu sorular yarı yapılandırılmış şekilde sorulmuş olup; görsel tasarım, gezinim, güncellik ve genel değerlendirme ile ilgilidir.

BULGULAR

Uygulama Bulguları

Katılımcılara başlangıçta bilgisayar ve internet kullanım tecrübeleri ve günlük bilgisayar ve internet kullanım düzeyleri ile ilgili sorular yöneltilmiştir. Buna göre çalışma grubunu oluşturan katılımcıların büyük çoğunluğu 4-6 yıldır bilgisayar ve internet kullanma tecrübesine sahip olduklarını, BÖTE ve Elektrik-Elektronik bölümlerinde okuyan öğrencilerin ise 7 yıldan daha uzun süredir tecrübeli olduklarını

belirtmişlerdir. Günlük bilgisayar ve internet kullanım saatlerini ise BÖTE öğrencileri, bölümleri gereği 4-6 saat, diğer bölümlerin öğrencileri ise 2-4 saat olarak belirtmişlerdir. Sonuç olarak, araştırmanın çalışma grubunu oluşturan katılımcılar, bilgisayar ve internet kullanım tecrübesine sahip; ayrıca her gün muhakkak bilgisayar ve internet kullanan bireylerdir.

Daha sonra öğrencilere HÜÖİDB web sitesini kullanıp kullanmadıkları, kullanıyorlar ise ne sıklıkla, ne zaman ve ne amaçla kullandıkları ile ilgili sorular içeren görüşmeler yapılmıştır. Öğrencilerle yapılan görüşmeler sonucunda tüm öğrencilerin Öğrenci İşleri Daire Başkanlığı web sitesini kullandıkları ortaya çıkmıştır. Öğrenciler bu siteyi en çok dönem başı ve dönem sonlarında kullandıklarını, dönem içinde pek kullanmadıklarını ifade etmişlerdir. Dönem başında öğrencilerin tamamı ders kaydı için, bazısı haftası geldiğinde ders ekleme ve silme için, bazısı ise ek olarak dönem başı duyuruları için siteyi kullandıklarını söylemişlerdir. Öğrencilerden bir tanesi de harcının yatıp yatmadığını öğrenmek için siteyi kullandığını ifade etmiştir. Dönem sonunda ise öğrencilerin tamamı doldurmaları zorunlu olan ders değerlendirme anketini doldurmak ve notlarını kontrol etmek için siteyi kullandıklarını belirtmişlerdir. Dönem içinde siteyi kullandığını ifade eden bazı öğrenciler sadece notlarına bakmak için giriş yaptıklarını söylemişlerdir. Ek olarak sınav tarihlerini öğrenmek için de siteye giriş yaptığını ifade eden bir öğrenci bulunmaktadır. Sadece bir öğrenci dönem içinde 15-20 günde bir siteye girip güncel duyuruları takip ettiğini dile getirmiştir. Sonuç olarak, öğrenci işleri daire başkanlığı web sitesi dönem başı ve dönem sonunda yoğun bir şekilde kullanılırken, dönem için pek kullanılmamaktadır. Bunun nedeni öğrenciler dönem başı ve dönem sonunda zorunluluk ve ihtiyaçtan dolayı siteyi kullanmak durumunda kalırken, dönem içinde siteyi kullanmak için ne zorunluluk ne de ihtiyaç hissetmektedirler.

Görev süreleri ile ilgili olan Tablo 3 incelendiğinde öğrencilerin en çok zaman harcadıkları görevin ortalama 87 saniye ile kimlik kartlarının kaybolması durumu ile ilgili olan sekizinci görev olduğu anlaşılmaktadır. Sekizinci görevi 74 saniye ortalaması ile yönetmelik ile ilgili olan dördüncü görev, 61 saniye ortalaması ile akademik takvim ile ilgili olan ikinci görev izlemektedir. Öğrencilerin en az zaman harcadığı görev 25 saniye ortalaması ile şifre ile ilgili olan beşinci görev olmuştur. Bu görevi 45 saniye ortalaması ile duyurularla ilgili olan beşinci görev takip etmektedir. Tablo 3'te dikkat çeken nokta hemen hemen bütün görevlerin ranjlarının yüksek olmasıdır. Bunun nedeni öğrencilerin deneme yanılma yoluyla görevi gerçekleştirdikleri, web sitesini kullanan öğrencilerin görev için daha az zaman ayırmaları, web sitesini kullanmayan öğrencilerin ise sayfaya aşina olmadıkları için fazla zaman ayırdıkları söylenebilir.

Tablo 3: Görev Süreleri (Saniye)

	Ranj	Minimum	Maksimum	Ortalama	Standart Sapma
Görev1	76	20	96	56	27,22
Görev2	68	26	94	61	22,40
Görev3	106	12	118	58	34,07
Görev4	108	27	135	74	39,09
Görev5	28	17	45	25	10,48
Görev6	95	28	123	56	32,22
Görev7	81	17	98	45	33,22
Görev8	71	47	118	87	28,99
Görev9	56	26	82	56	21,63
Görev10	74	23	97	52	26,85

Tablo 4'te ise görevlere ait başarı durumları ve başarı oranları verilmiştir. Tablo4'e bakıldığında üçüncü, dördüncü, yedinci, dokuzuncu ve onuncu görevlerin bütün katılımcılar tarafından başarılı bir şekilde tamamlandığı görülmektedir. Ayrıca beşinci görev de altı öğrenci tarafından yerine getirilerek büyük başarı oranı ile tamamlanan görevler arasında yer almıştır. Diğer taraftan en az başarı gösterilen görev bir öğrenci başarısı ile birinci görevdir. Ayrıca birinci görev için en çok kısmen başarı gösterilen görev de diyebiliriz. Birinci görevde beş öğrenci görevin bir parçasını gerçekleştirerek kısmen başarılı olmuşlardır. Birinci görevin ardından %29 başarı oranı ile en başarısız olunan görev sekizinci görevdir.

Tablo 4: Görev Başarı Durumları

	Sonuç			
	Başarılı	Başarısız	Kısmen Başarılı	Başarı Oranı(%)
Görev1	1	1	5	14
Görev2	5	-	2	71
Görev3	7	-	-	100
Görev4	7	-	-	100
Görev5	6	1	-	85
Görev6	5	2	-	71
Görev7	7	-	-	100
Görev8	2	5	-	29
Görev9	7	-	-	100
Görev10	7	-	-	100

Görüşme Bulguları

Görevlerle ilgili uygulama yapıldıktan sonra, katılımcılarla görüşme formunda yer alan sorular doğrultusunda görüşmeler gerçekleştirilmiştir. Katılımcılara ilk olarak, ***"Sitenin görsel tasarımını nasıl buldunuz?"*** sorusunu yönelttiğimizde genel olarak, verilen cevapları olumlu görüşler ve olumsuz görüşler olmak üzere iki kategoride inceleyebiliriz. Bu soruya verilen cevaplar incelendiğinde, sitenin görsel tasarımının sade ve yeterli olduğu, yazı tipinin okunaklı ve anlaşılır olduğu fakat biraz daha büyük olsa daha iyi olabileceği ve renklerin çok uyumlu olduğu katılımcılar tarafından belirtilmiştir. Katılımcıların en çok sıkıntıya düştükleri ve olumsuz görüş belirttikleri konu ise, yazıların çok iç içe olmasıydı. Konu başlıkları, daha büyük ve daha belirgin yapılırsa görsel tasarım açısından sitenin daha çok göze hitap edeceği belirtilmiştir. Ayrıca sağ üst köşede sürekli akan yazı, kullanıcıların dikkatini dağıtmış ve bu durumdan rahatsız olmuşlardır.

Genel olarak katılımcılar, sitenin tasarımını kullanışlı ve uygun bulsalar da, yazıların çok fazla alt alta olmasından, menülerin yeterince belirginleştirilmemesinden ve bilgilerin ayrıntılı başlıklar halinde verilmemesinden şikâyetçi olmuşlardır.

Katılımcılara ***"Sitede aradıklarınızı kolaylıkla bulabildiniz mi? En çok nerelerde sıkıntı yaşadınız?"*** sorusunu yönelttiğimizde genelde verilen cevaplar kolaylıkla bulabildim ve birazcık zorlandım şeklinde iki kategoride toplanabilir. Verilen cevaplar incelendiğinde kullanıcıların 5 tanesi görevleri gerçekleştirirken zorlanmadıklarını, 2 tanesi ise biraz zorlandığını belirtmişlerdir. Sitede zorlandığını belirten kullanıcılar, genellikle yapamadıkları görevleri belirterek zorlanmalarını, istenilen görevi yerine getirememelerine bağlamışlardır. Katılımcılar en çok sıkıntı yaşadıkları yerleri ise, kimlik kartının kaybolması, yerleşke haritasının bulunması ve iletişim bilgilerinin bulunması görevleri olarak belirtmişlerdir. Bu durum görev başarı çizelgesindeki bilgilerle de örtüşmektedir. Ayrıca katılımcılar, devamlı kullandıkları bilgilere ulaşmakta zorlanmadıklarını, kullanmadıkları bilgilerde ise zorlandıklarını ifade etmişlerdir.

Katılımcılara, ***"Sitedeki bilgilerin güncelliği ile ilgili ne düşünüyorsunuz?"*** sorusunu yönelttiğimizde bütün katılımcılar sitenin oldukça güncel olduğunu, duyuruların çok yakın tarihlere ait olduğunu ve sitenin güncellikle ilgili herhangi bir problemi olmadığını belirtmişlerdir. Ayrıca kullanıcılar, siteye her girdiklerinde mutlaka güncel bilgilerin sitede yer aldığını, bu açıdan siteden çok memnun olduklarını ve sitenin güncellik açısından ihtiyaçlarını karşıladıklarını belirtmişlerdir.

Katılımcılara, web sitesinde yapılabilecek değişikliklerle ilgili fikirlerini öğrenebilmek amacıyla ***"Sitenin daha iyi olabilmesi için neler değiştirilebilir?"*** sorusu yöneltilmiştir. Katılımcıların genel olarak odaklandıkları sorunun sitenin görsel tasarımı, gezinimi ve içeriği olduğu görülmektedir. Sitenin çok dağınık ve düzensiz olması, duyuruların bütün siteyi kaplaması, yukarıdaki başlığın gereksiz kalınlıkta olması, sitenin çok uzun olduğu ve bu yüzden bir bilgi ararken sürekli aşağı-yukarı gitmek zorunda kalındığı, menülerin bir kısmının aşağıda, bir kısmının yukarıda ve bir kısmının ise sağda olması gibi sorunlar kullanıcılar tarafından belirtilen sorunlardır.

SONUÇ VE ÖNERİLER

HÜÖİDB web sitesinin kullanılabilirlik analizinin sonuçları incelendiğinde, gerek yapılan görevlerde gerekse görüşmeler sonucunda, katılımcıların ana sayfadaki menülerin kullanımı konusunda sorun yaşadıkları görülmüştür.

Katılımcıların görevleri gerçekleştirme süreçleri ve yapılan görüşmeler incelendiği zaman sitenin tasarımıyla ilgili sorunlar yaşadıkları açıktır. Kendileri için düzenlenen bu sayfada aradıkları bilgiyi bulmakta güçlük çektikleri, menüler arasında kayboldukları, menülerin alt menülerini tasarım hatalarından dolayı deneme yanılma yoluyla, uzun uğraşlar sonunda buldukları görülmüştür. Sayfanın tasarımında genel web sitesi tasarım standartlarından farklı olarak menünün üst ve solda olması yerine; sayfanın üst, sağ ve en altında bulunması öğrencilerin kullanımını etkilemektedir. İlk başta gözleri ile menüleri uzun süre arayan öğrenciler aradıklarını bulamamaları durumunda sayfanın altına yönelmişler ve işlemlerini oradan gerçekleştirmişlerdir. Bu durum öğrenci işleri ana sayfasının tasarım hatalarından ve eksiklerinden kaynaklanmaktadır. Bununla ilgili olarak sayfanın başındaki menüler ve başlıkları yeniden düzenlenebilir. Bunun için menülerinin üstüne gelindiği zaman kullanıcıların en çok tercih ettiği menülerin açık haline ulaşılması sağlanabilir. Böylece öğrencilerin menülerin karmaşasından kurtulması, deneme yanılma yolu ile gereksiz zaman harcamalarının önüne geçilmesi sağlanmış olacaktır. Ayrıca bu düzenleme ile menülerin açık haline sayfanın alt tarafında yer verilmesine gerek kalmayacaktır.

İlgili bağlantıların sayfanın farklı yerlerinde verilmesi de aranılan bağlantının bulunmasında sıkıntılar yaratmıştır. Bununla ilgili olarak tüm ilgili linklerin bir arada bulunması ve sayfanın görülebilir kısımlarında kullanılmasının yaşanılan sorunu azaltacağı düşünülmektedir.

Kullanıcıların görüşleri ve yorumları ile ilgili bir değerlendirme yapıldığında, genel olarak sistemde gezinim rahat gibi görünse de, sayfanın çok uzun olması, menülerin farklı yerlerde bulunması ve bilgilerin dağınık bir şekilde yapılandırılması kullanıcılar açısından, görevleri tamamlarken sıkıntı yaratmıştır. Bu bağlamda sitenin yerleşimi tekrar gözden geçirilmeli ve menüler tekrar düzenlenmelidir.

Bu düzenlemeler yapılırken sayfada aynı anda pek çok bilginin verilmesinin de önüne geçilebilir. Çünkü öğrenciler yapılan görüşmelerde yazıların çok alt alta ve karmaşık olmasından şikâyetçi olmuştur. Ayrıca menülerin yeteri kadar belirgin ve dikkat çekici olmadığını dile getirmişlerdir. Bununla ilgili olarak hazırlanan başlıklar daha rahat ve ayırt edilebilir bir fontta ve renkte hazırlanırsa; duyurular anasayfa yerine ilgili linkte toplanarak düzenlenirse, öğrencilerin yaşadıkları bu sorunların da önüne geçilebileceği düşünülmektedir.

İçerik ve bilginin güncelliği açısından sorun yaşanmayan sitenin görsel tasarım ve gezinim açısından tekrardan gözden geçirilip; belirlenen sorunlar doğrultusunda düzenlemelerin yapılması web sitesinin kullanılabilirliğini arttıracaktır.

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BİREYSELLEŞTİRİLMİŞ ÖĞRETİM SİSTEMLERİ VE YENİ YAKLAŞIMLAR

INDIVIDUALIZED LEARNING SYSTEMS AND NEW APPROACHES

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Özet
Bireyselleştirme; öğretimin kişinin ihtiyaçları, öğrenme stili gibi duyuşsal özelliklerinin yanı sıra bilişsel bilgi düzeyine göre biçimlendirilmesidir. Bir öğretim sistemi tasarlanırken bireysel farklılıklar göz önüne alınarak bir sistem tasarımı yapılmalıdır. Bireyselleştirilmiş öğretim sistemleri alanındaki ilk çalışmalar Zeki Öğretim Sistemleri ile başlamıştır. Hipermedya sistemlerinin eğitim alanında kullanılmaya başlanması ile Uyarlanır Öğretim Hipermedya Sistemleri geliştirilmiştir. Bu sistemlerde yaşanan içerik bağımlı problemlerin giderilmesinde Semantik Web ve web servislerine dair teknolojilerin kullanılmaya başlanması ile bireyselleştirilmiş öğretim sistemleri alanındaki çalışmalar gelişimi yeni bir hal almıştır. Son on yıldır, mimari yapısını Zeki öğretim Sistemi ve Uyarlanır Hipermedya Öğretim Sistemleri'nden alan ontoloji ve semantik web servislerine dayalı Web Tabanlı Uyarlanır ve Zeki Öğretim Sistemleri veya Zeki ve Uyarlanır E-Öğrenme Sistemleri olarak adlandırılan alanda çalışmalar yoğunlaşmıştır. Bu çalışmada; bireyselleştirilmiş öğretim sistemleri alanında yapılan çalışmaların değerlendirilmesinin yanında bu alanda yaşanan gelişmeler ve yeni teknolojiler açıklanmakta ve gelecekte yapılacak çalışmalara yönelik öneriler sunulmaktadır.

Abstract
Personalization is formatted of the education according to the person's needs as well as emotional characteristics such as learning styles and the level of cognitive information of the person. When designing a teaching system individual differences should take into consideration. The first studies in the field of individualized educational system began with Intelligent Tutoring Systems. Then, Adaptive Education Hypermedia Systems have been developed. Because of the content related problems of these systems, Semantic Web and Web services technology begins to be used in the field of individualized instructional systems development. The last ten years, the works in the area which are called intelligent and Adaptive E-Learning System are based on the architectural structure of intelligent educational system and Adaptive Hypermedia Teaching System the ontology and semantic web services are increased. In this study, previous studies in the field of individualized instruction system is evaluated and the developments in this field and new technologies are explained and suggestions for future work to be done are presented.

GİRİŞ

Bireyselleştirilmiş öğretim alanında yapılan çalışmalar 1970'li yıllardan itibaren; Eğitim Teknolojisi, Bilgisayar Bilimleri ve Yapay Zekâ disiplinlerinin ortak alanında tasarım, gerçekleştirme ve uygulama boyutunda devam etmektedir (Brusilovsky&Peylo, 2003). İlk çalışmalar "Zeki Öğretim Sistemleri(ZÖS)" ile başlamıştır. ZÖS alanında 1990'lara kadar devam eden çalışmalar, hiper ortam sistemlerinin eğitim alanında kullanılmaya başlanması ile yerini "Uyarlanır Öğretim Hiper Ortam Sistemleri (UÖHS)"ne bırakmıştır. 2000'li yıllardan itibarende Web teknolojileri temel alınarak sürdürülen uyarlanır hiper ortam sistemleri alanındaki araştırmalar son yıllarda Semantik Web ve web servislerine dair teknolojilerin gelişimi ile yeni bir hal almıştır. Son on yıldır, mimari yapısını ZÖS ve UÖHS'lerden alan ontoloji ve semantik web servislerine dayalı "Web Tabanlı Uyarlanır ve Zeki Öğretim Sistemleri" olarak adlandırılan alanda çalışmalar yoğunlaşmıştır. Bu alandaki araştırmalar, hem Eğitim Bilimleri hem de Bilgisayar Bilimleri alanında çalışan araştırmacılar için bireysel veya ortak çalışma alanıdır.

Bu çalışmada öncelikle bireyselleştirilmiş öğretim sistemi alanındaki çalışamaların gelişim süreci açıklanmaktadır. Takip eden bölümde, Semantik Web teknolojileri, bu teknolojilerin öğretim sistemlerine ve e-öğrenme üzerindeki etkisi ve Semantik Web teknolojilerine dayalı olarak geliştirilen bireyselleştirilmiş e-öğrenme sistemleri ve bu alandaki çalışmalar açıklanmaktadır. Sonuç kısmında ise, sunulan çalışmaların bir değerlendirmesinin yanı sıra bireyeselleştirilmiş öğretim sistemleri alanında ileriye yönelik yapılacak çalışmalara dair öneriler yer almaktadır.

BİREYSELLEŞTİRİLMİŞ ÖĞRETİM SİSTEMLERİNİN GELİŞİM SÜRECİ

Bireyselleştirilmiş öğretim sistemleri alanında yapılan ilk çalışmalar, BDE programlarında öğrenci bilgisini değerlendirmede kullanılan "doğru/yanlış" soruları veya "çoktan seçmeli" sorulardan daha akıllı değerlendirme tekniklerinin kullanılması fikriyle ortaya çıkmıştır. Bu teknikler; öğretimin doğrusal ve dallanmış bir yapıda sunulmasına göre daha fazla bireyselleştirme yeteneğine sahip olmasını amaçlayan "Zeki BDE (I-CAI)" olarak adlandırılan öğretim sistemlerinin ortaya çıkmasına sebep olmuştur. Bu sistemlerde kullanılan ilk zeki teknikler, "öğretim programı sıralama (curriculum sequencing)" ve "zeki çözüm analizi (Intelligent Solution Analysis)"dir (Brusilovsky&Peylo, 2003). Bu sistemler; genellikle öğretim içeriğinin bireyin ihtiyaçlarına uygun olarak uyarlanmasını hedef alan, bunun yanında örnek ve problem uyarlmasıyla öğretimi pekiştiren sistemlerdir. Scholar, Sophie adlı ZÖS'leri bu sistemlerin örnekleridir (Shute&Psotka, 1996).

1980-1990 yılları arasında geçen on yıllık süreçte gerçeklenen ZÖS, genelde bağımsız(stand-alone) sistemlerdi. Bu sistemler problem çözme desteği sağlayarak öğretimi amaçlayan sistemlerdir. Dolayısıyla, bu sistemlerde kullanılan temel ZÖS teknolojisi de "etkileşimli problem çözme desteği (interactive problem solving support)"dir (Brusilovsky&Peylo, 2003). Guidon (Wu&Lee, 1998), Circsim Tutor (Zhou, 2000), ELM-ART (ilk versiyonu) (Brusilovsky et al., 1996) bu alanda değerlendirilen ZÖS örnekleridir.

1990'ların sonundan itibaren, Web teknolojilerinin ve Web teknolojileriyle ilişkili hipermedya teknolojilerinin ZÖS alanında kullanılmaya başlanmasıyla daha kapsamlı öğretim desteği sunan, farklı öğrenme nesnelerini (problem, örnek, sunum,..vb. gibi) içeren birden fazla ZÖS teknolojisini kullanan Uyarlanır ve Zeki Web Tabanlı Öğretim Sistemleri (Adaptive and Intelligent Web Based Learning Systems) alanında çalışmalar yapılmıştır. 1990'lı yılların sonuna kadar, geliştirilen tüm ZÖS örnekleri, tek bir ilgi alanı için uzmanlık bilgisi sunan sistemlerken; hipermedya ve web teknolojilerinin kullanılmaya başlanması ile, ZÖS'nin büyük bir açığı olan ilgi alanı bağımsız (domain independent) ZÖS geliştirilmesi üzerine çalışmalar yapılmıştır. İlgi alanı bağımsızlığı, bazı araştırmacılar tarafından "zeka"nın temel karakteristiği olarak görülmektedir. Birçok uzmana göre de herhangi bir ilgi alanı için geçerli sayılabilecek bazı temel pedagojik bilgiler, ZÖS içinde model alınarak; özünde ilgi alanı bağımsız sistemler tasarlanabilir (Freedman, 2000). Yapılandırmacı öğretim yaklaşımına göre tasarlanan COFALE (Chieu, 2005) adlı sistem bu görüşü destekleyen bir örnek olarak incelemeye değerdir.

ZÖS VE UÖHS'NİN DEĞERLENDİRİLMESİ

Y.Z-Eğitim disiplinin araştırma alanı olan Z.Ö.S ve UÖHS'nin her biri, bilgi tabanlı sistem uygulamasıdır. Bilgi tabanlı sistemlerin temel bileşeni ilgi alanıdır. ZÖS alanında ortaya konan sistemlerin hemen hepsi ilgi alanı bağımlı sistemlerdir (Örn: Elm-Art, InterBook). Bu sistemler, büyük emekle uzun araştırmalar sonucu sadece tek bir ilgi alanı için geliştirilmiş uzman sistem uygulamalarıdır. Bu durum, hem maddi ve manevi zorluklarla karşılaşılmasına hem de sistemlerin kısıtlı uygulama alanı bulmasına sebep olmuştur. Geliştirilen sistemlerin alana özel olması başka ZÖS veya UÖHS ile kıyaslanabilirliklerini de engellemiştir. Bu sebeple, sistemlerin modelleri için oluşturulan kavramsal yapıların aynı sistemde farklı biçimlerde veya farklı sistemlerde kullanılabilirliği mümkün olmamıştır. Bu sebeple geliştirilen sistemler için bir standart ortaya koymak mümkün değildir. Bu tip sistemler için ortaya çıkarılan tek standart, sistemleri meydana getiren modeller için sunulan standart yapıdır. Bir ZÖS veya UÖHS'nin mimarisi üç model üzerine kuruludur. Bu modeller; İlgi Alanı Modeli, Kullanıcı Modeli ve Öğretici Model (veya Uyarlama Modeli)'dir. Bu modellerin uygulanış şekillerinde sistemden sisteme farklılık göstermiştir. Sistemlerdeki kavramsallaştırmadan kaynaklanan sorunların giderilmesi için bilgi temsilinin belli standartlara göre gerçekleştirilmesi ve en azından temel bilgileri kavramsallaştırmada ortak bir ilgi alanı sözlüğünün kullanılması veya geliştirilmesi gereklidir. Araştırmacılar, ontoloji-tabanlı mimarinin ve metadata kontrollü öğrenme nesneleri kullanımının bu sorunların giderilmesini sağlayacağını savunmaktadırlar (Mizoguchi & Bourdeu, 2000; Brusilovsky, 2003; Hayashi, Bourdeau & Mizoguchi, R., 2006). Y.Z- Eğitim alanı içinde ele alınan sistemlerin zeka, kavramsallaştırma ve standartlaştırma çerçevesinde yeni yaklaşımlarla düzenlenmesi gerektiği öne sürülmektedir (Mizoguchi & Bourdeu, 2000; Hayashi, Bourdeau & Mizoguchi, R., 2006). Eğitim alanında özellikle meta data standartları geliştiren IMS, IEEE LTSC, ADL SCORM, AICC gibi organizasyonlar bu anlamda altyapının oluşturulmasını sağlamışlardır.

BİREYSELLEŞTİRİLMİŞ E-ÖĞRENME SİSTEMLERİ

2000'li yıllardan itibaren "Uyarlanır Öğretim Hiperortam Sistemleri (UÖHS)" ve "Zeki Öğretim Sistemleri (ZÖS)" alanlarındaki çalışmaların Semantik Web teknolojileri ile yeniden yorumlanması sonucunda ortaya çıkan, "Web-Tabanlı Uyarlanır ve Zeki Öğretim Sistemleri (WTUZÖS) – Bireyselleştirilmiş e-öğrenme sistemleri" alanında araştırmalar başlamıştır. Bu alandaki araştırmalarda temel amaç; UÖHS ve ZÖS için geliştirilen mimari yapının kullanılmasına dayalı olarak, ortam ve içerik bağımsız, öğretim sistemleri geliştirmektir. Bu amacın başarılması için, öğrenme nesneleri, bir bilgi modelleme yaklaşımı olarak ontoloji, ZÖS'nin Öğretim içeriği sıralama tekniği ve UÖHS'nde kullanılan uyarlama teknikleri kullanılarak bireyselleştirilmiş e-öğrenme sistemlerinin gerçekleştirilmesine çalışılmaktadır (Hatzilygeroudis, Prentzas & Garofalakis, 2005). Bireyselleştirilmiş e-öğrenme sistemlerinin altyapısının kurulmasında Semantik Web teknolojileri bir gerçekleştirme aracı ve ortamı olarak kullanılmaktadır.

Semantik Web ve Ontoloji

Semantik Web, web içeriğinin araştırılması ve web içeriğinden bilgi çıkarımının yapılabilmesinde bilgisayarlarında bu içeriğini kolayca işleyebileceği ve akıllı arama teknikleri kullanarak bilgi çıkarımı yapabileceği bir formatta web içeriğinin temsil edilebilmesini amaçlamaktadır (Berners-Lee, Hendler & Lassila, 2001). Bunun için, ontoloji teknolojisi web kaynaklarını ve dokümanlarını belirtmek için ek semantik açıklayıcılar eklemek ve böylece web içeriği için genel paylaşılır bir belirtim yapısı oluşturmak için kullanılmaktadır.

Ontoloji, Semantik Web için temel kavramdır. Genel bir tanımlamayla ontoloji, kavramlar arasındaki ilişkilerin biçimsel ve açıkça belirtilmesidir (Berners-Lee, Hendler & Lassila, 2001; Noy &Mcguinness). Sözlük anlamı "varlık bilimi" olarak tanımlanan ontoloji, bilgisayar biliminde bir bilgi modelleme yaklaşımı olarak yer almaktadır. Ontoloji ile amaçlanan, bir ilgi alanını oluşturan kavramların ve kavramlar arasındaki ilişkilerin bilgisayarlar tarafından yorumlanabileceği soyut bir model oluşturmaktır (Antoniou & Van Harmelen, 2008). Kavramlar, bir ilgi alanı tanımlayan temel kelimelerdir. Örneğin, bir kurs ontolojisinde temel kavramlar o kursu tanımlamada kullanılabilecek bölüm, ders, konu gibi kelimelerdir. İlişkiler ise kavramlar arasındaki ilişkiyi açıklayan kelimelerdir. Örneğin, "kurs ontolojisinde konu dersin alt bileşenidir. Dersde bölümün alt bileşenidir. Bir kurs bölümlerden oluşur." İfadeleri kavramlar arasındaki ilişkileri göstermektedir. Bu şekilde, ontolojide bir ilgi alanına ait kavramların özellikleri açıklanmakta dolayısıyla ilgi alanı kodlanmaktadır. Bu kodlama ile ilgi alanının soyut bir modeli ortaya çıkartılmaktadır. Ontoloji; bir ilgi alanı için terminolojik farklılıkları ortadan kaldırarak genel geçer bir tanımlama yapısı oluşturmayı olanıklı hale getirdiği için standartlaşmayı kolaylaştırmakta ve bu sayede ilgi alanına ait bilgilerin yeniden kullanılabilirliğini de sağlamaktadır (Choe, 2006). Örneğin, öğrenme nesneleri için IEEE Learning Technology grubu tarafından oluşturulan LOM(Learning Object Metadata) ontolojisi farklı öğrenme nesnesi depolarında öğrenme nesnesi tanımlaması için kullanılabilmektedir. Ayrıca farklı ilgi alanları için oluşturlan ontolojileri birleştirici ortak terminolojiler oluşturarak anlamsal birlikteçalışırlığında desteklenmesine olanak sağlamaktadır (Antoniou & Van Harmelen, 2008). Örneğin, LOM(Learning Object Metadata) ontolojisi, IMS tarafından oluşturulan öğrenme ontolojileri ile birlikte öğrenme ortamı tanımlamakta kullanılabilmektedir.

Semantik Web teknolojileri XML (Extensible Markup Language) veri tanımlama dilini temel alan üç katmanlı bir yapıya sahiptir. Birinci katman "metadata katmanı" olarak adlandırılır. Bu katmanda Web içeriği basit semantik etiketlerle temsil edilir. İkinci katman ise "Şema katmanı" olarak adlandırılmaktadır. Bu katman, bir web kaynağı için kavramların sıradüzen yapısının ve kavramların özelliklerinin açıklanması ontolojilerle belirtilir. Bu katmanda, farklı diller ontoloji temsil etmek için tasarlanmıştır. Bu diller XML tabanlı dilerdir. XML bir veri tanımlama dilidir fakat veriyi tanımlada semantik bir anlam sağlamaz. Bu sebeple, bu katmanda bir tanımlama çerçevesi olarak RDF(Resource Description Framework) kullanılır. RDF ontoloji tanımlanması için yeterli bir dil bir "veri modeli" olmadığı için W3C kapsamında çalışan Web Ontoloji çalışma grubu tarafından yürütülen çalışmalarla daha güçlü bir ontoloji dili olan OWL (Web Ontology Language) dili geliştirilmiştir. OWL kavramsal modelleme için kullanılabilecek, semantik tanımlama özellikleri güçlendirilmiş bir dildir. Günümüzde, bir ilgi alanı için ontoloji geliştirme işi OWL dili kullanılarak gerçekleştirilmektedir. Semantik Web'in üçüncü katmanı ise "mantıksal katman" dır. Bu katmanın tamamiyle geliştirme süreci bitmiş değildir. Bu katmanın geliştirilmesi süreci tamamlandığında Semantik Web için dayanıklı ve güvenilir biçimde ontolojilerin yorumlanması ve bilgi çıkarımına dayalı bir mekanizmanın oluşturulması sağlanmış olacaktır. Böylece, açıklayıcılığı daha iyi olan ve karmaşık ontolojiler için mantıksal çıkarım ilkelerinin kullanıldığı bir çıkarım mekanizması kurmak mümkün olacaktır (O'Connor ve diğ. 2005). Mevcut durumda ontolojiler üzerinde mantıksal muhakeme yapmak ve bilgi çıkarımını gerçekleştirmek için SWRL (Semantic Web Rule Language) kural dili ve SQWRL (Semantic Web Query Language) Sorgu dili kullanılmaktadır. Bu dillerin geliştirilmesine yönelik çalışmalarda devam etmektedir.

Semantik Web teknolojileri alanındaki mevcut gelişmeler daha fazla bireyselleştirme özelliklerine sahip e-öğrenme sistemlerinin ontoloji tabanlı olarak geliştirilmesi için daha fazla avantaj ve olanak sunmaktadır. E-öğrenme bağlamında, daha etkin veri depolanması ve bilgi kazanımı için semantik web teknolojileri etkili araçlardır (Aroya & Dicheva, 2004). Bu teknolojiler; bir öğrenme nesnesini metadata ile tanımlamak ve bu tanımlamayı benzer tanımlamalar ile genişletmek imkanı sunmaktadır. IEEE LOM metadata tanımlamasının SCORM modeli içinde geliştirilerek kullanılması buna örnektir. Bunun yanında, bir öğretim alanına ait semantik kavramsallaştırma yapmak diğer bir deyişle ontoloji geliştirmek mümkündür. IMS tarafından geliştirilen öğrenme ontolojileri buna örnek verilebilir. Buna ilave olarak, web servislerini ve yazılımsal ajanları kullanarak öğrenme ontolojilerinden bilgi çıkarımı yapmak ve buna göre kullanıcıya uygun öğrenme içeriği üretmek mümkün olmaktadır (Dag, 2008).

Öğrenme Nesneleri ve Öğrenme Nesnesi Standartları

Öğrenme nesnesi, Web ortamında sunulabilen ve e-öğrenme sistemiyle kullanıcıya ulaştırılan dijital kaynaklardır. Öğrenme nesnesi, e-öğrenme sistemleri için temel araştırma konusudur. Özellikle, öğrenme nesnelerinin tekrar kullanılırlık (reusability) ve öğeboyu (granularity) özellikleri ile öğrenme nesnelerinin eğitsel niteliği üzerine çalışmalar yoğunlaşmaktadır. Bazı araştırmacılar, öğrenme nesnelerinin oluşturulması ve öğrenme ilgi alanlarının tanımlanması için ontolojilerin kullanılabileceğini savunmaktadırlar. Bu yaklaşımla beraber, son yıllarda öğretim tasarımı, öğrenme nesnesi, e-öğrenme ortamları ve ontoloji tasarımını entegre eden araştırmalar artarak devam etmektedir (Mohan, Greer, & McCalla, 2003; Hayashi, Bourdeau, & Mizoguchi, 2006).

Günümüz e-öğrenme standartları, öğrenme nesneslerini sadece uygulama teknolojilerine göre veya sadece bir eğitim metadolojisine göre tanımlamaktadır. Bu yaklaşımlara göre, IEEE LOM, ADL Scorm gibi bazı standartlar öğrenme nesnelerini e-öğrenme sistemi içinde uygulama teknolojilerine göre ve nesne tabanlı programlama mantığına uyan bir yaklaşımla teknik özellikleri açısından tanımlayan metadata modelleri sunmaktadırlar. Bunun yanısıra teknik açıdan bir tanımlama metadolojisi oluşturmaktan öte öğrenme nesnelerinin eğitsel özelliklerini ön plana çıkaran içerik standartları da bulunmaktadır. Cisco tarafından sunulan RLO/RIO modeli bu içerik modelleri içinde en kapsamlı ve ayrıntılandırılmış olanıdır (Cisco, 2003).

Metadata standartları veya içerik standartları öğrenme nesnelerinin yapısını tanımlamakla beraber, öğrenme nesnelerinin sıralanmasına ve uyarlanır olmasına dair bir bilgi içermemektedir. Bu noktadan yola çıkarak, YZ-Eğitim alanında çalışmalar yapan bazı araştırmacılar, ZÖS ve UÖHS çalışmalarını referans alarak, öğrenme nesnelerinin uyarlanır yapılabilmesi üzerine çalışmalar yapmaktadırlar (Mohan, Greer, & McCalla, 2003). Bu araştırmacılar, ZÖS ve UÖHS'nin mimari yapılarını, öğrenme nesnesi yaklaşımları ve Semantik Web teknolojileriyle birleştirerek uyarlanır e-öğrenme sistemlerinin geliştirilmesi üzerine çalışmaktadırlar (Mizoguchi & Bourdeu, 2000; Aroya, & Dicheva, 2004; Dvedžić, 2004; Karampiperis & Sampson, 2004; Dicheva ve diğ. 2005; Hayashi, Bourdeau & Mizoguchi, 2006). Bu çalışmalarda, UÖHS'nin uyarlama yöntemleri kullanılarak e-öğrenme sistemlerinde dinamik içerik uyarlaması veya uyarlanır içerik oluşturulmasına çalışılmaktadır.

Öğrenme nesnelerine dayalı ve ontoloji tabanlı e-öğrenme sistemleri alanındaki çalışmalar

Karampiperis and Sampson (2004), öğrenme nesnelerinin bir e-öğrenme ortamında uyarlanır sıralanması için bir yaklaşım sunmaktadırlar. Bu amaçla, ilgi alanı ontolojisi ve öğrenme nesnesi metadata tanımlarını kullanmışlardır. Her öğrenme nesnesi için öğrenme süresi olarak tanımladıkları bir en uygun şekle sokma kıstasına göre bir en kısa yol algoritması kullanarak bir öğrenme içeriği üretmek bu çalışmanın temel fikri olarak sunulmaktadır.

Ullrich (2005) hiyerarşik planlama yaklaşımı ile öğrenme nesnelerinin sıralanması üzerine bir model önerilmektedir. Geliştirilen bir öğretim ontolojisine bağlı olarak, bir YZ planlama yaklaşımı olan hiyerarşik görev planlama yaklaşımı kullanılarak öğrenme nensnelerinin öğretim amaçlarına ve öğretimsel görevlere göre sıralanması ve bir kurs içeriğinin oluşturulması bu çalışmanın ana fikrini oluşturmaktadır.

Bu alanda yapılan çalışmalardan bir diğeri, Kontopoulos ve diğ (2008)'de sunulmaktadır. Bu çalışmada, öğrenme amaçlarına ve ön koşullara göre oluşturulan bir öğretim ontolojisi makine öğrenme teknikleriyle birleştirilerek bir UÖHS modeli önerilmektedir.

Dağ (2008)'de sunulan çalışmada bilgi sunumu, değerlendirme ve uygulama gibi farklı öğretimsel özelliklere sahip sayısal kaynak olarak tanımlanan öğrenme içerikleri öğrencinin akademik başarı düzeyi ve öğrenme stiline göre öğrenme hedefi, öğrenme içeriği ve değerlendirme bileşenlerine sahip eğitsel öğrenme nesneleri formuna dönüştürülerek sunulmaktadır. Bu amaçla, kapsamlı bir ilgi alanı ontolojisi tasarlanan çalışmada bir kullanıcı ontolojiside tasarlanmıştır. Bu ontolojilerden mantıksal çıkarım sağlayan DL tabanlı mantıksal muhakeme ve kural tabanlı çıkarsama teknolojileri kullanılarak geliştirilen bir uyarlama modelide tasarlanarak Semantik Web teknolojilerinin kullanıldığı ilgi alanı bağımsız bir bireyselleştirilmiş öğretim sistemi modeli ortaya konmuştur.

Tüm çalışmalarda, temel araştırma konusu ilgi alanı modeline bağlı olarak bir ilgi alanı ontolojisinin kurulmasıdır. Sadece ilgi alanı ontolojisinin oluşturulması sistemlerin uyarlama yeteneklerinin sağlanması için yeterli değildir. Bu sebeple, bir öğretim tasarımı yaklaşımı referans alınarak geliştirilecek bir uyarlama modelinin kullanılması kaçınılmazdır. Bu sebeple, öğrenme hedeflerinin taksonomik sınıflandırmasının ve ilgi alanı kavramlarının önkoşulluluk analizi yapılarak oluşturulmuş bir ilgi alanı ontolojisi geliştirilmesi daha etkili olacaktır (Onaindía, Sapena & Garrido, 2007; Dag, 2008). Buna ilave olarak, bu şekilde geliştirilmiş bir ilgi alanı ontolojisinden uygun öğretim içeriğini üretebilecek (uyarlayabilecek) bir uyarlama modelide yine öğretim tasarımı yaklaşımları dikkate alınarak planlanmalıdır.

SONUÇ

UÖHS ve ZÖS alanlarındaki çalışmalarda karşılaşılan içerikle ilgili, kavramsallaştırma ve standartlaşma problemleri bireyselleştirilmiş öğretim sistemlerini meydana getiren modellerin gerçeklenmesinde yeni yaklaşımları gerektirmiştir. Kavramsallaştırma problemlerinin çözümü için; öğretim sistemlerinde bilgi gösteriminin e-öğrenme standartlarına göre gerçekleştirilmesi ve temel bilgileri kavramsallaştırmada ontolojilerin kullanılması önerilmektedir. Bu durum, bireyselleştirilmiş öğretim sistemlerinin sadece bir araştırma alanı olmaktan çıkıp pratikte uygulama alanı bulmasını kolaylaştıracaktır. E-öğrenme alanındaki standartlar sayesinde öğretim sistemlerinde kullanılan öğrenme materyallerinin yeniden kullanılırlık ve birlikte işlerlik özellikleri sağlanabilmektedir. Bu sayede, standart yapıya sahip bireyselleştirilmiş öğretim sistemlerinin karşılaştırılabilirlikleri mümkün olacak ve bu durum sistemlerin eksik taraflarının belirlenip geliştirilmesine katkıda bulunacaktır.

E-öğrenme standartları çerçevesinde, öğrenme nesnelerine dayalı bireyselleştirilmiş öğretim sistemleri için Semantik Web teknolojileri bir gerçekleme yaklaşımı olarak sunulmaktadır. Semantik Web ile amaçlanan, veriyi anlamlı biçimde göstermektir. Bu yaklaşımla, bilgi gösterimi için sadece insanların değil aynı zamanda bilgisayarlarında kolayca anlayabileceği ve işleyebileceği bir bilgi formatının oluşturulması amaçlanmaktadır. Semantik Web uygulamalarının önemli bir bileşeni olan ontoloji, bireyselleştirilmiş öğretim sistemlerinin gerçeklenmesinde karşılaşılan kavramsallaştırma problemleri için de bir çözüm yaklaşımıdır.

Bir Semantik Web uygulaması olarak bakıldığında bireyselleştirilmiş öğretim sistemi, modellerin oluşturulmasında ontoloji dilleri ve ontoloji geliştirme ortamlarının kullanılmasıyla, modeller arasında ilişki kurulması ve mantıksal muhakeme ile bilgi çıkarımı için Semantik Web servislerinin kullanılmasıyla gerçekleştirilebilir bir hal almaktadır. Bu anlamda, Semantik Web teknolojileri bireyselleştirilmiş öğretim sistemi geliştirme çalışmalarına yeni bir boyut kazandırmıştır.

Ontoloji tabanlı bilgi modelleme yaklaşımıyla geliştirilen bireyselleştirilmiş öğretim sistemleri çalışmalarında yoğunlukla ilgi alanı ontolojisi üzerinde durulmuştur. Bununla beraber, kullanıcı modelinin de ontolojiye dayalı gerçekleştirilmesi önemli bir araştırma konusudur. Farklı

öğrenme sitili modelleride değerlendirilerek, e-öğrenme standartlarına uygun, bireyselleştirilmiş öğrenme ortamlarının oluşturulması için kullanıcı modeli geliştirilmesi üzerinde çalışılması gereken bir alandır. Bunun yanında, öğrenme içeriğinin öğrenme sitiline göre oluşturulması amacıyla bireyselleştirilmiş öğretim sistemlerinde uyarlama modelinin geliştirilmesi üzerine çalışmalar yapılması da gereklidir. Bireyselleştirilmiş öğretim sistemlerinin pratikte uygulama bulamamasının en önemli sebebi sistemlerin yazarlık araçlarının olmaması veya yetersiz olmasıdır. Bu çerçevede, bireyselleştirilmiş öğretim sistemi oluşturmak için yazarlık araçlarının tasarlanması ve geliştirilmesi bu tür sistemlerin kullanılırlığını arttıracaktır.

Bunun dışında, yeni nesil bireyselleştirilmiş öğretim sistemlerinin ilgi alanı ontolojisi ve uyarlama modelinin var olan öğrenme yönetim sistemleri ile kullanılabilmesini sağlamak amacıyla Semantik Web servislerinin geliştirilmesi ve öğrenme yönetim sistemlerine bireyselleştirilmiş içerik sunma yeteneğinin kazandırılması üzerinde çalışmalar yapılmalıdır. Böylece, bireyselleştirilmiş öğretim sistemlerinin pratikte uygulama alanı bulması sağlanabilecektir. Bu sayede, sistemler arasında nitel ve nicel karşılaştırmalar yapmak ve bu doğrultuda sistemlerin geliştirilmesine katkıda bulunmak mümkün olacaktır.

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BİYOLOJİ ÖĞRETMEN ADAYLARININ İNTERNET ÖZ-YETERLİK İNANÇLARININ İNCELENMESİ (DİCLE ÜNİVERSİTESİ ÖRNEĞİ)

A STUDY ON THE INTERNET SELF-EFFICACY BELIEVES OF BIOLOGY TEACHER CANDIDATES (DİCLE UNIVERSITY CASE STUDY)

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Özet
Bu çalışmada; biyoloji öğretmen adaylarının internet öz-yeterliklerinin çeşitli değişkenler açısından incelenmesi amaçlanmaktadır. Çalışma grubunu Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Biyoloji Eğitimi Anabilim Dalında öğrenim gören 125 öğrenci oluşturmaktadır. Veri toplama aracı olarak İnternet Öz-yeterlik Ölçeği (Gündüz ve Özdinç, 2008) kullanılmıştır. Ölçekte 38 madde yer almaktadır. Ölçeğin Cronbach's Alpha iç tutarlılık katsayısı 0.96 olarak hesaplanmıştır. Verilerin analizinde SPSS 15.0 paket programı kullanılmıştır. Verilerin çözümünde istatistiksel teknikler olarak; frekans, yüzde, aritmetik ortalama, standart sapma, t testi ve varyans analizi kullanılmıştır. Anlamlılık düzeyi .05 olarak alınmıştır. Elde edilen bulgulara göre; erkek öğrencilerin kız öğrencilerden, 4. ve 5. sınıf öğrencilerinin 1. sınıf öğrencilerinden, evinde bilgisayar ve internet kullanma olanağı olan öğrencilerin olmayanlardan daha yüksek internet öz-yeterlik düzeyine sahip olduğu ortaya çıkarılmıştır.
Anahtar kelimeler: Biyoloji, internet, öz-yeterlik.

Abstract
The aim of this study is to determine the biology teacher candidates' internet self-efficacy believes in terms of various variables. The research group consist of 125 students who studying at Department of Biology Education of Ziya Gokalp Education Faculty in Dicle University. Internet Self-efficacy Scale (Gündüz and Özdinç, 2008) which includes 38 items was used as data collection tool. Cronbach's Alpha internal consistency coefficient of the scale was calculated to be 0.96. It was used SPSS 15.0 package program in the analysis of the data. The analysis of the data were made by t test and ANOVA techniques. Significance level was taken to be .05. According to the results of the analysis; male students have higher level of internet self-efficacy than female students have and 4th and 5th classes students have higher level of internet self-efficacy than 1st class students have. In addition, the students who have computer at home and possibility of reaching internet have higher level of internet self-efficacy than the students who don't have.
Key words: Biology, internet, self-efficacy.

GİRİŞ

Günümüzde bilgiyi bilinçli kullanan bireylerin yanında bilgi üreten, kendini geliştiren ve gelişimlere ayak uydurabilen bireylerin yetiştirilmesine ihtiyaç duyulmaktadır. Bu ihtiyacı gerçekleştirmek üzere ülkelerin eğitim sistemleri yeniden yapılandırılmaktadır. Bu yapılandırma neticesinde eğitim kurumlarından, bilgiye ulaşabilen, onu kullanıp yeni bilgiler üretebilen, öğrenmeyi öğrenmiş bireyler yetiştirmesi beklenmektedir (Gündüz ve Özdinç, 2008).
Bilginin hızla artması sonucu bilgiye ulaşma yolları da kendiliğinden yön değiştirmeye başlamıştır. Bir kaç yıl içerisinde hızla gelişen internet teknolojisi insanların sadece haberleşmesini değil, öğretme ve öğrenme sürecini de etkilemiştir (Erdoğan,2008). Bilgi çağının gerekliliği olarak bilginin yazılı materyallerden takip edilmesi yerine sanal kütüphanelerden ve veritabanlarından yararlanılması ön plana çıkmış, dolayısıyla bu kaynaklara internet vasıtasıyla ulaşma gerekliliği önem kazanmıştır. Teknolojinin eğitim açısından avantajlarını değerlendirecek olursak; bunlardan ilki, öğrencilerin interneti iletişim, araştırma yapma, bilgiye ulaşma ve paylaşma becerilerini geliştirmek, diğeri ise, internete erişimin, bilgiye ulaşma açısından tüm sınırları ortadan kaldırması ve büyük imkanlar sunmasıdır (Aksüt, 2005).
Hızla gelişen teknolojiye paralel olarak, diğer alanlarda olduğu gibi, eğitim alanında da değişim ve gelişimin aynı hızla gerçekleştirilmesine ihtiyaç duyulmaktadır. Eğitim alanında değişimin ve gelişimin gerçekleşmesi çok sayıda faktöre bağlıdır. Bu faktörlerin en önemlilerinden biri öğretmendir. Öğretmenlerin eğitim kurumlarında değişimi gerçekleştirebilmeleri için her şeyden önce kendilerinin değişimi kabul etmeleri ve özellikle eğitim teknolojisi alanında meydana gelen gelişmelerden haberdar olmaları gerekir. (Oral, 2004). Geleceğe yön veren öğretmenlerimiz eğitim ve iletişim teknolojisini kullanmaz ve bu konu hakkında yeterli bilgiye sahip olmaz iseler eğitim sistemimiz ve ülkemiz insanları gereksinim duyulan toplumsal gelişmeleri gerçekleştiremez ve cağın gerisinde kalarak bilgiyi dışarıdan alan geri kalmış bir toplum olarak kalırız (İşman, 2002). Eğitimin temel amaçlarından bir tanesi, bilimi ve teknolojileri kullanan ve bunları üreten bireyler yetiştirmektir. Bu amacı yerine getiremezsek bilgi toplumunun insanını yetiştiremeyiz (İşman, 2008).
Öğretmen adayları için, çalışma alanlarıyla ilgili gelişmeleri izlemek, karşılaştıkları mesleki problemlere çözüm bulabilmek ve mesleki dergilerde yayınlanan bilimsel makaleleri devamlı izleyerek alanlarındaki gelişmelerden haberdar olmak ve diğer meslektaşlarının bilgi ve deneyimlerinden faydalanmak gibi konuların interneti kaçınılmaz bir bilgi kaynağı haline getirdiği anlaşılmaktadır (Erdoğan, 2008).
Özyeterlik, sosyal bilişsel kuramın anahtar değişkenlerinden biridir. Bandura'ya göre özyeterlik, davranışların oluşmasında etkili olan bir niteliktir ve "bireyin, belli bir performansı göstermek için gerekli etkinlikleri organize edip, başarılı olarak yapabilme yeteneği hakkında kendine ilişkin yargısı" olarak tanımlanmaktadır (Bandura, 1997; Akt. Aşkar ve Umay, 2001). Bandura'ya (1986) göre, özyeterlik inancının, bireyin doğru ya da yanlış etkinlikler yapma davranışını etkilediği, aynı zamanda bireyin bir sorun ile karşılaştığında sorunu çözmek için ne kadar çaba harcayacağı ve ne kadar ısrarcı olacağının da belirtisi olduğu vurgulanmaktadır. İnsanların sahip oldukları bilgi ve beceriler ya da önceki başarıları, onların ileride neleri başarabileceklerini tahmin etmelerinde her zaman yeterli olmayabilmektedir. İnsanların kendi yetenekleriyle ilgili inançları, belirli bir durumda gösterecekleri performansın belirleyicisidir. İnsan davranışları, daha önceki performans sonuçlarından çok, yeteneklere olan inançlarla daha iyi tahmin edilmektedir (Akt. Bıkmaz, 2004).
Sharp (2002) öz yeterlik inancını, insan motivasyonunun, refahının ve kişisel başarılarının temelini oluşturduğunu vurgular. Çünkü insan, eylemlerinin istediği sonuçları doğuracağına inanmazsa hayattaki güçlüklere karşı durabilme ve reaksiyon göstermede isteksiz olur (Akt. Akbulut, 2006).

Öz-yeterliği güçlü olan bireyler zor bir görevle karşı karşıya kaldıklarında bu durumdan kaçmak yerine üstesinden gelinmesi gereken bir iş olarak yaklaşmaktadırlar. Bu açıdan bakıldığında öz-yeterlik algısı eğitimde üzerinde durulması gereken önemli özelliklerden biri olarak kabul edilmektedir (Aşkar ve Umay, 2001).
İnternet öz-yeterliği sadece bilgisayar becerilerini değil, ayrıca e-posta kullanımı, web adreslerini tarama v.b. internet becerilerini de içerir. İnternet öz-yeterliği, temel bilgisayar becerilerinin üstünde, internetin daha etkili bir biçimde kullanılması için gerekli, farklı bir davranışlar kümesi oluşturabilme inancı olarak tanımlanır (Eastin & LaRose, 2000).
Öğrencileri internet tabanlı öğrenme ortamlarından faydalanma olanakları artarken, onların, bu ortamlardaki öğrenme çıktılarını çok etkilediği düşünülen internet yönelik öz yeterlikleri de eğitimciler ve araştırmacılar tarafından önemli bir araştırma konusu olmuştur. İnternet öz-yeterliği kavramı, internet kullanıcılarının internet kullanırken kendilerine duydukları güven ve beklentilerini göstermektedir. Bilgisayar ve internet ile ilgili konularda yüksek öz yeterlik seviyesi o işi başarmak için büyük bir adımdır (Tsai ve Tsai, 2003).
Bilgisayarların, bilgiyi görsel bir biçimde sunabilmesi biyoloji için özellikle önemlidir. İyi hazırlanmış resimler, üç boyutlu modellemeler, hareketli animasyonlar, interaktif ortamlar vb. hedeflenen bilginin daha kolay kavranmasını sağlamaktadır (Çömlekçioğlu ve Bayraktaroğlu, 2001). Bilgisayar ve internet kullanımının biyoloji dersi açısından önemi giderek artmaktadır. Biyoloji öğretmen adaylarının bu kaynakları kullanabilecek yeterliğe sahip olmaları, gelecekteki mesleki yaşamları için oldukça önemlidir. Bu bağlamda; biyoloji öğretmen adaylarının internet öz-yeterlik inançlarının belirlenmesi çalışmanın amacını oluşturmaktadır.

YÖNTEM

Araştırmada tarama modeli kullanılmıştır.

Çalışma Grubu
Araştırmanın örneklemini; 2009-2010 öğretim yılında Dicle Üniversitesi Z.G. Eğitim Fakültesi Biyoloji Eğitimi Anabilim Dalında öğrenim gören 125 öğrenci oluşturmaktadır.

Verilerin Toplanması ve Analizi
Veri toplama aracı olarak İnternet Öz-yeterlik Ölçeği (Gündüz,Özdinç; 2008) kullanılmıştır. Ölçekte 38 madde yer almaktadır. Öğrenciler, ölçekte yer alan maddeleri okumuşlar, eğer maddede belirtilen ifadeyi yapabileceklerini düşünüyorlarsa "Evet"; yapamayacaklarını düşünüyorlarsa "Hayır" seçeneğini işaretlemişlerdir. Verilerin bilgisayara girilmesinde, "Evet" seçeneğine 1; "Hayır" seçeneğine ise 0 puan verilmiştir. Ölçekten alınabilecek en düşük puan (38x0) 0, en yüksek puan ise (38x1) 38'dir. Puanın yüksek olması, öğrencinin ya da ilgili grubun internet öz-yeterliğinin yüksek olduğunu göstermektedir. Ayrıca; ölçekte öğrencinin öğrenim gördüğü sınıf, cinsiyet, evinde bilgisayar ya da internet kullanma olanağı bulunup bulunmaması ve interneti ne kadar süredir kullandıklarına ilişkin sorular yer almıştır. Bu uygulama için ölçeğin Cronbach's Alpha iç tutarlılık katsayısı 0.96 olarak hesaplanmıştır.
Verilerin analizinde SPSS 15.0 paket programı kullanılmıştır. Verilerin çözümünde istatistiksel teknikler olarak; frekans, yüzde, aritmetik ortalama, standart sapma, t testi ve varyans analizi kullanılmıştır. Anlamlılık düzeyi .05 olarak alınmıştır.

BULGULAR VE YORUM

İnternet Öz-yeterlik Düzeylerine Ait Bulgular
Çalışma grubunun ölçekten aldığı puanların ortalaması, standart sapması ile minimum ve maksimum puanları belirlenmiştir. Araştırmaya katılan öğrencilerin ölçekten almış oldukları puanların dağılımına ilişkin bulgular Tablo 1'de gösterilmiştir.

Tablo1. Biyoloji Öğretmen Adaylarının İnternet Öz-Yeterliklerine İlişkin Puan Ortalamaları, Standart Sapması, Minimum ve Maksimumum Puanları

n	$\overline{X}$	ss	Minimum	Maksimum
125	**27,184**	**10.332**	**2**	**38**

Araştırmaya toplam 125 biyoloji öğretmen adayı katılmıştır. Araştırmaya katılan öğrencilerin ölçekten aldıkları puanların dağılımında; alınan en düşük puan 2 iken, en yüksek puan 38 olmuştur. Araştırmaya katılanların internet öz-yeterlikleri puanlarının aritmetik ortalaması 27.184, standart sapması ise 10.332 bulunmuştur. Aritmetik ortalama puanına bakıldığında araştırmaya katılan öğrencilerin internet öz-yeterlik düzeylerinin ortalamanın oldukça üstünde olduğu söylenebilir.

Cinsiyete Göre İnternet Öz-yeterliklerine İlişkin Bulgular
Çalışma grubunun internet öz-yeterlik puanlarının cinsiyete göre değişip değişmediğini incelemek için bağımsız örneklemler t-testi yapılmıştır. T-testi sonuçları Tablo 2' de gösterilmiştir.

Tablo 2. Cinsiyete Göre Öz-yeterlik Puanlarının Karşılaştırılmasına İlişkin t-testi Sonuçları

Grup	n	$\overline{X}$	ss	sd	t	p
Erkek	51	32,12	8,849	123	4,789	.000
Bayan	74	23,78	10, 022			

Tablo 2'de görüldüğü gibi; araştırmaya katılan 51 erkek öğrencinin internet öz-yeterlik puanlarının ortalaması 32.12 iken; 74 bayan öğrencinin internet öz-yeterlik puanlarının ortalaması 23.78 olarak bulunmuştur. Bu farkın anlamlı olup olmadığını test etmek için yapılan bağımsız örneklemler t testi sonucunda, t değeri istatistiksel açıdan anlamlı bulunmuştur ($p< .05$). Bu sonuca göre erkek öğrencilerin internet öz-yeterlik inançlarının bayan öğrencilerin internet öz-yeterliklerinden daha yüksek olduğu söylenebilir.
Peng, Tsai ve Wu (2006), 915 erkek, 502 bayan olmak üzere toplam 1417 üniversite öğrencisiyle yaptığı çalışmada, erkek öğrencilerin bayanlara oranla daha yüksek internet öz-yeterlik inancına sahip olduğunu belirlemişlerdir. Bu sonuç; araştırmanın cinsiyet açısından bulgularını destekler niteliktedir.
Geçmiş yıllarda, üniversite öğrencilerinin internet kullanma durumları, internet tutumları ile ilgili yapılan araştırmalar (Schuamacher ve Morahan, 2000; Hong, Ridzuan ve Kuek, 2003; Nai ve Kirkup,2007) sonucu ortaya çıkan bulguların erkekler lehine olduğu görülmektedir. Erkeklerin interneti kullanma durumları ve tutumlarının daha yüksek olması internet öz-yeterlik düzeylerini de etkileyebileceği düşünülmektedir.

Peng, Tsai ve Wu (2006), üniversite öğrencilerinin interneti nasıl algıladıkları ile ilgili yaptıkları çalışmada, erkeklerin interneti "eğlence" ve "oyun" amaçlı kullandıkları, kızların ise interneti "hayat şartlarını geliştiren" bir araç olarak algıladıkları sonucuna ulaşmıştır.

Evde Bilgisayar Bulunup Bulunmamasına Göre İnternet Öz-yeterliklerine İlişkin Bulgular
Çalışma grubunun internet öz-yeterlik puanlarının evlerinde bilgisayar bulunup bulunmamasına göre değişip değişmediğini incelemek için bağımsız örneklemler t-testi yapılmıştır. T-testi sonuçları Tablo 3' de gösterilmiştir.

Tablo 3. Evde Bilgisayar Bulunup Bulunmamasına Göre Öz-yeterlik Puanlarının Karşılaştırılmasına İlişkin t-testi Sonuçları

Grup	n	$\overline{X}$	ss	sd	t	p
Var	78	29,99	9,074	123	3.962	.000
Yok	47	22,53	10,808			

Tablo 3'de görüldüğü gibi; evinde bilgisayar kullanma olanağı bulunan 78 öğrencinin internet öz-yeterlik puanlarının ortalaması 29.99 iken; evinde bilgisayar kullanma olanağı bulunmayan 47 öğrencinin internet öz-yeterlik puanlarının ortalaması 22,53 olarak bulunmuştur. Bu farkın anlamlı olup olmadığını test etmek için yapılan bağımsız örneklemler t testi sonucunda, t değeri istatistiksel açıdan anlamlı bulunmuştur ($p< .05$). Bu sonuca göre evinde bilgisayar kullanma olanağı bulunan öğrencilerin internet öz-yeterlik inançlarının bulunmayanlara oranla daha yüksek olduğu söylenebilir.

Evde İnternet Kullanma Olanağı Bulunup Bulunmamasına Göre İnternet Öz-yeterliklerine İlişkin Bulgular
Çalışma grubunun internet öz-yeterlik puanlarının evlerinde internet kullanma olanağı bulunup bulunmamasına göre değişip değişmediğini incelemek için bağımsız örneklemler t-testi yapılmıştır. T-testi sonuçları Tablo 4' de gösterilmiştir.

Tablo 4. Evde İnternet Kullanma Olanağı Bulunup Bulunmamasına Göre Öz-yeterlik Puanlarının Karşılaştırılmasına İlişkin t-testi Sonuçları

Grup	n	$\overline{X}$	ss	sd	t	p
Var	57	31,21	8,747	123	4,304	.000
Yok	68	23,80	10,481			

Tablo 4'de görüldüğü gibi; evinde internet kullanma olanağı bulunan 57 öğrencinin internet öz-yeterlik puanlarının ortalaması 31,21 iken; evinde internet kullanma olanağı bulunmayan 68 öğrencinin internet öz-yeterlik puanlarının ortalaması 23,80 olarak bulunmuştur. Bu farkın anlamlı olup olmadığını test etmek için yapılan bağımsız örneklemler t testi sonucunda, t değeri istatistiksel açıdan anlamlı bulunmuştur ($p< .05$). Bu sonuca göre evinde bilgisayar kullanma olanağı bulunan öğrencilerin internet öz-yeterlik inançlarının bulunmayanlara oranla daha yüksek olduğu söylenebilir.

Sınıflara Göre İnternet Öz-yeterliklerine Ait Bulgular
Çalışma grubunun internet öz-yeterlik puanlarının öğrenim gördükleri sınıflara göre değişip değişmediği incelenmiştir. Sınıf bazında alınan puanların genel dağılımı Tablo 5' te gösterilmiştir.

Tablo 5. Öğrenim Görülen Sınıfa Göre Öz-yeterlik Puanlarının Genel Dağılımı

Sınıflar	n	$\overline{X}$	ss
1	36	21,20	10,917
2	34	25,97	12,609
3	17	26,47	8,815
4	23	32,00	7,289
5	15	30,48	8,107

Tablo 5'teki verilere göre internet öz-yeterlik düzeyi ortalaması en yüksek olan sınıf 32.00 puanla 4. sınıflar olurken, internet öz-yeterlik düzeyi ortalaması en düşük olan sınıf ise 21.20 puan ile 1. Sınıflar olmuştur. Sınıflar arası aritmetik ortalamaların istatistiksel açıdan anlamlı olup olmadığını test etmek için tek yönlü varyans analizi (One way ANOVA) yapılmıştır. Bu analizin sonuçları Tablo 6'da gösterilmiştir.

Tablo 6. Öğrenim Görülen Sınıfa Göre Öz-yeterlik Puanlarının Karşılaştırılmasına İlişkin Tek Yönlü Varyans Analizi Sonuçları

Kaynak	KT	Sd	KO	F	p	Farkın Kaynağı
Gruplar arası	1251,186	4	312,797	3,104	,018	4.sınıf ile 1.sınıf, 5.sınıf ile 1.sınıf
Grup içi	12093,582	120	100,780			
Toplam	13344,768	124				

Tablo 6'da görüldüğü gibi sınıfların internet öz-yeterlik puanlarının arasındaki farkların anlamlılığına ilişkin varyans analizinden hesaplanan F değerinin ($F=3,104$; $p<.05$) anlamlı olduğu görülmektedir. Ortaya çıkan bu farkın hangi grup ya da gruplar arasından kaynaklandığını belirlemek için Tukey HSD testi uygulanmıştır. Tukey HSD testi sonucuna göre; 4. ve 5. sınıfların 1. sınıfla aralarındaki farkın 4. ve 5. sınıflar lehine anlamlı olduğu görülmüştür. 1. sınıf öğrencilerinin internet öz-yeterlik puanlarının diğer sınıflardan daha düşük olmasında bu öğrencilerin henüz üniversite düzeyinde bilgisayar dersi almamış olmaları sebep olarak gösterilebilir.
Peng, Tsai ve Wu (2006), yaptıkları çalışmada öğrencileri sınıf bazında; 1. ve 2. sınıf(n=320), 3. ve 4. sınıf (n=573) ve mezun (n=420) olmak üzere 3 grupta toplamışlardır. Üst sınıf ve mezun öğrencilerin yeni öğrencilere oranla internet öz-yeterlik inançlarının daha yüksek olduğu sonucunu ortaya çıkarmışlardır. Bu sonuç; sınıf açısından araştırmanın bulgularını destekler niteliktedir.

İnternet Kullanma Sürelerine Göre İnternet Öz-yeterliklerine Ait Bulgular

Çalışma grubunun internet öz-yeterlik puanlarının internet kullanma sürelerine göre değişip değişmediği incelenmiştir. İnternet kullanma sürelerine göre alınan puanların genel dağılımı Tablo 7' de gösterilmiştir.

Tablo 7. İnternet Kullanma Sürelerine Göre Öz-yeterlik Puanlarının Genel Dağılımı

İnt.Kull.Yılı	**n**	$\overline{X}$	**ss**
1 Yıldan Az	30	19,90	11,716
1-2 Yıl	24	22,67	8,550
2-4 Yıl	24	27,33	8,928
4 Yıldan Çok	47	34,06	5,791
Toplam	125		

Tablo 7'deki verilere göre internet öz-yeterlik düzeyi ortalaması en yüksek olanlar 34.06 puanla interneti 4 yıldan daha uzun süredir kullananlar olurken, internet öz-yeterlik düzeyi ortalaması en düşük olanlar ise 19.90 puan ile 1 yıldan daha az süredir interneti kullananlar olmuştur İnternet kullanma süreleri arası aritmetik ortalamaların istatistiksel açıdan anlamlı olup olmadığını test etmek için tek yönlü varyans analizi (One way ANOVA) yapılmıştır. Bu analizin sonuçları Tablo 8'de gösterilmiştir.

Tablo 8. İnternet Kullanma Sürelerine Göre Öz-yeterlik Puanlarının Karşılaştırılmasına İlişkin Tek Yönlü Varyans Analizi Sonuçları

Kaynak	**KT**	**Sd**	**KO**	**F**	**p**	**Farkın Kaynağı**
Gruplar arası	4306,593	3	1435,531	19,218	,000	4yıldan çok ile 2-4 yıl, 1-2 yıl,1 yıldan az arasında; 2-4 yıl ile 1 yıldan az arasında
Grup içi	9038,175	121	74,696			
Toplam	13344,768	124				

Tablo 8'de görüldüğü gibi internet kullanma sürelerine göre internet öz-yeterlik puanlarının arasındaki farkların anlamlılığına ilişkin varyans analizinden hesaplanan F değerinin (F=19,218; p<.05) anlamlı olduğu görülmektedir. Ortaya çıkan bu farkın hangi grup ya da gruplar arasından kaynaklandığını belirlemek için Tukey HSD testi uygulanmıştır. Tukey HSD testi sonucuna göre; interneti 4 yıldan daha uzun süredir kullanan öğrencilerin puanları ile diğer 3 grubun puanları arasındaki farkın, interneti 4 yıldan daha uzun süredir kullanan öğrenciler lehine anlamlı olduğu görülmüştür. Ayrıca; interneti 2-4 yıldır kullanan öğrencilerin puanları ile 1 yıldan az süredir kullananların puanları arasındaki fark da istatistiksel olarak anlamlı bulunmuştur.

SONUÇ VE ÖNERİLER

Elde edilen bulgular değerlendirildiğinde şu sonuçlar elde edilmiştir:

- Cinsiyet açısından internet öz-yeterlik düzeyleri incelendiğinde; erkek öğrencilerin internet öz-yeterlik düzeylerinin kız öğrencilerin internet öz-yeterlik düzeylerinden daha yüksek olduğu sonucuna ulaşılmıştır.
- Evinde bilgisayar kullanma olanağı olan öğrencilerin internet öz-yeterliklerinin evinde bilgisayar kullanma olanağı olmayan öğrencilerden daha yüksek olduğu sonucuna ulaşılmıştır.
- Evinde internet kullanma olanağı olan öğrencilerin internet öz-yeterliklerinin evinde internet kullanma olanağı olmayan öğrencilerden daha yüksek olduğu sonucuna ulaşılmıştır.
- Öğrenim görülen sınıfa göre değerlendirildiğinde; 4. ve 5. sınıf öğrencilerinin 1. sınıfa oranla internet öz-yeterliklerinin daha yüksek olduğu sonucuna ulaşılmıştır.
- İnternet kullanma sürelerine göre değerlendirildiğinde; interneti 4 yıl ve daha fazla süredir kullanan öğrencilerin diğerlerine oranla internet öz-yeterliklerinin daha yüksek olduğu sonucuna ulaşılmıştır.
- Genel olarak bakıldığında; biyoloji öğretmen adaylarının internet öz-yeterliklerinin ortalamanın oldukça üstünde olduğu söylenebilir.

Özellikle biyoloji derslerinde; soyut kavramların somutlaştırılması için görsel öğelerin (resim, animasyon, video vb.) kullanımı oldukça önemlidir. Bu öğelerin elde edilmesinde en büyük kaynak şüphesiz internettir. İnternetin etkili bir biçimde kullanımında, bir biyoloji öğretmeninin öz-yeterliğinin gelişmiş olmasının, biyoloji dersinin öğretim sürecini de olumlu yönde etkileyeceği söylenebilir.

Akpınar (2003); öğretmen yetiştiren kurumların eğitim ve bilgi teknolojileri kullanımı üzerine yaptığı araştırmasında bir takım sorunlar saptamıştır. Bu sorunlardan bazıları; öğretmen adaylarının bilgisayar okur-yazarlığı konusunda yeterli bilgiye sahip olmadıkları, teknolojik materyallerin kullanımı konusunda yeterli uygulamadan yoksun oldukları, teknolojiye yönelik tutumlarında fakültelerin geliştirdiği olumsuz tutumun etkili olduğu, internet kaynaklarının mesleki gelişim ve öğrenmeyi sağlayacak materyallerin hazırlanmasında, kullanılmasına ilişkin yeterli bilgi verilmediği, öğretmen adaylarına teknoloji kullanımı etkileşimli derslerin verilmesi gerekliliği yeterince benimsetilmediği ve öğretmen adaylarının ve öğretmenlerin eğitimde uygun araç gereç kullanmadığıdır (Akt. Ertürk, 2007).

Ortaya çıkan sonuçlar ışığında şu öneriler yapılabilir:

- Evinde bilgisayar ve internet olanağı bulunan öğrencilerin bulunmayanlara oranla daha yüksek internet öz-yeterlik düzeyine sahip olmaları göz önünde bulundurulursa; özellikle ailelerin çocuklarına bu imkanları sunması ve üniversitelerde de bilişim olanaklarının arttırılması, öz-yeterlik düzeyini arttırabilir.
- Öğretmen adaylarının bilgisayar ve internet ile ilgili tutumları, bilgisayar ve internet kullanma becerileri gibi özelliklerin lisans eğitimi sırasında yükseltilmesine yönelik uygulamaların arttırılması öz-yeterliklerin de artmasını sağlayabilir. Bu bağlamda web destekli uygulamaların arttırılması sağlanabilir.
- Üniversitelerde uygulanacak web destekli uygulamalardan önce; öğrencilerin internet öz-yeterlik düzeylerinin belirlenmesi, uygulamaların etkililiğini arttırabilir.
- Bayanların erkeklere oranla daha düşük internet öz-yeterlik düzeyine sahip olmalarının sebepleri derinlemesine araştırılabilir.

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BLENDING MAKES THE DIFFERENCE: COMPARISON OF BLENDED AND TRADITIONAL INSTRUCTION ON STUDENTS PERFORMANCE AND ATTITUDE IN COMPUTER LITERACY

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Abstract
In this study, a blended mode of instruction was developed based on Dick & Carey's Instructional Design Model for a computer literacy course. Participants were 179 students from the Faculty of Education at Uludag University in Turkey. The study was conducted during the fall of the 2006-2007 academic year. Eighty-six students were taught with the blended mode delivery. The rest of the students (93) were taught with FTF mode alone. At the beginning of the study, prior knowledge about computer literacy and attitudes towards computers were measured in both groups. At the end of the study, students' final course grades and attitudes towards computers were evaluated. Data were analyzed using independent samples t-tests. A statistically significant difference was found between the FTF and blended group ($p<0.05$). The analysis showed that the blended group was more successful than the traditional group in terms of both course achievement and attitudes towards computers.
***Keywords*:** Blended learning, face to face learning, online learning, technology enhanced learning, interactive learning environments, computer literacy, attitudes towards computers

INTRODUCTION

Background

As the most popular form of distance education today, online learning is a rapidly growing trend in instructional technology. According to the United States Distance Learning Association (USDLA) and the Hale Group's report on distance learning, more than 96% of US colleges and universities now offer some form of online learning. Online learning has become popular because of its strategic advantages, such as cost effectiveness and flexible learning environments.
Different forms of online education have been examined in the literature. Therefore, it is possible to identify numerous varieties of online education, such as online, web-based, web-enhanced, blended, hybrid and mixed mode online learning. Since the concept of online learning is relatively new and there is no consortium that decides and defines all of these terms, different researchers have different points of view. Smith & Kurthen (2007) stated that using four distinct categories (web-enhanced, blended, hybrid learning and fully online) provides a more practical taxonomy. Web-enhanced courses incorporate a minimal number of web-based elements, such as the syllabus and course announcements. In blended courses, the instructor adds some significant online learning activities in addition to an online syllabus and a few online documents. For example, a blended course might have online quizzes or a few online discussions, which account for a certain percentage of the course grade. An important point is that these online activities do not replace any of the regular face-to-face (FTF) class meetings; they account for only a limited percentage of course activities (less than 45%). If online activities replace 45% to 80% of FTF class meetings, the course can then be thought of as a hybrid. Classes with 80% or more e-learning are considered fully online. Allen & Seaman (2004) defined web-facilitated courses as those in which the proportion of content delivered online is less than 30%. If the proportion is between 30% and 80%, the course is defined as blended or hybrid. Finally, if the proportion is greater than 80%, then the course is defined as fully online. Bourne, Harris, & Mayadas (2005) and George E., Anna C., & Barrie Jo (2003) defined blended learning as an optimal combination of FTF and online education that improves learning and satisfaction of instructors and students at a reasonable cost. The concept of blending should help teaching and performance professionals create and manage plans to make the best use of face-to-face and technological formats, selecting the optimum instructional or non-instructional performance solutions (Yoon & Lim, 2007).
Despite the fact that online learning is a widely used learning practice with many strategic advantages, instructor-led training (FTF) and online learning are still side by side in the educational world. Some researchers believe that there will always be a place for instructor-led educational programs. Others believe that online learning is more successful than FTF learning, and may therefore possibly take the place of FTF learning in the future. When we look at the literature, we find many advocates of these two opinions. Researchers usually focus on students' performance, attitudes and satisfaction in their empirical studies on FTF, fully online and blended mode forms of instruction. Russell (1999) cataloged 355 comparative studies in distance education between 1928 and 1996 and argued that no one method of delivering instruction is more effective than any other. This is known in the literature as the *no significant difference phenomenon*. Shen, Chung, Challis & Cheung (2007) conducted an empirical study with over 2000 students enrolled in a master's program in the department of computing at a university in Hong Kong. The study was conducted over a four-year period, and the researchers found no significant difference in student outcomes between traditional FTF teaching and technology-delivered instruction. Hauck (2006), Liu (2007), Sweat-Guy & Wishart (2008), Finlay, Desmet & Evans (2004) and Silver & Nickel (2007) have also found the no significant difference phenomenon in their studies. On the other hand, the empirical studies of some researchers have indicated that online education is more efficient than traditional FTF education. Robertson, Grant & Jackson (2005) examined students' perceived quality of the learning experience in online courses as compared to classroom-based learning in a graduate program. They stated that students perceived the quality of their online learning in the graduate program similar or even superior to campus courses. Guiller, Durndell & Ross (2008) conducted a study that engaged students in a critical thinking activity using both online and face-to-face methods, and compared the two modes in terms of evidence for critical thinking skills. They stated that more evidence for critical thinking was found in the online condition, and more students stated that they preferred this mode of discussion. Another emerging idea is that mixing FTF and online delivery options provides the most successful instruction. Schrum, Burbank & Capps (2007) researched students in introductory teacher preparation courses and stated that the best online teacher preparation courses maybe those that blend virtual and FTF interaction, rather than those that are strictly online. According to Amrein-Beardsley, Foulger & Toth (2007), instructors reported that the blended course model allows them to accomplish course objectives more successfully than either an online course model or a traditional course model. Most instructors noted increased interaction and contact among their students in a blended learning environment (Smith S., 2005). Tang & Byrne (2007) found no significant difference in course achievement between FTF instruction and blended instruction, though they stated that students appeared to be more satisfied with the blended mode of delivery than the FTF mode of delivery.
Since blended learning is a relatively new concept in online education, relatively few studies from the literature of online instruction have looked specifically at blended courses (Lin, 2008; Delialioglu & Yildirim, 2008). This study is an empirical study that evaluates the effectiveness of the blended mode of delivery on students' achievement and attitudes towards computers in a computer literacy course.

Purpose of the study

The Computer Literacy Course is taken by all students in the Education Faculties in Turkey. This course includes basic concepts of computer literacy, and its purpose is to help students use information technologies effectively when they become teachers. Therefore, it is one of the

most important courses in teacher education. This study aimed to determine the best delivery method for this course in order to enhance students' course outcomes and their attitudes towards computers. Blended mode instruction was selected for the experimental group; traditional FTF mode instruction was selected for the control group. A new instructional design was utilized for the experimental and control groups based on Dick and Carey's Instructional Design Model. Therefore, the purpose of this study was to compare the effectiveness of blended mode instruction with FTF instruction on students' course achievement and attitudes towards computers. To accomplish this purpose, the research questions for the study were constructed as follows:

1- Is there a significant difference between the FTF group and the blended group in terms of course achievement?

2- Is there a significant difference between the FTF group and the blended group in terms of attitudes towards computers?

METHOD

Design of the study

A pretest/posttest control group experimental design model was used in this study. The independent samples t-test was used to determine the difference between the sample and the control group in terms of course achievement and attitudes towards computers. The independent variable was the instructional method (FTF or blended). The dependent variables were students' course achievement and attitudes towards computers.

Participants

The population for this study consisted of students in Uludag University's Faculty of Education. A total of 179 students were chosen for the sample. The sample consisted of 59 students from the Department of Educational Science, 34 students from the Department of Turkish Education and 86 students from the Department of Primary Education. The students were assigned to the control and the experimental groups according to test scores examining their prior knowledge about computer literacy and attitudes towards computers. Equal representation in terms of students' prior knowledge and attitudes towards computers was achieved for both groups.

Features of traditional FTF instruction and blended instruction

In this study, a new instructional design based on Dick and Carey's Instructional Design Model was utilized for both the experimental and the control groups. Dick and Carey's Instructional Design Model was selected because it has been one of the widely used models in the past, and it is a systematic model that defines each step in detail for the instructors.

The FTF group took the course traditionally (two hours of theoretical material in the classroom and two hours of applied material in laboratory). The theoretical part of lectures was supported by PowerPoint presentations, books, lecture notes and tutorials. Classroom discussions and question and answer techniques were used in teacher-student interactions. Teamwork, classroom discussions and projects were used in order to provide opportunities for collaborative learning.

Classroom meetings for the blended group were two hours each. In addition to these classroom meetings, the blended group used a website that was developed for the course. Additional learning materials consisted of online lecture notes and multimedia-rich components such as screen captures, assessment simulations and online tutorials. Questions, e-mail and web announcements were used as means of student-teacher interaction. Teamwork, classroom discussions and e-mail were used in order to enhance students' collaborative learning experiences. The website, which included the learning materials, was developed in ASP .NET 2.0 and Sql Server 2005. Macromedia Captivate was used for screen captures and assessment simulations. The website was developed like a small model of a learning management system. Students in the blended group could log in to this web site with their passwords reaching order to access the systematically structured learning materials.

Data collection tools

An achievement test and an attitude scale were used as data collection tools. The achievement test was developed by the researchers, and it was used to test students' prior knowledge at the beginning of the study. The same test was used at the end of the course. The test was checked for internal validity by four subject matter experts. The attitude scale that was used in this study was developed by Loyd & Gressard in 1984. This scale was translated into Turkish by Berberoğlu & Çalıkoğlu (1992). The scale consisted of 40 items with a four-point Likert response format; values ranged from strongly agree (4) to strongly disagree (1). The alpha reliability coefficient of the attitude scale was .90.

Procedures of the study

A needs analysis was conducted at the beginning of the study. Performance objectives were written in light of the information gathered from the needs analysis. After that, the instructional materials were developed. At the beginning of the study, the achievement test and the attitude scale were given to the control and the experimental groups as pretests. The control group and the experimental group were then taught for 14 weeks. At the end of the course, the same test and scale were given to students as posttests. The data collected before the course and after the course were analyzed using SPSS software. An independent samples t-test was used in order to compare the groups in terms of achievement in computer literacy and attitudes towards computers.

RESULTS AND DISCUSSION

Results of the first research question

The first research question was, "Is there a significant difference between the FTF group and the blended group in terms of course achievement?" In order to answer this question, students' prior knowledge and final achievement test results were considered. The FTF and the blended groups' pretest results (prior knowledge about computer literacy) are shown in Table 1.

Table 1 Comparison of prior knowledge about computer literacy in the FTF and blended groups

Group	N	Mean	SD	d.f.	T	P
FTF	93	26.173	13.587	177	.999	0.319
Blended	86	24.071	14.331			

As shown in Table 1, the independent samples t-test technique was applied to the mean pretest scores for the FTF and blended groups in order to examine the differences in prior knowledge. According to the test results, there was no significant difference in prior knowledge about the course between the FTF and blended groups ($p>.05$). The FTF and blended groups' posttest results (course achievement) are shown in Table 2.

Table 2 Comparison of course achievement in the FTF and blended groups

Group	N	Mean	SD	d.f.	T	P
FTF	93	51.16	9.97	177	6.913	0.000
Blended	86	61.49	10.003			

As shown in Table 2, the independent samples t-test technique was applied to the mean posttest scores for the FTF and blended groups in order to examine the differences in course achievement. According to the test results, there was significant difference in course achievement

between the FTF and blended groups (p<.05). The experimental (blended) group's mean score on the achievement test was higher than the control (FTF) group's mean score.
The results indicate that the blended mode instructional design, which was the combination of FTF and online instruction, had a positive effect on students' learning outcomes. There was no statistically significant difference in prior knowledge of computer literacy between the experimental group (blended group) and the control group (FTF group) at the beginning of the course. After 14 weeks of instruction, the experimental group received higher grades than the control group on the achievement test. The difference in the mean scores of the groups was statistically significant.

Results of the second research question

The second research question was, "Is there a significant difference between the FTF group and the blended group in terms of attitudes towards computers?" In order to answer this question, the Computer Attitude Scale (CAS) was applied to the FTF and blended groups at the beginning and at the end of the instructional period. The independent samples t-test technique was applied to the mean scores of both groups, and the results were compared at the significance level of .05. The comparison of the FTF and blended groups' mean CAS scores at the beginning of the instructional period are shown in Table 3.

Table 3 Comparison of the FTF and blended groups' mean CAS scores at the beginning of instruction

Group	N	Mean	SD	d.f.	T	P
FTF	93	126.868	12.422	177	.237	.813
Blended	86	127.337	13.948			

According to the test results shown in Table 3, there was no significant difference in attitudes towards computers between the FTF and blended groups before instruction (p>.05).

The comparison of the FTF and blended groups' mean scores on the CAS at the end of instruction are shown in Table 4.

Table 4 Comparison of the FTF and blended groups' mean CAS scores at the end of instruction

Group	N	Mean	SD	d.f.	T	P
FTF	93	124.505	12.180	177	3.003	0.003
Blended	86	130.535	14.644			

According to the test results shown in Table 4, there was a significant difference in attitudes towards computers between the FTF and blended groups after the instruction took place (p<.05).The experimental (blended) group's mean score on the CAS was higher than the control (FTF) group's mean score.
The results indicate that the blended mode instructional design had a positive effect on students' attitudes towards computers. Before the instruction, there was no statistically significant difference in CAS mean scores between the experimental group (blended group) and the control group (FTF group). After 14 weeks of instruction, the experimental group received higher grades than the control group on the same CAS. The difference in mean scores of both groups was statistically significant.

CONCLUSION AND IMPLICATIONS

This study evaluated the effects of blended and FTF course delivery methods on students' performance and attitudes towards computers in a computer literacy course. According to the test results, the blended mode course delivery method was more successful than the FTF course delivery method in terms of both students' course achievement and attitudes towards computers. Some possible reasons for these findings may be listed as follows. At the beginning of the study, needs analysis and learner analysis were conducted for both groups. Performance objectives, assessment instruments, instructional strategy and instructional materials were structured based upon the needs analysis and learner analysis. Students' opinions on the contents of the course were considered. Learning activities were designed in order to achieve a learner centered environment. Teaching methods were selected by taking students' preferences, needs and individual differences into account. The samples provided in the lessons were selected in relation to real world problems. The learner centered approach was adopted for both groups since in a learner-centered environment; students are active participants and construct their own knowledge by interacting with the information available. The only difference between the experimental (Blended) and control (FTF) groups was the learning medium, in other words, course delivery method. The blended group used the web site containing instructional videos, screen captures, assessment simulations, reading texts, self-paced learning materials, synchronous and asynchronous communication tools and various other tools from information and communication technologies. However, the FTF group took the course with traditional learning activities such as PowerPoint presentations, books, lecture notes, tutorials, classroom discussions, question and answer techniques. It is believed that interactive materials such as instructional videos, screen captures and assessment simulations are the most effective factors for success. This is the reason why the blended group was more successful than the FTF group in both course achievement and attitudes towards computers. In computer literacy, there are much more skills required for practice rather than learning concepts, therefore, the students are to learn these skills by following the many guiding steps reinforcing these skills. In traditional learning environments, this is not possible for the students however through interactive learning materials such as screen captures and assessments simulations, it is easier for the students to watch a video and to be able to pause or rewind that video and to perform a simulation resembling the usage of a real computer in a safe environment. In computer literacy it is not possible to make such interactions in traditional learning environments. The findings of this study are supported by the literature: Schrum, Burbank & Capps (2007), Amrein-Beardsley, Foulger & Toth (2007) and Smith (2005) emphasized that the blended learning environment provides improved learning outcomes and improved student and faculty satisfaction. They also stated that faculty-student interaction and instructors' abilities to accomplish course objectives increased in the blended learning environments compared to an online or traditional course. On the other hand, researchers such as Tang & Byrne (2007) and Delialioglu & Yildirim (2008) have found no significant difference in course achievement between FTF instruction and blended instruction. Their findings of no significant difference does not conflict with the results of this research study because blended learning can be considered as successful as FTF learning according to this phenomenon. When the literature is reviewed as a whole, it can be concluded that blending online and FTF instruction, on average, produces stronger learning outcomes than FTF instruction alone (U.S. Department of Education, Office of Planning, Evaluation, and Policy Development, 2009).
Blended learning has numerous strategic advantages, such as cost effectiveness, flexibility and a reduction in students' seat time in classrooms. Although these advantages change the learning environment, the way that students learn does not change. Therefore, the theoretical framework of instruction must be considered when designing instruction; technology itself is not enough to make people learn. According to Pang (2009), technology is a tool that is strategically used in order to deliver instructional content. The focus, therefore, is on the instructional uses of technology rather than the technology itself.
Since blended learning is a relatively new concept of online learning, there are a limited number of empirical research studies in the literature that evaluate students' learning outcomes and their attitudes. In addition, most of the research practices are from the Western world. Furthermore, these studies were conducted under different conditions and with different subjects. The present study examines Turkish instructional practices, comparing the effectiveness of blended and FTF learning in a computer literacy course with a sample group of

preservice teachers. It can be said that this study's originality comes from this characteristic. Of course, the study was conducted in a limited period of time (14 weeks), with a limited number of students (176 preservice teachers) and a limited subject (a computer literacy course). Consequently, it is not possible to generalize the findings that have been obtained from the present study. Further research should be conducted on a larger group of students and with different subjects in order to achieve the best blending of online and FTF learning.

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BÖTE BÖLÜMÜ ÖĞRENCİLERİNİN İNTERNET ETİĞİ ALGILARININ İNCELENMESİ

THE ANALISY OF CEIT DEPARTMENT STUDENTS' INTERNET ETHICS PERCEPTIONS

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Özet: İnternet, bilişim teknolojileri dünyasında kendine büyük ve etkili bir kullanım alanı bulmuştur. BT'lerin hızlıca gelişmesi ve yaşamımızın bir parçası olması insanlığa büyük kazançlar sağlamış ancak her alanda olduğu gibi bir takım sorunların da beraberinde gelmesine neden olmuştur.
İnternet üzerinde kabul edilebilir ya da edilemez davranışları tanımlayan kurallar internet etiği olarak adlandırılır. İnternet etiği olarak adlandırılan bu kurallar, interneti kullanırken diğer insanların haklarına saygılı olmak ve internetin olumsuz etkilerini bertaraf etmek için ne yapılıp ne yapılamayacağına ilişkindir. Kullanıcı sayısı ile sorunların ve olumsuzlukların artacağı düşünülürse, internetin zararlı yönlerinden korunmak için internet etiği kurallarının bilinmesi ve uygulanması gerekmektedir (MEB, 2004).
Bu çalışmada üniversite öğrencilerinin internet etiği algıları Torun (2007) tarafından geliştirilen 'İnternet Etiği Tutum Ölçeği' kullanılarak tespit edilmeye çalışılmış ve cinsiyete, sınıf düzeyine ve anne-babanın eğitim durumuna göre incelenmiştir. Araştırmaya Yıldız Teknik Üniversitesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümünde okuyan 1. 2. 3. ve 4. sınıf olmak üzere toplam 155 öğrenci katılmıştır. Araştırma sonuçları doğrultusunda önerilerde bulunulmuştur.
Anahtar Kelimeler: İnternet, etik, bilgisayar etiği, internet etiği.

Abstract: The use of Internet has had a great and effective place in the world of information and communication technology field. The rapid development of ICT and its use in our daily lives has provided many advantages however as in all the fields it brought some challenges.
The set of rules which determine the acceptable and unacceptable behaviors among the Internet is called internet ethics. These rules of internet ethics are related with the respect to others while using the Internet and what to do and not to do in order to eliminate the negative effects of the Internet. If it is considered that by the increase in the number of internet users, challenges and challenges increase, then it is essential to learn and apply the rules of internet ethics in order to prevent the negative aspects of the Internet (MEB, 2004).
In this study, 'internet ethics attitude questionnaire' which was improved by Torun (2007) was applied to university students. Students' internet ethics attitudes were examined in terms of gender, class levels and parents' education situations. The participants are consisted of a total number of 155 undergraduate students from 1st, 2nd, 3rd and 4th graders of Computer Education and Instructional Technology department of Yıldız Technical University. According to the research results, discussions and suggestions are provided.
Key Words: Internet, Ethics, Computer Ethics, Internet Ethics.

GİRİŞ

21. yüzyıl dünyasında bilimin, teknolojinin, endüstri ve politikanın farklı alanlarında modern dünyadaki rekabette ayakta kalabilmek için bilgi ve haberleşme tekniklerinin önemine vurgu yapıla gelmektedir (Narciss,1998).
20. yüzyılın sonlarında hızla gelişen bilgisayar ve bilişim teknolojilerinin meyvesi olan internetin, yaşamın her alanında gerek kişisel gerekse toplumsal temelde kendisini hissettirmesiyle birlikte farklılaşan bilgiyi üretme, bilgiye ulaşım, bilgiyi işleme, bilgiyi depolama, bilgiyi geri çağırma, bilgiyi dağıtma ve iletişim kavramları toplumları daha az hiyerarşik, birbirleriyle bağlantılı, etkileşimli yapılara doğru dönüştürmeye başlamıştır (Capurro, 2000).
Ancak internetin kullanımında olumlu gelişmeler sağlayacak davranışlar kadar, yanlış kullanımdan kaynaklanan olumsuzlukları da göz önünde bulundurmak gerekir (Schaffer, Hall ve Bilt, 2000).
Konu için öncelikle etik, bilgisayar etiği ve internet etiği kavramlarına bir göz atmakta fayda olacaktır.

Etik

Etiğin tarihi milattan önce 5. ve 6. yüzyıla, bu dönemin Hint ve Çin felsefelerine, özellikle de İlkçağ Yunan felsefesine kadar geriye gider (Atayman, 2005). Etik yaşanılan çağın özelliklerine göre şekillenir. Örneğin tarım toplumundaki etik sorunlar, köleler ve efendiler arasındaki adaletsizlik iken yaşadığımız bilgi çağında; bilginin doğruluğu, gizliliği, kime ait olduğu gibi konular üzerinde odaklanmaktadır (Akt. Torun, 2007).
Yunanca karakter, adet, usûl anlamlarına sahip 'ethos' sözcüğünden gelen etiğin birçok tanımı olduğunu görmekteyiz (Campbell, 1995).
Etik kavramı hakkında literatür taraması yapıldığında çoğu zaman etik ve ahlak kavramlarının birbirlerinin yerine kullanıldığı görülür. Bunun nedeni etiğin ahlak felsefesi olarak tanımlanmasıdır. Ergüç (2002)'e göre; etik, bir kişinin belli bir durumda ifade etmek istediği değerle ilgiliyken, ahlak bunu hayata geçirme tarzıdır (Akt. Uysal, 2006).
Etik, neyin iyi ve doğru, neyin kötü ve yanlış olduğunu araştıran, insan hayatının gerçek amacının ne olması gerektiğini soruşturan, ahlâklı ve erdemli bir yaşayışın hangi unsurları içerdiğini irdeleyen felsefe dalıdır (Cevizci, 2002).
Saunders'e göre etik, toplum tarafından kabul görmüş benimsenmiş doğru davranışlar bütünüdür (Dedeoğlu, 2001).
Demokratik toplumlarda uzun zamandır çalışma alanı olan etik son yıllarda toplumumuzda her geçen gün artan etik sorunlar nedeniyle güncel bir kavram olmuştur.

Bilgisayar Etiği

İnternet etiği daha geniş bir kategori olan bilgisayar etiğinin bir parçası olduğundan internet etiği kavramının anlaşılması için önce bilgisayar etiği kavramının irdelenmesi gerekmektedir (Fox, 2003).
Bilgisayar etiği bilgisayar teknolojisiyle ortaya çıkmış tartışma konularından birisidir. Baase (2003) gibi bazı araştırmacılara göre bilgisayar etiği, tıp etiği, kanun etiği, muhasebe etiği ve öğretim etiği gibi mesleki bir etik kategorisi olarak tanımlanabilir (Odabaşı ve Namlu, 2007).
Moor (1985)'a göre bilgisayar etiği, bilgisayar teknolojisinin doğal ve sosyal etkisinin bir çözümlenmesi ve bu teknolojinin etiğe uygun kullanımı için politikaların gerekçelerinden oluşmaktadır. Bilgisayar etiği; sürekli gelişen bilgisayar teknolojileri ile ilişkili olarak gerçekler, kavramsallaştırmalar, politikalar ve değerler arasındaki ilişkileri ele alan dinamik ve karmaşık bir çalışma alanıdır.
Yani Moor'a göre bilgisayar etiği (1) bilgisayar oluşumlu politika boşluklarının saptanması, (2) kavramsal kargaşanın açıklığa kavuşturulması, (3) bilgisayar teknolojisinin kullanımı için ilkelerin düzenlenmesini içermektedir. Mason (1986) ise bilgisayar etiğini gizlilik, erişim, fikri mülkiyet hakkı ve doğruluk olarak 4 ana başlık altında toplamıştır.

İnternet etiği

İnternetin hızla gelişimiyle birlikte, internet teknolojisinin beraberinde mevcut bilgisayar etiği sorunlarından farklı sorunlar getirip getirmediği tartışılmaya başlanmıştır (Tavani, 2000). Bazı yazarlar internetin mevcut etik sorunlara yenisini eklemediğini fakat olan sorunları daha da körüklediğini iddia etmektedirler.

Fox (2003) internet etiğinin kapsamlı bir tanımını aşağıdaki gibi yapmıştır:

- İnternet Etiği, internette ve internetle alakalı yanlış ya da doğru davranışların kapsamlı araştırmasıdır. Bu araştırma internetin bugünkü ve gelecekteki kullanımı, üretimi ve düzenlenmesine has potansiyel etik kaygıların saptanmasıyla sonuçlanır.
- İE bu endişeleri inceleyen ve bu endişelerden hangisinin müdahaleye gereksinim duyduğuna karar veren titiz bir süreçtir.
- İE alternatifleri inceler, zamanında müdahale için en uygun seçeneği kararlaştırır.
- İE yanlış ve doğru davranışlara ek olarak internetin direk ve dolaylı sonuçları olan değişen sosyal değerleri saptar, inceler ve gerekli olduğunda müdahaleyi teşvik eder.
- İE yansıma, tekrar değerlendirme ve gözden geçirme için bir genel düzen sağlar.

Laudon ve Laudon (1996)'a göre günümüz bilişim toplumunda ortaya çıkan etik sorunlar şu soyut gruplar altında toplanabilir (Dedeoğlu, 2001):

- Bilgi edinme hakları ve yükümlülükleri.
- Fikrî mülkiyet hakları.
- Sistem kalitesi.
- Hesap verebilirlik ve denetim.
- Yaşam nitelikleri.

Bu sorunlar Mason (1986)'un da bilgisayar etiğine dair yazdığı kitabında mahremiyet (**P**rivacy), doğruluk (**A**ccuracy), fikrî mülkiyet (**P**roperty), erişebilirlik **A**ccessibility) başlıkları altında belirttiği sorunlarla (PAPA) paralellik göstermektedir.

DeLisse (2000)'nin Fodor (1996), Johnson (1991) ve Sivin&Bialo (1992)'dan aktardığına göre üretilen her yeni icat gibi, bilgi teknolojilerinin de toplum üzerinde hem olumlu hem de olumsuz yönleri olduğunu ve bilgi teknolojilerinin, ahlaki ve etik sorunların ortaya çıkmasına neden olmaktadır. Ortaya çıkan etik sorunlar, bilgisayar sistemlerini kullanan insanların etik sorunların farkında olmalarını ve etik kararlar verebilme yeteneğine sahip olmalarını gerektirmiştir (Charlesworth, 2000).

Bu sorunlar bilgisayar etiği çerçevesinde araştırılmakta ve değerlendirilmektedir. Yeni bilgi, yeni fikirler ve yeni değerlerin oluştuğu toplumların bireyleri, sürekli kendilerini geliştirmek gereksinimi duymuşlardır (Jarvis, 1995). Kullanıcı sayısı ile sorunların ve olumsuzlukların artacağı düşünülürse, internetin zararlı yönlerinden korunmak için internet etiği kurallarının bilinmesi ve uygulanması gerekmektedir.

Bu bilgiler temel alınarak planlanan bu araştırmanın temel amacı: Yıldız Teknik Üniversitesi Eğitim Fakültesi BÖTE bölümünde 2009-2010 öğretim yılı bahar yarıyılında öğrenim gören öğrencilerin, internet etiği algı düzeyinin; cinsiyet, sınıf düzeyi, anne ve baba eğitim durumu göre değişiklik gösterip göstermediğini ortaya koymaktır.

YÖNTEM

Yöntem

Öğrencilerin demografik özellikleri ve internet etiği algıları ilgili verilerin toplanması için anket uygulanmıştır. İnternet etiği algılarını ölçmek için Torun (2007) tarafından geliştirilen 'İnternet Etiği Tutum Ölçeği' kullanılmıştır. Araştırmada elde edilen verilerin istatistiksel analizinin yapılmasında SPSS 17.0 paket programı kullanılmıştır.

Araştırmanın Modeli

Araştırma, tarama modellerinden, tekil tarama modeline uygun olarak planlanmış ve gerçekleştirilmiştir. Tekil tarama modelinde; ilgilenilen olay, grup gibi birim ve duruma ait değişkenler, ayrı ayrı betimlenmeye çalışılır. Bu betimlenmede geçmiş ya da şimdiki zamanla sınırlı olabileceği gibi, zamanın bir fonksiyonu olarak gelişimsel de olabilir (Karasar, 2004). Bu araştırmada da yansız seçilmiş dört grubun internet etiği algı düzeylerinin, bu gruplara ait değişkenlere göre farklılık gösterip göstermediği ortaya konulmak istendiği için tekil tarama modeli seçilmiştir.

Çalışma Grubu

Araştırmanın çalışma grubunu; 2009-2010 öğretim yılı bahar yarıyılında Yıldız Teknik Üniversitesi Eğitim Fakültesi'nin Bilgisayar ve Öğretim Teknolojileri Öğretmenliği Bölümünde 1. 2. 3. ve 4. sınıfta okuyan, toplam 155 öğrenci oluşturmuştur. Bu öğrencilerin seçiminde 1. 2. 3. ve 4. sınıfa devam eden tüm öğrenciler çalışma grubuna seçilmiş ancak veri toplanamayan öğrenciler araştırmadan çıkarılmıştır.

Veri Toplama Aracı

Bu araştırmada, kullanılan veri toplama aracı olan İnternet Etiği Tutum Ölçeği Torun tarafından 2007 yılında geliştirilmiştir. Testin orijinalinde geçerlilik ve güvenirlilik çalışması yapılmıştır. Lise öğrencileri için geliştirilen bu ölçek araştırmacı tarafından üniversite öğrencilerine göre uyarlanmıştır.

Bu ölçek yedi alt faktörden oluşmaktadır. Yedi faktörün açıklayabildiği toplam varyans miktarı % 57,891'dir. Faktörlerin açıklayabildikleri varyans miktarı şöyledir: birinci faktör % 10,668'ini, ikinci faktör % 9,960'ını, üçüncü faktör % 9,026'sını, dördüncü faktör % 8,779'unu, beşinci faktör % 7,696'unu, altıncı faktör % 7,265'ini ve son faktörde % 4,497'sini açıklamaktadır.

Birinci faktör, "cinsel içerik", ikinci faktör "bilgisayar korsanlığı ve rahatsız etme", üçüncü faktör "ödev aşırma", dördüncü faktör "telif hakları", beşinci faktör "internet bağımlılığı", altıncı faktör "şiddet içeren oyunlar" ve yedinci faktör "sanal dürüstlük" olarak adlandırılmıştır. Tüm faktörlerin Cronbach alpha değeri 0,70'in üzerindedir.

Maddelerin yanıtlandırılmasında beşli Likert tipinde "Tamamen katılıyorum", "Çok katılıyorum", "Kararsızım", "Az katılıyorum" ve "Hiç katılmıyorum" seçeneklerinden oluşan bir derecelendirme ölçeği kullanılmıştır.

Verilerin Toplanması ve Analizi

Araştırmanın verileri 2009–2010 öğretim yılı bahar yarıyılında yapılan ölçümler sonunda elde edilmiştir. Ölçekteki Hiç Katılmıyorum Seçeneği 1 puan üzerinden, Tamamen Katılıyorum seçeneği 5 puan üzerinden hesaplanmıştır. Cinsiyete göre internet etiği algı düzeylerinin ortalamasının karşılaştırılmasına t testi ile bakılmıştır. Bunun yanı sıra öğrencilerin anne-baba eğitim durumları ve sınıf düzeyi ile internet etiği algıları arasında anlamlı bir fark olup olmadığının tespitine ANOVA testi ile bakılmıştır.

BULGULAR

Araştırmaya katılan öğrencilerin % 71,6'sını (n=111) erkek, % 28,4'ünü (n=44) kız öğrenciler oluşturmaktadır. Bu öğrencilerden %19,4'ü (n=30) birinci sınıf, % 23,9'u (n=37) ikinci sınıf, % 24,5'i (n=38) üçüncü sınıf ve % 32,3'ü (n=50) dördüncü sınıf öğrencileridir. Öğrencilerin %73,5'inin (n=114) evinde internet bağlantısı bulunmaktadır.

Öğrencilerin % 72,3'ü çoğunlukla internete evden, %11,6'sı internet kafeden, % 10,3'ü okuldan ve % 5,8'i ise işyeri/bir yakının evi vb yerlerden bağlantı sağlamaktadır. Öğrencilerin ortalama internet kullanım saatleri ise şu şekildedir: % 34,2'si günde 1-2 saat; % 25,2'si günde 3-4 saat; % 23,2'si günde 4 saatten fazla; % 16,1'i haftada 1-2 saat ve % 1,3'ü de ayda 1-2 saat internet kullanmaktadır.

Tablo 1: Cinsiyete Göre İnternet Etiği Algı Düzeyi

Cinsiyet	N	Ortalama	Standart Sapma	p
Kız	44	250	15,300	,003
Erkek	111	232	21,911	

Tablo 1'e göre kız öğrencilerin internet etiği algı düzeylerinin puan ortalaması X=250, erkek öğrencilerin internet etiği algı düzeylerinin ortalaması ise X=232'dir. P değerine bakıldığında (p<,05) istatistiksel olarak kız öğrencilerin internet etiği algı düzeylerinin erkek öğrencilerin internet etiği algı düzeylerinden anlamlı bir farkının olduğu söylenebilir.

Tablo 2: Sınıf Seviyesine Göre İnternet Etiği Algı Düzeyi

Sınıf	N	Ortalama	Standart Sapma	p
1.sınıf	30	233	17,133	,060
2. sınıf	37	235	26,076	
3. sınıf	38	237	19,880	
4. sınıf	50	242	21,493	

Tablo 2'ye göre birinci sınıf öğrencilerinin internet etiği algı düzeylerinin ortalaması X=233, ikinci sınıf öğrencilerinin internet etiği algı düzeylerinin ortalaması X=235, üçüncü sınıf öğrencilerinin internet etiği algı düzeylerinin ortalaması X=237, dördüncü sınıf öğrencilerinin internet etiği algı düzeylerinin ortalaması ise X=242'dir. Dördüncü sınıf öğrencilerin internet etiği algı düzeylerinin diğer sınıf düzeylerine göre biraz daha yüksek olduğu görülse de P değerine bakıldığında (p>,05) istatistiksel olarak öğrencilerin internet etiği algı düzeylerinin sınıf derecelerine göre anlamlı bir fark yaratmadığı söylenebilir.

Tablo 3: Öğrencilerin Anne Eğitim Durumlarına Göre İnternet Etiği Algı Düzeyi

Annenin eğitim durumu	N	Ortalama	Standart Sapma	p
Okur-yazar değil	20	246,0500	19,898	,276
İlkokul mezunu	86	238,3488	19,686	
Ortaokul mezunu	15	235,8000	27,867	
Lise mezunu	21	229,0000	25,065	
Üniversite mezunu	9	232,4444	16,583	
Diğer	4	249,2500	26,512	

Tablo 3'e göre, öğrencilerin anne eğitim durumlarında; annesi okur-yazar olmayan öğrencilerin internet etiği algı düzeylerinin ortalaması X= 246, annesi ilkokul mezunu olan öğrencilerin internet etiği algı düzeylerinin ortalaması X= 238, annesi ortaokul mezunu olan öğrencilerin internet etiği algı düzeylerinin ortalaması X= 235, annesi lise mezunu olan öğrencilerin internet etiği algı düzeylerinin ortalaması X= 229, annesi üniversite mezunu olan öğrencilerin internet etiği algı düzeylerinin ortalaması X= 232'dir. P değerine bakıldığında (p>,05) olduğu için istatistiksel olarak anne eğitim durumuna göre öğrencilerin internet etiği algı düzeyleri arasında anlamlı bir farkın olmadığı söylenebilir. Annesi ilkokul mezunu olan öğrencilerin oranı % 55,5, lise mezunu olan öğrencilerin oranı % 13,5, okur-yazar olmayan öğrencilerin oranı % 12,9, ortaokul mezunu olan öğrencilerin oranı % 9,7 ve üniversite mezunu olan öğrencilerin oranı ise %5,8'dir.

Tablo 4: Öğrencilerin Baba Eğitim Durumlarına Göre İnternet Etiği Algı Düzeyi

Babanın eğitim durumu	N	Ortalama	Standart Sapma	p
Okur-yazar değil	2	213,0000	7,071	,198
İlkokul mezunu	68	242,5147	18,902	
Ortaokul mezunu	24	234,6250	23,004	
Lise mezunu	35	236,2286	20,745	
Üniversite mezunu	25	230,3200	25,022	
Diğer	1	280,0000		

Tablo 4'e göre, öğrencilerin baba eğitim durumlarında; babası okur-yazar olmayan öğrencilerin internet etiği algı düzeylerinin ortalaması X= 213, babası ilkokul mezunu olan öğrencilerin internet etiği algı düzeylerinin ortalaması X= 242, babası ortaokul mezunu olan öğrencilerin internet etiği algı düzeylerinin ortalaması X= 234, babası lise mezunu olan öğrencilerin internet etiği algı düzeylerinin ortalaması X= 236, babası üniversite mezunu olan öğrencilerin internet etiği algı düzeylerinin ortalaması X= 230'dir. P değerine bakıldığında (p>,05) olduğu için istatistiksel olarak baba eğitim durumuna göre öğrencilerin internet etiği algı düzeyleri arasında anlamlı bir farkın olmadığı söylenebilir. Babası ilkokul mezunu olan öğrencilerin oranı % 43,9, lise mezunu olan öğrencilerin oranı % 22,6, üniversite mezunu olan öğrencilerin oranı %16,1, ortaokul mezunu olan öğrencilerin % 15,5 ve okur-yazar olmayan öğrencilerin oranı ise % 1,3'dür.

SONUÇ VE ÖNERİLER

Araştırmada cinsiyet yönünden kız öğrencilerin erkek öğrencilere göre internet etiği algı düzeylerinin yüksek olduğu bulunmuştur. Bu sonuca göre bayanların erkeklere göre belirtilen faktörler altındaki maddelere ilişkin daha etik görüş bildirdikleri söylenebilir. Bu bulgu Khazanchi (1996), Bissett ve Simpson (1999), Mert (2003) ve Uysal (2006) ve Torun (2007)'un bulgularıyla tutarlıdır. Alan yazında yapılan araştırmaların çoğunda bayanların etik algı puanlarının erkeklerden daha yüksek olduğunu sonucuna ulaşılmıştır.

Sınıf düzeyine göre bir karşılaştırma yapıldığında 4. sınıfların internet etiğine ilişkin görüşlerinin toplam puan ortalamalarının 1., 2. ve 3. sınıfların internet etiğine ilişkin görüşlerinin toplam puan ortalamalarından daha yüksek olduğu bulunmuş, fakat bu farkın istatistiksel olarak anlamlı olmadığı görülmüştür. Uysal (2006)'ın çalışmasında bilgisayar kullanım yılının sadece internet etiğinde Fikri Mülkiyet faktörünü etkilediği görülmüştür. Gattiker ve Kelley (1999) bilgisayar kullanma süresinin, bilgisayar teknolojilerini ilgilendiren etik ikilemler hakkında verilen ahlaki kararlara etkisi olmadığı sonucuna ulaşmıştır (Akt. Uysal, 2006).

Anne eğitim düzeyine göre öğrencilerin, internet etiğine ilişkin maddelere verdikleri yanıtlar arasında anlamlı bir fark görülmemiştir. Bu sonuca göre, anne eğitim düzeyinin öğrencilerin internet etiğine ilişkin görüşlerini etkilemediği söylenebilir. Bu bulgu Torun (2007)'un çalışmasındaki bulgu ile çelişmektedir. Bu çalışmada, öğrencilerin internet etiği tutumları, annenin algılanan eğitim düzeyi değişkenine göre farklılık göstermektedir. Anlamlı farklılıklar anneleri çoğunlukla ortaokul mezunu olan katılımcılar lehindedir.

Araştırmada son olarak, baba eğitim düzeyine göre öğrencilerin, internet etiğine ilişkin maddelere verdikleri yanıtlar arasında anlamlı bir fark görülmemiştir. Bu sonuca göre, baba eğitim düzeyinin öğrencilerin internet etiğine ilişkin görüşlerini etkilemediği söylenebilir.

Bu araştırmadan elde edilen bulgulara ve bilgisayar ve internet etiği konusundaki ilgili araştırmalara dayanarak, öğrencilerin internet etiğine ilişkin duyarlılıklarını yükseltmek amacıyla eğitim merkezlerimizin bilgisayar ve internet etiği konusu üzerinde etkili önlemler alması gerekmektedir. İlk olarak eğitimciler bilgisayar ve internet etiği konusunda bilgilendirilmelidir.

Öğrenciler ilköğretimden itibaren etik konusunda eğitilmeye başlanmalıdır. Öğrencilerin çeşitli yöntemlerle etik davranış yollarını öğrenmeleri ve etik bir şekilde davranmaları için pratik deneyimler sağlayan olanaklar sunulmalıdır.

Bir sonraki adımlarında toplum içinde aktif rol alıp bilişim teknolojileri öğretmeni olarak görev alacak olan BÖTE Bölümü öğrencileri için spesifik bilgisayar ve internet etiği dersleri açılmalıdır.

Ailelerin internet etiği konusunda bilinçlendirilebilmesi için seminerler yapılmalı, konferanslar düzenlenmelidir.

Tüm ülkece benimsenen ve yaşanabilecek etik sorunların çözümünde kaynak olabilme özelliğine sahip bilgisayar ve internet etiği davranış kuralları saptanıp, ilgili çevreler bu konuda bilgilendirilmelidir.

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BÖTE ÖĞRENCİLERİNİN BLOGLAR HAKKINDAKİ GÖRÜŞLERİ

OPINIOS OF CEIT STUDENTS ABOUT BLOGS

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Özet
Blog güncelden eskiye doğru yazılan çeşitli yazı ve yorumların yanı sıra çoklu ortam nesnelerini (grafik, animasyon, film, vs) kapsayan Web tabanlı bir yayın aracıdır (Vikipedi, 2010). Bu çalışmanın amacı blog yayıncılığı ve kullanımı konusunda tecrübeleri olan Abant İzzet Baysal Üniversitesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü (BÖTE) öğrencilerinin bloglar hakkındaki görüşlerini incelemektir. Veriler kişisel bilgi formu (cinsiyet, İnternet kullanım sıklığı) ve bloglar hakkında çoktan seçmeli ve yarı yapılandırılmış soruları içeren anket formuyla toplanmıştır. Araştırmaya 3. ve 4. sınıfta öğrenim gören yaklaşık 33 BÖTE öğrencisi katılmıştır. Araştırmada blog yayınlamanın öğrencilere yaptığı katkılar, blog yayıncılığının avantajları ve dezavantajları incelenmiştir. Ayrıca, BÖTE öğrencilerinin ileriki mesleki yaşantılarında blog kullanımı konusundaki düşünceleri ve blog kullanımın öğrenme-öğretme ortamlarına yapabileceği katkılar konusundaki düşünceleri de incelenmiştir.
Anahtar kelimeler: Blog, BÖTE öğrencileri, avantajlar, dezavantajlar

Abstract
Blog is a Web-based publication tool which contains multimedia objects (e.g., graphic, animation, video, etc.) as well as various text and interpretations in a chronological order from new to old (Vikipedi, 2010). The purpose of this study is to investigate opinions of Computer Education and Instructional Technology (CEIT) students who have experiences in blog publication and usage. The data were collected through personnel information form and a questionnaire that covers multiple and semi-structured questions about blogs. Thirty-three students who have studied in third and forth grades in the CEIT program participated in the study. The study investigated contributions of the blog publishing to the students and advantages and disadvantages of blog publishing for the students. In addition, the study investigated the opinions of CEIT students about blog usage in their future professions and contributions of blog usage in teaching-learning environments.
Keywords: Blog, CEIT students, advantages, disadvantages.

GİRİŞ

Blog ve Wiki gibi Web 2.0 temelli teknolojiler günümüzde oldukça popüler yayın araçları haline gelmişlerdir. Blog güncelden eskiye doğru yazılan çeşitli yazı ve yorumların yayınlandığı ve çoklu ortam nesnelerini de (grafik, animasyon, film, vs) kapsayan Web tabanlı bir yayın aracıdır (Vikipedi, 2010). Ayrıca blog Holtz (2006) tarafından minimum teknik beceriyle kullanıcıya Web içeriği oluşturma ve edit etme fırsatı veren Web yayıncılığı yazılımı olarak tanımlanmaktadır. Weblog (ağ kütüğü) ya da blog (ağ günlüğü) olarak da bilinin bu yazılım Türkiye'de dahil birçok ülkede önemsenen ve ciddiye alınan bir yayın aracı haline gelmiştir. Örneğin, Mayıs 2005'de Google'da Türkçe sayfalarda "blog" kelimesi 65.400 kez yer alırken, Mayıs 2006'da bu sayı nerdeyse 5 milyona ulaşmış, Mayıs 2008'de ise 10 milyonu geçmiştir (Vikipedi, 2010). Bugün bu sayının çok daha fazla olduğu tahmin edilmektedir. Bu kullanımı kolay Web tabanlı yayın araçlarıyla ilgili birçok akademik çalışma yapılmıştır. Fakat bloglarla ilgili bu çalışmaların çoğunda teknoloji ve bilgisayarlar konusunda eğitim alan ya da bu alanlarda uzmanlık öğrenimi gören öğrencilerin görüşlerine çok fazla yer verilmemiştir (Guenther, 2005; Johnson, 2005; Ray, 2006; Tekinarslan, 2008; Philip, & Nicholls, 2009). Bu çalışmanın amacı Bilgisayar ve Öğretim Teknolojileri Eğitimi alanında öğrenim gören öğrencilerin bu kullanımı kolay Web yayın araçları bir diğer ifadeyle bloglar hakkındaki görüşlerini incelemektir.

Eğitimsel Ortamlarda Blog Kullanımı

Sosyal ve kişisel etkinliklerin yansıtılması ve ilerletilmesinin (Anderson, 2007; Godwin-Jones, 2003; Nardi et al., 2004) yanı sıra eğitimsel ortamlarda öğrenme etkinlikleri (e.g. Chong, 2008; Hurlburt, 2008; Tekinarslan, 2008; Williams & Jacobs, 2004) ve grup çalışması etkinliklerinde (Philip, & Nicholls, 2009) kullanılan bloglar hakkındaki literatür ya da alan yazın her geçen artmaktadır. İlgili alan yazın incelendiğinde blog kullanımın birçok alanda (iş, eğitim, iletişim, vs) her geçen gün arttığı görülmektedir (Winder, 2006; Williams & Jacobs, 2004; Philip, & Nicholls, 2009). İş dünyasında olanlar bloglardan daha erken yararlanmaya başladılar sonra onları eğitimciler, kütüphaneciler ve araştırmacılar takip ettiler (Winder, 2006; Williams & Jacobs, 2004). Bir konu hakkındaki düşünceleri, deneyimleri ve bilgi birikimlerini kişisel olarak ifade etmenin yanı sıra başka insanların yorumlarına ve düşüncelerine açık olması ve grup çalışmalarına da fırsat vermesi açısından bloglar birer sosyal etkileşim ağı ve eğitimsel bilgi kaynakları olarak da düşünülmektedir (Williams & Jacobs, 2004; Burgess, 2006; Philip, & Nicholls, 2009). Eğitim ortamlarında bloglar müzik eğitiminden (Chong, 2008) dil eğitimine (Embrey, 2002) kadar birçok alanda kullanılmaktadır. Eğitimsel blog kullanımı blog içeriği geliştirirken öğrencilerin bilgi tarama becerilerine, akademik yazma becerilerine, (Johnson, 2004; Huffaker, 2005; Hernández-Ramos 2004, Tekinarslan, 2008, Williams & Jacobs, 2004; Embrey, 2002), grup çalışması becerilerine, işbirlikçi öğrenme becerilerine ve tecrübe ve bilgi paylaşımı alışkanlıklarına olumlu katkılar sağlamaktadır (Chong, 2008; Philip, & Nicholls, 2009).

Araştırmanın Amacı

Blog kullanımıyla ilgili eğitimin birçok alanında araştırma yapılmasına rağmen bilgisayar ve öğretim teknolojileri alanında öğrenim gören öğrencilerin bloglar hakkındaki görüşlerine çok fazla yer verilmemiştir. Bu çalışmanın amacı blog yayıncılığı ve kullanımı konusunda tecrübeleri olan Abant İzzet Baysal Üniversitesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü (BÖTE) öğrencilerinin bloglar hakkındaki görüşlerini incelemektir. Araştırmada blog yayınlamanın BÖTE öğrencilerine varsa yaptığı katkılar, blog yayıncılığının avantajları, ve dezavantajları incelenmektedir. Ayrıca, öğrencilerin ileriki mesleki yaşantılarında blog kullanımı konusundaki düşünceleri ve blog kullanımın öğrenme-öğretme ortamlarına yapabileceği katkılar konusundaki düşünceleri de incelenmektedir.

YÖNTEM

Katılımcılar

Araştırmaya gönüllü olarak 2009-2010 öğretim yılı Güz döneminde Abant İzzet baysal Üniversitesi BÖTE bölümü 3. sınıfta öğrenim gören 21 ve 4. sınıflarda öğrenim gören 12 olmak üzere toplam 33 öğrenci (14 kız, 19 erkek) katılmıştır (Bakınız Tablo 1).

Tablo 1. Sınıf ve cinsiyete göre araştırmaya katılan BÖTE öğrencilerinin dağılımı.

	Cinsiyet		
Sınıf	Kız	Erkek	Toplam
BÖTE 3	11	10	21
BÖTE 4	3	9	12
Toplam	14	19	33

Araştırmaya katılan öğrencilerin tamamı (N=33) blog yayıncılığı becerilerine sahip olduklarını ve oluşturma tecrübelerinin olduğunu bildirmişlerdir. Ayrıca Tablo 2'de de görüldüğü gibi 8 öğrenci haftada en az 1-5, 7 öğrenci günde 5 saatten fazla ve 18 öğrenci de günde en az 1-5 saat arası Internet kullandıklarını beyan etmişlerdir.

Tablo 2. BÖTE öğrencilerinin İnternet kullanma sıklıkları.

İnternet Kullanma Sıklılığı	N	Yüzde (%)	Kümülatif Yüzde (%)
Haftada 1-5 saat	8	24,2	24,2
Günde 1-5 saat	18	54,5	78,8
Günde 5 saatten fazla	7	21,2	100,0
Total	33	100,0	

Veri Toplama Araçları

Araştırmada kullanılacak veriler kişisel bilgi formu (cinsiyet, İnternet kullanım sıklığı, blog oluşturma tecrübesi, vs) ve bloglar hakkında çoktan seçmeli ve yarı yapılandırılmış soruları içeren anket formuyla toplanmıştır. Kişisel bilgi formundaki sorulardan sonra öğrencilerin bloglar hakkındaki görüşleri aşağıdaki sorularla tespit edilmeye çalışılmıştır:

1. Blog sayfası yayınladıysanız size ne gibi katkıları oldu? Birden fazla seçenek işaretleyebilirsiniz.

a. Web yayıncılığı konusunda teknik becerilerim arttı,
b. Akademik yazma ve tartışma becerilerim arttı,
c. Referans gösterme becerilerim artı,
d. Düşüncelerimi ifade etme becerilerim arttı,
e. Ses, yazı, görüntü ve video gibi multimedya nesnelerini Web ortamında paylaşma becerilerim arttı,
f. Diğer (lütfen belirtiniz).

2. Blog yayıncılığının ne gibi avantajları var? Birden fazla seçenek işaretleyebilirsiniz.

a. Ücretsiz olması,
b. Yayınlamanın ve edit etmenin kolay olması,
c. Yayınlarınızın başkalarının yorumlarına açık olması,
d. Olumlu ve olumsuz yorumlara bakarak düzeltme şansımın olması,
e. Multimedya nesnelerini (ses, yazı, görüntü, vs) kullanarak yayın yapabilmem,
f. Kolay erişim olması,
g. Diğer (lütfen belirtiniz).

3. Blog kullanmanın sizin için bir dezavantajı var mı? Varsa belirtiniz

4. Mesleki yaşantınızda blog kullanmayı düşünüyor musunuz? Neden?

5. Blog yayıncılığının öğrenme-öğretme ortamlarına katkı sağlayacağına inanıyor musunuz? Neden?

Veri Analizi

Elde edilen verilerin bir kısmı (kişisel bilgi formundaki sorular ve yukarıdaki 1. ve 2. sorular) SPPS programında betimsel istatistikler kullanılarak analiz edilmiştir. Bunun yanı sıra, öğrencilerin görüşlerini yazılı olarak ifade etikleri yukarıdaki 3, 4, ve 5. sorular nitel analiz yöntemlerinden kategori oluşturma yöntemi kullanılarak analiz edilmiştir. Bunun için verileri analiz etmeden önce her bir katılımcıya anket formları üzerinde bir kod numarası verilmiştir ve öğrencilerin bu sorulara verdikleri cevaplar bu kod numaralarının altında soru numarasıyla birlikte bir kelime işlemci programına aktarılmıştır. Sonra, kelime işlemciye aktarılan verilere üzerinde veri birimlerinin kotlanmasıyla kavramsal kategorilerin yaratılması işlemini kapsayan kategori oluşturma yaklaşımı uygulanmıştır (Bogdan & Biklen, 1992). Daha sonra, ilgisiz ya da alakasız veriler elenerek kavramsal kategori kodları ve isimleri verilen veriler uygun kategori başlıkları altında (örneğin; katkılar, avantajlar, dezavantajlar, öğrenme-öğretme ortamı, vs) bir kelime işlemci programı içerisinde gruplanmıştır. Sonra elde edilen bulgular bu kategorilere dayanılarak ya da bu kategoriler etrafında rapor edilmiştir. Elde edilen verilerin raporlaştırılması ya da sunulması sırasında öğrencilerin gerçek isimleri değil takma isimleri kullanılmıştır.

BULGULAR

Blog Yayıncılığının BÖTE Öğrencilerine Katkıları ve Avantajları

Bu çalışmada blog yayıncılığının BÖTE öğrencilerinin çeşitli konulardaki (örneğin; Web yayıncılığı, akademik yazma ve tartışma, referans gösterme, düşüncelerini ifade etme, multimedya nesneleri paylaşma) becerilerine katkı sağlayıp sağlamadığı sorulmuştur. Öğrencilerin blog yayıncılığının bu alanlardaki becerilerine katkı yapıp yapmadığına ilişkin verdiği cevapların yüzde ve frekans dağılımları Tablo 3'de gösterilmektedir. Tablo 3'deki bulgulara göre blog yayıncılığı öğrencilerin en fazla düşüncelerini ifade etme becerilerine katkı yapmıştır (N=19, %57,6). Ayrıca, öğrencilerin yarısından biraz fazlası (N=17, 51,5%) blog yayıncılığının akademik yazma ve tartışma becerilerine katkı yaptığını, ve öğrencilerin yarısından biraz daha azı (N=15, %45,5) referans gösterme becerilerine katkı yaptığını belirtmişlerdir. Bununla birlikte, daha az sayıdaki öğrenci (N=13, %39,4) blog yayıncılığının kendilerinin ses, yazı, görüntü ve video gibi multimedya nesnelerini Web ortamında paylaşma becerilerine katkı yaptığını belirtmişlerdir. Bunun dışında elde edilen verilere göre blog yayıncılığı en son sırada öğrencilerin Web yayıncılığı konusunda teknik becerilerine katkı yapmıştır (N=12, %36,4).

Tablo 3. Blog sayfası yayınlamanın BÖTE öğrencilerine yaptığı katkılar

Katkı Alanları	Evet N (%)	Hayır N (%)	Toplam
Düşüncelerimi ifade etme becerilerim arttı	19 (%57,6)	14 (%42,4)	33
Akademik yazma ve tartışma becerilerim arttı	17 (%51,5)	16 (%48,5)	33
Referans gösterme becerilerim artı	15 (%45,5)	18 (%54,5)	33
Ses, yazı, görüntü ve video gibi multimedya nesnelerini Web ortamında paylaşma becerilerim arttı	13 (%39,4)	20 (%60,6)	33
Web yayıncılığı konusunda teknik becerilerim artı	12 (%36,4)	21 (%63,6)	33

Bunların yanı sıra bu çalışmada blog yayıncılığının BÖTE öğrencileri için çeşitli konularda bir avantaj sağlayıp sağlamadığı sorulmuştur. Öğrencilerin blog yayıncılığının çeşitli konularda (örneğin, yayınlamanın ve edit etmenin kolay olması, olumlu ve olumsuz yorumlara bakarak düzeltme şansımın olması, vs) kendilerine avantaj sağlayıp sağlamadığına ilişkin verdiği cevapların yüzde ve frekans dağılımları Tablo 4'de gösterilmektedir. Elde edilen bulgulara göre blog yayıncılığının öğrenciler için en büyük avantajı %87,9'luk bir oranla (N=29) ücretsiz olmasıdır. Daha sonra bunu %78,8'lik bir oranla (N=26) blog yayınlarının başkalarının yorumlarına açık olması takip etmektedir. Olumlu ve olumsuz yorumlara bakarak blog yayınlarını düzeltme şanslarının olması öğrenciler tarafından %72,7'lik bir oranla (N=24) 3. sırada bir avantaj olarak görülmektedir. Yayınlamanın ve edit etmenin kolay olması %63,6'lik bir oranla (N=21) öğrenciler için 4. sırada bir avantaj olarak ortaya çıkmaktadır. Öğrenciler %57,6'lık bir oranla (N=19) multimedya nesnelerini kullanarak yayın yapabilmeyi 5. sırada bir avantaj olarak göstermişlerdir. Kolay erişim olması seçeneği %51,5'lik bir oranla (N= 17) 6. ve en son sırada yer alan bir avantaj olarak ortaya çıkmaktadır.

Tablo 4. Blog sayfası yayınlamanın BÖTE öğrenciler için avantajları

Avantajları	Evet N (%)	Hayır N (%)	Toplam
Ücretsiz olması	29 (%87,9)	4 (%12,1)	33
Yayınların başkalarının yorumlarına açık olması	26 (%78,8)	7 (%21,2)	33
Olumlu ve olumsuz yorumlara bakarak düzeltme şansının olması	24 (%72,7)	9 (%27,3)	33
Yayınlamanın ve edit etmenin kolay olması	21 (%63,6)	12 (%36,4)	33
Multimedya nesnelerini (ses, yazı, görüntü, vs) kullanarak yayın yapabilme	19 (%57,6)	14 (%42,4)	33
Kolay erişim olması	17 (%51,5)	16 (%48,5)	33

Blog Yayıncılığının Dezavantajları

Öğrencilerin blogların dezavantajına ilişkin görüşleri, "Blog kullanmanın sizin için bir dezavantajı var mı? Varsa belirtiniz" sorusuyla tespit edilmeye çalışılmıştır. Öğrencilerin (N=33) büyük bir çoğunluğu (N=22) herhangi bir dezavantaj belirtmemiştir. Fakat, 11 öğrenci çeşitli konularda blog kullanmanın dezavantajı olduğunu belirtmiştir. Örneğin üç öğrenci (Burak, Alper, Burcu) blog kullanmanın BÖTE öğrencileri için teknik yönden "zaman kaybı" olduğunu belirtmiştir. Ayrıca bir öğrenci, Sema, blogların BÖTE öğrencilerinin teknik becerilerine katkısı olup olmadığı konusundaki düşüncesini, "Blog ortamını beceri geliştirecek bir yer olarak görmüyorum. Web sitesi tasarlamak için uğraşmadan hiçbir şey öğrenilmez" şeklinde belirtmiştir.

Ayrıca, dört öğrenci bloglarda zaman zaman teknik sorunların çıktığını belirtmiştir. Örneğin bir öğrenci, Aslı, "Bazen Blogcu ve Blogger'da sorun çıkıyor, giriş yapamıyorum" yazarak teknik konudaki bir problemi belirtmiştir. Bir diğer öğrenci, Ali, bloglardaki teknik problemle ilgili tecrübesini, "Sadece bazen blogda çıkan problemlerden dolayı yazı eklemede sorun çıkması sonucunda fazla zaman alması" olarak ifade etmiştir.

Bunlarla birlikte üç öğrenci akademik yazma ve telif hakları konusunda bilgisi olmayanların blog yayıncılığı sırasında intihal ve telif hakkı konusunda sorunlarla karşılaşabileceklerini belirtmişlerdir. Örneğin, bir öğrenci, Zeki, "Bir bilgiyi kaynak belirtmeden yayınladığımızda telif hakkı konusu sorun olabilir" yazarak bu konudaki düşüncesini ifade etmiştir.

Ayrıca, bir öğrenci, Sema, blogların sosyal bir paylaşım aracı olduğunu işaret ederek, akademik ödevler için kullanılmaları konusundaki düşüncesini şu ifadelerle belirtmiştir: "Kişisel blogları öğretmenlerin ödev yaptırmak için kullanması öğrenciyi bloglardan soğutur. Sosyal bir paylaşım aracı olan bloglarda bence akademik ödevlerin yapılması gereksiz".

Mesleki Yaşantıda Blog Kullanmaya Yönelik Görüşler

Öğrencilere mezun olduktan sonra "Mesleki yaşantınızda blog kullanmayı düşünüyor musunuz? Neden?" diye sorulmuştur. Öğrencilerin büyük bir çoğunluğu (N=26) blog kullanmaya olumlu bakarken beş öğrenci blog kullanmayı düşünmediğini ve iki öğrenci soruya herhangi bir cevap yazmamıştır.

Mesleki yaşantılarında Blog kullanmaya olumlu bakan öğrenciler (N=26) arasından 12 öğrenci "neden" sorusuna "bilgi paylaşımı" ve altı öğrenci "düşünce ya da fikir paylaşımı" için blog kullanmayı düşündüklerini belirtmişlerdir. Bilgi paylaşımı için blog kullanmayı düşündüğünü belirten bir öğrenci, Melek, düşüncesini "Öğrencilere ek bilgileri blogla vermek isterim" diye ifade etmiştir. Bununla birlikte bir öğrenci, Yağmur, "Bir konuda fikir ve görüş bildirmek için iyi bir araç olacağına inanıyorum" diye yazarak blogların fikir paylaşımı için kullanılabileceğini belirtmiştir. Ayrıca bir öğrenci, Taner, ilerde meslek hayatında neden blog kullanmak istediği konusundaki düşüncesini, "Bilgi paylaşımıyla birlikte düşünce ve fikirlerimi paylaşmak için faydalı olabileceğini düşünüyorum" diye belirterek blogların hem bilgi hem de düşünce ya da fikir paylaşımı için kullanılabileceğini işaret etmiştir.

Bunlarla birlikte bir diğer öğrenci, Can, "Akademik yazma ve tartışma becerisi artırdığı için kullanabilirim" diye belirtmiştir. Benzer olarak bir başka öğrenci, Esma, ileride blog kullanıma yönelik düşüncesini, "Ders bünyesinde katkı sağlayacak bir çalışma etkinliği olabilir" şeklinde açıklamıştır. Bir diğer öğrenci, Akif, ileride neden blog kullanmak istediğini, "Multimedya nesnelerini kullanarak yayın yapabiliyorum ve yayınladığım yazılar yoruma açık olduğu için kendimi geliştirmem için yararlı olabilir" diye açıklamıştır.

Ayrıca, bilgi ve düşünce paylaşımı dışında öğrencilerin ilerde meslek yaşantılarında başka konularda da blog kullanma konusunda kayda değer başka fikirler de ortaya çıkmıştır. Örneğin, bir öğrenci, Tekin, ileride blog kullanmaya yönelik düşüncesini, "Sınav sonuçları ya da ödevleri gönderme ve tartışma ortamı oluşturmak için kullanabilirim" diye açıklamıştır. Bir başka öğrenci, Zehra, düşüncesini, "Mesleki hayatımda gerçekleşen olayları yayınlayabilirim" diye açılamıştır. Bir diğer öğrenci, Yonca, ileride blog kullanma gerekçesini, "Günlük

değerlendirme yapmak için" olarak açıklamıştır. Başka bir katılımcı, Elif, ileride neden blog kullanmak istediğini, "Herkese açık, kolay yayınlanabilir, ve ücretsiz olması nedeniyle" şeklinde açıklamıştır.
Fakat beş öğrenci ileriki meslek yaşantılarında blog kullanmayı düşünmediklerini belirtmişlerdir. Örneğin bir öğrenci, Derya, ileride blog kullanmama düşüncesini, "Bunun yerine kendi Web sitemi yapmayı tercih ederim. Kolaya kaçan bir insan değilim" şeklinde açıklamıştır.

Bloglar ve Öğrenme-Öğretme Ortamları

Öğrencilerin büyük bir çoğunluğu (N=29), "Blog yayıncılığının öğrenme-öğretme ortamlarına katkı sağlayacağına inanıyor musunuz?" sorusuna "evet" ya da olumlu şekilde cevap verirken, iki öğrenci "hayır" inanmıyoruz diye cevap vermişlerdir, iki öğrenci de bu soruya hiçbir cevap vermemiştir. Dokuz öğrenci de blog yayıncılığının öğrenme-öğretme ortamlarına katkı sağlayacağına inanmasına rağmen gerekçesini yazmamış ya da net bir şekilde açıklamamıştır.
11 öğrenci "Neden?" sorusuna blogların bilgi paylaşımı ve bilgi alış-verişleri için uygun araçlar olduğu için öğrenme-öğretme ortamlarına katkı sağlayacağına inandıklarını belirtmişlerdir. Örneğin, bir öğrenci, Cemal, "Evet inanıyorum çünkü bilgi paylaşımı noktasında geniş bir ortam oluyor ve farklı alanlardaki birçok bilgiye ulaşılabilir olduğu için faydalı olacağına inanıyorum" şeklinde cevap vermiştir. Benzer olarak bir başka öğrenci, Cemre, "Bilgisayarla o kadar ilgili olmayan öğretmenlerin bile bilgi paylaşımı için rahatlıkla kullanabileceği bir yazılım" diye cevap vermiştir.
Ayrıca, dört öğrenci blogların düşüncelerin ya da fikirlerin paylaşılması açısından uygun araçlar olduğu için öğrenme-öğretme ortamlarına katkı sağlayacağına inandıklarını belirtmişlerdir. Örneğin, bir katılımcı, Başak, düşüncesini, "Evet, çünkü bir eğitim konusunda fikirler belirtilebilir, bu konuda yorumlar yapılarak olumlu yönde tartışmalar yapılabilir" şeklinde ifade etmiştir. Benzer olarak bir başka öğrenci, Erdem, öğrenme-öğretme ortamlarında blog kullanımıyla ilgili düşüncesini, "İnanıyorum, çünkü her insan farklı fikir ve öğrenme yaşantısına sahiptir. Birbirleriyle etkileşim içerisinde daha iyi öğrenmeyi sağlayacağına inanıyorum" biçiminde belirtmiştir.
Bilgi ve fikir paylaşımı dışında öğrenciler blogların öğrenme-öğretme ortamlarında yapacağı katkılara ilişkin başka kayda değer düşünceler de ortaya koymuşlardır. Örneğin, bir öğrenci, Kemal, blogların öğrenme-öğretme ortamına yapacağı katkı konusundaki düşüncesini, "Ses, yazı ve görüntü nesneleriyle eğitim ortamı daha da zenginleşir" diye ifade etmiştir. Bir başka öğrenci, Ebru, düşüncesini "Öğrenciler araştırma, yorum yapma ve referans gösterme yeteneklerini geliştirirler" şeklinde belirtmiştir. Benzer olarak bir başka öğrenci, Cüneyt, "daha kaliteli makaleler yazma" konusunda blogların katkı sağlayabileceğini belirtmiştir.
Ayrıca, iki öğrenci blogların öğrenme-öğretme ortamına katkı sağlayacağına inanmadıklarını belirtirken başka bir öğrenci, Sunay, düşüncesini "İnanıyorum, ancak bu sadece bizim gibi sınıfın büyük çoğunluğunun İnternet ve bilgisayar olanağı olan bir sınıfta yararlı olabilir" şeklinde belirtmiştir. Bir başka öğrenci, Zeynep, düşüncesini, "Bazı bloglar öğrenme-öğretme ortamına katkı sağlamayacak kadar boş. Ama güzel kullanabilirsek çok katkısı olabilir" ifadesiyle belirtmiştir.

TARTIŞMA VE SONUÇ

Bu çalışma blog yayıncılığı ve kullanımı konusunda tecrübeleri olan Abant İzzet Baysal Üniversitesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü (BÖTE) öğrencilerinin bloglar hakkındaki görüşlerini incelemek için yapılmıştır. Araştırmada blog yayınlamanın BÖTE öğrencilerine yaptığı katkılar, blog yayıncılığının avantajları ve dezavantajları incelenmiştir. Ayrıca, öğrencilerin ileriki mesleki yaşantılarında blog kullanımı konusundaki düşünceleri ve blog kullanımın öğrenme-öğretme ortamlarına yapabileceği katkılar konusundaki düşünceleri de incelenmiştir.
BÖTE öğrencileri blog yayıncılığının ücretsiz olmasını (N=29, %87,9), yayınların başkalarının yorumlarına açık olmasını (N=26, %78,8), olumlu ve olumsuz yorumlara bakarak blog yayınlarını düzeltme şanslarının olmasını(N=24, %72,7), yayınlamanın ve edit etmenin kolay olmasını (N=21, %63,6), multimedya nesnelerini kullanarak yayın yapabilme fırsatlarının olmasını (N=19, %57,6) ve bloglara kolay erişim olmasını (N=17, %51,5) avantaj olarak görmektedirler.
Ayrıca, ilgili alan yazınla tutarlı olarak (Johnson, 2004; Huffaker, 2005; Hernández-Ramos 2004, Williams & Jacobs, 2004; Embrey, 2002, Tekinarslan, 2008) dikkate değer sayıdaki öğrenciler blog yayıncılığının düşüncelerini ifade etme becerilerine (N=19, %57,6), akademik yazma-tartışma (N=17, %51,5) ve referans gösterme becerilerine (N=15, %45,5) katkı yaptıklarını belirtmişlerdir. Bunların dışında daha az sayıdaki öğrenci blog yayıncılığının kendilerinin ses, yazı, görüntü ve video gibi multimedya nesnelerini Web ortamında paylaşma becerilerine (N= 13, %39,4) ve Web yayıncılığı konusunda teknik becerilerine (N=12, %36,4) katkı yaptığını belirtmişlerdir.
Bununla birlikte öğrencilerin büyük bir çoğunluğu (N=26) mesleki yaşantılarında Blog kullanmaya olumlu bakmaktadırlar. Öğrenciler genellikle blogların "bilgi paylaşımı" ve "düşünce ya da fikir paylaşımı" için uygun araçlar olduğu için ileride kullanmayı düşündüklerini ve blogların bu özelliklerin öğrenme-öğretme ortamlarına katkı sağlayacağına inandıklarını belirtmişlerdir. Bloglarla ilgili elde edilen bu bulgular ilgili alan yazını (Ray, 2006; Gruhl, Guha ve Liben-Nowell, 2004) destekler niteliktedir.
Fakat, bu çalışmada öğrencilerin çoğunluğu blog yayıncılığının Web yayıncılığı konusundaki teknik becerilerine (N=21, %63,6) ve ses, yazı, görüntü ve video gibi multimedya nesnelerini Web ortamında paylaşma becerilerine (N=20, %60,6) herhangi bir katkı yapmadığını belirtmişlerdir. Ayrıca, bazı öğrenciler (Burak, Alper, Burcu) blog kullanmanın BÖTE öğrencileri için teknik yönden "zaman kaybı" olduğunu ifade etmişlerdir. Ayrıca bir öğrenci, Sema, blog kullanımının BÖTE öğrencilerinin teknik yönden becerilerine bir katkısın olmayacağını bir diğer öğrenci, Derya, blog kullanmanın kendisi için kolaya kaçmak olduğunu bunun yerine kendi Web sitesini kullanmayı tercih edeceğini belirtmiştir.
Sonuç olarak elde edilen bu bulgulara göre, blog yayıncılığının BÖTE öğrencilerinin teknik becerilerine çok fazla katkı yapmadığı fakat ilgili literatürle tutarlı olarak (Johnson, 2004; Huffaker, 2005; Hernández-Ramos 2004, Williams & Jacobs, 2004; Embrey, 2002, Tekinarslan, 2008) onların düşüncelerini ifade teme, akademik yazma ve tartışma becerilerine dikkate değer ölçüde katkı yaptığı belirtilebilir.

KAYNAKÇA

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BÖTE ÖĞRENCİLERİNİN EKONOMİ OKURYAZARLIKLARI: ANADOLU ÜNİVERSİTESİ ÖRNEĞİ

ECONOMIC LITERACY OF CEIT STUDENTS: SAMPLE OF ANADOLU UNIVERSITY

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Özet
Günümüz dünyası gücünü teknolojiden alan, sürücüsünün bilgi, yakıtının enformasyon olduğu yeni bir ekonomik dünyadır. Özellikle teknoloji ve iletişimdeki ilerlemeler doğrultusunda bireylerin geçmişten farklı olarak daha çok ekonomik şapka giydiği günümüzde, bu süreçte önemli rol ve sorumluluklara sahip Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) bölümü öğrencilerinin ekonomi okuryazarlığı becerilerinin ne olduğunun belirlenmesi önemlidir. Bu bağlamda bu çalışmanın amacı BÖTE bölümü öğrencilerinin ekonomi okuryazarlıklarının çeşitli değişkenler açısından incelenmesidir. Çalışma grubunu 166 öğrencinin oluşturduğu tarama modeline göre desenlenen araştırmada veri toplama aracı olarak "Ekonomi Okuryazarlığı Becerileri Anketi" kullanılmıştır. Araştırma sonucunda öğrencilerin ekonomi okuryazarlıklarının orta düzeyde olduğu, erkek öğrencilerin ekonomi okuryazarlıklarının kız öğrencilere göre daha yüksek olduğu, en yüksek ekonomi okuryazarlığına üçüncü sınıf öğrencilerinin sahip olduğu bulgularına ulaşılmıştır. Ayrıca bir işte çalışan ve çalışmayan öğrencilerin ekonomi okuryazarlıkları ile öğretim programlarında ekonomi dersi isteyen ve istemeyen öğrencilerin ekonomi okuryazarlıklarının benzer olduğu araştırmada ulaşılan diğer bulgulardır.
Anahtar Kavramlar: BÖTE, ekonomi, ekonomi okuryazarlığı

Abstract
We are living a world of economy powered by technology, driven by information and fueled by knowledge. Especially driven by fluent advancements in technology and communication, individuals take more economic roles than yesterday and it is of great importance to define economy literacy skills of CEIT (Computer Education and Instructional Technology) students who have crucial roles in this process. Within this context, aim of this study is investigating economy literacy skills of CEIT students by various variables. Research was conducted in survey methodology, research sample composed of 166 students and "Economy Literacy Skills Questionnaire" was used for data collection. Results showed that, students have medium economy literacy skills, male students are more skilled than females and third graders are most skilled amongst other graders. Furthermore, no statistically significant difference found on employed or unemployed and willing to take or unwilling to take economy related courses.
Keywords: CEIT, economy, economy literacy

GİRİŞ

İçinde bulunduğumuz 21. yüzyılda bilgi ve iletişim teknolojilerinde yaşanan hızlı değişim ve gelişim tüm sistemleri etkilediği gibi bireyleri de etkilemiş ve bireylerden beklentilerin hızla artmasına neden olmuştur. Geçmişte sadece okuma-yazma becerisine sahip her birey okuryazar olarak adlandırılırken günümüzde gelişen her yeni teknoloji beraberinde okuryazarlık alanını da getirdiği için bireylerin farklı okuryazarlık becerilerine sahip olmaları neredeyse zorunlu hale gelmiştir. "Okuryazarlık, yaşam boyu süren, dinamik, okumanın yanı sıra kazanılan bilgi ve beceriyi yaşama etkin olarak geçirmeyi de içeren bir kavramdır" (Yılmaz, 1989). Yaşam boyu öğrenme sürecinin hem girdisi hem ürünü (Gürdal, 2000) olan okuryazarlık alanına olan ilgi Birleşmiş Milletlerin 1990 yılını "uluslararası okuryazarlık yılı" ilan etmesi ile artmış, alanyazında farklı okuryazarlık türleri tanımlanmış ve günün gereksinimleri doğrultusunda yeni okuryazarlık alanları da tanımlanmaya devam etmektedir. Alanyazında tanımlanan 21. yüzyıl bireylerinin sahip olması gereken becerilerden birisinin de ekonomi okuryazarlığı olduğu söylenebilir.

Ekonomi Okuryazarlığı

Ekonomi, "sınırlı kaynaklarla sınırsız gereksinmelerini karşılama sorunu ile karşı karşıya olan bir kişinin ya da toplumun tatmin düzeyinin en yükseğe erişmesinin yollarını arayan bilim dalıdır" (Dinler, 2006). Farklı kaynaklarda paranın kullanımı ve yönetimiyle ilgili etkili kararlar alma yeteneği olarak tanımlanan, finansal okuryazarlık olarak da adlandırılan ekonomi okuryazarlığı, ekonomik problemleri, farklı seçenekleri, maliyet ve karları tanımlama, ekonomik koşullardaki ve kamusal politikalardaki değişimlerin sonuçlarını inceleme, ekonomik verileri toplama ve organize etme, kar ve maliyetleri tartma yeteneğidir (North Central Regional Educational Laboratory-NCREL, 2006). Bir başka deyişle ekonomi okuryazarlığı ekonomik gelişmeleri ve bu gelişmelerin etkilerini yorumlayabilme becerisidir (Gerek ve Kurt, 2008). Bireylerin yaşam kalitesine etki eden güçlerin bireyler tarafından anlaşılıp anlaşılmadığını ölçen ekonomi okuryazarlığı özellikle günümüzde yaşanan küresel krizle birlikte alfabe okuryazarlığı kadar önemli bir beceri olarak karşımıza çıkmaktadır. Ekonomi okuryazarı bireyler (NCREL, 2006):

- Kar ve maliyet ile kaynakların sınırlılığını değerlendirir ve bu bilgiyi kullanarak bilinçli tüketici, üretici, tasarruf sahibi, yatırımcı olarak seçimler yapabilir.
- Her bir yöntemin fayda/maliyetlerini karşılaştırarak mal ve hizmetlerin dağılımı konusunda farklı yöntemleri değerlendirebilir.
- Bireylerin davranışlarını etkileyen ekonomik güdüleri tanımlayabilir ve bu güdülerin kendi davranışlarına etkisini açıklayabilir.
- Rekabetin, ticari engellerin, kıtlık ve fazlalık ile alıcı ve satıcı arasındaki etkileşimin fiyatlara nasıl etki edebileceğini anlayabilir.
- Kamu ve özel ekonomi kurumlarının rollerini tanımlayabilir.
- Gelirin temellerini ve dağılımını, faiz oranlarını, enflasyon, işsizlik, yatırım ve riski anlayabilir.
- Alternatif kamu politikalarının kar ve zararlarını değerlendirip tanımlayabilir ve kimlerin kardan yararlanacağını kimlerin zararları taşıyacağını değerlendirebilir.
- Girişimciliğin değerini ve ekonomideki küçük ve büyük ölçekli işletmelerin rollerini anlayabilir.

Günümüz dünyası U.S. Department of Labor'un (1991) da belirttiği gibi gücünü teknolojiden alan, sürücüsünün bilgi, yakıtının enformasyon olduğu yeni bir ekonomik dünyadır (NCREL, 2003). Bilgi ve iletişim teknolojileriyle bağlantılı olarak gerçekleştirilen yeni ürün ve hizmetlerin sayısı geçtiğimiz on yılda hızla artmıştır. Buradan yola çıkarak bilgi ve iletişim teknolojilerinin ekonomik büyüme üzerinde etkisinin olduğunu ve bunu farklı kanallar aracılığıyla gösterdiğini söylemek olanaklıdır. Bunlardan ilki yeni ürün ve hizmetlerin (bilgisayar

donanımı, cep telefonları, uydu yayınları vb.) üretilmesiyle toplam üretim artmakta bu nedenle bu sektörlerde büyük bir hızla iş olanakları yaratılmaktadır. İkincisi elektronik ticaret ve bilgisayar destekli robotlar gibi yeni yöntemlerle verimlilik artmaktadır. Üçüncüsü ise internet satışları, dijital reklam gibi yeni pazarlama ve yönetim teknikleri ile ekonomik etkinlikler artmaktadır (Odyakmaz, 2009). Yaşantılarının hemen hemen her anında bilgi ve iletişim teknolojileri ile iç içe olan ve olacak Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü (BÖTE) öğrencilerinin bu süreçteki rolleri de oldukça önemlidir. Bu nedenle özellikle teknoloji ve iletişimdeki ilerlemeler doğrultusunda bireylerin geçmişten farklı olarak daha çok ekonomik şapka giydiği günümüzde BÖTE öğrencilerinin ekonomi okuryazarlığı becerilerinin ne olduğunun belirlenmesi önemlidir. Bu bağlamda bu çalışmanın amacı BÖTE bölümü öğrencilerinin ekonomi okuryazarlıklarını çeşitli değişkenler açısından incelemektir. Bu amaç doğrultusunda, araştırmada yanıtı aranan sorular şunlardır:

1. BÖTE bölümü öğrencilerinin ekonomi okuryazarlıkları hangi düzeydedir?
2. BÖTE bölümü öğrencilerinin ekonomi okuryazarlıkları
   a. cinsiyetlerine
   b. sınıflarına
   c. bir işte çalışma durumlarına
   d. ekonomi dersi isteme durumlarına

göre değişmekte midir?

YÖNTEM

Araştırma Modeli

Araştırma sorularına yanıt bulmak amacıyla, tekil tarama ve ilişkisel tarama modelinden yararlanılmıştır. Araştırmada BÖTE bölümü öğrencilerinin cinsiyetlerini, sınıflarını, işte çalışma durumlarını, ekonomi dersi isteme durumlarını betimlemek için tekil tarama modeli, ekonomi okuryazarlıklarının çeşitli değişkenler açısından incelenmesi için ise ilişkisel tarama modeli kullanılmıştır.

Çalışma Grubu

Araştırmanın çalışma grubunu Anadolu Üniversitesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümüne devam eden 166 öğrenci oluşturmuştur. Araştırmanın çalışma grubunu oluşturan öğrencilerin demografik bilgileri Tablo 1'de yer almaktadır.

Tablo 1: Araştırmaya katılan öğrencilerin kişisel bilgileri

		n	%
Cinsiyet			
	Kız	57	34.3
	Erkek	109	65.7
Sınıf			
	1	46	27.7
	2	53	31.9
	3	47	28.3
	4	19	11.4
İşte Çalışma Durumu			
	Çalışıyor	33	19.9
	Çalışmıyor	133	80.1
Ders İsteme Durumu			
	İstiyor	53	31.9
	İstemiyor	113	68.1
Toplam		166	100

Tablo 1'den de görüldüğü gibi araştırmanın çalışma grubunu oluşturan öğrencilerin çoğunluğu (%65.7) erkek ve ikinci sınıf öğrencisidir (%31.9). Öğrencilerin %80.1'i bir işte çalışmamakta ve %68.1'i öğretim programında ekonomi dersi istememektedir.

Veri Toplama Aracı

Araştırmanın amacını gerçekleştirmek için ekonomi okuryazarı bireyin sahip olması gerek becerilerden yola çıkarak araştırmacılar tarafından "Ekonomi Okuryazarlığı Becerileri Anketi" geliştirilmiştir. Geliştirilen anket iki bölümden oluşmaktadır. Anketin birinci bölümü kişisel bilgilerden, ikinci bölümü ise 1 en az, 5 en çok olmak üzere beşli seçenekten oluşan ekonomi okuryazarlığı becerilerine ilişkin 38 ifadeden oluşmaktadır.

Anket geliştirilirken, ilk önce alanyazın taraması yapılarak madde havuzu oluşturulmuş ve taslak anket maddeleri hazırlanmıştır. Hazırlanan anket taslağı kapsam geçerliğinin sağlanması amacıyla beşi ekonomi alanında beşi BÖTE alanında 10 uzmanın görüşüne sunulmuştur. Uzman görüşlerinden gelen dönütler doğrultusunda düzeltmeler yapıldıktan sonra anket maddelerine son hali verilmiştir.

BULGULAR ve YORUMLAR

Araştırmanın birinci alt problemi olan "BÖTE bölümü öğrencilerinin ekonomi okuryazarlıkları hangi düzeydedir?" sorusuna cevap aramak için betimsel istatistiklerden yararlanılmış ve elde edilen değerler Tablo 2'de verilmiştir.

Tablo 2. Öğrencilerin ekonomi okuryazarlığı puanları

	n	En düşük	En yüksek	$\overline{X}$	ss
Ekonomi Okuryazarlığı Puanları	166	62	188	131.24	23.18

Anketten elde edilen verilere göre ortalama değerden bir standart sapma değeri altı düşük grup, ortalama değerden bir standart sapma değeri üstü yüksek grup, her iki grup arasındaki değerlere sahip öğrencilerde orta grup olmak üzere puanlanmıştır. Elde edilen dağılıma göre; Düşük grup: 108 puan-altı (düşük düzey); Orta grup: 108-154 puan arası (orta düzey); Yüksek grup: 154 puan-üssü (yüksek düzey) şeklinde düzenlenmiştir. Bu dağılıma göre, düşük düzey gruptaki öğrenci sayısı 26, orta düzey gruptaki öğrenci sayısı 113 ve yüksek düzey gruptaki öğrenci sayısı 27 olarak belirlenmiştir. Elde edilen bu sonuca göre öğrencilerin ekonomi okuryazarlıklarının orta düzeyde olduğu söylenebilir.

Öğrencilerin ekonomi okuryazarlıklarının cinsiyetlerine göre değişip değişmediği t-testi ile test edilmiş, elde edilen değerler Tablo 3'te verilmiştir.

Tablo 3: Cinsiyet değişkeni ve ekonomi okuryazarlığı t-testi sonuçları

Grup	n	$\overline{X}$	ss	df	t	p
Kız	57	125.26	24.25	164	-2.438	,016
Erkek	109	134.36	22.07			

* p <.05

Yapılan t-testi sonucunda cinsiyet ile ekonomi okuryazarlığı arasında erkek öğrenciler lehine anlamlı bir farklılık ortaya çıkmıştır (t=-2.438, p <.05). Bir başka deyişle erkek öğrencilerin ekonomi okuryazarlıkları kız öğrencilere göre daha yüksektir.

Öğrencilerin ekonomi okuryazarlıklarının sınıflarına göre değişip değişmediği varyans analizi ile test edilmiş, elde edilen değerler Tablo 4'te verilmiştir.

Tablo 4: Sınıf değişkeni ve ekonomi okuryazarlığı varyans analizi sonuçları

Varyansın Kaynağı	Kareler Toplamı	Sd	Kareler Ortalaması	F	p	Fark
Gruplararası	6177.47	3	2059.15	4.045	,008*	1-3
Gruplariçi	81957.47	161	509.05			2-3
Toplam	88134.94	164				

Tablo 4'ten görüldüğü gibi öğrencilerin sınıfları ile ekonomi okuryazarlıkları arasında anlamlı bir farklılık bulunmaktadır (F(3-161)=4.045, p<.05). Bir başka deyişle öğrencilerin ekonomi okuryazarlıkları sınıflarına göre anlamlı bir şekilde değişmektedir. Ortaya çıkan bu farklılık birinci sınıf öğrencilerinin ortalaması ($\overline{X}$ =125) ile üçüncü sınıf öğrencilerinin ortalaması ($\overline{X}$ =140.42) ve ikinci sınıf öğrencilerinin ortalaması ($\overline{X}$ =128.5) ile üçüncü sınıf öğrencilerinin ortalaması ($\overline{X}$ =140.42) arasındaki farklılıktan kaynaklanmaktadır.

Öğrencilerin ekonomi okuryazarlıklarının bir işte çalışıp çalışmama durumlarına göre değişip değişmediği t-testi ile test edilmiş, elde edilen değerler Tablo 5'te verilmiştir.

Tablo 5: Bir işte çalışma durumu değişkeni ve ekonomi okuryazarlığı t-testi sonuçları

Grup	n	$\overline{X}$	ss	df	t	p
Çalışıyor	33	133.78	27.25	164	-704	,482
Çalışmıyor	133	130.60	22.12			

Yapılan t-testi sonucunda bir işte çalışma durumu ile ekonomi okuryazarlığı arasında anlamlı bir farklılık ortaya çıkmamıştır (t=-704, p>.05). Bir başka deyişle bir işte çalışan ve çalışmayan öğrencilerin ekonomi okuryazarlıkları benzerdir.

Öğrencilerin ekonomi okuryazarlıklarının ekonomi dersi isteme durumlarına göre değişip değişmediği t-testi ile test edilmiş, elde edilen değerler Tablo 6'da verilmiştir.

Tablo 6: Ekonomi dersi isteme durumu değişkeni ve ekonomi okuryazarlığı t-testi sonuçları

Grup	n	$\overline{X}$	ss	df	t	p
İstiyor	53	135.03	23.69	164	1.450	,149
İstemiyor	113	129.46	22.82			

Tablo 6'dan da görüldüğü gibi yapılan t-testi sonucunda ekonomi dersi isteme durumu ile ekonomi okuryazarlığı arasında anlamlı bir farklılık ortaya çıkmamıştır (t=1.450, p>.05). Bir başka deyişle öğretim programlarında ekonomi dersi isteyen ve istemeyen öğrencilerin ekonomi okuryazarlıkları benzerdir.

SONUÇ ve ÖNERİLER

Araştırmada çalışma grubundaki BÖTE öğrencilerinin ekonomi okuryazarlıklarının orta düzeyde olduğu sonucuna ulaşılmıştır. Bu bulgu Gerek ve Kurt'un (2008) Ulusal Ekonomi Eğitimi Kurumu tarafından hazırlanan Ekonomik Araştırmanın Standartları isimli çoktan seçmeli test ile belirlenen üniversite öğrencilerinin ekonomi okuryazarlıklarının orta düzeyde olduğu bulgusuyla tutarlık göstermektedir. Ancak araştırmanın bu bulgusu Cutler (1997) ve Chatzky'nin (2002) yaptıkları çalışmalarda Amerikan halkının ekonomi okuryazarlık becerilerinin düşük olduğu bulgularından farklılaşmaktadır. Araştırmada öğrencilerin ekonomi okuryazarlıklarının orta düzeyde çıkmasının nedeni henüz parasal yaşam döngüsünün başında olmaları olabilir.

Araştırmada erkek öğrencilerin ekonomi okuryazarlıklarının kız öğrencilere göre daha yüksek olduğu bulgusuna ulaşılmıştır. Bu bulgu Chen ve Volpe (2002), Goldsmith ve Goldsmith (1997), Volpe, Chen ve Pavlicko (1996), Lewin (1995), Martinez (1994), Harris Scholastic Research-HSR (1993) yaptıkları araştırmalarda ortaya çıkan erkeklerin kızlara göre ekonomi konusunda daha bilgili oldukları bulgusuyla tutarlıdır. Ancak bu bulgu Danes ve Hira'nın (1987) kadınların finansal yönetimlerinin erkeklerden daha yüksek olduğu bulgusundan farklılaşmaktadır. Bu sonucun ortaya çıkmasında kültürümüzde ailenin geçimini erkekler sağlar inancının ve çalışma grubunda erkek öğrencilerin sayısının fazla olmasının etkili olduğu söylenebilir.

Araştırmada öğrencilerin ekonomi okuryazarlıkları sınıflarına göre anlamlı bir şekilde değişmektedir. Tüm sınıflar içerisinde üçüncü sınıf öğrencilerinin ekonomi okuryazarlıkları diğer sınıflara göre daha yüksek çıkmıştır. Bu bulgu Chen ve Volpe'nin (1998) üst sınıflardaki öğrencilerin alt sınıftaki öğrencilere göre finansal bilgilerinin daha fazla olduğu bulgusundan farklılaşmaktadır. Bu sonucun ortaya çıkmasında üçüncü sınıf öğrencileri arasında yatay/dikey geçiş kontenjanıyla gelen öğrencilerin fazla olması ve bu öğrencilerin daha önceki öğretim yaşantılarında ekonomiye ilişkin dersleri almış olmalarının etkili olduğu söylenebilir.

Araştırma ulaşılan bir diğer bulgu ise bir işte çalışan ve çalışmayan öğrencilerin ekonomi okuryazarlıklarının benzerliğidir. Bu bulgu Chen ve Volpe'nin (1998) araştırmalarında ortaya çıkan çalışanların çalışmayanlara göre ekonomi okuryazarlıklarının daha yüksek olduğu bulgusundan farklılaşmaktadır. Bu sonucun ortaya çıkmasında çalışan öğrencilerin yaşlarının küçük olması nedeniyle ekonominin önemini henüz kavrayamamış olmaları ve araştırma grubunda çalışmayan öğrencilerin çoğunlukta olmasının etkili olduğu söylenebilir. Araştırmada ulaşılan bulgulardan bir diğeri ise öğretim programlarında ekonomi dersi isteyen ve istemeyen öğrencilerin ekonomi okuryazarlıklarının benzer olduğudur. Bu sonucun ortaya çıkmasında öğretim programında ekonomi dersi isteyen ve istemeyen öğrenci dağılımın farklı olması etkili olmuş olabilir. Alanyazında alınan ekonomi eğitimi ile ekonomi okuryazarlığı arasında ilişki olduğu (Chen ve Volpe, 2002) ancak çoğu eğitim sisteminde bu alanın ihmal edildiğine vurgu yapılmaktadır (Chen ve Volpe, 1998). Benzer şekilde ülkemizde de özellikle BÖTE bölümü öğretim programlarında ekonomi alanının ihmal edildiği söylenebilir (Gerek ve Kurt, 2010).

Araştırmada ortaya çıkan bulgular ışığında BÖTE bölümleri öğretim programlarına ekonomi okuryazarlığı becerilerinin kazandırılabileceği seçmeli derslerin eklenmesi gerektiği söylenebilir. Bunun yanı sıra benzer çalışmanın örneklem grubu genişletilerek gerçekleştirilmesi, BÖTE öğrencilerinin ekonomi okuryazarlıkları ile daha derinlemesine bilgi edinmek için nitel araştırmaların desenlenmesi gerektiği söylenebilir.

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BÖTE PROGRAMINDA YER ALAN DERSLERİN ALANA HAZIRLAMASINA YÖNELİK ÖĞRENCİ GÖRÜŞLERİ

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Öz
Bu araştırmanın amacı, BÖTE alanı lisans programında verilen ve farklı alanlara hizmet eden derslerin, öğrencileri alana hazırlamasına yönelik öğrenci görüşlerini belirlemektir. Araştırmada, söz konusu dersler öğretmenlik meslek bilgisi (MB), bilişim teknolojileri (BT) ve öğretim teknolojileri (ÖT) olmak üzere üç alana ayrılarak öğrencilerin bu derslerin alana hazırlamasına ilişkin görüşlerinin cinsiyetlerine, mezun oldukları lise türüne ve mezun olduktan sonra yapmayı düşündükleri mesleğe göre değişip değişmediği incelenmiştir. Araştırmaya, Yıldız Teknik Üniversitesi (YTÜ) BÖTE bölümünde okuyan 249 öğrenci katılmış ve görüşleri 4 maddeden oluşan 5'li likert tipinde bir oluşturucu indeks kullanılarak alınmıştır. Yapılan istatistiksel analizler sonucunda, söz konusu derslerin alana hazırlamasına yönelik öğrenci görüşlerinde öğrencilerin cinsiyetlerine, mezun oldukları lise türüne ve mezun olduktan sonra çalışmayı düşündükleri alana göre anlamlı farklılıklar olduğu bulgusuna ulaşılmıştır. Araştırma, BÖTE lisans programında yer alan derslerin, öğrencileri alana hazırlama konusundaki rolü açısından önemlidir. Dolayısıyla, araştırmanın bahar dönemi için de yapılması planlanmakta ve diğer üniversitelerin BÖTE bölümü öğrencilerinin de bu yöndeki görüşlerinin belirleneceği çalışmaların yapılması önerilmektedir.
Anahtar Sözcükler: Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü, Meslek seçimi, Alana hazırlık

Abstract
It is aimed in the study to determine the views of students on the courses in the CEIT department's curriculum related to different sectors in terms of preparing for the field. In the study, the courses have been categorized into 3 categories based on the related field that Teaching Profession, Information Technologies, and Instructional Technologies. It has been researched whether the views of the students on these courses in terms of preparing for the field differ significantly according to their gender, the type of high school they have graduated, and the job they plan to have in the future. The study group consists of 249 students from the CEIT department of Yıldız Technical University. In order to determine the students' views, it has been used that a 5-likert type of formative index consisting of 4 items related to the courses' role on preparing for the field, with a form of demographic information and the field choice they plan to work in the future. At the end of the analysis session, it has been found that there are significant differences for the views of the students on the courses' role on preparing for the sector according to all of the three variables. The study is important in terms of the role of the courses in the CEIT department's curriculum on preparing for the sector. Therefore it is going to be continued with the spring term courses. Additionally, it is suggested that the views of students from other CEIT departments should be examined in the same way.
Keywords: Computer Education and Instructional Technologies Department, Career decision, Preparing for the field

GİRİŞ

1997 yılında Yükseköğretim Kurumu'nun (YÖK) öğretmen yetiştirme ile ilgili olarak hayata geçirdiği yeniden yapılanma uygulaması çerçevesinde kurulan Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) bölümlerinin temel amacı ilköğretim ve ortaöğretime öğretmen yetiştirmektedirler (YÖK, 1998). Ancak bu bölümlerden mezun olan öğrenciler öğretmenliğin yanı sıra öğretim tasarımı, ders yazılımı geliştirme, Web tasarımı veya öğrenme yönetim sistemi geliştirme uzmanı olarak da farklı alanlarda çalışabilmektedirler (Deryakulu, 2008). Nitekim Durdu ve Yıldırım (2005) tarafından gerçekleştirilen bir araştırmanın bulgularına göre, birinci sınıf BÖTE öğrencilerinin % 80'i, üçüncü ve dördüncü sınıf BÖTE öğrencilerinin ise % 64'ü öğretmenlik dışında bir meslek yapmak istemektedirler. Bu durum BÖTE alanı lisans programında bilişim ve öğretim teknolojileri alanlarına yönelik derslerin sayı ve çeşitliliği ile de açıklanabilir.
YÖK'ün 2007 yılında lisans programlarında yaptığı değişiklikten sonra BÖTE lisans programında yer alan derslerin alanlara göre dağılımları Tablo 1'deki gibidir:

Tablo 1 BÖTE Alanı Lisans Programında Yer Alan Derslerin Alanlarına Göre Dağılımları

Öğretmenlik Meslek Bilgisi Alanına Yönelik Dersler	Bilişim Alanına Yönelik Dersler	Öğretim Teknolojileri Alanına Yönelik Dersler
Eğitim Bilimine Giriş*	Eğitimde Bilişim Teknolojileri I*- II	Öğretim Tasarımı
Eğitim Psikolojisi	Bilgisayar Donanımı	Uzaktan Eğitim*
Öğretim İlke ve Yöntemleri	Programlama Dilleri I* ve II	Proje Geliştirme ve Yönetimi*
Türk Eğitim Sistemi ve Okul Yönetimi	İşletim Sistemleri ve Uygulamaları*	Eğitimde Materyal Tasarımı ve Kullanımı*
Sınıf Yönetimi	Bilgisayar Ağları ve İletişim	Eğitim Yazılımı Geliştirme ve Tasarlama (Seçimlik)
Ölçme ve Değerlendirme	Eğitimde Grafik ve Canlandırma	Bilgisayar Destekli Öğretim (Seçimlik)
Özel Öğretim Yöntemleri I*- II	Çoklu Ortam Tasarımı ve Üretimi	
Okul Deneyimi*	İnternet Tabanlı Programlama*	
Rehberlik	Web Tasarımı*	
Öğretmenlik Uygulaması	Veri Tabanı Yönetim Sistemleri*	
	Eğitimde Yapay Zeka Uygulamaları*	

** İşaretli dersler güz yarıyılı dersleri olup bu çalışmada değerlendirilmeye alınmışlardır.*

Tablo 1'de de görüldüğü üzere, öğretmenlik meslek bilgisi alanında, bilişim alanında ve öğretim teknolojileri alanında dersler yer almaktadır. Diğer bir deyişle BÖTE lisans programında öğretmenlik meslek bilgisi alanına hazırlayan derslerle bilişim alanına hazırlayan derslerin sayısı yaklaşık olarak eşit durumdadır. Diğer yandan öğrencilerin her iki alanın kazanımlarını bir araya getirebilecekleri öğretim teknolojileri alanı için de dersler söz konusudur.
Stables ve Wikeley (1997) yaptıkları araştırmada öğrencilerin bir dersin ileride seçmeyi planladıkları meslek açısından yararlı olup olmadığına yönelik algılarının, o dersin önemine karar verirken kullandıkları en güçlü belirleyici olduğunu saptamışlardır. Bu kapsamda

BÖTE öğrencilerinin birbirinden farklı beceriler kazandıran alanlara yönelik bu derslerin alana hazırlamasına yönelik görüşlerini belirlemek bu çalışmanın temel amacını oluşturmaktadır.

Yukarıda da belirtildiği gibi YÖK BÖTE bölümlerinin kuruluş amacını öğretmen yetiştirmek olarak belirlemiştir ve çoğu toplumda öğretmenlik kız öğrencilerin ağırlıklı olarak tercih ettikleri bir kariyer alanı olarak görülmektedir (Sikora ve Saha, 2009). Ancak aynı araştırmacılar PISA 2006 verileri üzerinde gerçekleştirdikleri çalışmalarında, PISA kapsamında değerlendirmeye alınan kız öğrencilerin öteden beri erkeklere has olarak düşünülen alanlar ile ilgili kariyer planı yaptıklarına dair kanıtların varlığından bahsetmektedirler (Sikora ve Saha, 2009). Bu araştırma kapsamında da öğrencilerin derslerin alana hazırlamasına yönelik görüşlerinin cinsiyetlerine göre farklılaşıp farklılaşmadığı incelenmiştir.

Diğer yandan BÖTE bölümlerine öğrenci yerleştirilmesi sırasında, meslekî/teknik liselerin ilgili alanlarından mezun olan öğrencilere 0.24 katsayı ile elde edilen ek puan verilmesi uygulaması, bu bölüm öğrencilerinin pratikte ağırlıklı olarak meslekî/teknik lise mezunu öğrencilerden oluşması sonucunu doğurmaktadır. Bilişim alanına yönelik belirli bir bilgi birikimi ve alanda çalışmaya yönelik istekle bölüme kaydolan bu öğrencilerin, öğretim teknolojileri ve öğretmenlik meslek bilgisi ile ilgili derslerin alana hazırlaması ile ilgili görüşleri de araştırmanın konusu içinde yer almaktadır.

Sonuç olarak bu çalışmada farklı alanlara yönelik beceriler geliştirmeye dayalı derslerin öğrencileri alana hazırlamasına yönelik öğrenci görüşlerinin belirtilen değişkenlere göre farklılaşıp farklılaşmadığı araştırılmıştır. Bu çerçevede çalışmanın araştırma soruları aşağıdaki gibidir:

1. Öğrencilerin öğretmenlik meslek bilgisi (MB), bilişim teknolojileri (BT) ve öğretim teknolojileri (ÖT) derslerinin alana hazırlamasına yönelik görüşleri cinsiyete göre farklılaşmakta mıdır?
2. Öğrencilerin MB, BT ve ÖT derslerinin alana hazırlamasına yönelik görüşleri mezun oldukları lise türüne göre farklılaşmakta mıdır?
3. Öğrencilerin MB, BT ve ÖT derslerinin alana hazırlamasına yönelik görüşleri mezun olduktan sonra yapmayı düşündükleri mesleğe göre farklılaşmakta mıdır?

YÖNTEM

Araştırmanın çalışma grubu Yıldız Teknik Üniversitesi (YTU) BÖTE bölümünde okuyan ve Güz yarıyılında bölümde verilen dersleri alan öğrencilerden oluşmuştur. Öğrencilere, araştırma sorularının yer aldığı ve demografik bilgilerinin istendiği veri toplama aracı yarıyıl sonunda her bir dersin final sınavı başlarken verilmiş, öğrencilerden isim ve numaraları istenmemiştir. Aynı öğrencinin farklı derslere ait cevaplarını takip edebilmek üzere anne-baba ismi ve cep telefonu numaralarını kullanarak belirli bir sistemle oluşturdukları 6 haneli bir şifre kullanılmıştır. Bu şekilde 2009-2010 eğitim-öğretim yılı için bölümde kayıtlı olan 266 öğrencinin tamamına ulaşılabilmiştir. Ancak bu öğrencilerden mezun olunca çalışmak istediği alanı ve mezun olduğu lise türünü işaretlememiş olanlar çalışma gurubu dışında bırakılmış ve geri kalan toplam 249 lisans öğrencisi ($n_{kız}$=68, n_{erkek}=181) araştırmanın çalışma grubunu oluşturmuştur. Öğrencilerinden 31'i 1. sınıf (% 12.5), 47'si 2. sınıf (% 19), 44'ü 3. sınıf (% 17.5), 78'i 4. sınıf (% 31) ve üstüdür, 49 öğrenci (% 20) sınıf bilgisini vermemiştir. Öğrencilerden 172'si (% 69) meslekî/teknik lise mezunu iken 77 öğrenci (% 31) ise Anadolu/Fen/Süper/Öğretmen lisesi ve düz liseden mezun olmuşlardır. Son olarak öğrencilere mezun olunca çalışmayı düşündükleri alanlarla ilgili seçenekler ise öğretmenlik (devlet, özel), bilişim alanı (yazılım uzmanı, grafiker vb.) ve öğretim teknolojileri olarak sunulmuştur. Buna göre öğrencilerin 128'i öğretmen olarak (% 51), 102'si bilişim alanında (% 41), 19'u ise öğretim teknoloğu olarak (% 8) çalışmak istediklerini beyan etmişlerdir.

Öğrencilerin demografik bilgilerinin ve mezun olduktan sonra çalışmayı düşündükleri alanın sorulduğu bir form ile birlikte, aldıkları derslerin alana hazırlamasına yönelik görüşlerini öğrenmek amacıyla dört maddeden oluşan bir oluşturucu indeks uygulanmıştır. Oluşturucu indeks, gizli bir değişkeni ortaya çıkarma hedefi güdülmeksizin belirli bir kavramsal boyut çerçevesinde *evet-hayır* yanıtları temel alınarak ya da Likert ölçek derecesi kullanılarak oluşturulan ve tek bir toplam ya da ortalama puana göre değerlendirme yapılan ölçüm araçlarıdır (Şencan, 2005, s. 73). Bu araçlarda temel bileşenler analizi yöntemiyle tek bir boyut saptanmaya çalışılır (Şencan, 2005, s. 77). Nitekim bu araştırmada da öğrencilerden demografik bilgileri dışında, öğrencilere aldıkları derslerin alana hazırlaması ile ilgili görüşlerini ortaya çıkarmak amacıyla toplam dört madde ile ilgili görüşleri istenmiştir. Bu maddeler "Bu dersin kazandırdığı bilgi ve becerileri başka derslerde ve meslek hayatımda kullanabilirim", "Bu derste kazanılan bilgi ve beceriler önemli idi", "Bu ders mesleğimi ve uğraşı alanlarını anlamama katkı sağladı", "Bu ders bana mesleğimin toplumdaki yerini ve etik yönlerini öğretti" biçiminde oluşturulmuştur.

Temel bileşenler analizi öncesinde veriler üzerinde normal dağılım analizleri yapılmış ve her dört soru için de dağılım normal bulunmuştur. Daha sonra yapılan analizlerde veri setinin yeterliliği KMO testi ile değerlendirilerek .74 bulunmuş ve bu değer orta olarak nitelendirilmiştir (Tavşancıl, 2005, 50). Yine temel bileşenler analizine uygunluğu denetlemek üzere yapılan Bartlett küresellik testi sonucunda ki-kare değeri 1125,478 (sd=6; p=.000) bulunmuş ve istatistiksel olarak p=.01 düzeyinde anlamlı olmasından yola çıkılarak eldeki veri setinin faktör analizi için uygun olduğu sonucuna varılmıştır (Şencan, 2005, 384). Tüm ön değerlendirmelerden sonra yapılan temel bileşenler analizi sonunda, öğrencilere yöneltilen dört maddenin özdeğeri 1'den büyük tek bir faktör altında toplandığı ve toplam varyansın %68'ini açıkladığı görülmüştür. İndekse ait Cronbach-Alpha değeri .84 bulunmuştur.

Öğrencilerin görüşlerini almak üzere dört madde için 5'li Likert tipinde bir form kullanılmıştır. 5'li Likert tipinde ortalamalar alındığında ise öğrencilerin görüş ortalamaları, 1-1.80 aralığı için "Hiç katılmıyorum", 1.81-2.60 aralığı için "Katılmıyorum", 2.61-3.40 aralığı için "Kararsızım", 3.41-4.20 aralığı için "Katılıyorum" ve 4.21-5.0 aralığı için "Tamamen katılıyorum" şeklindedir.

BULGULAR ve YORUM

Öğrencilerin meslek bilgisi (MB), bilişim teknolojisi (BT) ve öğretim teknolojisi (ÖT) derslerinin alana hazırlamasına yönelik görüşlerinin ortalaması 5'li Likert tipinde sırasıyla 4.14, 4.25 ve 3.67 olarak bulunmuştur. Buna göre öğrencilerin BÖTE lisans programında yer alan derslerin alana hazırlamasına yönelik görüş ortalamaları MB alanı için 'katılıyorum', BT alanı için 'tamamen katılıyorum', ÖT alanı için 'katılıyorum' şeklinde belirlenmiştir.

Söz konusu bulgulara göre; öğrenciler her üç alana yönelik aldıkları derslerle ilgili olarak, bu derslerin kendilerini ilgili alanlara hazırladığı yönünde olumlu görüş belirtmişlerdir. Öte yandan, öğrencilerin bilişim alanına yönelik aldıkları derslerin alana hazırlaması konusundaki görüşlerinin diğer iki alana yönelik derslere kıyasla bir miktar daha yüksek olduğu görülmektedir. Bu durum, öğrencilerin BT alanı ile ilgili becerilerini yapılan ders içi uygulamalarla kısa zamanda değerlendirme olanağı ile açıklanabilir. MB ve ÖT alanlarında ise öğrenciler dersle ilgili becerileri hangi oranda edindiklerini anlayabilmek için ilgili alanda çalışmayı beklemek zorunda kalmaktadırlar. Bu durumda öğrencilerin bu derslerin alana katkısı ile ilgili değerlendirmelerini yaparken BT derslerinde olduğu kadar emin davranamamış olmaları mümkün görülmektedir.

Araştırma sorularına yönelik bulgu ve yorumlar aşağıda sunulmaktadır.

1. Araştırma Sorusuna Yönelik Bulgular ve Yorum

Araştırmada öğrencilerin görüş ortalamaları arasında cinsiyete bağlı fark olup olmadığını belirlemek üzere her bir ders alanı için ayrı ayrı bağımsız grup t-testi uygulanmış ve sonuçlar Tablo 2'de verilmiştir.

Tablo 2 Öğrencilerin, derslerin alana hazırlamasına yönelik görüşlerinin cinsiyete göre farklılaşmasına yönelik bağımsız grup t-testi sonuçları

Ders Alanı	Cinsiyet	N*	$\bar{X}$	S	sd	t	P
MB	Kız	69	4,34	,81	239	2.27	.024
	Erkek	172	4,06	,92			
BT	Kız	50	4,24	,73	166	-.529	.597
	Erkek	118	4,30	,71			
ÖT	Kız	56	3,76	,86	178	-.858	.392
	Erkek	124	3,63	,96			

** Dersleri alan öğrenci sayıları ders alanına göre değişmektedir.*

Tablo 2'de yer alan bulgular incelendiğinde; öğrencilerin eğitim psikolojisi ve sınıf yönetimi gibi derslerin yer aldığı ve meslek bilgisi alan dersleri olarak gruplandırılan derslerle ilgili görüşlerinin ortalamasının alana hazırlamasının "tamamen katılıyorum" şeklinde olduğu görülmektedir. Aynı şekilde programlama dilleri, internet tabanlı programlama gibi bilişim teknolojileri olarak gruplandırılan derslerle ilgili görüşleri de yine bu derslerde ulaştıkları becerilerin alana hazırlamasını yüksek bir ortalama ile destekler niteliktedir. Öğretim teknolojileri alanı ile ilgili derslerin alana hazırlamasına yönelik görüşleri de diğer iki alana oranla bir miktar düşük olmakla beraber alana hazırladığı görüşüne katıldıklarını ortaya koymaktadır. Diğer bir deyişle, hem kız hem erkek öğrencilerin her üç alana yönelik olarak aldıkları derslerin kendilerini alana hazırlaması ile ilgili görüşlerinin olumlu olduğu görülmektedir.

Her üç alana yönelik öğrenci görüşlerinin cinsiyetlerine göre istatistiksel olarak anlamlı fark gösterip göstermediğine dair t-testi sonuçları, öğrencilerin ÖT ve BT alanına yönelik derslerin alana hazırlamasına yönelik görüşlerinin cinsiyete göre istatistiksel olarak anlamlı bir fark göstermediğini ortaya koymaktadır. Diğer yandan MB alanına yönelik derslerin alana hazırlamasına yönelik görüş ortalamalarına cinsiyete göre bakıldığında, kız öğrencilerin "tamamen katılıyorum" ($\bar{X}$=4.34), erkek öğrencilerin ise "katılıyorum" ($\bar{X}$=4.06) aralığında olduğu görülmektedir. Bu durum öğrencilerin MB derslerinin alana hazırlamasına yönelik görüşlerinin cinsiyete bağlı olarak kız öğrenciler lehine p=0.5 düzeyinde istatistiksel olarak anlamlı şekilde farklılaştığını ortaya koymaktadır. Bu durum kız öğrencilerinin öğretmenlik mesleğini erkek öğrencilere nazaran daha fazla istemeleri durumu ile açıklanabilir. Ancak aksi yönde ve sevindirici olan diğer bir bulgu, kız ve erkek öğrencilerin, derslerin alana hazırlaması ile ilgili görüşlerinin bilgisayar donanımı, çoklu ortam tasarımı gibi teknik derslerin yer aldığı BT alanına yönelik dersler açısından anlamlı fark göstermemesidir. Dikkat çekici bu bulgu, kız öğrencilerin de teknik derslere en az erkek öğrenciler kadar önem verdikleri biçiminde yorumlanabilir.

2. Araştırma Sorusuna Yönelik Bulgular ve Yorum

İkinci araştırma sorusu kapsamında öğrencilerin MB, BT ve ÖT derslerinin alana hazırlamasına yönelik görüşlerinin mezun oldukları lise türüne göre fark olup olmadığı incelenmiştir. Bu amaçla her bir ders alanı için ayrı ayrı grup bağımsız t-test uygulanmış ve sonuçlar Tablo 3'de verilmiştir.

Tablo 3 Öğrencilerin, derslerin alana hazırlamasına yönelik görüşlerinin mezun oldukları lise türüne göre farklılaşmasına yönelik bağımsız grup t-testi sonuçları

Ders Alanı	Mezun olunan lise türü	N*	$\bar{X}$	S	sd	T	p
MB	Meslekî/Teknik Lise	153	4,23	,796	239	2.14	.033
	Düz/Fen/Anadolu/Süper Lise	88	3,98	1,032			
BT	Meslekî/Teknik Lise	125	4,35	,679	167	2.09	.038
	Düz/Fen/Anadolu/Süper Lise	44	4,09	,766			
ÖT	Meslekî/Teknik Lise	118	3,80	,845	178	2.59	.010
	Düz/Fen/Anadolu/Süper Lise	62	3,43	1,04			

** Dersleri alan öğrenci sayıları ders alanına göre değişmektedir.*

Tablo 3'de yer alan bulgular incelendiğinde dikkati çeken ilk durum, meslekî/teknik lise mezunu öğrencilerin görüş ortalamalarının her üç alana ait dersler için de diğer lise mezunlarının ortalamalarından yüksek olmasıdır. Nitekim her üç alan için de meslekî/teknik lise mezunu öğrencilerinin görüşlerinin diğer lise mezunlarının görüşlerine göre p=0.1 ve p=0.5 düzeyinde istatistiksel olarak anlamlı şekilde farklılaştığı görülmektedir. Elde edilen bu dikkat çekici bulgu, daha lise yıllarında iken mesleki kariyer bilinci oluşmaya başlamış olma olasılığı yüksek olan meslekî/teknik lise mezunu öğrencilerinin lisans düzeyinde aldıkları derslerin alana hazırlaması konusunda diğer lise mezunlarından farklı bir noktada olduklarını göstermektedir. Bu öğrencilerin daha lise yıllarından itibaren aldıkları derslere kariyer odaklı yaklaşma özelliğini edindikleri düşünülebilir. Buna bağlı olarak da meslekî/teknik lise mezunu öğrencilerin herhangi bir alanda aldıkları dersin geliştirdiği becerilerini mezun olduklarında kariyer gelişimlerinde nasıl kullanacakları konusundaki farkındalıklarının diğer lise mezunlarına göre daha yüksek olması olasılığı söz konusu olabilir.

3. Araştırma Sorusuna Yönelik Bulgular ve Yorum

Yöntem kısmında da belirtildiği gibi, öğrencilerin % 51'i öğretmen olarak ***(1)***, % 41'i bilişim alanında ***(2)***, % 8'i ise öğretim teknoloğu ***(3)*** olarak çalışmak istediklerini beyan etmişlerdir. Araştırmada öğrencilerin gelecekte yapmayı düşündükleri mesleğe göre MB, BT ve ÖT derslerinin alana hazırlamasına yönelik görüşleri arasında fark olup olmadığı incelemek amacıyla her bir ders alanı için ayrı ayrı tek faktörlü varyans analizi (ANOVA) uygulanmış ve bulgular Tablo 4'de verilmiştir.

Tablo 4 Öğrencilerin, derslerin alana hazırlamasına yönelik görüşlerinin mezun olduktan sonra yapmayı düşündükleri mesleğe göre farklılaşmasına yönelik ANOVA sonuçları

	Varyansın Kaynağı	Kareler Toplamı	sd	Kareler ortalaması	F	p	Anlamlı Fark
MB	Gruplararası	8,26	2	4,13	5,33	,005	*(1) –(2)*
	Gruplariçi	184,46	238	,78			
	Toplam	192,72	240				
BT	Gruplararası	,77	2	,39	,77	,47	-
	Gruplariçi	83,86	166	,51			
	Toplam	84,65	168				
ÖT	Gruplararası	3,74	2	1,87	2,18	,12	-
	Gruplariçi	151,71	177	,86			
	Toplam	155,45	179				

Tablo 4'de yer alan analiz sonuçları, öğrencilerin gerek BT gerekse ÖT alanındaki derslerin alana hazırlamasına yönelik görüşlerinin mezun olduktan sonra çalışmayı düşündükleri alana göre anlamlı fark göstermediğini ortaya koymaktadır. Diğer bir deyişle, gelecekte BT uzmanı

veya ÖT olarak çalışmayı hedefleyen öğrenciler herhangi bir alandaki derslere, alana hazırlaması açısından özel önem atfetmemekte, görüşleri tüm dersler için birbirine yakın seyretmektedir.

Buna karşılık Tablo 4'de yer alan bulgular, öğrencilerin MB derslerine yönelik görüşleri arasında gelecekte çalışmayı düşündükleri alana göre anlamlı fark olduğunu göstermektedir ($F_{(2\text{-}238)}$=5.33, p<0.1). Görüşler arasındaki farkların hangi alanlar arasında olduğunu bulmak üzere yapılan Scheffe testi sonuçlarına göre, mezun olduktan sonra öğretmenlik yapmak isteyen öğrencilerin MB derslerine yönelik görüş ortalamaları ($\overline{X}$=4.33) mezun olduktan sonra bilişim sektöründe çalışma isteyen öğrencilerin görüş ortalamalarına göre ($\overline{X}$=3.93) istatistiksel olarak anlamlı şekilde yüksektir. Bu bulgu öğrencilerin MB alanı için gerekli becerileri BT alanında gereken becerilere göre daha sınırlı bir çerçevede ele almaları ile yorumlanabilir. BT alanına yönelik derslerin içeriğinin bu alandaki farklı uzmanlık türlerinin (yazılım, web, veri tabanı, vb.) tamamına hitap etmediğini düşünmeleri mümkün görülmektedir.

SONUÇLAR ve ÖNERİLER

Bu araştırmanın bulgularına göre, ÖT ve BT alanlarındaki derslerin alana hazırlamasına yönelik öğrenci görüşlerinin cinsiyete göre değişmediği ancak MB alanındaki dersler için görüşlerin cinsiyete bağlı olarak kız öğrenciler lehine farklılaştığı ortaya çıkmıştır. Kız öğrencilerin, öğretmelikle ilgili olan MB alandaki derslerin alana hazırlaması ile ilgili görüşlerinin erkek öğrencilere göre daha yüksek derecede olumlu olması şaşırtıcı bir sonuç olmasa da, ÖT ve özellikle BT alanlarındaki derslerin alana hazırlaması ile ilgili görüşlerinin erkek öğrencilere göre düşük olmaması, kız öğrenciler açısından sevindirici bir bulgudur. Söz konusu bu bulgu, BÖTE öğrencilerinin aldıkları derslerin onları alana hazırlaması ile ilgili görüşlerinin gelecekte çalışmayı düşündükleri alana yönelik eğilimlerine göre değişip değişmediğinin araştırılmasının önemini ortaya çıkarmaktadır. Gelecekte bu konuda yapılacak olan araştırmalarda cinsiyete bağlı farkların araştırılması, bu sonucun genele yayılıp yayılmadığını irdelemek açısından da önemli olacaktır.

Mezun olunan lise türüne ile ilgili bulgular, meslekî/teknik lise mezunu öğrencilerin her üç alan derslerinin alana hazırlamasına yönelik görüşlerinin, özellikle MB ve BT alanlarındaki dersler için diğer lise türlerinden mezun öğrencilerden anlamlı şekilde yüksek olduğunu göstermektedir. Bu bulgu, son dönemlerde sıklıkla tartışma konusu olan, öğrencilerin erken yaşta meslekî alana yönlendirilmelerinin ve üniversite düzeyinde de aynı alanda devam etme şansı verilmesinin önemini ortaya koymaktadır. Diğer taraftan diğer lise türlerinden mezun olan öğrencilerin derslerin alana hazırlaması ile ilgili görüşlerinin neden meslek lisesi öğrencilerine göre daha düşük çıktığını ortaya koymaya yardımcı olacak nitel araştırma ihtiyacını göstermektedir. Araştırmacılar bu durumu yorumlarken, meslekî/teknik lise mezunu öğrencilerin lise döneminde kariyer planlama açıdan daha bilinçli kılınmış olmaları ihtimalini dikkate almışlardır.

Araştırma bulguları öğrencilerin, mezun olduktan sonra yapmayı düşündüğü mesleğe göre, derslerin alana hazırlamasına yönelik öğrenci görüşlerinin BT ve ÖT alanına yönelik dersler için anlamlı fark göstermediğini, MB dersleri için ise mezun olduktan sonra öğretmenlik yapmak isteyen öğrenciler lehine anlamlı fark gösterdiğini ortaya koymaktadır. Söz konusu bu bulgu araştırmacılar tarafından düşündürücü bulunmuştur. Üzerinde çalışılan grubun 1'den 4'e tüm sınıflardaki öğrencileri kapsadığı düşünüldüğünde, öğrencilerin gelecekte çalışmak istedikleri alana yönelik eğilimlerine bağlı olarak, bazı derslerin diğerlerine göre daha az alana hazırladığını düşünmeleri onların öğrenim gördükleri alana dar bir çerçeveden baktıkları sonucunu ortaya çıkarmaktadır. Aslında BÖTE bölümünün öğretim programında yer alan derslerin hepsi gerek bu alanda öğretmenlik yapacak gerekse bilişim uzmanı veya öğretim teknoloğu olarak çalışacak olan öğrencilere yararlı olacak ve çalışma alanlarında sık sık kullanacakları çok önemli becerilere ulaşmalarını sağlayan derslerdir. Bu bulgu, bölüm öğretim elemanları tarafından dikkate alınmalı ve -ister öğretmenlik mesleğini seçsinler, ister e-öğrenme firmalarında bilişim uzmanı / öğretim teknoloğu olarak çalışsınlar- tüm derslerde edinecekleri becerilerin kariyerlerinde ilerleyebilmeleri için önemli olduğunu hissetmelerini sağlayacak öğrenme ortamları oluşturulmalıdır.

Araştırma bulgularına genel olarak bakıldığında, öğrencilerinin BÖTE alanı ile ilgili çalışma alanlarını tanımalarının ve mesleki kariyer bilinçlerinin oluşmasının, önemli olduğu ortaya çıkmaktadır. Bu bilinci oluşturmak üzere çeşitli kariyer etkinlikleri düzenlenmesi önerilmektedir. Farklı alanlarda çalışan mezunlarla öğrencileri bir araya getiren panel vb. etkinlikler sayesinde, öğrenciler hem çalışma alanları tanıma hem de BÖTE bölümünde aldıkları derslerin alana hazırlaması ile ilgili olarak bölümden mezun olan kişilerle iletişime geçme imkânı bulabileceklerdir. Benzer şekilde, BÖTE mezunlarının çalıştığı farklı alanlardaki kurum ve kuruluşlarla yapılacak ortak çalışmalar ve etkinliklerle öğrencilerin çalışmayı düşündükleri alanı tanımaları sağlanabilir. Ayrıca, BÖTE öğretim elemanlarının, verdikleri derslerde hedefledikleri becerilerin gelecekte hangi alanda ve nasıl işe yarayacağı konusunda öğrencilerini bilgilendirmek yönünde çaba harcaması gerektiği düşünülmektedir.

Araştırma, BÖTE bölümü güz dönemi dersleri ile sınırlıdır. Bu nedenle, araştırmanın tüm dönemleri kapsayacak şekilde bahar dönemi dersleri için de tekrarlanması önerilmektedir. Bu sayede, BÖTE lisans programında yer alan her üç alandaki tüm derslerin öğrencileri alana hazırlamasına yönelik öğrenci görüşleri elde edilecek ve değerlendirilecektir.

Araştırmanın YTÜ BÖTE bölümü öğrencileri ile sınırlı olduğu göz önüne alınırsa, getirilen bu önerilerin BÖTE bölümü öğrencileri için genelleştirilebilmesi açısından diğer üniversitelerin BÖTE bölümü öğrencilerinin de aldıkları derslerin kendilerini alana hazırlamasına yönelik görüşlerinin belirleneceği çalışmaların yapılması gerektiği düşünülmektedir. Böylece, YÖK'ün 2007 yılında eğitim fakültelerindeki lisans programlarında yaptığı değişiklikten sonra BÖTE lisans programında yer alan derslerin alana hazırlaması ile ilgili önemli veriler elde edilebilecektir.

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BUHARLAŞMA VE KAYNAMA KONULARINDAKİ KAVRAM YANILGILARININ ÖNLENMESİNDE ANİMASYONLARIN ETKİSİ

THE EFFECTS OF ANIMATIONS TO PREVENT MISCONCEPTIONS ABOUT BOILING AND EVAPORATIONS

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Özet

Bu araştırmanın amacı, buharlaşma ve kaynama konuları ile ilgili olarak geliştirilen animasyonların, kavram yanılgılarının önlenmesi üzerindeki etkisini saptamaktır. Bu amaçla anlamlı öğrenme yaklaşımını temel alan animasyonlar, öğrencilerin kavram yanılgıları dikkate alınarak geliştirilmiştir. Araştırmanın örneklemini İzmir ilindeki iki farklı lisedeki toplam 96 9.sınıf öğrencisi oluşturmaktadır. Deney gruplarında dersler animasyonlarla işlenirken, kontrol gruplarında geleneksel öğretim takip edilmiştir. Araştırmada ön ve son test olarak başarı testi ve kimya tutum ölçeği kullanılmıştır. Ayrıca her iki lisenin deney ve kontrol gruplarından 6 öğrenci ile görüşme yapılmıştır. Araştırma sonucunda, başarı testi analiz sonuçlarına göre deney gruplarının başarısının istatistiksel olarak kontrol gruplarına göre daha iyi olduğu saptanmıştır. Kimya tutum ölçeği sonuçları da, deney grubu öğrencilerinin tutumlarında olumlu yönde bir gelişme olurken kontrol gruplarında her hangi bir değişimin olmadığı göstermiştir. Görüşme analizi sonuçlarında ise, deney grubu öğrencilerinde kontrol grubu öğrencilerine nazaran daha az kavram yanılgısına rastlanması, animasyonların kavram yanılgılarını önlemede geleneksel öğretime göre daha başarılı olduğunu ortaya koymaktadır.

Anahtar Sözcükler: Animasyon, buharlaşma ve kaynama, kavram yanılgısı

Abstract

This research aims to investigate the influence of animations to prevent misconceptions about boiling and evaporation. On this account, animations based on meaningful learning approach were developed by considering students' misconceptions. The sample of this study consists of 96 9th grade students who were studying at 2 diffrent high schools in İzmir, Turkey. While experimental groups students were instructed via analogies, traditional approach was used in control groups. Before and after the study, boths groups were given achievement and chemistry attitude scale test. Besides, an interview was conducted over six students selected from each group. Consequently, the experimental groups statistically showed that higher performance than control groups. Results of chemistry attitude scale pointed out that while experimental groups stududents' attitude developed positifly, the control groups students' attitude didn't change. Also, interview analysis indicated that animations were effective than the traditional approach to prevent misconceptions as the experimental groups had less misconceptions than the control groups.

Key Words: Animation, boiling and evaporation, misconceptions

CABRİ GEOMETRİ İLE YAPILAN BİR DERS TASARIMININ ÖĞRETMEN ADAYLARININ GELİŞİMLERİNE ETKİSİ

LESSON DESIGN WITH CABRI GEOMETRIES EFFECT OF TEACHER CANDIDATES DEVELOPMENT

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Özet
Bilgisayar ve teknoloji destekli yazılımlar eğitime hızlı bir giriş yapmış olsalar da istenilen oranda gelişim sağlanamamıştır. Dinamik geometri yazılımları da teknoloji destekli eğitime ayrı bir boyut kazandırmıştır. Öğrenciler dinamik geometri yazılımları ile şekilleri hareket ettirip, sürükleyebilmektedir. Böylece genellemelere ulaşmaları da kolaylaşmakta ve anlamlı öğrenme gerçekleşmektedir. Buradaki asıl sorun, yani bu yazılımların gelişememesine öncelikli etken, öğretmenlerin ve öğrencilerin teknoloji destekli yazılıma bakış açılarından ve öğretmenlerin bu konuda yetersiz olmasından kaynaklanmaktadır. Bu çalışmada öğretmen adaylarının Cabri Geometri programı ile yapılan bir ders tasarımı sonrasındaki gelişmelerinin gözlemlenmesi amaçlanmıştır. Bu doğrultuda Marmara Üniversitesi İlköğretim Matematik Öğretmenliği son sınıfta okuyan 30 öğretmen adayına ders boyunca Cabri Geometri programının teknik özellikleri ve işleyişi anlatılarak matematik öğrenme, öğretme ve yapma sürecinde nasıl kullanıldıklarıyla ilgili etkinlikler yaptırılmıştır. Öğretmen adayları yapılan etkinlikler sonunda hem teknoloji destekli eğitimle ilgili akıllarında soru işareti bırakmış zaman problemi gibi konularda sıkıntı yaşamayacaklarını gördüklerini hem de fiziki şartlar uygun olduğu sürece derslerinde bu tür etkinlikleri sıklıkla kullanacaklarını ifade etmişlerdir.
Anahtar Kelimeler: Cabri Geometri, Öğretmen Adayları, Geometri Öğretimi

Abstract
Software which is supported by the computer and technology to enter the education life quickly but not effect wanted level. Dynamic geometry software has made different view point to education which is supported by the technology. Students can move and drag the lines with dynamic geometry software, In this way they find generalization easily and become meaningful learning. The main problem about inadequat improvement of these softwares is view of both students and teachers and also not knowing enough about this subject By this project, it is aimed that teachher candidates will improve themselves with taking a lesson supported with cabri geometry programme. For this reason thirty teacher candidates who have studied at Marmara University primary school math teaching in senior class, explain them technical features and working conditions to cabri geometry programme and then be made practice about how it has been used to period of learning, teaching and doing. Teacher candidates declared that they wouldn't distress theirselves about the issues on technology supported training such as time management . They also told that since they have the appropriate physical conditions they would more likely use these activities during classes.
Key Words: Cabri Geometry, Teacher Candıdates, Teaching Geometry

GİRİŞ

Gelişmekte olan bir toplumda her şey değişirken toplumların ilgi odakları ve gereksinimleri de değişmektedir. Toplum olarak bunun getirisi bir süreçte eğitimde de bir yenilenme sürecine adım atılırken, bir yandan müfredatlar, eğitim sistemleri değişirken bir yandan da öğretim teknolojileri gelişmektedir. Bu konuda en köklü yenilik son çeyrek yüzyılda teknolojinin matematik eğitimi ve öğretiminde kullanılmasıdır. Matematik ve fen bilimleri olmak üzere eğitimin her alanında teknoloji kullanımı her ülkede ve her düzeyde okulda her geçen yıl artan ölçüde zorunlu olmaktadır. Söz konusu gelişme, bir yandan ileriye dönük bir hareketin başlatıcı gücü iken öte yandan her düzeydeki okulda eğitmenlere yeni sorumluluklar, roller ve görevler yüklemektedir. Bir başka anlatımla "öğreten-bilgi-öğrenen" üçgeninde, eğitmen olarak öğretmenin işlevi değişmekte, bilginin öğrenenin zihninde yapılandırılmasında teknoloji bir takım kolaylıklar sunmaktadır (Ersoy, 2005). Matematik ve geometri derslerinde özellikle farklı gösterim biçimlerinin karakteristik özelliklerini görselleştiren ve birinden diğerine geçişleri ilgilendiren etkinlikleri etkin bir şekilde kullanmayı sağlayan teknolojik yazılımlar ön planda tutulmaktadır (Yavuz, Baştürk, 2008). Matematik eğitiminde kullanılan teknolojik yazılımlar içerisinde genelde dinamik geometri yazılımları özelde de Cabri Geometri yazılımı derslerin gücünü arttırmada önemli bir yere sahip yazılımların başında gelmektedir. Derslerin verimliliğini arttırdığı birçok araştırmacı tarafından kabul edilmekte ancak bu yazılımlar öğretmenler tarafından pek de kullanılmamaktadır. Öğretmenin bu durumda sınıfta oynayacağı rolde değişmekte ve önem kazanmaktadır. Teknolojiyle öğretimin başarılı olabilmesi için, uygun aktivitelerin öğretmen tarafından organize edilmesi gerekmekte ve dolayısıyla öğretmenin oynayacağı rolü daha da artmaktadır (Laborde et Capponi, 2004, akt. Yavuz, Baştürk, 2008). Öğretmenin sınıfta edineceği rol üniversite eğitimi sırasında gördüğü eğitimle de ilişkilidir. Çünkü böylesine temelden değişimler ancak aşama aşama ve evrimsel bir süreç içerisinde gerçekleşecektir. Eğitim kurumları (özellikle eğitim fakülteleri), öğrenci, öğretmen ve yöneticilerin, bu yeni öğrenme yöntemlerini bireysel, toplumsal ve ekonomik yönden hayatlarına adapte edebilmek için mutlaka zamana ihtiyaç duyacaklardır (Keşan, Kaya, 2007). Bu durumdan yola çıkılarak bu çalışma da Marmara Üniversitesi İlköğretim Matematik öğretmeliği son sınıfta okuyan öğrencilere bir dönem boyunca Cabri Geometri programı anlatılmış ve konu ile ilgili uygulamalar yapılmıştır. Üniversite öğrencilerinin matematik ve geometri derslerinde teknoloji kullanımına bakış açıları, konuyla ilgili eğitim almadan önceki ve sonraki tutumları, Cabri Geometri kullanarak problem çözme yetileri, eğitim sisteminde teknoloji kullanılmamasına ilişkin gördükleri olumsuz yönler ve bu gibi durumlar incelenerek genelde öğretmen adaylarına ya da öğretmenlere teknolojiyle ilgili eğitim verildiğinde konuyla ilgili değişen ve değişmeyen tutumları incelenmiştir.

Dinamik Geometri Yazılımları

Dinamik geometri yazılımını diğer yazılımlardan ayıran ve daha önemli yapan başlıca özellik; oluşturulan şekillerin sürüklenebilmesi ve değiştirilebilmesi ve değişim esnasında değişen ve değişmeyen özelliklerin keşfedilebilmesidir (Güven, 2002; Köse, 2008; Toker, 2008).
Dinamik geometri yazılımlarını karakterize eden genel özellikleri Güven ve Karataş (2003) şöyle ifade etmişlerdir:

- Geometrik şekiller çok rahatlıkla oluşturulabilir.

– Oluşturulan şekillerin özelliklerini belirlemek için ölçümler yapılabilir.
– Şekiller ekran üzerinde sürüklenebilir (Bu DGY'nin en önemli özelliğidir), genişletilebilir, daraltılabilir ve döndürülebilir. (Bu özellik sayesinde öğrenci şeklin bir takım özelliklerini değiştirirken değişmeyen özellikleri gözlemleyerek keşfedebilir)
– Yapı hareket ettirildiğinde daha önce ölçülen nicelikler de dinamik olarak değişir. Bu özellik yardımıyla yapının değişimi izlenirken yapı hakkında hipotezler kurulabilir, kurulan hipotezler test edilebilir, genellemelerde bulunulabilir.
– Dönüşüm geometrisinin tüm konuları çalışılabilir.
– Bu yazılımlar hiçbir hazır bilgi ve konu gerektirmezler.

Cabri Geometri Yazılımı

Cabri Geometri yazılımı bir araç olarak matematiksel nesneleri manipüle ederek matematiksel düşünceleri güçlendirmektedir. Cabri Geometri, öğrenciye geometrik şekilleri oluşturma ve onları kolayca değiştirebilme, hareket ettirebilme, döndürme ve küçültme gibi olanaklar sunan bir program olmasıyla diğer birçok programdan farklılık göstermektedir. Geleneksel ortamlarda görülemeyen, oluşturulamayan birçok ilişki, özellik, genelleme rahatlıkla çalışılabilmektedir. Öğrenciye interaktif bir ortam sunması ve dolayısıyla geri bildirimler yardımı ile yeni stratejiler geliştirilmesine yardımcı olması bu programı geometri ve bazı analiz kavramlarının öğretiminde önemli bir yere getirmiştir (Baki, 2001; Yavuz ve Baştürk, 2008).

Cabri ortamında çalışma şu şekilde olmaktadır: önce geometrik şekil tanıtılır daha sonra bu şekil üzerinde ilişkiler işaretlenerek yeniden kurulur. Şekil, değişkenlere ve sabitlere bağlı olarak değiştirilebilir, yönlendirilebilir. Bu nedenle Cabri'de kullanıcı ekran ile ve dolayısıyla kurulan şekil ile iç içedir. Problem üzerinde yoğunlaşarak sonuçlara ulaşır ve kendi bilgisini kurar. Ekranda yapılan işlemlerin kavranabilmesi için yazılım dili önemlidir. Bu durumda "yazılım dili matematik dilini karşılayabiliyor mu?" sorusu tartışılmalıdır. Yazılımların sağladığı kolaylıklarla matematiksel kavramlar ve onların sözlü ifadeleri tam olarak açıklanabiliyor mu? Çoğu yazılımların bu yönde eksiklikleri vardır. Cabri'de bu eksiklikler önemli bir ölçüde giderilmiştir. Bu nedenle; Cabri Geometri yazılımını yapısalcı bir öğrenme ortamı yaratabilmek için bir araç olarak kullanmak istendik yönde değişim ve gelişim görülmesinde yarar sağlayabilecektir (Baki, 1996).

Çalışmanın Amacı

Bu çalışmanın amacı, birinci aşamada öğretmen adaylarının teknolojik programlar öğrenmeden ya da az ölçüdeki bilgilerle bu konu hakkındaki düşüncelerini gözlemleyip ikinci aşamada da uygun etkinlikler geliştirerek programı öğretmen adaylarına öğretmek ve bu durumda teknoloji destekli eğitime bakışlarındaki değişimi incelemektir. Böylece; hem hizmet öncesi eğitimin etkisi de bir açıdan gözlemlenmiş olup bir yandan da neler yapılabileceği ile ilgili deneyimler kazanılmış olacaktır.

YÖNTEM

Marmara Üniversitesi Atatürk Eğitim Fakültesi İlköğretim Matematik Öğretmenliği Anabilim Dalında okuyan 30 öğretmen adayı araştırmaya dâhil edilmiştir. Bu öğretmen adaylarına öncelikle biri açık uçlu sorulardan oluşan diğeri de likert tipi olan iki anket uygulanmış ve daha sonraki etkinliklerde kullanılacak matematik problemlerini kağıt kalem ile çözmeleri istenmiştir. 6 hafta boyunca Cabri-geometri programının işleyişi anlatılmış ve uygulamalar yaptırılmıştır. Bu derslerin sonunda ilk anketlerin devamı niteliğinde yine iki anket uygulanmış ve son derste de Cabri geometri kullanarak hazırlayacakları bir matematik dersi için birkaç etkinlik hazırlamaları istenmiştir ve bunlar sınıfta sunulmuştur. Yapılan anketlerden elde edilen sonuçlar değerlendirilmiş, hazırladıkları etkinlikler de dinamikliği ve buluş yöntemini kullanışına göre değerlendirilip, sınıf içi yapılan gözlemlerle birlikte analiz edilerek yorumlanmıştır.

BULGULAR

Bu bölüm temelde iki ana konu etrafında toplanmıştır. Bunlardan birincisi uygulama öncesi elde edilen bulgulardır. İlk bölümde birkaç soru ile öğretmen adaylarının temel bilgisayar bilgileri, teknoloji destekli eğitim düzeyleri, teknoloji destekli eğitime bakış açıları, teknoloji destekli eğitim düzeylerinin teknolojiye bakış açılarına etkisi üzerinde özellikle durulmuştur ki programı öğrendikten sonra gelişimlerinin gözlemlenmesinde ön bilgi olarak kullanılacak ve çapraz sorgulama ile analiz edilecektir. Ayrıca bu durumlara destek olması ve gelişimlerinin yanında düşüncelerindeki değişimleri gözlemlemek adına da öğretmen olduklarında kullanmalarına ve şu an okullardaki kullanım durumuyla ilgili düşüncelerine yönelik sorular sorulmuş ve cevapları analiz edilmiştir. İlk bölümde ayrıca matematik problemlerinin kağıt kalemle yapılan çözümleri de analiz edilmiştir. İkinci bölümde ise hazırlanan ders tasarımının uygulanmasından sonra ilk durumlara göre değişen durumlar üzerinde durulmuş ve yapılan anketlerden ve gözlemlerden yola çıkılarak analiz edilmiştir.

Temel Bilgisayar Bilgileri Ve Teknoloji Destekli Eğitim Düzeyleri

Her ne kadar bir öğretmenin teknoloji destekli eğitime bakış açısı olumlu da olsa teknoloji bakımından yoksunsa bu durumda etkinlik hazırlamak ve sunmak onun için bir külfet haline geleceğinden olumlu düşüncesine rağmen teknoloji destekli eğitimden kaçacaktır. Bu sebeple; açık uçlu anketin ilk sorusunda öğretmen adaylarının kişisel bilgisayara sahip olmaları, hangi seviyede, kaç yıldır ve hangi amaçlarla bilgisayarı kullandıkları sorulmuştur.

Bu soruların birbirleriyle ilişkisi konusunda şu sonuçlara varılmıştır:

1. Bilgisayar kullanım süreleri ile kişisel bilgisayara sahip olmaları paralellik göstermektedir.
2. Bilgisayar kullanım süreleri ve kişisel bilgisayara sahip olmaları bilgisayar kullanma süreleri ile her ne kadar büyük oranda paralellik gösterse de bu durum kişinin kendi yeterlilik seviyesini nerede gördüğüyle de ilgili olabilmektedir.
3. Bilgisayar kulanım amaçları da internet ve ödev yapımı konularında yoğunlaşmaktadır.

Bireyin bir konu hakkında bakış açısının oluşabilmesi için öncelikle o konuya dair bilgi birikimine sahip olması gerekmektedir. Araştırmaya katılan öğretmen adaylarının bu konudaki bilgileri incelendiğinde dört yıllık öğretim hayatlarında teknolojiyle ilgili çok fazla eğitim görmedikleri anlaşılmaktadır.

Teknolojiye Bakış Açıları

Bireyin bir konu hakkında bakış açısının oluşabilmesi için öncelikle o konuya dair bilgi birikimine sahip olması gerekmektedir. Araştırmaya katılan öğretmen adaylarının bu konudaki bilgileri incelendiğinde dört yıllık öğretim hayatlarında teknolojiyle ilgili çok fazla eğitim görmedikleri öğrenilmiştir. Bu duruma rağmen teknolojiye bakış açıları olumludur ancak nasıl kullanacaklarını bilmemeleri ve kullanılacak ortamın oluşamamasından dolayı ümitsizdirler.

Öğretmen adaylarının teknolojiye bakış açılarıyla teknolojik eğitim düzeyleri arasındaki ilişki incelenmiştir. Teknolojik eğitim düzeyleri incelendiğinde bu konuyla ilgili bilgileri yok denebilecek kadar azdır. Bir bireyin bir konuya olumlu yaklaşabilmesi için öncelikle o konunun olumlu yönlerini görmesi gerekmektedir ve konuya hakim olmalıdır. Öğrencilerin teknolojik eğitime bakışlarındaki olumsuzluklardan;

- Öğretmen adaylarının eğitim sırasında yeterli eğitimi almamaları
- Yüklü bir müfredattan dolayı kısıtlı zamanda konuları yetiştirme açısından oluşacak problemler
- Kendilerini yetersiz bulduklarından etkinlik hazırlayamama ve hazır etkinlikler olursa kullanılması

olan bu üç madde onların bu konuya dair yeterli bilgiye sahip olmamasından kaynaklanmaktadır.

Öğretmen olduklarında sınıflarında kullanma durumları ve şuan okullardaki kullanılma durumuna ilişkin görüşleri

Bu konuda genel yargı; kullanmayı istemeleri ancak yeterli eğitimin ve gerekli ortamın sağlanamayacağı konusundaki kaygılar üzerinde yoğunlaşmıştır. Bir öğretmen adayının bu konudaki yorumu bu durumu özetlemektedir.

Düşünüyorum ama pek de yapabilecek ortama sahip olacağımı sanmıyorum çünkü imkânlar yeterli olmayacak.

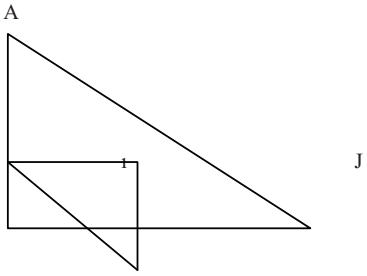
Şu an okullarda kullanımı ile ilgili düşünceleri sınıf olarak olumsuzdur. Bu durumun nedenleri olarak verdikleri cevaplar da şöyledir:

Ülkenin ekonomik durumu, sınıfların kalabalık oluşu, okulların fiziki durumu, müfredatın yüklü olması gibi nedenler kullanılmamasında etkili gördükleri önemli nedenlerden biridir.

Matematik problemlerinin Cabri Geometri kullanmadan yapılan çözümleri

Bu bölümde sorulan problemlerden biri üzerinde durulacaktır. Öğretmen adaylarına sorulan bir soru şöyledir:

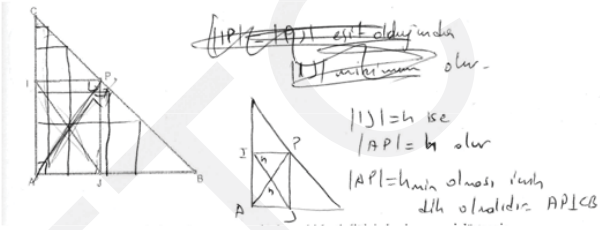
ABC bir dik üçgen, P noktası hipotenüs üzerinde bir nokta ve IJP de bir dik üçgen olmak üzere; P nerede olmalı ki IJ uzunluğu minimum olsun?



Matematik sorusuna verilen cevaplar;

"|AP | ⊥ |BC| olmalıdır" sonucuna sadece % 10 luk bir dilim ulaşmıştır. Bu iki sorudan anlıyoruz ki öğretmen adayları geometri konusunda kavramsal bir anlama gerçekleştirememişlerdir. Öyle ki % 56 "[BC] nin tam orta noktasında olmalıdır" sonucuna ulaşırken birçoğu iki kare toplamının (|IP |, |PJ| kenarları için) en küçük olması gerektiği kanısından varmışlardır. Bu dilimin içindeki diğer bir çözüm yolu da birkaç tane dikdörtgen oluşturup hipotenüsün ortaya doğru küçülmesi sonucunda orta nokta olarak cevap bulmuşlardır. "|IP |= |PJ| olmalıdır" sonucuna ulaşan diğer %10 luk kısımda yine iki kare toplamının en küçük olması düşüncesinden hareket etmişler ancak onlarda |IP | ve |PJ| nin eşit olması gerektiği sonucuna ulaşmışlardır. Bir öğretmen adayı da AIJP nin kare olması gerektiğini söylemiştir. Ki bu iki durum aynı sonuca çıkar o yüzden aynı yüzdelik dilimin içinde değerlendirilmişlerdir. Ancak iki grupta ta genelde varsayım üzerinden gidilmiş iki kare toplamı dışında bir işlem yapılmamıştır.

Doğru cevaba ulaşan üç öğretmen adayından birinin ki en doğru şekilde ifade edilmiştir. Diğerleri de aynı yolla ulaşsalar da matematiksel gösterimlerinde sıkıntı vardır. Bu öğretmen adayının cevabı şöyledir:



Şekil 1: Bir öğretmen adayının cevabı

Doğru cevaba ulaşan öğretmen adayı da ilk öncelikle orta nokta olması gerektiğini düşünmüş ve ardından doğru cevaba ulaşması öğretmen adaylarının aslında temel bilgilerinin var olduğunu ancak anlamlandırmada ve kalıcı öğrenmede sorun yaşadıkları durumundan kaynaklanıyor olabilir..

Cabri Geometri İle Yapılan Çalışmaların Değerlendirilmesi

Bu bölüm üç maddeli bir soru ile değerlendirilmiştir. Sorunun birinci maddesinde programı nasıl buldukları, ikinci maddesinde programda zorlandıkları noktalar ve nedenleri ve son maddede de Cabri' nin en çok hangi özelliğinin dikkatlerini çektiği sorulmuştur.

Program, bütün öğretmen adayları tarafından bazı eksik yanlar bulunsa bile kullanımı basit, kullanışlı, eğlenceli ve yararlı bulunmuştur. Cabri geometri programını bu şekilde tanımlamaları onların bu konudaki ön yargılarını kırdıklarını göstermektedir. Öğretmen adayları ayrıca mezun olmadan önce bir program öğrendikleri ve kullanabilecek düzeye geldikleri için oldukça memnunlar ki hatta bu dersi bazı derslere göre çok daha yararlı bulmuşlardır. Öğretmen adaylarının bazılarının bu konudaki görüşü; başlarda zor ama öğrendikçe zevkli olan bir program olması yönündedir. Bunun nedeni hem programı öğrenmeden önceki ön yargıları hem daha önceden böyle bir programı kullanmamaları olabilir. Ki önyargılarının kaynağındaki bir sebepte zaten daha önce öğrenmemiş olmalarıdır.

Öğretmen adaylarının cabri geometri programını kullanırken ve etkinlikleri hazırlarken zorlandıkları genel olarak programın yeni öğrenilmesi ve kısıtlı bir zamanda öğretilmiş olmasından kaynaklanmaktadır.

Zorlanılan noktalardan biri geometriyi ilk defa bilgisayar ortamında kullanmak olmuş. Öğretmen adayının bu konudaki yorumu şöyledir:

Evet oldu. Çünkü geometriyi ilk defa bilgisayar ortamında uygulama fırsatı buldum. Öğrendikçe daha farklı şeyler uygulamaya başladım.

Bu durum öğretmen adaylarının ilk defa bilgisayar destekli eğitimle geometri üzerinden ispatlar, çıkarımlar yapmaya çalışmalarından kaynaklanmaktadır. Yani öğretmen adaylarına ilk yıldan son yıla kadar basitten karmaşığa olacak şekilde programların sunulduğu bir eğitim sistemi düzenlemesi yapılmalıdır.

Öğretmen adaylarının en çok dikkatlerini çeken özellikle ilgili verdikleri cevaplar ne kadar istekli olduklarını gösterirken, aynı zamanda öğretmen adaylarının ve öğretmenlerin teknoloji destekli eğitime ilgilerini çekebilmek için hangi özelliklere sahip programların kullanılması daha ilgi çekici olacağı konusunda ön bilgi olabilecektir.

Öğretmen adaylarının cabri geometri programında en çok ilgilerini çeken özelliklerden biri dinamik, pratik ve kolay kullanıma sahip olmasıdır. Şeklin dinamik olması genellemelere ulaşmada kolaylık sağlayacağından öğrenmeyi buluş yöntemiyle sağlayacağından ve ezberden kurtarıp ispatlara öğrencilerin kendilerinin ulaşma durumundan dolayı en çok ilgi çeken özellik olmuştur.

Öğretmen Adaylarının Cabri Geometri Programını Öğrendikten Sonra Matematik Eğitiminde Teknoloji Kullanılmasıyla İlgili Değişen Görüşleri

Sınıf içi gözlemlere dayanarak Cabri Geometri öğrendikten sonra öğretmenlerin teknoloji destekli eğitime bakış açılarında olumlu gelişmelerin olduğu söylenebilir. Genelde olumlu baktıkları durumla ilgili bazı çelişkileri olan öğretmen adayları bu çelişkilerinden de büyük ölçüde kurtulmuşlardır.

Öğretmen adaylarının bu konudaki kendi yorumlarına göz atıldığında bir öğretmen adayının program öğretilmeden önce yapılan ankette matematik derslerinde bilgisayar teknolojisi kullanımına bakış açınız nedir sorusuna şöyle yanıt vermiştir:

> *Matematik dersinde bilgisayar teknolojisi kullanımını gerekli buluyorum; yapılandırmacı eğitime katkı sağlayacağını düşünüyorum. Görsellik katacağından daha verimli ve etkili bir ders sunabilir, bu yüzden olumlu olacağını düşünüyorum.*

Öğretmen adayının bu cevabı aslında oldukça duyarlı bir yaklaşım tarzını göstermektedir. Ancak bu konuyla ilgili bir yaşantısı olmadığından sadece düşüncelerini paylaşabiliyor. Sadece faydalı olabilme ihtimalini öne sürüyor. Bu konuda ihtimali var ama olumsuz olması durumuna da ihtimal veriyor demek bu aynı zamanda. Bunun nedeni yaşantısının olmadığı bir konuyla ilgili ön yargılarından kaynaklanıyor olabilir.

Programın öğrenilmesinden sonra yapılan ankette aynı öğretmen adayının matematik eğitiminde bilgisayar teknolojisi kullanımına bakış açınız da herhangi bir değişiklik oldu mu sorusuna verdiği cevap ta şöyledir:

> *Evet, daha önce ders süresi kısıtlı olduğundan bilgisayar kullanımının çok sık ve **etkin kullanılmaması** gerektiğini düşünüyordum fakat şimdi bilgisayar teknolojisinin daha etkin ve **her fırsatta kullanılması** gerektiğini düşünüyorum.*

Bu cevap gösteriyor ki öğretmen adayının ilk ankette kesin yargılar kuramamasının nedeni bilmediğinden olduğu gibi eksik bir tarafın olduğunu düşünmesinden de kaynaklanıyormuş. Süre sıkıntısından dolayı olmama ihtimalini derste yaşayarak tersi olduğunu görmüş ve kesin kararlarla kullanma isteklerini açığa çıkarmış oldular böylece.

SONUÇ VE TARTIŞMA

Bu çalışmada öğretmen adaylarının teknoloji destekli eğitime bakış açıları ve Cabri Geometri programı bağlamında teknoloji destekli yazılımların eğitimi verildikten sonra bu konuya olan tutumlarındaki değişmeler ve gelişimleri üzerinde durulmuştur. Öğretmen adayları aldıkları bu eğitimle kendi anlama ve anlamlandırma güçlerini keşfettiler ve ayrıca öğrenciler içinde genellemelere varmanın çok daha kolay olduğunu gözlemleyebildiler.

Öğretmenlerin teknoloji destekli eğitime bakış açıları teknolojik eğitim düzeyleri ile ilişki göstermektedir. Cabri geometri programını öğrendikten sonraki tutumları da bunu destekler niteliktedir. Programı öğrendikten sonra akıllarında soru işareti olarak kalan durumlar netliğe ulaşmış ve imkanlar dahilinde müfredat yetiştirememe ve zaman kaybı gibi sıkıntıların sorun olmayacağını kendileri yaşayarak öğrenmişlerdir. Matematik probleminin çözümünde karşılaşılan sıkıntılar da kağıt kalemle yapılmasından kaynaklandığını gibi matematiksel bilgi eksikliği ve kavram yanılgılarından da oluşmaktadır.

Bu etmenler göz önüne alındığında öğretmen adaylarının eğitim süreleri boyunca teknoloji destekli eğitim konusu üzerinde yoğun bir müfredat hazırlanmalıdır. Çünkü bugüne kadar tüm öğretmenlerin ve öğrencilerin bu konudaki yaşantıları sadece klasik öğrenme üzerine koşullanmıştır. Daha önce öğrenilmemiş yaşantıyı sonradan hayatımıza adapte etmek ve onu uygulamak oldukça zordur. Alışkanlıklardan vazgeçmek zaman ister çünkü. Dolayısıyla 4 yıl içerisinde bir iki dersle halledilebilecek bir durum değildir bu. Teknoloji destekli eğitimi doğru ve etkin bir şekilde sınıfta kullanabilmesi için öğretmen adaylarının etkinlik hazırlayabilecek, bu konuda sınıftaki rollerini doğru olarak belirleyebilecek seviyede eğitim almış olmaları gerekmektedir. Böylece öğretmen adayları doğru şekilde eğitildikçe öğretmen nesli yeni nesile doğru kaymaya başladıkça teknoloji destekli matematik eğitiminde de hızlı bir gelişme sağlanmış olacaktır.

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CASPER – COMPUTER ASSISTED INTERACTIVE SPEECH READING TUTOR

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Abstract
The aim of this paper is to present the features of a computer assisted interactive speech tutor to help individuals with hearing problems to get the most out of spoken messages by using visual information.
The CASPER project has two major amendmends to the existing computerized speech-reading programs. First of all, the target is not the hearing-impaired only, but whoever would be interested in developing speech-reading skills based on visual information. Exercises are designed to cover daily interaction material rather than using only boring minimal-pair identification tasks. Secondly, the present design presents features not present in similar projects. To give one eabcample, the present tutor enables to present open-ended recognition material and gives feed-back on how well the learner performed on this task.
This paper will focus on the second type improvements, namely the technical infrastructure of CASPER- (or the BGD - Turkish name of the project **B**AK (Look) –**G**ÖR (See) – **D**UY (Hear)).
Key Words: speech reading, lipreading, computer assisted instruction, deaf education, educational technology, hearing impaired

INTRODUCTION

Individuals need to communicate with each other to survive within a given society. For some of us, like the hearing impaired, this essential social interaction is not free of serious problems. Irrespective of their hearing levels and abilities, people with hearing disorders suffer from face-to-face communication based on spoken language. Face-to-face communication and speech perception difficulties encountered by hearing impaired individuals vary not only due to several audilogical factors (Välimaa, 2002) but also personality (Bothe, 2006), cognitive, psychological, social (Kohl, 1966; Berhie, 2002) factors and alike.
Presbycusis is another type of disorder which is "characterised by reduced hearing sensitivity and speech understanding in noisy environments, slowed central processing of acoustic information, and impaired localisation of sound sources" (Gates and Mills, 2005, p.1111). This condition occurs later in life and if not managed effectively, "may contribute to isolation, depression, and, possibly, dementia (ibid.)". It is suggested that such psychological effects should be considered seriously and catered for through various rehabilitative interventions. Along this line, improvement in speech reading abilities may help these elderly people to cope with face-to-face spoken communication relatively easily.
The above statements may seem to suggest that normal-hearing individuals rely on auditory cues only but not focus on visual aspects of spoken messages. However, there is abundant evidence that face-to-face speech perception is bi-modal and brain areas reponsible for hearing and vision are activated during this process (e.g. Watkins, Strafella and Paus, 2003; Schwartz, Berthommier and Savariaux, 2004; Woll, 2009). Recent studies revealed that seeing the speaker's lips and facial movements during speech enhances "sensitivity to acoustic information" (Schwartz, Berthommier and Savariaux, 2004).
One of the earliest books on speech reading was by Alexander Melville Bell published in 1890. He wrote the book at Miss Sarah Fuller's suggestion to whom he dedicated his book. It is worth quoting a passage from Alexander Melville Bell's preface to this book:

> "Miss Sarah Fuller, one of the most successful teachers of Articulation to the Deaf, wrote to me, asking: 'Will you not now write a book for the benefit of persons wishing to learn Speech Reading? If they could be told what to look for in the differentpositions of the mouth during the utterance of words, they would almost learn it without the aid of a teacher. I believe that such a book would supply a great want.' " (Bell, 1890 p.7).

As Bell (1890) points out, speech "addresses itself to the ear" but "it also moves the mouth" and "hence, mouth-motions of speech convey to the eye of a deaf person more or less a perfect suggestion of the words of a speaker".
From such views, various lip-reading teaching manuals have emerged and been published (e.g. Bell, 1890; Parsons, 1900; Nitchie ,1905; Wyatt, 1961; Kaplan, Bally and Garretson,1985; Woerner, 1998). Much of these books provide excercises to improve speech reading by exploring facial movements of the self using a mirror. Some others encourage readers to make use of a communication partner to perform the excercises suggested in the book.
Recently, providing speech reading material on CDs or DVDs seems to be promising (e.g. Williams, 1997; Slike, 1999; Allen, 2000; Cook, 2001; Tye-Murray, 2002; Scott, 2003; Smith, 2004; Sarmaşık, et.al., 2007). There are considerable differences between these computerized speech reading programs. Some of these projects is still at the developing stage (e.g. Sarmaşık, et.al., 2007) and some are commercially available (e.g. **Seeing and Hearing Speech**, Cook, 2001; **Lipreader**, Smith,2004).
Except for the above mentioned project by Sarmaşık et.al.2007, we are not arware of any serious attempt to develop a speech-reading program in Turkish language. Thus, the present project sprang from an immediate and a groving demand to produce a speech-reading program in Turkish language. The aim of this paper is to present major technical aspects of CASPER and to demonstrate features not found in similar programs but in CASPER

CASPER FRAMEWORK

The primary aim of this project is to develop a computer assisted interactive speech tutor to help individuals with hearing problems to get the most out of spoken messages in Turkish by using visual information. However, we considered that anyone desiring to improve their visual speech perception abilities should be able to benefit from it. In accordance with this projection, the following major features were determined to be included in the CASPER project:

1. To be suitable for self studying;
2. To allows interaction;
3. To be flexible and user friendly;
4. To provide variety in terms of studying material and speaking faces;
5. To accommodates immediate feedback and to record progress;
6. To present real-life situations;
7. To offer objective evaluation of performance.

Suitability for Self-Studying

Improving visual speech reading abilities is a time-consuming and an individual effort. One needs to decipher visual clues during speech by watching the same utterance repeatedly before reaching a certain level of perceptual accuracy. This could be a tiring and a boring process both for the tutor and the student in a conventional teaching-learning situation. Computer technology, however, provides invaluable opportunities in this sense. CASPER users will be able to decide when, where, what, how and for how long to "study".

Interactive Structure

As mentioned above, users will be able to choose among the choices they are provided with. Additionally, the program should provide immediate feedback to the users responses. Giving feedback to close-ended material can be achieved easily and is integrated in almost all the speech-reading programs aforementioned. The major difference of CASPER is to give feedback to open-ended tasks. This is achived by providing a space for the user to type in the perceived context-free utterance (Figure. 1). The program will detect the items perceived correctly and incorrectly, and respond to the user's input by indicating whether the target utterance and the user's input matched. Computer's response is expected to be as detailed as possible for the user to minimize errors and improve visual perceptual abilities. In doing this, users are expected and will be encouraged to bring in their linguistic and paralinguistic skills.

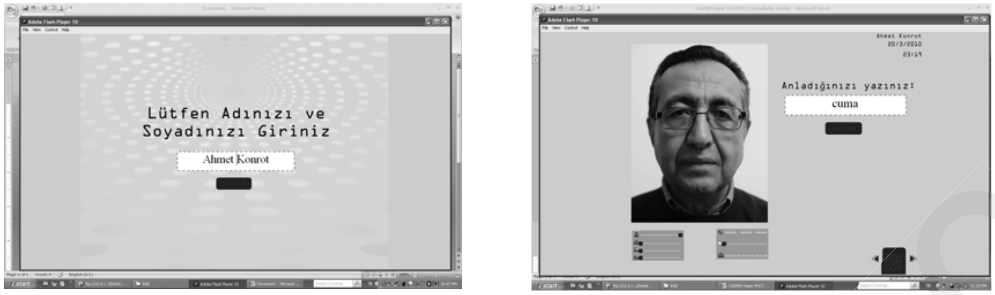

Figure 1. CASPER is designed to be an interactive program.

Flexibility and User-friendliness

Considering users to be of different ages and with variable competences, any computer program with similar intentions has to cater for flexibilty and user friendliness; so is CASPER. Flexibility is not only sought for the internal design of the program but also for future amendmends and changes to the present version.

Figure 2. CASPER provides a user-friendly flexible medium.

For example, the learner can not only view and listen an item that s/he choses to work on at the same time, s/he may add a variety of background sounds to make the task more difficult. Should s/he wishes to work with one modality only (i.e. auditory or visually only), s/he could use the virtual buttons designed to adjust the desired modality. When working with audio signals only (i.e. turning off the visual channel), learners may set the difficulty level of the task according to their performances and preferences.

Visual angle is another important aspect of speech reading. Computer based speech reading programs we have examined so far include 180 degrees video-recordings of the speaker, but do not use other degrees. Is becomes especially difficult to speech-read a speaker when viewed from the side (i.e. 90 degrees shot). Thus, CASPER provides learners to view the same utterances from three different angles - 45, 90 and 180 degrees (Figure 2).

One other feature unique to CASPER at present is to provide learners with close-up details of visual movements. When working with video recordings, one may zoom in and out to observe visual clues, especially the movements of the lips and the jaw more closely.

Speaker and Activity Variety

Some people may be very difficult to speech-read due to factors like lip-shape, low visibility of the lips in males wearing mustache or beards, speech rate, speaking with clenched teeth etc.. Such factors should be integrated in speech-reading tutorials. Video recordings of different speakers with varying visual and speech characteristics provide condierable contribution to tutorials. Thus, this feature is an essential part of CASPER.

Most of the speech-reading training programs focus on lip-reading; hence, design activities based on phonetic and visual aspects of spoken items in relation to the phological system of the target language. To elaborate more, most of the time, the learners are asked to identify and distinguish between similar items that vary in terms of one aspect only (i.e. minimal-pairs like '*pill*'/pil/ vs. *'bill'* /bil/, *'my'*/ mai/ vs. *'Hi!'*/hai/ etc.). This seems to be a practical way because teaching methodology and assessment of performance and progress will be rather straihgtforward. However, we do not converse through minimal pairs during daily interactions. Therefore, we think that designing activities with meaningful contexts (i.e. instead of starting teaching to discriminate various articulatory movements through visually and phonetically similar items, using easy to identify items first to encourage interest in the activities and to prepare learners to improve their own preferred strategies) would be a more appropriate approach to help individuals to acquire visual speech perception 'rules' and skills. This issue is beyond the scope of the current presentation and will be discussed elsewhere in detail.

Immediate Feedback and Recording Progress

Any interactive self-learning computer assisted program is expected to provide immediate feedback and record progress of the learner's performance. CASPER also does this. As each session performance is recorded, an objective progress report is also available for the learners to evaluate their performance. When CASPER is used in educational establishments, such logs and objective reports provide a valuable assessment tool for the instructor.

CONCLUSION

The prototype of CASPER is tested for its technical specifications at this stage with no major problems. Obviously, user reflections will lead us to a better evaluation of the technical design. We are very well aware of the fact that no speech reading program can provide an ideal solution but may contribute to the ongoing efforts. This is what we have intended to do and hope to design a useful model to help individuals to improve their visual speech perception skills.

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COLLEGE STUDENTS' INTERNET ADDICTION AND USE OF INTERNET FUNCTIONS IN TURKEY AND TAIWAN: A COMPARATIVE STUDY

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Abstract
In this study, the relationships between Turkish and Taiwanese college students' Internet addictions and Internet use functions were analyzed. The eta-squared method was employed to determine the statistical effects on the variables of the college students' country on their Internet addiction and Internet use functions. The findings shows that Taiwanese college students were better at social function, information function, and leisure function, when compared with Turkish college students, who were better at virtual emotional function. According to the eta-squared values, it was determined that the degree of the effect was large for social, information, leisure, and virtual emotional functions. Furthermore, it was found that Taiwanese students were better at withdraw, tolerance, time management problems, and interpersonal and health problems. There was no significant difference between these students in compulsive use. According to the eta-squared values, the degree of the effect was large for withdraw. The effect sizes for tolerance, time management problems, and interpersonal and health problems were moderate. Also, the degree of the effect was weaker for compulsive use.
Keywords: Internet addiction, Use of Internet functions, Turkey, Taiwan

INTRODUCTION

The Internet use is popular among college students, who spend 164 minutes daily using the Internet on average (Yu, 2001). In Taiwan, 6% of the college students are Internet addicts (Chou & Hsiao, 2000). Therefore, Internet use problems deserve careful attention and scrutiny. Griffith (1998) considered Internet addiction to be a kind of technological addiction and one in a subset of behavioral addictions. In Taiwan, Chen et al. (2003) followed the concept of Young's (1998) Internet addiction model and designed the Chinese Internet Addiction Scale (CIAS) to assess Internet addictive behavior among Internet users in Taiwan. The subscales of CIAS follow the substance-dependent concept of the Diagnostic and Statistical Manual–Fourth Edition (DSM-IV). The subscales of CIAS not only include the core criteria like tolerance, withdrawal, and dysfunction, but also added the impulsive use as an important criterion, also a criterion in DSM-III-R. In this study, the CIAS is used to assess Internet addictive behavior.

Davis (2001) used the cognitive-behavior model to explain pathological Internet use (PIU), which is similar to Internet addictive behavior. According to his model, maladaptive cognition and social isolation play the proximal roles in pathological Internet use. Caplan (2002) further includes 386 college students to explain PIU by using the cognitive-behavior model, and he found that one's preference for computer-mediated social interaction plays a role in the etiology, development, and outcome of generalized PIU. Caplan (2002) detected the interpersonal factor yields the generalized PIU. Ju (2000) found the Internet function is related to the severity of Internet addiction and the social function (r = 0.62) of Internet for the college student can be the best example. Chou and Hsiao (2000) determined the most powerful predictor of Internet addiction is communication pleasure. These studies revealed interpersonal factors play an important role in the Internet behavior spectrum.

As addictive behavior, the substance functions cannot be abandoned (DSM-IV). Take tobacco as an example. Tobacco has a social, pleasurable, empowering, emotional, and full-fledged function for adolescents or adults, who have tobacco dependence. The Internet-dependence user uses the Internet for social interactions (Ju, 2000; Young, 1998). Therefore, the social function of the Internet may be an important issue in an Internet addiction study. Recently, Li and Chung (2006) found the relationship between the Internet function and the Internet addictive index. The social function plays the core role in Internet dependence in Taiwan. In a meta-analysis study, the main antecedents of Internet addiction are interpersonal issues like loneliness and intrapersonal issues such as a low self-esteem (Douglas et al., 2008). Kim and Davis (2009) found that low self-esteem and anxiety online were related to Internet addiction in U.S. college students. As a different culture (Chen & West, 2008), Taiwan is under collectivism and interpersonal factors are trivial. In Taiwan, Internet usage is popular in everyday life. Under the influence of Confucianism, the people in Taiwan pay more attention to interpersonal relationships. As a result from Li's study (2006), social function was the core character in the college student's Internet addiction. The literature shows that while Internet addiction is a global problem, there might be cultural differences in the Internet addictive issue. In the present study, college students' Internet usage and addictive problems with different cultures, Turkey and Taiwan, will be compared.

METHODS

Research Approach

In this study, a quantitative method is used. The quantitative data help determine whether significant associations between independent variables (country) and dependent variables (Internet addiction and Internet use functions) exist, using statistical techniques such as the independent t-test and eta-squared (Cooligan, 1996; Kerlinger, 1986).

Data Analysis

An independent t-test was used to test the relationships between Turkish and Taiwanese college students' Internet addictions and Internet use functions. The eta-squared method was employed to determine the statistical effects on the variables of the college students' country on their Internet addiction and Internet use functions. Although the eta-squared statistic is similar to r-squared in correlation and regression tests, it is used to measure of the significance of the relationship between a continuous dependent variable and a categorical independent variable (Burba, Petrosko, & Boyle, 2001).

Instruments

To collect data for this study, the Internet Use Function Questionnaire (IUFQ) and the Internet Addiction Scale (IAS) were used.

Internet Use Function Questionnaire (IUFQ)

The IUFQ, originally developed by Ju (2000), was used to compare Turkish and Taiwanese college students' Internet addictions and use of Internet functions. In the IUFQ, the construct responses were given on a 4-point Likert-type questionnaire, ranging from 1 = very dislike me to 4 = very like me, to evaluate how often participants act in the manner stated for each of the items. This 18-item questionnaire was composed of four subscales: social function, information function, leisure function, and virtual emotional function.

Internet Addiction Scale (IAS)

The IAS, originally developed Cheng et al. (2003), was used to compare Turkish and Taiwanese college students' Internet addictions and use of Internet functions. Construct responses are given on a 4-point Likert-type scale, ranging from 1 = very dislike me to 4 = very like me, to evaluate how often participants act in the manner stated for each of the items. This 26-item scale included five subscales—compulsive use, withdrawal, tolerance, time management problems, and interpersonal and health problems.

RESULTS

The independent t-test technique is applied with the purpose of testing college students' Internet use functions, taking country (Turkey and Taiwan) into consideration. Results from the analysis (see Table 1) show a considerable difference between Turkish college students and Taiwanese college students in the subscales of Internet use functions—social function ($t = 8.51$, $p < 0.01$), information function ($t = 5.66$, $p < 0.01$), leisure function ($t = 6.92$, $p < 0.01$), and virtual emotional function ($t = 5.85$, $p < 0.01$). Taiwanese college students are better at social function, information function, and leisure function, when compared with Turkish college students, who were better at virtual emotional function. According to the eta-squared values (see Table 1) calculated with the purpose of determining the extent to which the country variable affects college students' Internet use functions, it was determined that the degree of the effect is large for social, information, leisure, and virtual emotional functions.

Table 1. College students' Internet use functions according to country

Internet Use Functions	Country	N	Mean	Std. Dev.	t	p	Eta-squared
Social function	Turkey	122	8.68	2.48	8.51**	.000	.269
	Taiwan	77	11.96	2.86			
Information function	Turkey	122	13.59	2.90	5.66**	.000	.140
	Taiwan	77	15.76	2.11			
Leisure function	Turkey	122	9.00	2.56	6.92**	.000	.196
	Taiwan	77	11.53	2.41			
Virtual emotional function	Turkey	122	5.28	1.53	5.85**	.000	.148
	Taiwan	77	4.03	1.33			

** $p < .001$

The independent t-test technique was also applied to compare college students' Internet addiction, based on their origin of country (Turkey and Taiwan). Findings from this analysis (see Table 2) revealed a significant difference between Turkish college students and Taiwanese college students in the subscales of Internet addiction— withdraw ($t = 5.47$, $p < 0.01$), tolerance ($t = 2.19$, $p < 0.05$), time management problems ($t = 2.62$, $p < 0.01$), and interpersonal and health problems ($t = 4.27$, $p < 0.01$). Taiwanese students were better at withdraw, tolerance, time management problems, and interpersonal and health problems. There is no significant difference between these students in compulsive use ($t = 0.36$, $p > 0.05$).

Table 2. College students' Internet addiction according to country

Internet Addiction	Country	N	Mean	Std. Dev.	t	p	Eta-squared
Compulsive Use	Turkey	122	9.42	2.99	.36	.713	.001
	Taiwan	77	9.27	2.42			
Withdraw	Turkey	122	9.27	3.49	5.47**	.000	.132
	Taiwan	77	11.84	2.54			
Tolerance	Turkey	122	8.86	2.94	2.19*	.030	.024
	Taiwan	77	9.71	1.98			
Time Management Problems	Turkey	122	8.87	3,38	2.62*	.009	.034
	Taiwan	77	10.12	2.95			
Interpersonal and Health Problems	Turkey	122	12.15	4.39	4.27**	.000	.085
	Taiwan	77	14.78	3.76			

* $p < .05$; ** $p < .001$

According to the eta-squared values (see Table 2) calculated with the purpose of determining the extent to which country variable affects college students' Internet addiction, it was determined that the degree of the effect is large for withdraw. The effect sizes for tolerance, time management problems, and interpersonal and health problems were moderate. Also, the degree of the effect was weaker for compulsive use.

DISCUSSION

The results obtained from this comparative research study show that Taiwanese college students are better at social function, information function, and leisure function when compared to Turkish college students. This finding can be explained with the cultural differences between the two countries. At the cultural level, Taiwan is under collectivism. The core element of collectivism is the assumption that groups bind and mutually obligate individuals, and the social function plays an important role in daily life (Oyserman, Coon & Kemmelmeier; 2002; Yang, 2004). East Asia is more collective than the Middle East or Europe (Oyserman et al., 2002). Thus, Taiwanese students may use social function of the Internet more than Turkish students. Also, Taiwanese students use information function and leisure function more than Turkish students. In addition, Lin, Ko, and Wel-Wu (2008) studied Internet addiction among college students in Taiwan. Based on their study, they found that self-efficacy is related to positive outcome expectancy and negative outcome expectancy. Moreover, positive outcome expectancy and negative outcome expectancy are related to Internet addiction. Thus, this is agreement with the findings of this current study. The difference between Taiwanese and Turkish college students' use of Internet functions is related to their choice of Internet function. The needs for Internet may be determinative in their choices. In their study, Wan and Chiou (2006) determined that psychological needs of players of online games are close to satisfaction and dissatisfaction.

Turkish college students are better at virtual emotional function, when compared to Taiwanese college students. While describing a "Turkish Portrait," English historian Lewis describes the Turkish as emotional and dignified people (Lewis, 1974: quoted by Guvenc, 2008). Since

Turkish people are emotional, they tend to express their emotions better on the Internet. Ceyhan (2008) conducted a study on Turkish college students' Internet use and determines factors, such as gender, level of psychological symptoms, connecting to the Internet most often at night, and using the Internet primarily to communicate with their relatives and friends, and to have a good time, predict significantly the level of the problematic Internet use of students. This finding shows how frequently Turkish students use the emotional function of the Internet. Bayraktar and Gun's (2007) finding that adolescents use the Internet generally for entertainment and communication may support both the virtual emotional function of Internet use by Turkish students, so Taiwanese students use information function more than Turkish students.

The extent to which country (Turkey-Taiwan) variable affects college students' use of Internet functions, it can be said the degree of the effect is large for social function, information function, leisure function, and virtual emotional function. Among the Internet use functions, the social function dimension has the greatest effect between Turkish and Taiwanese students. Li and Chung (2006) conducted a study on the relationship between college students' use of Internet functions and Internet addictive behavior. They discovered that social function played the core role in Internet addictive behavior. This finding by Li and Chung supports the finding from the current study. Following the social function, the effect degrees of the country variable on Internet use functions are listed as leisure function, information function, and virtual emotional function. Yang and Tung's (2007) finding that Internet users view Internet use as enhancing peer relations agrees with our findings related to leisure function and virtual emotional function.

College students from Taiwan are better at withdraw, tolerance, time management problems, and interpersonal and health problems, when compared to Turkish college students. High dependence index in Taiwan shows no difference exists in compulsive use, but Taiwanese students have more problems in the dependent index, such as withdraw, tolerance, time management problems, and interpersonal and health problems. In their study, Li and Chung (2006) found social function plays a significant role in Internet dependency. This result shows that Taiwanese students have more social function than Turkish students. Thus, Taiwanese students have an Internet dependency problem. In other related studies, Yang and Tung (2007) found that social motivation and gratification were positively related to Internet addiction.

In their study, Wu and Cheng (2007) found out that social support is positively related to Internet café addiction. This finding is important in terms of both Internet use function and Internet addiction results of this study. Its importance may stem from the fact that Taiwanese students use social function of the Internet more than Turkish students, and social function is one of the causes of Internet addiction.

About the extent to which country (Turkey-Taiwan) variable affects college students' Internet addiction, it can be said the degree of the effect is large for withdraw, and it is moderate for tolerance, time management problems, and interpersonal and health problems. Also, the degree of the effect is weaker for compulsive use. Chou and Hsiao (2000) found that addicts spend more time for social connection on the Internet than non-addicts. In their study related to Internet addiction of adolescents in Taiwan, Tsai and Lin (2003) determined Internet addiction causes some problems for school, family, health, and finance. Tsai and Lin's findings support the results of the current study on time management problems and interpersonal and health problems. Tsai and Lin (2001) also state that with the rapid growth and prevalence of computer network technology, most people have experienced some of the various benefits of computer networks. For example, on the Internet, people can find specific information, talk with others, and purchase almost any kind of merchandise. Furthermore, Taiwanese students use social function, information function, and leisure function of the Internet more than Turkish students and also receive higher scores from the Internet addiction scale. This may be explained with the years when the countries began to use the Internet. While popular use of the Internet began during the 1970s in Taiwan (APNIC Open Policy Meeting, 2006), it started in 1993 in Turkey (Development Center, 2009).

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COMPARING MENTAL MODEL ASSESSMENT TECHNOLOGIES[1]

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Abstract: Practical measurement and assessment of mental models is not a simple task. There is a lack of assessment tools that can directly and accurately evaluate mental models. The present research study on evaluation of mental models uses a set of Web-based assessment tools called HIMATT (Highly Integrated Model Assessment Technology and Tools) developed by an international researcher group to address the need for automated tools. Participants in this study use DEEP (Dynamic Evaluation of Enhanced Problem Solving) and T-MITOCAR (Text-Model Inspection Trace of Concepts and Relations) which are embedded into HIMATT. Participants' conceptualizations of complex mathematics problems are analyzed and compared within a novice group and with an expert group. Results of participants' conceptualizations of given problem scenarios and solutions are analyzed by comparison of using DEEP tool and T-MITOCAR tool.
Keywords: Mental Models, Automated Assessment, HIMATT, T-MITOCAR, DEEP.

INTRODUCTION

Mental models reveal the individual's ability at transferring their mental processing to novel and familiar situations (Gogus, 2009). How concepts are organized in the human mind, how people use these concepts in problem solving can be explained by cognitive strategies (Gogus, 2009). The individual develops cognitive strategies such as concept grouping and mental schema when constructing knowledge (Erdoğan, 2000). The main goal of this research study is to establish a reliable and valid methodology to capture and create conceptual representations of individuals and groups. This research study proposes that web-based assessment tools using concept mapping method, problem-based and model-based learning approaches can be used in assessment of learning in complex domains. Participants in this study use a web-based assessment tool kit to explain what they understand from a problem scenario and how they solve the problem. This tool kit allows learning of internal conceptual systems by interpreting individuals' models and representations of own knowledge (Gogus & Gogus, 2009).

There are a number of methods that demonstrate how people perceive and express knowledge and present what people know as well as their mental structures, such as concept mapping, causal integration diagram, conceptual frames and knowledge model. These models are based on Ausubel's (1968) Assimilation Theory. Mental Model researchers (Seel, Al-Diban, & Blumschein, 2000) have used concept mapping and causal interaction diagram as tools to obtain experts' comments on various scenarios. Even though these methods provide the framework for transforming internal knowledge into a visual form, they cannot solve the compensation and adaptation difficulties created by novel problems. A number of institutions and researchers have developed software tools to extend especially the use of concept mapping. For example, NASA uses concept maps to textually describe the information on spatial events and to present a richer content in space projects. Studies in Turkey, which philosophically analyze computerized modeling in cognitive science (e.g., Urgen, 2007), emphasize four basic elements in understanding models' place in science: installation of models, operation of models, representation of models and forms of learning from models. The model discussed in these studies is the Q-Soar model, which is created with Soar architecture and represents a particular group of model. These studies discuss that generalizations can be made for computerized cognitive models (Urgen, 2007).

The present research project considers the process of learning as gaining expertise in problem solving. Therefore, experts' mental models are compared with the mental models of individuals who are getting educated on the path to becoming an expert. This method was used in the National Science Foundation (NSF)-supported NSF 02-34 DEEP project entitled *"Enhanced Evaluation of Learning in Complex Domains"* and was termed as Dynamic Evaluation of Enhanced Problem Solving – DEEP methodology. It was demonstrated that the DEEP methodology is a reliable and valid method in the studied areas but the fact that the ideas of this methodology are still new and need to be developed was emphasized (Gogus, Koszalka, & Spector, 2009). Moreover, the DEEP methodology has not been tested in the area of mathematics yet. Therefore, mathematics is determined as a study domain in this research.

Another tool that is used in this study is T-MITOCAR (Text- Model Inspection Trace of Concepts and Relations) which relies on the dependence of syntax and semantics within natural language and uses the associative features of text as a methodological heuristic to represent knowledge from text sources (Pirnay-Dummer, Ifenthaler, & Spector, 2008). DEEP only automated the process of eliciting the representation; in its first incarnation it did not automate the analysis, although the analytical methods used by Spector and Koszalka (2004) are completely compatible with the T-MITOCAR. Therefore, DEEP and T-MOTOCAR are embedded into a new tool called HIMATT (Highly Integrated Model Assessment Technology and Tools) developed by an international research group to address the need for automated tools (Pirnay-Dummer, Ifenthaler, & Spector, 2008). The present research study on evaluation of mental models uses the HIMATT technologies which is a set of Web-based assessment tools.

METHOD

Participants in this study used both DEEP and T-MITOCAR which are embedded into HIMATT. HIMATT provides advantages to researchers because of using both qualitative and quantitative research methods:

> Methodologically, the tools integrated into HIMATT touch the boundaries of qualitative and quantitative research methods and provide bridges between them. On the one hand, text can be analyzed very quickly without loosening the associative strength of natural language (MITOCAR and T-MITOCAR). Furthermore, conceptual graphs can be annotated by experts (DEEP). All of the data, regardless of how it is assessed, can be analyzed quantitatively with the same comparison functions for all built-in tools without further manual effort or recoding. Additionally, HIMATT generates standardized images of text and graphical representations (Pirnay-Dummer, Ifenthaler, & Spector, 2008, p. 20).

Participants' conceptualizations of complex mathematics problems are analyzed and compared within a novice group and with an expert group (Gogus & Gogus, 2009). Students' knowledge about the content of a problem and how they present this knowledge are investigated and evaluated by comparing to the expert's presentation of knowledge. The elements required to improve students' ability to solve complex problems and increase their domain knowledge, can be investigated as a result of this evaluation (Gogus & Gogus, 2009).

The method used for evaluation of mental models requires the analysis of the schemas that show individuals' cognitive frames and the investigation of the existence of common or different cognitive models by comparing these schemas. This project considers the process of learning as gaining expertise in problem solving (Ericson & Smith, 1991) and therefore aims to compare the mental models of experts and non-experts. The concept maps and both qualitative and quantitative data collection methods that are used in this study to elicit individuals' mental models enable the individuals to reveal what they know and what they conceive about the solution of a problem.

[1]This research study is related to a grant project called "Evaluation of Mental Models" and supported by the Scientific & Technological Research Council of Turkey (TUBİTAK).

Based on the literature reviewed above, this study has two main research questions:

1. Do novice participants exhibit recognizable patterns of problem conceptualizations in response to complex problem scenarios?
2. Are there differences between novices' written texts (from T-MITOCAR tool) and concept maps (from DEEP tool) compared to an expert's representation?

Data are collected from experts and non-experts. Experts are five faculty members whose expertise lies in the area of mathematics and teaching Differential Equations classes at Sabancı University. Non-experts are twenty-two students taking the Differential Equation course at Sabancı University taught by the above experts.

ANALYSIS

To analyze the concept maps and written text created by the participants in the HIMATT environment, the six core measures implemented in HIMATT (Ifenthaler, 2009) are used. These six measures of HIMATT are defined as follows (Ifenthaler, 2008; Ifenthaler, 2009; Pirnay-Dummer, 2007):

Surface Matching: The surface matching measure (Ifenthaler, 2008; Ifenthaler, 2009) compares the number of vertices within two graphs. It is a simple and easy way to calculate values for surface complexity.

Graphical Matching: The graphical matching (Ifenthaler, 2008; Ifenthaler, 2009) compares the diameters of the spanning trees of the graphs, which is an indicator for the range of conceptual knowledge. It corresponds to structural matching as it is also a measure for structural complexity only.

Concept Matching: Concept matching (Ifenthaler, 2009; Pirnay-Dummer, 2007) compares the sets of concepts (vertices) within a graph to determine the use of terms. This measure is especially important for different groups which operate in the same domain (e.g. use the same textbook). It determines differences in language use between the models.

Structural Matching: The structural matching (Ifenthaler, 2009; Pirnay-Dummer, 2007) compares the complete structures of two graphs without regard to their content. This measure is necessary for all hypotheses which make assumptions about general features of structure (e.g. assumptions which state that expert knowledge is structured differently from novice knowledge).

Gamma Matching: The gamma or density of vertices (Ifenthaler, 2009; Pirnay-Dummer, 2007) describes the quotient of terms per vertex within a graph. Since both graphs which connect every term with each other term (everything with everything) and graphs which only connect pairs of terms can be considered weak models, a medium density is expected for most good working models.

Propositional Matching: The propositional matching (Ifenthaler, 2008; Ifenthaler, 2009) value compares only fully identical propositions between two graphs. It is a good measure for quantifying semantic similarity between two graphs.

RESULTS

In order to answer the research questions of this study, the written text and concept maps constructed by the participants were automatically compared to an expert representation with the HIMATT analysis feature. Hence, for both written text and concept maps, six similarity scores (0 = no similarity; 1 = total similarity; for measures surface, graphical, concept, structural, gamma, and propositional matching) are available for further statistical analysis (see Table 1).

More specifically, research questions for this study were:

1. Do novice participants exhibit recognizable patterns of problem conceptualizations in response to complex problem scenarios?
2. Are there differences between novices' written texts (from T-MITOCAR tool) and concept maps (from DEEP tool) compared to an expert's representation?

In order to answer research question one, a one-sample t-test for the six HIMATT similarity scores (see Table 1) was computed. The concept maps of the novice participants (from the DEEP tool) were not significantly different from each other at p=.001 level according to concept matching, $t(21)$=1,814 p=.085. In other words, there is a similarity between novice participants' concept maps in terms of concept matching. The proportional matching data was not included for concept maps since concept map data for proportional matching did not reveal any matches. The written text (from the T-MITOCAR tool) were not significantly different from each other at p=.001 level according to proportional matching, $t(21)$=2,366 p=.028. That is, there is a similarity between novice participants' written text in terms of proportional matching. In summary, novice participants exhibited recognizable patterns of problem conceptualizations according to concept matching, as demonstrated by their concept maps in the DEEP tool and also according to proportional matching from their written text in T-MITOCAR tool.

Table 1. Average similarity scores (0 = no similarity, 1 = total similarity) for written text and concept maps of participants compared to the expert's representation (N = 22)

HIMATT Measures	Written Text Average	Written Text SD	Concept Map Average	Concept Map SD
Surface Matching	0,445	0,325	0,725	0,182
Graphical Matching	0,701	0,251	0,748	0,183
Concept Matching	0,131	0,087	0,018	0,045
Structural Matching	0,418	0,179	0,852	0,115
Gamma Matching	0,394	0,284	0,793	0,149
Propositional Matching	0,011	0,023	0,000	0,000

In order to answer research question two, paired-sample t-tests for the six HIMATT similarity scores (see Table 1) was computed. The three paired-sample t-tests computed revealed significant differences between written text and concept maps for the HIMATT measures concept matching, $t(21) = -6.184$, $p < .001$, structural matching, $t(21) = 12.078$, $p < .001$, and gamma matching, $t(21) = 5.048$, $p < .001$. Also, a paired-sample t-test computed revealed marginally significant differences between written text and concept maps for the HIMATT measures surface matching, $t(21) = 3.394$, $p=.003 > .001$. The two paired-sample t-tests show similarities between written text and concept maps for the HIMATT measures of graphical matching, $t(21) = .675$, $p = .507 > .001$ and proportional matching, $t(21) = -2.366$, $p=.028 > .001$. Therefore, novices' written texts (from T-MITOCAR tool) were different from their concept maps (from DEEP tool) in terms of concept, structure, gamma matching, and surface matching.

DISCUSSIONS

Firstly, we looked at two specific sources of externalized knowledge, written text and concept maps.

Participants exhibit recognizable patterns of problem conceptualizations according concept matching from their concept maps in the DEEP tool, therefore capturing shared models of groups is possible using the DEEP tool.

Secondly, we looked for differences between learners' written texts and concept maps compared to an expert's representation. Our results revealed significant differences between written text and concept maps for the HIMATT measures concept matching, structural matching, and gamma matching. Here, we found that the written text and concept maps represent different structure and content. Therefore, the results support that the type of externalization strategy influences the represented knowledge (structurally and semantically).

This research is significant in terms of presenting how problem based learning approach and causal interaction diagram methods could be applied to an educational research. In this research, learning is considered as becoming an expert on a subject; therefore the differences and similarities between experts and non-experts are compared according to their knowledge, experience, and problem solving skills (Gogus, 2009).

One of the problems frequently experienced in the field of education is that the learning theories are well taught theoretically but the practice of learning theory is constrained. Research intends to reduce the gap between the practice and the theoretical information in the literature of the methodologies that are planned to be developed and implemented and mental models' evaluation.. Producing a methodology that can have international and national acceptance has vital value in terms of its usability by various sciences in practice. Therefore the methodology of mental models evaluation, an internationally popular study subject, may considerably contribute to the science and education researches conducted in both Turkey and around the globe (Gogus, 2009).

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COMPUTER ADAPTIVE TESTING AS A SELF-DIRECTED-LEARNING TOOL IN PROJECT MANAGEMENT COMPETENCES BASED ENVIRONMENTS

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Abstract
This paper proposes a computer adaptive testing (CAT) model for project management competences assessment, where competences are represented using concept space graphs. The proposed model increases the tests configurability by considering several knowledge constraints when an item is selected. The proposed model is also seen as a self-directed-learning-tool, useful in the preparation process for project management certifications. The model is validated by comparison with an existing e-testing tool for simulation purposes: statistic results are presented and analyzed. Two groups of 75 master students each were asked to prepare themselves for the certification exam in project management, using the adaptive tool and the non-adaptive one. The average grade of both groups was similar, but more extreme values were obtained in the group who didn't use CAT in preparation. The percentage of failure was much higher in the group who prepared with the non-adaptive e-testing tool.

INTRODUCTION

Project management requires specific project management competencies. According to International Project Management Association (IPMA), the project management competencies can be grouped in three components and three main categories as depicted in Figure 1. IPMA also chose to define four levels of competence (ICB, 2008), which provide a suitable framework for developing career paths and organizational maturity models:

- *IPMA Level A;* at this level, the individual has to have demonstrated successful use of the competence elements in the coordination of programmes and/or portfolios;
- *IPMA Level B;* at this level, the individual has to have demonstrated successful use of the competence elements in complex project situations;
- *IPMA Level C;* at this level, the individual has to have demonstrated successful use of the competence element in project situations with limited complexity;
- *IPMA Level D;* at this level, only knowledge related to the competence element is assessed by written examination.

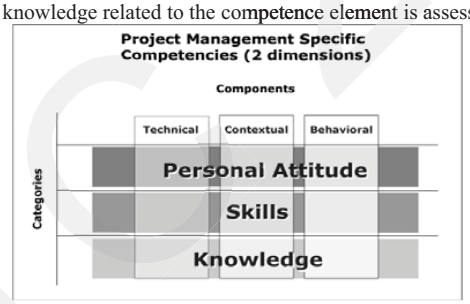

Figure 1. The project management competencies

Although no direct relationship exists, the education and training institutions probably want to improve the chance of their scholars, students or course participants achieving a certain certificate, for example:

- The project management programme of an advanced professional school or a training course aspires to prepare its students to develop their project management competences at level D.
- A project management master programme or postgraduate course wants to ensure that its candidates to develop their project management competences at Level C (or B).

THE ASSESSMENT OF THE PROJECT MANAGEMENT COMPETENCES

For each competence element, the knowledge and the experience are assessed, using a scale where values from 0 (no competence) through 10 (absolute maximum) are used. Knowledge does not mean just correctly reproducing facts, but also understanding relationships, knowing how to apply project management in practical situations and interpreting methods.
The assessment of the project management competence elements requires a mix of methods. Project management knowledge and experience can be assessed from training portfolio, written exam, the 360-degree feedback or the workshop, the project report, the references and the interview itself. The effectiveness of the assessment can benefit from the so called STAR-method (Situation, Task, Activity, Result).

COMPUTER ADAPTIVE TESTING AS A SELF-DIRECTED-LEARNING TOOL

Evaluation plays an important role in education, as it can improve the learning process itself. Frequent testing increases the quantity of knowledge assimilated by students/ trainees, but makes it difficult for the trainers/ professors to correct the exams. The solution to this problem was brought by electronic testing. Still, there are some stringent problems in conceiving computer tests: creating the questions (conceptual units of the tests) and creating the tests (the algorithms for selecting the questions). For the first problem, the phase of expert consultation has been exceeded, the automation of the questions creating process being envisaged. One solution is the one of the semantic nets, by which there is a correlation between the delivered content and the evaluated content. For the second problem, a test delivery model has been developed, which has evolved from linearly built tests, to the ones dynamically built, then to the adaptive ones which depend on the trainee's knowledge, because "classical assessment techniques such as multiple choice, true-false, fill in the blanks type tests etc. do not give a clear picture of learners" (Durmuş & Karakirik, 2005).
A form of computer based testing which increases flexibility and offers more information about the examinees competences is Computer Adaptive Testing (CAT): it is the next step in computerizing the assessment process. The principle behind CAT is to adjust the test items characteristics to the examinee's ability level (Desmarais & Pu, 2005). Basically, if the examinee answers correctly to a question, then the

next one will be more difficult. If the examinee answers wrongly, then the next question will be easier. Due to the Item Response Theory, similar scores are obtained by resolving different sets of test items.

Though is based on a simple idea, CAT is a complex mechanism. Each of the five **CAT components** discovered by Weiss & Kingsbury in 1984 (Rudner, 1998) have been optimized and tailored to different areas of knowledge evaluation. The five components are: item pool, starting point of the test, item selection algorithm, scoring procedure and termination criterion.

Each of the five components in a CAT mechanism can be changed, taking into consideration the domain of the test, the knowledge representation of the domain, the competences targeted for review or development, the reason for test conception. For example, Al-A'li improved the CAT mechanism for diminishing the number of questions in a test and, thus, the test length (Al-A'li, 2007), Tao, Wu and Chang developed a CAT variant suitable for daily routines and small-scale scenarios (Tao *et al.*, 2008).

CAT brings numerous **advantages**: saves up to 50% in test taking and test management time, enhances the examinee's motivation, by identifying the test user's needs and competences, incorporates an instant method of calculating grades. The examinee receives immediate feed-back, the questions are according to its level of knowledge, the time spent on giving a test is reduced (the test itself is shorter), the uniqueness of test questions is ensured and the evaluation is more accurate. On the other hand, the tutors spend less time on test creation, the test security is enhanced, supervision concerns are greatly diminished, and students' performance over time can be easily tracked. But, above all, CAT can be seen as a tool for self-directed-learning: a CAT user isn't bored with the same questions, receives new challenges, realizes what he/ she doesn't know, establishes his/ her own knowledge road. The better one is, the better one becomes. It's a competitive environment and the gained knowledge depends on self actions: CAT tests can be better experiences.

CAT MODEL IN A COMPETENCES BASED ENVIRONMENT

Computer Adaptive Testing is based on Item Response Theory, but it can be adapted and optimized according to each situation or field of activity. For example, using the domain ontology proposed by SinPers system (Bodea, 2007), the classic CAT mechanism is personalized for evaluating project management competences. SinPers is an e-learning platform which models digital content with learning objects, according to predefined domain ontology and metadata for describing the properties of these learning objects. Learning objects are explained or assessed by concepts defined in domain ontology. Relationships between concepts can be of three types: *Has_part* (defining hierarchical relationships), *Requires* (logical constrains defining the mandatory learning order of the concepts) and *Suggested_Order* (optionally). Concepts are grouped into 46 competences (technical, behavioral and contextual) as proposed in ICB v3.0 standard of the IPMA (see an example in Table 1).

Table 1. Concepts required by C1.19 - „Start-up" competence in the project management domain

Concept Code	Concept Description
DDI	Decision of making the investment
DIP	Document for initiating the project
PRO	Project proposal
CPR	Project charter
DDP	Decision to start the project
EEP	Pre-evaluation of the project
ATP	Assigning the project

The target of creating tests on the project management knowledge base described above is not only to adapt the questions to user level of ability, but also to obtain tests suitable for certification exams of level A, B, C or D in project management IPMA, tests which should verify certain competences. The area of concepts is different from level to level, for the same competence. To find it, concept space graphs are used. Some components from CAT are adjusted to project management competences structure and these enhancements are further presented.

PARAMETERIZED ITEM POOL

The CAT for project management knowledge uses a parameterized item pool: the parameters used to select certain questions from database are the concept lists, obtained from concept space graphs linearization. These concept space graphs are extracted from course ontology. Each competence from the course ontology has attached, as a parameter, an interval of values (threshold interval). According to it, the competence defines a set of concepts or projects a concept space graph. For this purpose, the path weight is used, as it is described by Hardas (2006).

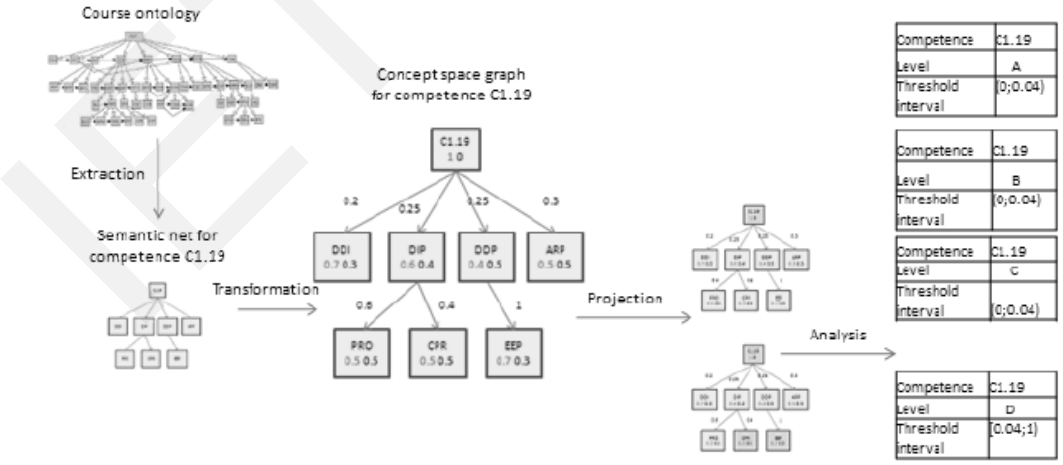

Figure 2. Knowledge structures in the project management automatic assessment, for C1.19 - „Start-up" competence

ITEM SELECTION ALGORITHM

The question selected is the one with the maximum information value (Rudner, 1998). Because we use knowledge structures to calculate different parameters (there are not provided by experts, as in a classical model), the information function is named knowledge function. The selection algorithm is the core of the CAT mechanism, which is shown by Figure 3. Another important aspect of the depicted model is that it is a dichotomous model: the test items are multiple-choice questions, but the answer receives all or nothing, no partial points are accorded, like in the polytomous model (Guzmán *et al.*, 2007).

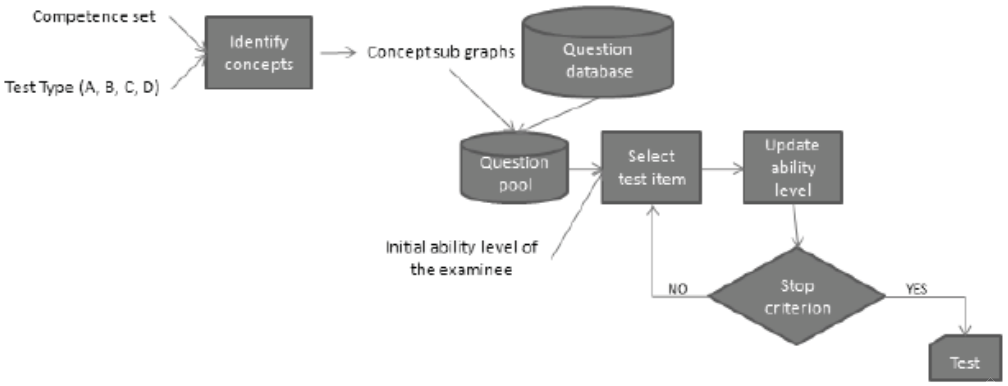

Figure 3. CAT mechanism for project management assessment

TERMINATION CRITERIA

The stop criteria is fired when all the concepts needed to be assimilated are among the already tested ones or when ability level (or the score) of the examinee is lower than 50/100. We should mention that the initial level of ability (start criteria) is 80.

CAT APPLIED TO PROJECT MANAGEMENT SIMULATION EXAMS

The proposed CAT mechanism lies on an improved knowledge representation successfully used by SinPers project. The immediate benefit of this mechanism is the reduction of conception time and the increased configurability of assessment in project management. Before being used in certification exams, Romanian International Project Management Association offered it as a learning tool in self-preparation processes for project management exams. For establishing its impact on the quality of examinees' preparation, a statistics was made and its results were analyzed. The experiment that preceded the statistics drafting will be further described, starting with the necessary instruments: software applications.

CLASSICAL E-TESTING APPLICATION FOR PROJECT MANAGEMENT COMPETENCES

Each certification exam offers the examinee a period of intense preparation, in which the Project Management Association (the official body which is validated to organize such examinations) proposes a certain training path: bibliography reading, workshops, simulation exams. The role of these simulations is not only to prepare the ones registered for certification with the questions style, but also to reveal what they should learn to master the targeted competences. The official simulation application proposed by IPMA Romania is a web application (http://www.pm.org.ro/certexam/).. It uses a web service to interrogate the question database and the user interface is developed using DHTML, JavaScript and Ajax functions offered by Dojo library (see Figure 4).

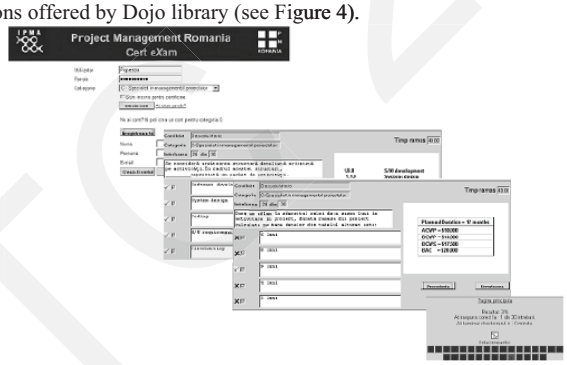

Figure 4. Workflow in project management simulation exam

ADAPTIVE E-TESTING APPLICATION FOR PROJECT MANAGEMENT COMPETENCES

The adaptive e-testing application respects the same interface rules and uses the same questions as the classical one. After registering to the appropriate account, the user receives a question at a time. This is a common feature of adaptive computer testing interfaces: the next question isn't known when test begins; it depends on the knowledge function of all unselected questions (included the current one), as described in previous chapter. The CAT user can't navigate through question screens: one can only go further. In this way, the system can't be tricked: the answer can't be changed. Technically, in the classical application, there is only one request to the server for obtaining the test questions. In an adaptive test, the requests number depends on the question number. In CAT, the overall time is somewhat shortened by test results calculation. In the classical variant, an algorithm is used and more database queries are necessary. In adaptive testing, results calculations are included in item selection algorithm.

A COMPARATIVE ANALYSIS BETWEEN CLASSICAL AND ADAPTIVE E-TESTING FOR PROJECT MANAGEMENT COMPETENCES

For validating the Adaptive E-testing application, a comparative analysis between it and the classical version was conducted.

Method Description and Data Collection

Two groups of 75 master students each were asked to prepare themselves for the certification exam in project management, level D. The preparation process lasted 3 months. First group was allowed to use 3 times the adaptive e-testing application for simulation purposes. The other group was allowed to use 3 times the classical e-testing application. Their simulation results were registered and analyzed. All students were initially tested using a pen- and- pencil test, consisting of the same questions. After the preparation period, they all gave the certification exam. The performance evolution was analyzed, for both groups. In the end, the impact of CAT simulation to final results was also quantified.

Data Analysis

The simulation results are reflected in Figure 5. The grades could have been between 0 and 100. In CAT case, the general trend is ascending: so, all the students improved their skills using CAT application. Still, it can be noticed that the ones having a high score at the first simulation, didn't progress very much. The explication is obvious: their questions were very difficult, as a result of their high level of knowledge. Based on this observation, CAT efficiency might decreases as the examinee participates for a higher level of certification. On the

other hand, in the right part of the Figure 5, the results of the classical e-testing simulations are represented. Only some of the participants had an ascending evolution. The trend is still ascending, but the slope is not as scarp as in students' evolution who used CAT.

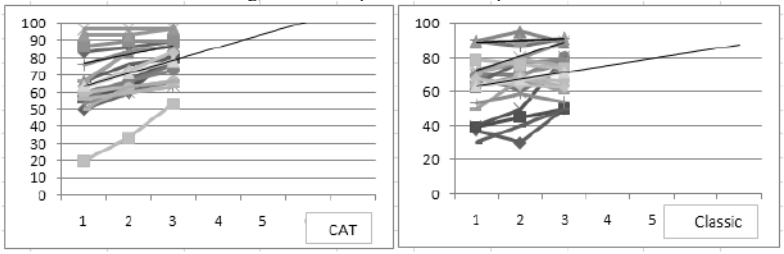

Figure 5. Successive project management evaluation results in certification simulations

A comparison was made between final certification results obtained by the master students, who prepared with CAT and the other group of examinees, who prepared with classical simulation software. Both groups gave the final exam on the same application (which doesn't implement yet CAT) and on the same database of questions. The average grade of both groups was similar, but more extreme values were obtained in the second group (the one who didn't use CAT in preparation). The percentage of failure was much higher in the group who prepared with classical e-testing tool: 40% of the students failed when working with the classical tool and only 15% of the students failed when preparing with CAT tool.

Still, the better results obtained among students who prepared with CAT software may be due to other factors: for example, the self-efficacy of the computer tests users could be affected by their computer level or gender (İşman & Çelikli, 2008). Because of this, a statistical study was made to establish the influence of students' initial level of knowledge and the simulation tests taken with CAT software to their final results. The study was made with EViews tool. In order to homogenize the initial data, a logarithm was applied. Some other reasons for applying a logarithm were: the residual variable wasn't normally distributed and exogenous variables weren't independent, there was a negative correlation of -2.73 between them. Ordinary Least Squares method was used. The t statistics proves that both initial level of knowledge and CAT simulation scores have an impact on the final test results (see Table 2): a 1.36% growth in initial knowledge level will conduct to 1% growth in final grade and a 0.39% growth in CAT simulation effects will conduct to 1% growth in final grade. According to the R square value (0.8), the endogenous variables are explained in 80% proportion by the exogenous ones. The Wald statistic test came to strengthen the idea that both considered variables have an impact on final results. Although the impact of the initial level of knowledge is greater, the impact of CAT tests can't be denied.

Table 2. Initial level of knowledge and CAT effects on final examination results: statistical data

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.636626	0.529571	-3.090476	0.0026
CAT_LEVEL	0.386338	0.082885	4.661126	0.0000
INIT_LEVEL	1.354864	0.120624	11.23215	0.0000

CONCLUSIONS

When building an automatic test for project management domain, question selection process becomes a challenge. CAT offers a quick, user oriented, secured solution for item selection issue. Testing in a computerized environment requires a framework to facilitate resource extraction in order to satisfy certain needs of evaluators. This framework should relay on a well-structured knowledge base. Ontology course, transformed in concept space graphs, then projected to sub graphs, according to the desired level of semantic significance, are a solution to this problem (Bodea & Dascălu, 2009). But Computer Adaptive Testing isn't just an instrument which measures knowledge: it is also an instrument which multiplies knowledge. Theoretical competences of project management can be easily developed by taking adaptive e-tests. This paper describes an experiment which supports this affirmation. The comparison between a group of examinees who prepared themselves with a CAT tool and another group who used a classical instrument of e-testing for preparation purposes proves that the proposed CAT model for project management knowledge assessment, where knowledge is represented using concept space graphs, might improve the examinees competences. Further experiments to strengthen the preliminary results and to improve the CAT mechanism will be made. CAT for project management knowledge can be used in certification purposes, as described in the current paper, but also in an employment context, as a tool to fill the employees' knowledge gaps.

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COMPUTER ANXIETY LEVEL OF SCHOOL ADMINISTRATORS

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Abstract
This research paper aims to reveal the attitudes of school administrators, (principals and assistant principals) who have been working in schools of Mersin district, towards the use of technology. The scale measuring computer anxiety/levels of school administrators was developed by Ağaoğlu et al. (2008), which has the potential of affecting the use of computers within an educational setting. Survey method was used to analyze the attitudes of public primary school managers towards technology. The population of the study comprises 100 primary school administrators of the Ministry of National Education. The data collected from the school administrators are evaluated using ANOVA, t-Test and Tukey LSD Tests.
Keywords: Computer, Anxiety, School Administrator

INTRODUCTION

Computers have become indispensable part of our lives due to increasing benefits of new information technologies. Computer-based information and web supports, linked with social constructivist learning model are of great help to meet the demands of information based society. Users, as process operators, support this rapid transformation and handle with the challenges for the adoption of new technology, which Karaca and Baturay (2005, p. 376) calls "pedagogical, institutional challenges". They struggle with superior organizational skills as compared to manual workers. Integration of new technologies into school settings, naturally, brings re/conceptualization of administrative process taking place in schools, principally the "school administrators".

School administrators have been expected to act "leaders" in the field of education (Şişman, 2000). Leadership, as a term, is pointing out "imposing the innovation", "monitoring the process", "evaluating and judging the process". They are expected to act as leaders of e-schools, effective technology users, instruction leaders, knower and implementer of technological hardware and software programs in educational environment. So school administrators are those who can act as leaders in education-instruction. Seeing that the use of computer facilitates educational process, administrators are expected to take the responsibility of using and spreading out the use of it. Hence, they can administer schools, as Ağaoğlu et al. (2008) say "the vast area of utilization provides the educational administrators with less workloads and economic time so that he or she can participate in the educational setting more effectively" (p. 45). On the other hand, İşman et al. (2003) point out the barriers for school administrators and lists down as "lack of integration, lack of structure of schools, lack of standards, lack of government support, lack of time, lack of finance, lack of technology skills, lack of training time, lack of needs, lack of curriculum, lack of integration, and lack of interest" (p. 158).

Computer anxiety has multiple dimensions, as Chua et al. (1999, p. 611) mention in the following extract

> Computer anxiety is a complex psychological construct. It cannot be fully described from a single perspective. For example, Howard (1986) suggested two dimensions: duration of computer anxiety (temporary vs permanent) and intensity of computer anxiety (normal vs neurotic) to measure computer anxiety. Other examples include: general computer anxiety and equipment anxiety (Marcoulides &Wang, 1990); learning anxiety, computer equipment anxiety, computer message anxiety, and computer observing anxiety (Mcinerney, Mcinerney & Sinclair, 1994); interactive computer learning anxiety, consumer technology anxiety and observational computer learning anxiety (Rosen & Weil, 1995).

Yet, the essence of five characteristics mentioned by Roblyer and Edwards (2000 in İşman et al., 2003) "increased student motivation; unique instructional opportunities; increased teacher efficiency; enhances students' information age skills; and supports constructivist approaches" imply the important roles of school administrators.

In Helvacı's (2008) study, the findings reveal that administrators have positive attitudes towards using technology during managing process, and using technology. Rosen and Maguire's (1990) meta-analysis research on computer anxiety levels revealed that females have slightly more, but not a significant computer anxiety than males. On the other hand, Maurer & Simonson (1994) state that investigation in whether computer anxiety is important or not reveal that individuals with high computer anxiety level are at a disadvantage (cited in Agaoglu et al., 2008). Namlu & Ceyhan (2002) point out that anxiety usually comes into existence in situations where new learning takes place and resistence is appearant, thus causing a negative effect on cognitive performance and learning cited in "the validity and reliability studies of the computer anxiety scale on educational administrators". There is another study about barriers of adapting technology for educational administrators. In Can's (2002) paper, elementary school administrators' technological leadership competencies, determining the efficacy level of the school administrators who work in Etimesgut primary schools in technological leadership, have been addressed. The attitude of primary school administrators' towards Computer Supportive Education was studies by Karadağ et al. (2008). Computer anxiety and some factors preventing computer use was studied by Fletcher and Deeds (2008) to determine the computer anxiety level of secondary agricultural education teachers in the United States.

In our study, the main research question is whether school administrators' affective and cognitive computer anxiety levels by measuring their computer anxiety behavioral change according to eight variables indicated as follows;

1. Does school administrators' computer anxiety level change according to their gender?
2. Does school administrators' computer anxiety level change according to their educational degree?
3. Does school administrators' computer anxiety level change according to the region of educational institutions they graduated from?
4. Does school administrators' computer anxiety level change according to their having computer at home or not?
5. Does school administrators' computer anxiety level change according to having internet access at home or not?
6. Does school administrators' computer anxiety level change according to their frequency of computer use?
7. Does school administrators' computer anxiety level change according to their frequency of internet use?
8. Does school administrators' computer anxiety level change according to their having computer education?

METHODOLOGY

The Participants

The study comprises 100 primary, secondary and high school administrators of the Ministry of National Education, in Mersin city, 2008-2009 academic year.

Table 1. ***The distribution of educational administrators' genders and educational degree***

Gender		Educational Degree			
Male	**Female**	**Undergraduate**	**Graduate**	**M.A**	**PhD**
19	**81**	14	73	10	3

As it is seen in table 1, females constitute 28% of the participants and males constitute 72%. When it is educational degree, 14% of the participants have undergraduate degree, 73% of them have graduate degree (B.A), 10% have master's degree (M.A), and lastly %3 of them have doctor of philosophy (PhD) degree. Moreover, when the educational institution where participants were graduated from is investigated, it is noticed that 23 of educational institution are in Central Anatolia Region, 6 of them are in Eastern Anatolia Region, 5 of them are in Southeastern Anatolia Region, and another 5 of them are in Blacksea Region, 4 of them are in Marmara Region, and lastly 57 of them are in Mediterranean Region. Furthermore, 92 of school administrators have computers at home, and 72 of them have internet connection. Lastly, 84 of school administrators have computer education.

The Instrument and Data Analysis

In this study, the computer anxiety scale (CAS-EA), developed by Ağaoğlu et al. (2008) is used. They give detailed information about the aim, and reliability/validity of the scale as follows;

The "Educational Administrators' Computer Anxiety Scale", which consists of 2 factors and 20 items allowing scores between 20 and 80 on a 4 point Likert-type scale, came into existence. The CAS-EA has been developed as a one dimensional continuum which starts with no computer anxiety towards intensively experienced anxiety, covering a wide range of continuity of intensity. Consequently, this scale should be considered as one which aims at determining educational administrators' affective and cognitive computer anxiety by measuring their computer anxiety behavior. Within this framework, a high score on the scale might indicate that educational administrators' computer anxiety is intense, that they might have some negative feelings about computers, that they might tend to exhibit behavior of avoidance regarding computer use, and that they can adopt a negative tendency of not using computers in the teaching learning process. Finally, CAS-EA can be suggested as a reliable and valid scale for further studies to measure educational administrators' computer anxiety.

The School Administrators Information Collection Form includes the questions about gender, education degree, the regions, whether they have a computer or not, and whether they make the most of the internet resources or not. To analyze the data obtained from the study, frequencies and percentages, arithmetic mean, standard deviation, t-test and variance analysis are applied. In the analysis, SPSS 11.0 program is used.

FINDINGS AND DISCUSSION

In this study, the differences according to 8 variables- gender, educational degree, region of educational institutions, owning a computer at home, having internet connection at home, frequency of computer use, frequency of internet use and having computer education are examined. As a result, 3 variables –gender, the educational degree and the region of educational instutitions- are found no difference with computer anxiety level. However, in 5 variables – having computer at home, having internet connection at home, the frequency of using computer, the frequency of using internet and having computer education-are found meaningful. The findings of this study are discussed as below.

Firstly, Table 1 illustrates if Computer Anxiety Score (COMPAS) changes according to school administrators' gender.

Table 2. ***The Results of t-test related to school administrators' gender and COMPAS***

	Gender	N	Mean	Std. deviation	t	p
Anxiety	female	19	26,4737	5,02625	-,454	,651
	male	81	27,2625	7,15603		

The result shows that there is no meaningful difference between males and females in terms of their Computer Anxiety Scores. Hence, it can be said that computer anxiety may not be explained with a gender variable. However, some of the studies (Bozionelos, 1996; Farina, 1991) concluded that gender was a significant variable in computer anxiety. While females tend to have a higher degree of computer anxiety (Rosen & Weil, 1995; Sigurdsson, 1991), our study is consistent with the findings of Carlson and Wright, 1993; Parasuraman & Igbaria, 1990. The findings of the recent studies reveal that situation is vice versa and still inclonclusive. As a result the findings of this study, no difference has been found in anxiety levels of male and female school administrators.

Secondly, the present study examines if there is any change in school administrators computer anxiety level according to their educational degree. The obtained data is presented in table 3.

Table 3. ***The variation analysis results of educational degree (licence, bachelor, master, doctorate) in terms of COMPAS (ANOVA)***

	Sum of Squares	*df*	*Mean Square*	*F*	*Sig.*
Between Groups	12,880	2	12,880		
Within Groups	4496,898	98	46,360	,278	,599
Total	4509,778	100			

One of the aims of this study is to state whether the degrees school administrators hold can be a significant variable in understanding computer anxiety levels. From this perspective, the graduation degrees of administrators are examined by taking four educational degrees into consideration. Herein, Table 3 shows that educational degree of school administrators makes no difference concerning to COMPAS. In conclusion, it is proved that there is no meaningful correlation between educational degree and computer anxiety level of educational administrators.

As a third, it is a guestion that if the school administrators' computer anxiety levels differ according to the region of educational institutions they graduated from. The results are shown at the table 4.

Table 4. ***The variation analysis results of regions of educational institutions in terms of COMPAS (ANOVA)***

	Sum of squares	*df*	*Mean square*	*F*	*Sig.*
Between groups	300,825	6	50,137		
Within groups	4208,953	94	45,749	1,096	,371
Total	4509,778	100			

Another aim of this study is to point out whether there is a correlation between the region of instutions where they graduated from and their computer anxiety level. The data of table 4 shows that there is not any meaningful correlation between these two factors. The results of this table can be seen as evidence that there is a balance in all regions of Turkey in aspect of the importance given to the use of computer, although there is a common thought that the east part of the country gives less importance to computer technology than the west part of the country. Based on that general assumption, the educational administrators graduated from educational institutions in the east of Turkey would have higher anxiety levels when compared to the ones who graduated from educational institutions in the west part of Turkey; however, the data presents that the situation is not as it is thought in common.
Next, in the present study, it is investigated if school administrators computer anxiety level change according to their having computer at home or not. The results are as follows

Table 5. ***The t-Test Results according to school administrators' having computers at home and their COMPAS***

	Computer	*N*	*Mean*	*Std. deviation*	*t*	*p*
Anxiety	yes	92	26,8791	6,51125	-1,151	,253
	no	8	29,7500	9,51315		

Regarding administrators' having their own computers at home, the result shows that there is a meaningful correlation between computer anxiety level and having a computer at home. The educational administrators who have computers at home have less computer anxiety than the ones who do not have computers at home since having computers at home enables school administrators to use computers for their own sake. Hereby, they feel themselves secure while using them as they have more chance to use it or they do not feel anxious about the use of computers. On the other hand, the ones who do not have computers at home are exposed to computer use at schools as a must; as a part of their work which makes them feel nervous. Therefore, this data supports our hypothesis in that the educational administrators who have their own computers at home have tendency to use computer without anxiety.
As a fifth, the present study examines that if school administrators' computer anxiety level change according to their having internet access at home or not. Table 6 presents the data and the results.

Table 6. ***The t-test results of school administrators having internet connection at home and their COMPAS***

	INTERNET	*N*	*Mean*	*Std. Dev.*	*t*	*P*
Anxiety	yes	78	26,6753	6,60032	-1,198	,234
	no	22	28,6364	7,34552		

The result indicates that there is a meaningful correlation between having internet connection at home and computer anxiety level. In other words, the educational administrators who have internet connection at home have lower anxiety scores than those who do not have internet connection at home. That is why, it is seen that having internet connection has a positive effect on computer anxiety since internet makes school administrators spend time on using computer, so this leads them not to feel anxious while using it.
Moreover, it is searched that if school administrators' computer anxiety level changes when the frequencies of computer use are taken into consideration. The obtained data is tabled below.

Table 7. ***The variation analysis results of school administrators' computer use frequency and their COMPAS (ANOVA)***

	Sum of squares	*Df*	*Mean square*	*F*	*Sig.*
Between groups	1034,155	5	206,831		
Within groups	3475,623	95	37,372	5,534	,000
Total	4509,778	100			

From the data above, it can be inferred that the frequency of computer use has a meaningful correlation with computer anxiety level. According to the table, the educational administrators who use computer more than 6 hours a day have lower anxiety level than those who use 1-2 hours a day, in a similar way, the ones who use computers more than 5-6 hours a day have lower anxiety level of computer use than the ones who use 1-2 and 4-5 hours a day (Tukey LSD Test results).
In order to answer the seventh research question, it is illustrated if school administrators' computer anxiety level differs according to frequency of internet use. The results are shown in the table 8 below.

Table 8. ***The variation analysis results of internet use frequency of school administrators and their COMPAS (ANOVA)***

	Sum of squares	*df*	*Mean square*	*F*	*Sig.*
Between groups	601,916	5	120,383		
Within groups	3907,862	95	42,020	2,865	,019
Total	4509,778	100			

A meaningful correlation between internet use frequency and computer anxiety level is seen in the table 8. It is noticed that the use of computer and internet has similar results. That is, the educational administrators using internet more than 6 hours a day have lower computer

anxiety than those using internet 1-2 hours a day. In addition, the educational administrators using internet more than 5-6 hours a day have lower computer anxiety level than the ones using internet 1-2 hours a day (Tukey LSD Test results).
Lastly, in the present study, it is questioned that if school administrators' computer anxiety level changes according to their having any computer education or not. Table 9 below shows the results.

Table 9. ***The t-Test results related to having computer education and COMPAS***

	Computer edu.	N	Mean	Std. Dev.	t	p
Anxiety	Yes	84	26,2024	6,02161	-3,311	,001
	No	15	32,2000	8,62886		

Table 9 presents that there is a meaningful correlation between having computer education and computer anxiety level of school administrators. The school administrators who have had computer education have lower computer anxiety whereas the ones who have not had computer education have higher anxiety level. The reason of this situation may be their having had education on the use of computer beforehand. This may make them feel confident, and that may be a reason for lowering their anxiety.

CONCLUSION

In this study, the aim is if school administrators have computer anxiety in terms of some variables or not. The correlation between the computer anxiety and variables 'gender, educational degree, the region of educational institutions, having computer at home, having internet connection at home, the frequency of computer use, the frequency of internet use and having computer education' are sought to be seen. For this purpose, the computer anxiety scale developed by Ağaoğlu et al. (2008) was used. It was applied to 100 school administrators in Mersin. After the scale was applied, the collected data was evaluated by using SPSS. The findings were examined by taking 8 variables into consideration. As a result, it has been revealed that in 3 variables –gender, the educational degree and the region of educational institutions- there are not meaningful correlations with computer anxiety level. However, in 5 variables – having computer at home, having internet connection at home, the frequency of using computer, the frequency of using internet and having computer education-there are meaningful correlations with computer anxiety level.
The results are gathered using *ANOVA, t-Test* and *Tukey LSD* Tests. The reason of using these types of tests is to see whether there is a meaningful difference between the dependent variable/s and the independent variable/s.
When the previous studies are examined, it is clearly seen that, they mostly deal with if computer anxiety is an important issue with school administrators. Moreover, the previous studies are based on contributions of computer technology to the educational fields, whereas in this study, it is not dealt with this issue. That is why; this is a unique study from this perspective.
Further studies on the issue of 'Computer Anxiety' can be held from different perspectives. For instance, more reliable results can be reached by increasing the number of school administrators. Secondly, whether there is a difference between the computer anxiety level of deputy principals and school administrators can be studied. Lastly, two or more cities can be compared from this aspect.

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COMPUTER-ASSISTED ACTIVITIES WITH LON-CAPA IN A UNIVERSITY PHYSICS CLASS

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Abstract
The present study investigates the effect of LON-CAPA used as a part of Hybrid Studio Format on the students` performances in an Introductory Calculus-Based Physics II for three semesters (F08, S08, S09). Student scores were obtained from LON-CAPA problems/homework, Written Homework, Hands-on Activities and Exams. The scores for all categories were found above average grade (≥60) and this outcome showed the success of the Hybrid Studio Format. The exam grades showing lowest performance were interpreted as some students` efforts getting the correct answer by trial-and-error strategy rather than understanding and solving the problem in well-defined steps. A design of conceptual problem presentation (Integrated Problem Solving Strategy Steps) was developed as an attempt to make a contribution to current LON-CAPA system. It is expected to prevent student getting lost in the intermediate solution steps. Using the IPSS method the number of tries for correct answers is also eliminated to focus the students` attention on getting the correct answer with the "full solution". If developed problem solving strategy steps can be introduced into LON-CAPA problems, it is expected that students will become experienced problem solvers.

INTRODUCTION

There are two constraints for students to engage effective learning. The first and more important is a regular active study of the material. The second, which helps students enormously, is collaboration, cooperation and discussion of the subject with other students (Cooper, 1995). However, in large-scale classrooms (as many as 600 per semester), group activities become harder due to logistical concerns. Besides, students get lost in the crowd and considerable care cannot be taken individually. Also for the instructors, the administration of examinations and problem sets can be almost overwhelming; the manual grading of the latter places a heavy load on teaching assistants and it is impossible for them to provide results rapidly enough for effective feedback. A computer-based supported learning system applied in Studio classrooms is one of the realistic ways to meet these demands (Hunter, 2000).

"Studio" was developed in 1993 by a physicist, Jack M. Wilson, who was teaching introductory physics at Rensselaer Polytechnic Institute. It is a learning environment which was designed to facilitate students` ability to interact with one another, with the instructor, and with the course material during their time in class (Wilson, 1994). Studio courses have been introduced to replace some of the large introductory lecture-based courses in science and engineering with a format including daily lectures, in-class activities, homework assignments, hands-on activities which are more integrated and incorporate technology. It presents a better learning environment for students and a better teaching environment for faculty (Wilson & Jennings, 2000). The configuration of the class can vary with the instruction style, traditional or computer-based, etc. The description of the studio configuration used in the research will be given in Method section.

There are many web-based educational tools available today that can be used in various ways. Some merely assist in managing traditional lecture courses, supplement the presentation of some of the material (e.g. Authorware-based visualization), provide question management and test construction (e.g. Question Mark Designer), or enable instructor-student conferencing on-line (e.g. AltaVista). Other tools (WebCT, WebAssign, etc.) enable entire web-based courses for either local or distance learning.

LON-CAPA (The LearningOnline Network with a Computer- Assisted Personalized Approach) is the combination of a course management system, an individualized assessment system, and a learning resources management system. LON-CAPA is free open source software, was originally developed at Michigan State University, and has its roots in the earlier software systems LON-CAPA (Kashy *et al*., 1995), Multimedia Physics (Bauer *et al*., 1992), and LectureOnline (Kortemeyer & Bauer, 1999).

LON-CAPA is an integrated system developed to create individual assignments for students in quantitative or semi-quantitative subjects (Morrissey *et al*., 1995). It is a tool that relies on modern networked computer technology, and its success in a particular setting clearly depends on the skill and dedication of the instructor who must create the problem sets. This networked software system enables instructors to write and distribute personalized problem sets, quizzes, and examinations for their students and includes an array of course management and statistical functions. The principal goals of LON-CAPA system of directed problem solving were to; a) provide students with timely feedback on problem solving, b) minimize the continuous judging and ranking of students during the learning process, c) reward diligent work and encourage students to work together to develop skills, d) reduce the impersonal nature of instruction in a large college class, e) produce a system without tedious grading of individual assignments that can be scaled to large classes.

LON-CAPA allows teaching web-based courses with either local or distance learning methods. The system provides a large variety of conceptual and quantitative problem functionality for personalized assignments, quizzes, and examinations (Kashy *et al*., 1993; Kashy *et al*., 2001; Kortemeyer *et al*., 2008; Kortemeyer 2009; Morrissey *et al*., 1995). The sophisticated LON-CAPA includes three parts; *Quizzer:* to create questions and prepare personalized problem sets or examinations, *Grader:* to record student responses and scores, *Manager:* to create class reports and compile various statistical information which is available with a detailed description of LON-CAPA (Hunter, 2000). The LON-CAPA, while similar to many others (WebCT, WebAssign, WWWAssign, etc.) in most aspects, differs in three important ways.

The first is its capability to randomize problems, both algorithmic numerical exercises as well as problems that are qualitative and conceptual, so numbers, options, images, graphs, formulas, labels, etc., differ from student to student (Kashy *et al*., 1995). The students can thus discuss the assignments, but cannot simply exchange answers.

The second is assisting instructors to collaborate in the creation and sharing of content in a fast and efficient manner, both within and across institutions, thus performing the first goal of the internet. Most of course management systems are built around the course as the main entity, and learning content is then uploaded to the courses. At the end of the semester, most systems allow export of the content to an instructor's personal computer, and then need reuploading in another semester. Within LON-CAPA, content is stored independently of a specific course in a shared cross-instructional content pool.

The third is its one-source multiple target capabilities, that is its ability to automatically transform one educational resource, for example a numerical or conceptual homework question, into a format suitable for multiple uses: the same code, which is used to present problems for on-line homework, can also create them for an on-line examination, or for a printed version suitable for a examination sheet examination which is later machine scored (Kortemeyer *et al*., 2005).

A key feature of LON-CAPA system is that it includes templates and tools which make it easy to generate hundreds (or thousands) of different questions from the same code. Thus each coded question has many variants of which one is selected at random whenever that coded question is assigned. This ability to produce hundreds of similar random questions from a single code is essential in allowing open formative assessment problem sets. Although the basic concepts of the problems are the same for all students, the numerical values are different for each student. In addition multiple-choice problems have x correct out of y-choices, where the number x is known to the students and can vary

for different students. The order of the y-statements is randomized and the text of each statement can even be varied. Such problems help the students to clarify common misconceptions and have them share their understanding (Kashy *et al*., 1995). The students then have the opportunity to type their answers into one of the many computer terminals on campus or by own computers equipped with modems, and thus can get immediate feedback from the computer as to whether the solution is correct or incorrect. They have unlimited tries to solve the problems and there is no penalty for incorrect answers. The automated grading frees up human resources that can be used for additional personalized attention toward the students. The instructor is viewed as a friend and helper and not as the grader or judge (Thoennessen & Harrison, 1996). A detailed description of LON-CAPA system is available elsewhere (Kashy *et al*., 1993; Kashy *et al*., 1995; Kortemeyer *et al*., 2008).

This research presents detailed investigation on the effects of LON-CAPA on students' performances (LON-CAPA/written homework, LON-CAPA problems, hands-on activities (in lab), and exams throughout three semesters (Spring 2008 "S08", Fall 2008 "F08", and Spring 2009 "S09"). Also, a design of conceptual problem presentation (Integrated Problem Solving Strategy Steps) will be presented as an attempt to make a contribution to current LON-CAPA system.

METHOD

The investigation was conducted with Hybrid Studio Format "HSF" (Lecture/Studio Physics/LON-CAPA) in the Introductory Calculus-Based Physics II (ICBP-II) for three semesters (Fall 2008-Spring 2008-2009). *ICBP-II* introduced the fundamental ideas of physics to students including electrical circuits, magnetic and optics. The basic goal of this course was: to understand the fundamental laws of electromagnetism as summarized in the Maxwell equations and related concepts and principles, to be able to apply these laws with the fundamental laws of motion using calculus, to construct a suitable understanding of the electromagnetic properties of physical systems in an applied context, and to begin to develop critical problem solving strategies. Each semester, enrolled students, divided into three class sections, were taught by two instructors, followed the same syllabus, submitted assignments individually, and took common exams. A standard course design including daily lectures, in-class activities and solutions, homework assignments and solutions, and reading assignments is provided by a course supervisor for use by all instructors.

The *Hybrid Studio Format* consisted of two one-hour lectures per week, and two two-hour blocks of studio time. Course material was separated into two-day blocks, where new principles were introduced in the lecture on one day, and students studied applications the next day in the studio on LON-CAPA software. HSF had two primary purposes; to model and practice problem solving strategies, show physics principles in different contexts, and to review the application of mathematical physics' techniques to describe physical situations to provide direct, hands-on experiences with electromagnetic phenomena in various situations. The activities provided connections between the abstract mathematical forms of the Maxwell laws of electromagnetism and their exhibitions in physical phenomena.

The studio class contained ten tables for groups of up to three/four students; the chairs had wheels to increase the mobility of the students around the table. Each table (workstation) was equipped with four computers. The computers contained LON-CAPA software and were connected to the Internet. One printer in the room was shared by all groups. The room had daily lab demo equipment storage. Also near each table, there was a small whiteboard for chalk-talks among students or between students and instructors. At the front center, there were two mobile lecture tables, two overhead projectors, and two large whiteboards for the instructor. The ceiling had a grid of beams capable of supporting apparatus.

Each studio section of roughly 100 students was staffed by two faculty members, two graduates, and two undergraduate teaching assistants. The purpose of this assistant team was to communicate with students and help them. This cooperation led to communication both in the Studio Physics (a certain time of the week) and outside the class. Faculty members or graduate teaching assistants then gave "recitation" for 10-15 minutes that serves to introduce the basic concepts and experimental approaches that the students used to examine that day's material. During the largest portion of each class period (~two hours), students worked in pairs or groups of three/four, with instructors moving around the room, answering and asking questions. Thus, students were exposed to teamwork and active learning, and the multiple learning modalities were used to provide friendly learning environment. The last ten minutes or so of each class period were a wrap-up session in which the instructor reviewed the important concepts and student shared data and summarized their findings.

The data were collected with grades of students taken from LON-CAPA problems (LON-CAPA, 2008) (asked on computer in studio), LON-CAPA homework (assign to be submitted on-line after studio in a week), Written homework (assign to be submitted in paper format in a week), Hands-on activities (lab experiments performed in studio) and Exams (given four times in a semester, 3 mid-terms and 1 final). The performances of students during three semesters were discussed technically and pedagogically. Finally, a contribution on the design of conceptual problem presentation for LON-CAPA problems was made to increase students` performances on problems and improve their problem solving skills. Problem Solving Strategy Steps (Kowalski *et al*., 2009) were integrated to a current LON-CAPA problem.

RESULTS and DISCUSSION

The results of the student performance during the use of LON-CAPA system are reported with the cumulative grades from hands-on activities, LON-CAPA problems, LON-CAPA/written homework and exams for S08, F08, and S09 in Table 1. Exams were given in the traditional method (pen-paper, multiple-choice, and open-ended questions). The table clearly shows that the students have high performance in all activities (Average grade ≥ 60). However, when scores were compared among each other, it is observed that students have the poorest performance on their exams. The main reason for this outcome could have been students` tight schedules including lecture, studio and assignment hours. Also, as in all exams being tested in two hours with 20 problems put much pressure on them. Because of the syllabus, exams cover a large variety of chapters and their activities. Thus, students couldn't combine and present their knowledge easily.

Table 1 The results of the HSF activities in terms of students' grades

	N	LON-CAPA Problems	LON-CAPA Homework	Written Homework	Hands-On Activities	Exams
Spring 2008	302	86.68	93.80	78.66	78.32	68.88
Fall 2008	371	83.40	93.35	82.27	75.87	68.40
Spring 2009	302	84.74	94.21	76.00	80.05	70.24

Note. *The grades weren't considered for students who didn't attend the activities, and the number of students is shown with N.

Students generally prefer to review the instructor's condensed lecture notes even though the fundamental concepts and exercises are also presented in the textbook in detail. Students often memorize the equations and problems presented in notes as if they do not responsible for the topic covering all related-fundamental-concepts and the problems with different difficult levels. Further, most of the students do not read the material to be covered in class, do not come prepared for class and do not take good lecture notes. They do not use office contact hours of teaching assistants and instructors to have better understanding of the subject.

Some technical features of LON-CAPA could also have improved: *i)* there is no feedback to the students that they have completed the problem properly as in LON-CAPA *ii)* students normally focus on getting some answer or calculating some number rather than organizing a

problem solving framework on paper *iii)* the interaction they have with their peers in the form of small groups lead to their getting lost in the problem as an individual, and students` motivation decreases.

As remarked in the Table 1, another striking result is students` lower grades on manually graded (written) assignments than for LON-CAPA homework. LON-CAPA score reflects higher performance because the system has some advantages over written homework.

They have the ability to enter a solution multiple times with a trial-and-error strategy in LON-CAPA homework. Persistent students can get the correct answer. However, in written homework, the students have to show their work on the paper and get one correct result. The most active member of the group often solve the problem on LON-CAPA and the others get the same grades from that person's effort, while in written assignments he/she has to submit the solution individually. Also, they might not revise and complete the written homework shortly after class while the material is fresh in their mind, thus they might forget how to solve that type of problem.

Another outcome is that students are more successful in solving chapter problems on computer (LON-CAPA problems) than doing experiments (hands-on activities) in the studio class. The results indicate that students have difficulty in making conceptual connections between physical facts and theoretical problems about same fundamentals. The hands-on activity providing related demonstrations or applets might cater for effective approach to physical representation of fundamental concepts. In the hands-on activities if the instructor or teaching assistants do not give a short talk at the beginning of the lab, students don't have enough understanding of the purpose of the experiment. The problem could also be the students' distractions by computer activities (internet, on-line games etc.)

The findings described above only highlight some side-effects of such computer-based active teaching/learning system. We, educators should support the technological improvements in educating system, but at the same time we should encourage students to achieve the following desirable instructional outcomes: i) students should identify the major physics principles and concepts that are used to solve problems, ii) they should explain the rationale for using a particular principle or concept, iii) they should describe how principles and concepts are applied to construct the solutions.

To meet these criteria and overcome some students` trial-and-error strategy used in current LON-CAPA, a design of LON-CAPA problem (Appendix) was developed. Integrated Problem Solving Strategy steps (Identifying the Fundamental Principles, Solving, and Checking) "IPSS" were used in the conceptual problem (Polya, 1957; Heller et at., 1992).

In the current problem style, students are required to solve the problem within 99 attempts. Corrective hints are given but sometimes hints shift the focus away from the goal to task completion. In that case, some students don't spend time to understand the concept behind the problem and continue to adopt formulaic approaches to problem solving. They tend to solve plug-and-chug or "just like the example" problems rather than complex problems with well-presented solution steps. This does not mean that equations are not important or useful. It means that equations are needed only at the end of the problem solving process, when principles, laws and definitions are applied.

When students come across a challenging problem, they either give up or get stuck on finding a solution. Now the question is: How to get students actively intellectually involved in thinking about the fundamental ideas? We know that fundamental ideas are not easily absorbed by students. But we can adapt their minds to think in an organized way while they are solving a complex problem.

IPSS, a contribution to current LON-CAPA, are expected to eliminate the students` potential misusage of LON-CAPA problems/homework and make all students experienced problem solvers both in pen-paper and computer-based problems. In the Appendix, a sample problem is presented with these Integrated Problem Solving Strategy steps (IPSS) as screenshots. In the *first* screen, students are asked to understand and choose related fundamental concept(s). The s*econd* display leads to the students` selecting the correct diagram or sketch to make the concept clear and then to restate the specific mathematical quantities. In the *third* window students are expected to fill the equation blanks by selecting parameters from symbolic/mathematical expression boxes and to calculate the numerical quantities with units. The f*ourth* screen encourages students to check the solution steps with the checklist if the entry is correct on the previous screen, and at the bottom of the page they confirm the numerical result. On the *last* page the students review the instructor's solution key. It may seem that this problem solving method takes students` time but this effort to engage with the problem in both conceptual and problem solving aspects is expected to be valuable in the exams when they are required to solve problems with different difficulty levels.

CONCLUSION

The purpose of this study was to observe the effect of LON-CAPA used as a part of Hybrid Studio Format on the students` performances in an Introductory Calculus-Based Physics II. Most of the scores obtained from LON-CAPA problems/homework, Written Homework, Hands-on Activities and Exams showed the success of the active teaching/learning system. However, the exam scores were the lowest among the others. Many pedagogical reasons could be listed but according to the observations and students` scores, the most important reason would be some students` efforts getting the correct answer by trial-and-error strategy rather than understanding and solving the problem in well-defined steps. A contribution was intended by integrating problem solving strategy step with one of current LON-CAPA problem to encourage students to explore the fundamental concept in depth. A new design of the problem presentation was also developed and it is expected to prevent student getting lost in the intermediate solution steps. Using the IPSS method the number of tries for correct answers was eliminated to focus the students` attention on getting the correct answer with the "full solution". If developed problem solving strategy steps can be introduced into LON-CAPA problems, it is expected that students will become experienced problem solvers. Besides, several modifications can be made to increase students` understanding. Open-ended problems solved by the instructor in lecture time and before hands-on activities could improve the rate of the students` learning. The applets and demonstrations are also recommended in the studio activities since students might have better understanding when they explore the real-world concepts on the computer.

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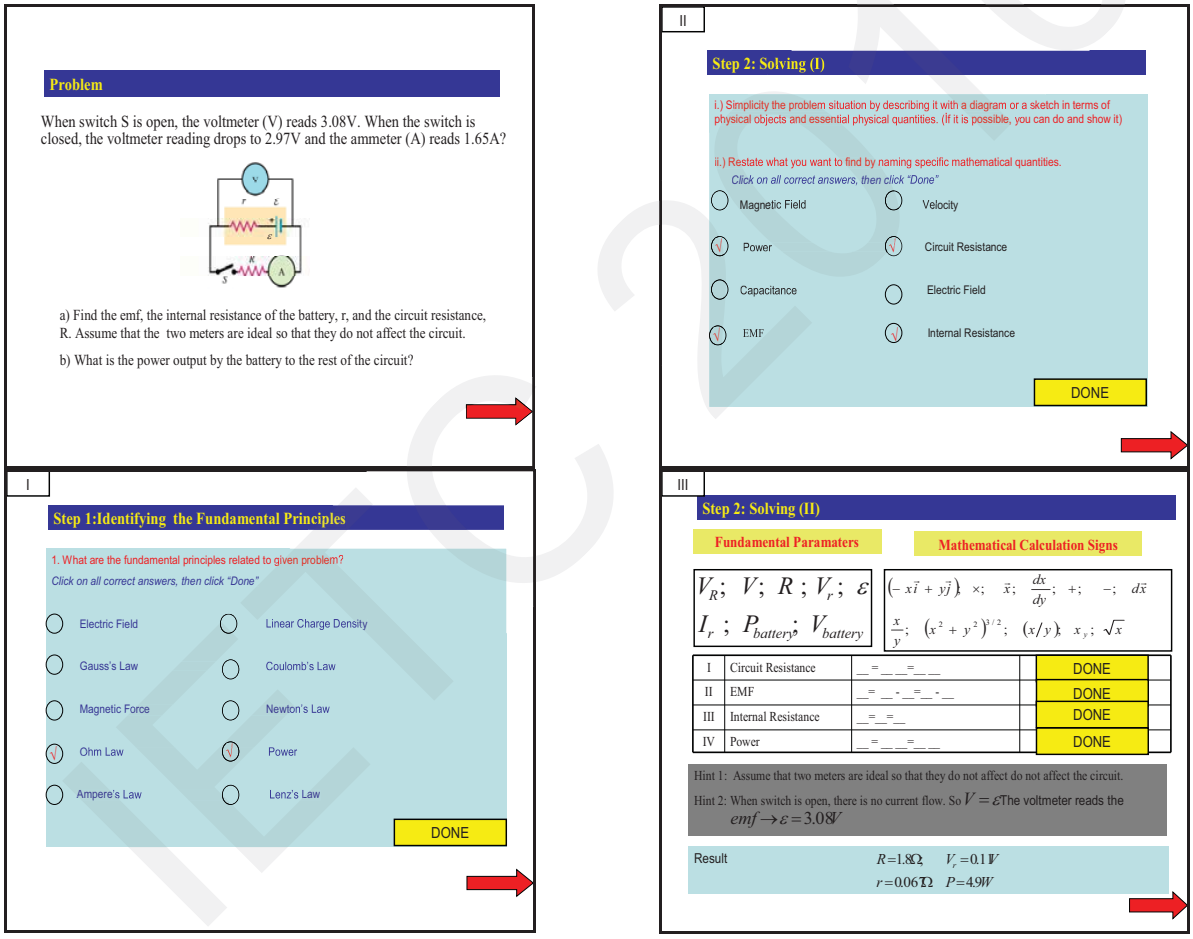
Appendix



IV

Step 3: Checking

i) Has all wanted information been found?	√
ii) Are answers expressed in terms of known quantities?	√
iii) Are units, signs or directions in equations consistent?	√
iv) Are both magnitudes and directions of vectors specified?	√
v) Are answers consistent with special cases or with expected functional dependence?	√
vi) Are answers consistent with those obtained by another solution method?	√
vii) Are answers and solution as clear and simple as possible?	√
viii) Are answers in general algebraic form?	√

CONFIRM

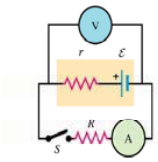
V

Solution of the problem

I. Identifying the Fundamental Principles

I. Ohm's Law II. Power

II. Solving



a) When switch is open, there is no current flow.
So $V = \varepsilon$. The voltmeter reads the $emf \rightarrow \varepsilon = 3.08V$
When switch is closed,
$V_{||} = V$ from voltmeter $R = \frac{V_{||}}{I} = \frac{2.97V}{1.65A} = 1.8\Omega$
$\varepsilon - V = V_r = 3.08V - 2.97V = 0.1V$
r & R are in series $I_r = 1.65A$
internal resistance $r = \frac{V_r}{I_r} = \frac{0.1V}{1.65A} = 0.067\Omega$
b) $P_{battery} = I_{battery} V = (1.65A)(2.97V) = 4.9W$

III. Checking

$R = 1.8\Omega$ $V_r = 0.1V$
$r = 0.067\Omega$ $P = 4.9W$

COMPUTING COURSES LEARNING MANAGEMENT SYSTEMS

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Abstract
LMS is essential tool in e-learning. LMS is become popular tool in e-Learning for universities, institutes, hospitals training and industry training. In University and academic institutes, different kinds of disciplines are using e-learning for courses delivery. One of the disciplines is computing major subjects, such as, computer engineering, computer science and information sciences. LMS provides a group of services for any kind of course. The scholar must find LMS as a support tool in different course activities from material availability to student publications and forum. There are some features that can be integrated in the LMS, such as marking and interactive email messages. Some features can be integrated to coop with the teaching requirement of computing courses. Computer courses require special features that are not available. This paper present the required features of design framework and the recommendations required for LMS of the e-Learning of computing courses.
Keywords: e-Learning, LMS, Computing courses, programming courses teaching,

INTRODUCTION

Learning management systems (LMS) are useful tool in e-Learning and distance learning. E-Learning is implemented tool by institutes and universities around the world for teaching different kinds of courses. Community, industry, hospitals and training centers are using LMS. LMS are becoming one of the important businesses in software industry.
LMS is highly required by any training in different area as mentioned earlier. Scholar and student will require the skills to be able to use the LMS. LMS are designed to be simple and easy to follow the traditional teaching methods. It is common practice to provide training for users of the LMS. There are different projects for implementing LMS in universities around the world. LMS become of the essential services in academic institutes expected by students.
There are some subjects that require special features in LMS. For instance, research and medical training have special features. One study presented a LMS for research only (Ding and Li, 2010). Another study presented the techniques to improve e-Learning in medical education (Muhsin, 2008). Some studies have concerned about the teaching of computing courses. Extra support from LMS in teaching computing courses to overcome the deficiency in student levels (ISMAIL et al, 2010).
This study present the required features that specifically required for computing courses. The features will help the student in finding a complete environment for learning computing courses. The features may help increase the student level of education in programming, the interaction between the scholar and the student can be enhanced by the integration of different software with the LMS. This study details the courses of computing requirements. This study assumes the LMS to be web-based application. Education and technical aspect are considered in the discussion.
This paper starts with the introduction and followed by a section about the available types computing courses. Section three explains the features of LMS for computing courses. In the fourth section, the model is summarized. Conclusion and future work are presented in the fifth section. Finally, the references are available at the last section, section six.

COMPUTING COURSES

There are a group of courses in computing that can be classified for the purpose of e-Learning. Some courses require programming languages. Some courses are completely theoretical and do not require any laboratory work, such as technical documentation and system design and analysis. Some courses require software systems such as databases and networking.

LMS FOR COMPUTING COURSES

LMS consists of different functions. For instance, student publications, forum, email interaction, authentication and authorization, and course contents. LMS can be used for teaching different course as well for teaching computing courses. However, extra configuration is required for programming courses. The programming courses include submission of homework using the LMS.
The teacher then runs the code in the local computer using the required software. For instance if the homework is in C++ programming language, the teacher will save the program file in the storage folder of the local computer to read and run the file for course marking.
The programming language could be ASP, which is one of the web programming languages. In general computer science and information systems courses includes different programming courses with different programming languages. The recommendations of this study are the implementation of the required functions to run the homework of the students in different programming languages.
This paper presents a model for LMS specifically for computing courses. The development of such model requires the consideration of the following entities. First, there are different programming languages and tools. Second, there are specific running requirements for any programming languages. Third, running the code will be in the server of the LMS. Fourth, there are security issues to consider. Fifth, the scholar requires a facility to grade the different student publications through the LMS.

Different Programming languages and tools

There are different programming languages for the different courses. Some courses include an application of low level programming language, such as assembly programming language. Some introduction courses to computing or programming includes an application using high level programming language. For instance, C++, Pascal, FORTRAN and Visual Basic are examples of high level programming languages.
Also, there are a group of courses that implement what is also considered high level language, such as web application. PHP, JSP and ASP are example of web and network programming languages.
There are some special tools or software used for projects as well as some homework in some courses, such as digital design, databases and networking. These tools are helpful to accomplish the required work either for course homework, course projects or laboratory exercises.

Software requirements

There are software requirement for each programming language or tool. C++, Pascal, FORTRAN, and Visual Basic require the installation of the compiler. PHP and similar web programming language require the setup of the required server's requirements, such as the compatible web server, mail server, FTP server and the engine to run the code. These requirements differ according to the system analysis and design and the

incorporated LMS. Database systems require the installation and the setup of the database management system (DBMS) and any required software drivers.
Networking programming and management and software require the setup and the configuration with the networking of the local area network (LAN). In general, different software packages either commercial or open source require special hardware and software and this is found from the documentation.

LMS and students publications

LMS provides different features, one of which is the student publication. So, rather than the students are submitting publications to the scholar office, the student submits homework or project reports using the LMS facilities. The submission is done using basic file upload. Then the scholar can download the work of the students. However, the LMS is software that can be supported by more functionality. It is noteworthy to define more functions to enhance the services to the scholar. The students are expected to submit different file formats according to the course work assignments, projects or laboratory exercises.
The student publications could be a text file in different formats, such as doc file or text file. Also, the student publications could be a programming code for different programming languages, such as PHP, ASP, C# or C++. Some LMS are web based and by default support some of the programming languages such as XHTML, JScript and CSS. However, some languages may not be supported and require.
Web-based application, such as LMS, is software that is installed in a web server. The web server is dependent in a complete server environment with all the connectivity and software and hardware requirements. It is assumed that any web server is highly equipped with high features of hardware and update software. The software and hardware of the server are well ready for any extra functionality to enhance the LMS.
LMS requires the development to be compatible and homogeneous to read documents files and to run programming code. As mentioned in the section of different programming languages and tools, the LMS need to be compatible with some tools as well. The compatibility issue requires the development of different software as drivers. The software libraries and documentation is required with such development to help LMS developer to easily integrate any tool in the LMS.
The communication between LMS and any tool or programming language is done through special scripting as mentioned earlier. The scripting required is developed by LMS developed. However, the software libraries, documentation and may be some driver are developed by either the developers of the LMS, the open source community, or commercial packages.
The LMS can read all the kinds of files of student publications for computing courses. Also, the LMS will be able to read or run the files. The operation invokes the file according to its type. This is an extra functionality required by the LMS.
If the file is of documentation with a format such as txt or doc, the LMS should be automatically detect the file format and place the output in useful format. The other option is to instruct the student to not submit any documentation file other than the format of XHTML. The other option is to provide a tool for writing and editing as web based tool then allow the student to save it as a submission way.
This is one of the useful tools, such as the tools provided by web based office services. While it is text, the LMS can include an extra functionality to check for similarities and plagiarisms. There are some tools that are part of projects to detect plagiarisms not only in one course but any course in specific university or country or even a group of joint cooperation of institutes of different countries.
This entity of the LMS includes different functions. The LMS is required to upload and define files types for the courses provided in computing courses. The LMS must be compatible with the software requirements of all files types. The LMS must be able to read and run all files types.
This section explains the student's publications for computer courses. However, there are several security issues with such methodologies. The following section addresses some of these issues and proposes some solutions.
The registration of user accounts in the LMS and the built in and equipped software, helps the user to upload any file types of interest to computing courses. Also, another feature to be included in LMS is highly useful and surprisingly ready. The LMS is equipped with support for programming languages files, text files and tools files. One of the tool files is the sequential query language (SQL) files. The file will be developed according to the used DBMS.
The student uploads the file. The scholar run the file and has the grading in the student portfolio. The scholar will indeed require the successful integration of the DBMS with LMS. Also, the LMS should automatically assign the scholar as a privileged user for all student database SQL files.
On the other hand, the students are developing the coursework or other publication through themselves in home, laboratory or office. In home or office, the students are required to have complete setup of DBMS. In laboratory, the students have the advantages of the support of the staff to do the exercises. However, if the students are able to use the LMS to develop the code and test it, then the LMS become more than a submission. LMS becomes the development tool for computing courses. This is a great advantage of computing students compared to other disciplines.
The integration of tools with the LMS is helpful, such that the laboratory management become centralized. The requirement is required more in client-server model rather than in the client side model. The networking features are required to be highly available in bandwidth and quality of service (QoS). The advantages of such design are the lower cost of laboratories management and maintenance and equipment of software and hardware.

Security and publications

In all cases there is a security risk that the for example if the student is required to submit a programmed file such as ASP file. The LMS should be implemented in a server environment with security. Web servers should support the different kind of student's files and OS should be supporting the security required of authentication and privileges required.
There are security issues with the submission of student's publications. The student submits the work electronically using a submission function in the LMS usually as file upload. The current methodology of submission is basic without any options. The LMS should detect the file type as well as allowing the user to define the file type. Any file type mismatch between the selection of the user and the LMS must be reported. Any LMS must be supported with excellent technical support (Cheung and Lam. 2009).
Some LMS include some restriction such as the file size and format. Extra restrictions are required, such as the privileges of the file. Operating systems (OS), such as UNIX, define the file modes. Available well known modes are read, write and execute. Also, the OS define the user of the file. If the user of the files does not have the privileges, the file will not run.
The privileges are the key features of running programming code peacefully in the server that host the LMS. All the users of the LMS will not be the root users of the server. Hence, the users will be able to run more than the assigned space in the server.
Every user must have an account in the LMS t use it. The same user account must be a user with other software and tools. For instance, in DBMS, the administrator must register every student as a user.
The files are of different types and security risks. Scanning for viruses is required for all files. Security risk is different for different file types. Some file types are referred to programming languages that are well known for its open applications where the risk is high such as C++. Some languages are known to be less risky like Java and C#. The system should also, check the content of the file and compare it with the file type.
Some of the security tools can be implemented in the server and do all the required check for viruses and file compatibility between names file

extension and content types.

Grading

The scholar gets the student publications in different forms, mainly as text or as compressed files or folders. Some LMS does not show the student his uploaded files. The student may try again and again and submit different times. The LMS should include a confirmation of submission.

The LMS should provide the scholar with a tool of marking. As the system is well able to run and read all files, now the scholar want to place some marks. For marking, the scholar have two options, either to read the output of opening the file and place some grading or place an answers of the correct output. The later method is helpful as it will automatically do the grading for all students in one click as an extra option.

All marking are saved in the LMS database. The LMS include the feature to send marking to all students based on the scholar action. The LMS must have a function to send the marking by e-mail when the scholar invokes it.

THE MODEL FOR LMS OF COMPUTING COURSES

This section summarizes the required LMS for computing courses. The System model should include the following features:

- read different kind of files
- define file type
- apply required security
- define privileges of each file
- define the required script to run any file
- scan for viruses
- run the code if programming file
- read contents if document file
- marking of the students publications
- grade is save in student portfolio

CONCLUSIONS AND FUTURE WORK

The design and development of LMS for computing courses can include some function that is very useful. The scholar will have different facilities for marking. The students are going to have a complete environment for doing coursework from writing to implementing.

The students are not going to require any software installation. The LMS is web based, which means the user or the student will require only an Internet connection and a web browser. The LMS includes all the software for all courses requirements. This implies that all integrated software is web based and embedded with the LMS. The user is one time login for a group of systems.

Future work includes the design and development of the proposed model. The development of the drivers and scripting required for each text editors, programming languages and tools.

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CONFIRMATION OF THE FACTOR STRUCTURE OF A SELF-REPORT MEASURE ON ICT INTEGRATION INDICATORS AND A MODEL PROPOSAL

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Abstract
A recent survey study conducted with 2515 senior students in Turkish education faculties defined the underlying structure sheltering ICT integration indicators as Teaching-Learning Methods, E-learning, E-interaction, Learning communities, Infrastructure, Access, Ease of Use, Technical Assistance, Policy, Special Education and Health. In addition, the study provided interrelationships among variables which could lead to an ICT integration model. This study first implemented the survey to 255 senior education faculty students to confirm the proposed factor structure. Secondly, based on the relationships among constructs provided in the previous study, second-order analyses were conducted revealing interesting insights about a potential ICT integration model. The suggested model was as follows: Policy of the institutions was at the center of the model predicting Infrastructure, Special Education, Health and Teaching-Learning Methods. Infrastructure predicted Access, Ease of Use and Technical Assistance; whereas Teaching-Learning Methods predicted E-interaction, E-learning and Learning Communities. Implications and suggestions for further research are provided.
Keywords: ICT integration; teacher training; higher education; confirmatory factor analysis; structural equation modeling

INTRODUCTION

Current practices in the workplace specifically evolving with emerging information and communication technologies (ICT) urge individuals to have the ability to use them with confidence and efficiency. ICTs were reported as a predictor of economic growth and job creation (Campbell, 2001). There are even instances indicating that the more ICTs are used, the more productivity gains are reported (e.g. Bresnahan, Brynjolfsson, & Hitt, 1999). Regarding that ICTs are crucial in the context of lifelong learning, an enormous challenge for educators awaits since they are supposed to equip students with relevant and high quality ICT experience before students emerge into the workplace (Gibson, O'Reilly, & Hughes, 2002).
Faculties of education carry utmost importance in shaping the technology use competencies of the future workforce. Positive experiences with ICTs help students to transfer these experiences to their own lives (Mueller, Wood, Willoughby, Ross & Specht, 2008). In addition, it is not plausible to expect learners to use ICTs responsibly and effectively if they are not exposed to relevant experiences (Barton & Haydn, 2006). In this regard, in addition to research endeavors on teacher competency, strengths and weaknesses of teacher training institutions should be investigated.
In order to diagnose the overall picture of an educational institution with regard to ICT indicators, Akbulut, Kesim and Odabasi (2007) purported to develop a measurement tool. While doing so, issues constituting successful ICT integration were determined according to those stated by UNESCO (2002). More specifically, (a) content and pedagogy issues, (b) collaboration and networking issues, (c) social issues, and (d) technical issues were considered as main headings each sheltering further subtitles. To determine subtitles of these four competencies, Akbulut et al. (2007) resorted to the Odabasi et al. (2006) report and maintained followings as subcomponents of each competency:

- *Content and Pedagogy*: 1) Teaching-learning method, (2) ICT in Curriculum Context,
- *Collaboration and Networking*: (3) Professional Development, (4) Learning Communities
- *Social Issues*: 5) Health, (6) Special Needs, (7) Ethics, (8) Policy,
- *Technical Issues*: (9) Infrastructure, (10) Ease of Use, (11) Access, (12) Technical Assistance

The Akbulut et al. (2007) study piloted a 54-item survey with 359 education college students at a Turkish state university, eliminated 13 of those items through exploratory and confirmatory factor analyses and retained ten of 12 components except for learning communities and technical assistance, as items addressing those components were somewhat shadowed by or merged with others. However, the number of items in each title was found insufficient for a reliable measurement. Thus, Akbulut (2008) developed new items for each competence and administered the revised 75-item form to 2515 senior students in six education faculties in Turkey, which were randomly selected from hierarchically ordered clusters. Even though each competency had ideal internal consistency coefficients, factor analyses did not lead to a consistent factor structure. Thus, the long-followed framework was not retained anymore and a new structure was proposed in Akbulut (2009). Factors extracted in the Akbulut (2009) study were E-learning, Infrastructure, Teaching-Learning Methods, Policy, Special Education, Health, Learning Communities, Ease of Use, E-interaction, Technical Assistance and Access. In addition, suggestive regression analyses revealing interesting relationships among variables were provided in the study (Table 1).

Table 1. Best predictors of each indicator

Indicator	Best predictors
E-learning	Teaching-Learning Methods, E-interaction, Ease of Use
Infrastructure	Access, Health, Ease of Use, Teaching-Learning Methods, Policy, Technical Assistance
Teaching-Learning Methods	Learning Communities, E-Learning, Infrastructure
Policy	Special Education, Ease of Use, Teaching-Learning Methods, Health, E-Interaction, Technical Assistance
Special Education	Policy, Ease of Use
Health	Infrastructure, Learning Communities, Technical Assistance, Access, Policy
Learning Communities	Teaching-Learning Methods, E-Interaction, Health
Ease of Use	Policy, Access, Technical Assistance, E-Interaction, Infrastructure
E-interaction	Learning Communities, E-Learning, Policy, Ease of Use
Technical Assistance	Ease of Use, Access, Health, Policy, Infrastructure
Access	Infrastructure, Ease of Use, Technical Assistance, Health

Adapted from Akbulut (2009, p.421)

Considering the reliable and consistent factor structure proposed in the study and examining the interrelationships provided, a covert ICT integration model underlying the study was detected through the help of the current literature, and the model was examined in this study (Figure 1). Considering the dynamics of learning organizations (Senge, 1990), the importance of contributive instructional technology management (Gay, Mahon, Devonish, Alleyne, & Alleyne, 2006), the significance of planning and management through resorting to all organization members (Lauerma, 2000), and

effective management and collaboration (Mehra & Mital, 2007; Sife, Lwoga, & Sanga, 2007), the suggested model centered Policy as a predictor of Infrastructure, Special Education, Health and Teaching-Learning methods. Infrastructure logically and theoretically predicted Access, Ease of Use, and Technical Assistance; whereas Teaching-Learning Methods predicted E-interaction, E-learning and Learning Communities. Teaching-Learning Methods was centered among these interrelated variables as students tend to live as they are preached in terms of their ICT use experiences (Barton & Haydn, 2006; Mueller et al., 2008; Steketee, 2006). In brief, this study confirms the factor structure of the Akbulut (2009) scale, and tests the proposed model through administering it to senior education faculty students.

METHODS AND PROCEDURES

Participants

To confirm the proposed factor structure through a new dataset, the questionnaire was administered to 255 senior education faculty students at a Turkish state university. It was possible to access 851 participants; however, it was not considered feasible to access all students to confirm the factor structure. A total of 255 senior students produced the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) as .817, which is considered good for factor analysis in several resources (Field, 2000; Hutcheson & Sofroniou, 1999; Pallant, 2001). Of 255 participants, 238 (65 %) were females, 121 (33.1 %) were males, whereas seven participants (1.9 %) did not indicate their genders. Respondents from different departments were available as English Language Teaching (f=69; 27.1 %), Pre-school Education (f=45; 17.6 %), Mathematics Education (f=31; 12.2 %), Computer Education (f=29, 11.4 %), German Language Teaching (f=26, 10.2 %), Social Studies Education (f=23; 9 %), French Language Teaching (f=19; 7.5 %) and Fine Arts Education (f=13; 5.1 %).

Data Collection Tool

The 61-item data collection tool developed in the Akbulut (2009) study was used to collect data. Item development stages, factor structure of the scale along with internal consistency coefficients and preliminary findings are all provided in Akbulut (2009). The internal consistency of the whole scale was 0.958 for the current administration. Corrected item total correlations were above 0.30, and the average of item total correlations was 0.51. Internal consistency coefficients of individual factors for the current implementation along with the number of items in each factor were as follows: E-learning: 6 items, 0.943; Infrastructure: 7 items, 0.889; Teaching-Learning Methods: 8 items, 0.841; Policy: 7 items, 0.872; Special Education: 6 items, 0.819; Health: 6 items, 0.887; Learning Communities: 6 items, 0.858; Ease of Use: 4 items, 0.887; E-interaction: 4 items, 0.802; Technical Assistance: 3 items, 0.866; Access: 4 items, 0.802.

Procedures

An official permission letter was received from the institution to implement the tool, which was administered to senior education faculty students in the end of 2008 fall semester. Responding took 11 to 15 minutes. After the dataset was checked for bad or missing values, the factor structure of the scale was processed through LISREL 8.51 (Jöreskog & Sörbom, 2001).

RESULTS

The confirmatory factor analysis (CFA) was conducted to examine the adequacy of how well the current data fit the structure suggested by Akbulut (2009). An ideal chi-square / df ratio (3081.92/1714=1.8) (Sümer, 2000) along with an acceptable Root Mean Square Error of Approximation (RMSEA=0.057) (Browne & Cudeck, 1993) was observed. None of the t-values was below significance and the fit indices were marginally below the acceptable fit values (Comparative Fit Index [CFI]:0.87; Incremental Fit Index [IFI]: 0.87; Goodness of Fit Index [GFI: 0.80]; Adjusted Goodness of Fit Index [AGFI] = 0.77). GFI and AGFI are given here on purpose, as there is a tendency to report these values. However, an expert in the field, David A. Kenny suggests in his personal website (http://davidakenny.net) that the current consensus is not to use these measures as they are generally affected by sample size. In addition to above indices, the standardized root mean square residual (SRMR) was 0.066, which is below the threshold of 0.10 to consider the value favorable (Kline, 2005).

As summarized, the first trial to confirm the model was mostly successful. Taking the abundance of observed variables, above values should be considered satisfactory. However, to make the model better than 'acceptable', some modifications might be suggested. Rather than adding every single path or error covariance among variables, some problematic items could be deleted so that the fit values became more favorable. When item 29 from Learning Communities, item 35 and 36 from Infrastructure, item 13 and 14 from Teaching-Learning Methods were deleted, most fit indices happened to be higher than 0.90, chi-square / df ratio became better (1964.12/1429=1.37), the RMSEA became 0.043, and the SRMR became 0.057. All these values indicated a good fit. In this regard, while administering the scale developed in the Akbulut (2009) study, researchers may prefer to eliminate those items for practicality, and use the 56-item version revealed here. Since items are not copied to this text, original item numbers are provided here so that the original scale can be downloaded from the official website of the *Journal of Educational Computing Research* and used for further administrations.

For the second order analysis, the structure partially implied in Akbulut (2009) was taken into account. Based on the relationships provided and with the help of the current literature, a model was proposed which put Policy into the center as the predictor of Infrastructure, Special Education, Health and Teaching-Learning Methods. In addition, Infrastructure predicted Access, Ease of Use and Technical Assistance whereas Teaching-Learning Methods predicted E-interaction, E-learning and Learning Communities. The conceptual diagram of the proposed model is provided in Figure 1 and the model with the standardized solution is provided in Figure 2. An ideal chi-square / df ratio (2269.12/1474=1.54), acceptable RMSEA (0.052) and SRMR (0.09) values were observed accompanied by marginally high fit indices (IFI: 0.87; CFI: 0.87; GFI: 0.81; AGFI: 0.78). Through adding error covariances between E-interaction and E-learning, E-interaction and Teaching-Learning Methods, Technical Assistance and Ease of Use, Access and Ease of Use, Health and Infrastructure, it was possible to increase the fit indices (except the GFI) to 0.90, reduce the RMSEA to .05, and improve the chi square / df ratio to 1.52. Creating two different variables as E-interaction and E-learning raised the question whether it was necessary to separate them. Combining the two was problematic as this increased the chi square / df ratio about ten percent (1.70), worsen the RMSEA (0.06), the SRMR (0.10) and the fit indices (IFI: 0.84; CFI: 0.84; GFI: 0.78; AGFI: 0.75).

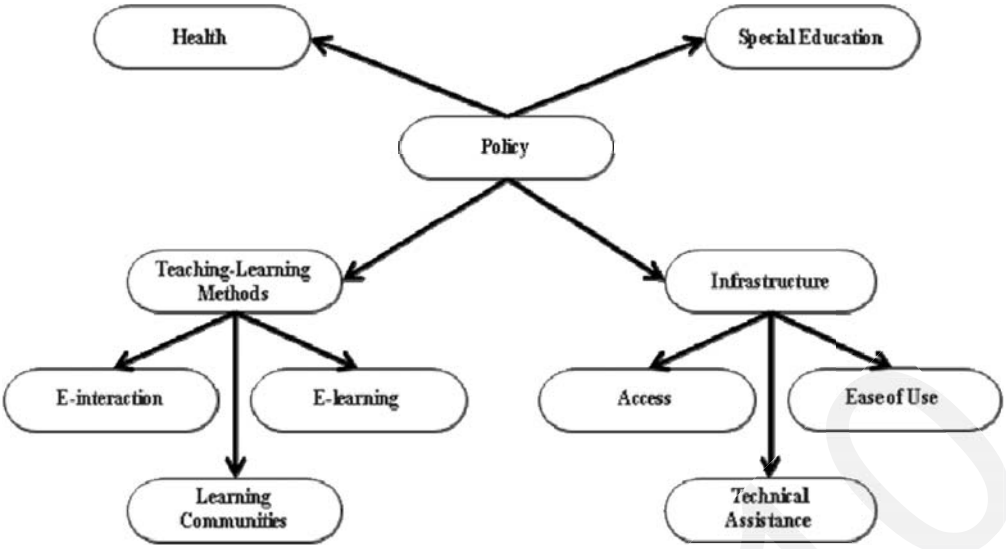

Figure 1. The conceptual diagram of the proposed model

Rather than adding error covariances between aforementioned variables, an alternative model can be created by combining latent variables predicted by Infrastructure under a single title, and variables predicted by Teaching-Learning Methods under a single title. Such a model put the Policy into the center of the model again, but the other four variables were only Infrastructure, Teaching-Learning Methods, Special Education and Health. Such a model had a worse chi square / df ratio (3982.66/1480=2.69), an unacceptable RMSEA value (0.092), worse SRMR (0.089), and bad fit indices (IFI: 0.73; CFI: 0.73; GFI: 0.65). This trial revealed the importance and unique contributions of individual variables for the model.

CONCLUSION

Confirmation of the proposed factor structure and the model centering on Policy as the predictor of Infrastructure, Special Education, Health and Teaching-learning Methods were successful to a great extent for the current administration. This suggests that successful ICT integration is primarily an administrative issue. In addition, observed variables constituting the latent constructs of Access, Ease of Use and Technical Assistance were primarily predicted by Infrastructure. Finally, the ICT integration quality of Teaching-Learning Methods predicted the quality of E-interaction, E-learning and Learning Communities simultaneously. In other words, the quality of distributed learning and educational communication endeavors in education faculties is reflected best through the construct of Teaching-Learning Methods.

The current study poses several limitations urging us to reconsider the items and the proposed model constantly. As indicated five items were somewhat problematic and should be reworded or replaced with new items addressing current practices, and piloted with a large enough sample to enhance the scale. Even if the model is plausible for the time being, items and sub-constructs should be modified in accordance with the developments in the field. In addition, the confirmation of the model which is 'currently plausible for tertiary education' should be extended to alternative educational settings. On the other hand, higher education dynamics in Turkey change in such a rapid way that the nature of the target population changes before the findings illustrating the current situation is published. For instance, before the Akbulut (2008) study was finished, new universities were founded, quotas of the existing units were increased, expelled students were given a chance to pursue their education, high schools were prolonged giving a higher chance to those who could not pass the university entrance exam the previous year since hundreds of thousands of high school seniors could not graduate that year. That is, even if researchers collect data from large enough samples that are representative of the target population, the population they represent expires before the implications and suggestions are provided, somewhat urging scholars to generalize beyond justified limits. Thus, ICT integration and scholarly work on the issue is an ongoing and tiresome process as the characteristics of the population change before the large scale needs assessments are complete in addition to constant developments in the field of instructional technology.

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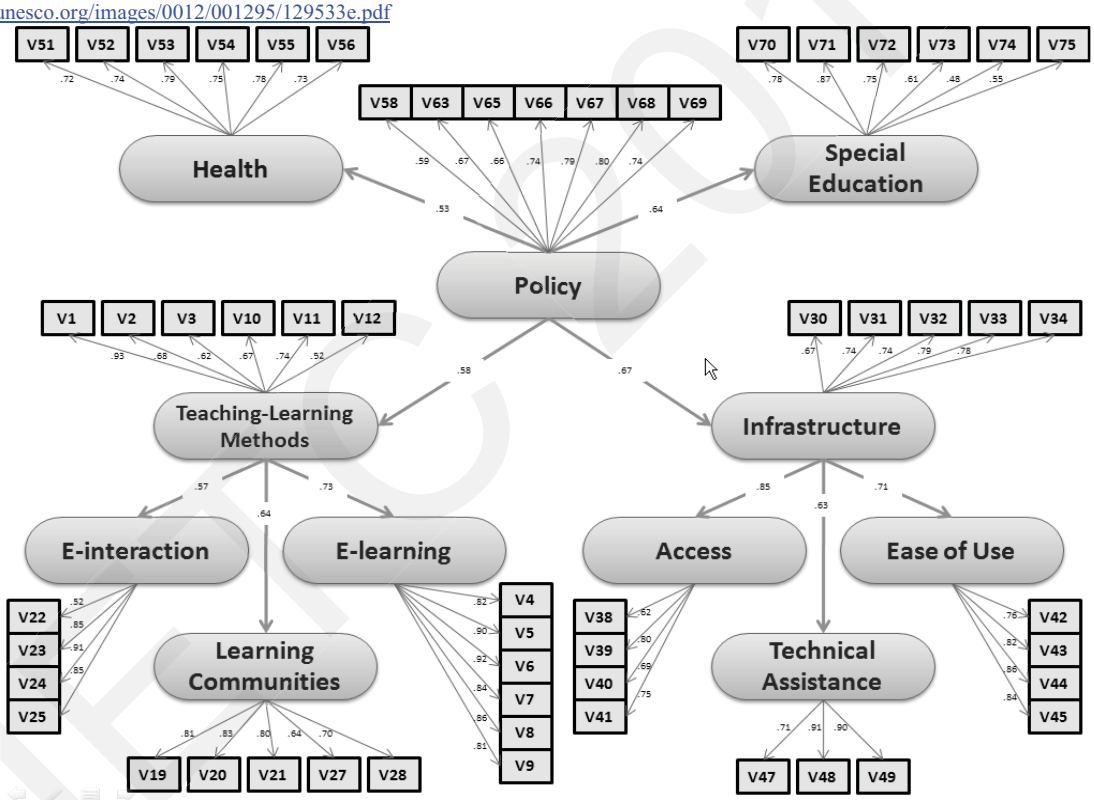

Figure 2. The illustration of the proposed model along with the standardized solution

CONSIDERATIONS FOR ON-LINE ENGLISH LANGUAGE LEARNING IN GREECE

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Abstract
The use of the internet in education is an indispensable tool. It is easily accessible and modified according to the needs of students. This paper deals with the use of web-enhanced teaching of the English language in Greece. More specifically, the influence of Facebook on information issues, the didactics and pedagogic material with regard to the foreign language is examined. First, theoretical framework of Web-based language teaching is introduced. A description of the course design along with task-based activities is also provided. The results drawn from the questionnaires and final oral interviews show that the experience of using Web-based learning has changed the way students view the role of Internet technology in the development of their English language learning. Facebook reinforces writing and communication skills and supports collaborative learning.
Key words: web-enhanced language learning, Computer-Mediated Communication, Interactive learning environments, social network

Introduction

The present study focuses on some basic pedagogical requirements related to web-enhanced TEFL (the teaching of English as a foreign language). In other words, the so called Computer-Mediated Communication (CMC) through both asynchronous exchange (e.g., emails and discussion boards) and synchronous interaction in real time (e.g., chat rooms and video conferences) sets a unique learning environment for Foreign Language (FL) learners to expand the use of the target language and thus develop their communicative language skills (Abrams, 2003; Blake, 2000; Lee, 2002a; Pellettieri, 2000). Previous studies have acknowledged a number of benefits that learners have obtained by using online technologies (e.g., Chun & Wade, 2003; Darhower, 2002; Sengupta, 2001; Smith, 2003; Warschauer, 2000). Kublin et al (1998) succinctly state that learners develop through participation in activities that require cognitive and communicative functions. Current language instruction often goes beyond just providing comprehensible input; it also creates socially interactive contexts in which learners actively engage themselves in the learning process (Kinginger, 2001). Through socialization, learners use the target language as a cognitive tool to perform and assist each other in a shared activity (Lantolf, 2000). Language learning that takes places in a social network can be based on sharing friends, instant messaging, links, comments, video or audio. In addition, the participants learn about socialization through the communication and interaction among themselves (Wilkenson & Sherman, 1996). Online learning creates a friendly and low-anxiety learning environment that allows even shy students to participate (e.g., Kern, 1995; Magnan, Farrell, Jan, Tsai, & Worth, 2003) and encourages affective support among peers to increase students' motivation toward L2 (Target Language) learning (Weasenforth, Biesenbach-Lucas, & Meloni, 2002). As opposed to the traditional classroom setting where a teacher-driven approach prevails, CMC promotes greater interaction and reduces teacher involvement, while the learners equally share turns in participation (Sullivan & Pratt, 1996). Through network collaboration, learners extend their communicative abilities; they experiment on discourse structures and interact with others (e.g., Kern & Warschauer, 2000; Smith, 2003; Toyoda & Harrison, 2002; Tudini, 2003). Through interaction, learners improve their grammatical competence (Pellettieri, 2000), written and oral communication skills (e.g., Abrams, 2003; Blake, 2000; Payne & Whitney, 2002). Moreover, task-based activities provide feedback aiming at developing linguistic abilities. Social networks provide authentic context ideal for indirect learning. Lamy and Goodfellow (1999) claim that a task that simply requires social conversation may not stretch learners' ability with language production. More important, tasks without a specified goal may not push learners to use their linguistic resources for negotiation of meaning (Pica, Kanagy, & Falodun, 1993).

In this context, this paper investigates appropriate uses of the Web in second language teaching and learning through the analysis of a CALL (Computer Assisted Language Learning) project on the WWW with Greek University students. It examines how one example of social networking Facebook, is having a direct impact on foreign language teaching and learning in Greece, by allowing both teacher and learners to build and participate in multimedia collaborative learning environments that are able to promote active and creative language learning.

Methods and Procedures

This sample consists of 25 self-selected University students enrolled in advanced EFL (English as a Foreign Language) class. The students were introduced to a website-based learning environment. In particular, Computer Mediated Synchronous Interaction such as Facebook was instructed to use in class.

The students were informed that they were required to carry out a variety of online tasks in class to develop their English skills throughout the term. Facebook served as the content tool which presented course material and assignments as well as a communication tool which allowed users to interact with each other. In facebook there is place to upload videos, links, make individual pictures, write blog entries. Web tools, such as "You tube" videos, podcasts, texts and assignments can make learning more efficient. First, the teacher introduced the topic and had students discuss and share opinions. The students were divided in small groups to facilitate online exchange and chatting. The students were introduced to this learning environment and were allowed to try out a few warm up activities .The task-based activities were available online (see Appendix A). The students started chatting online exchanging web opinions and having quick debates changing partners often. Next, students completed some before reading or listening activities such as gap fills, matching exercises, multiple choice answers. The aim of the tasks was to practice and extend writing, listening and speaking skills. The reading and listening links were provided. Task-based instruction was essential to build language proficiency through listening to podcasts, watching videos, explaining situations and expressing opinions in different contexts. After reading and listening to the topic based tasks students could post their answers on the wall, send their messages to the language instructor or log into the chat room for online exchanges. In addition to that, they continued with writing tasks and corrected their partner's essays. Last, after identifying students' mistakes on usage, vocabulary and grammar, the language instructor provided the answers to the assignments and posted revised copies of students' exchanges for the final evaluation. Finally, the students downloaded the revised copy and placed it in their portfolio as part of the course requirement.

A survey regarding students' perspectives and attitudes toward Web-based learning was given to all students at the end of the term. In the survey, students were asked to rank their level of satisfaction on a 5-point Likert scale ranging from (1) "Strongly Disagree" to (5) "Strongly Agree."

In addition to the survey, a final oral interview was given to all students at the end of the term (see interview questions in Appendix B). During the final interview, students were first asked to briefly discuss their experiences with online activities and to explain the most

valuable, appealing, and difficult aspects of the Web-based instruction. 92% of the students believed that this method of learning allowed them to have more opportunities to develop their linguistic abilities than a traditional class. The interaction in the conversation class was what they found most enjoyable (94%). They believed that the part where they were asked to upload videos and links for the reading, listening and writing activities provided learning in authentic context which was beneficial for indirect language learning (87%) Immediate feedback from the teacher was a source of motivation (97%). Then, they were asked to describe the least important part of the facebook course and explain the reasons. Some complained (4%) that time allotment (1hour per session) was not enough to complete the tasks. Finally, they were asked to discuss how this course changed their perspectives on web-based instruction. All students felt they had advanced in their learning (100%) All the interviews were recorded for the data analysis.

Survey Results

Learners' Perspectives on Using Web-Based Course

Overall, the results show that students reacted positively to the Web-based English learning course. Students reacted positively to the reading, writing and listening tasks (Statement 2) and believed that the online writing activities enhanced the development of their English skills (statement 6). They liked topic based activities (Statement 9). The online chats helped them improve their communication skills (Statements 5, 7 and 8). Socialising informally has a positive impact on learning (Statement 4). After a term-log trial period, the students expressed their willingness to use facebook for learning purposes in the future (Statement 10). (see Table1)

Learners' Perspectives of Web-based Instruction	
	Item statements Mean
1. I believe Facebook was useful to me	4.52
2. Online activities helped me improve my English skills.	4.47
3. I was at ease with using Facebook.	4.41
4. I find learning more effective when socialising informally.	4.34
5. I enjoyed chatting online with my peers.	4.02
6. I believe online writing activities have improved my writing skills.	4.16
7. I think chatting online has enhanced my communication skills.	3.25
8. Working with someone online was beneficial to me.	3.48
9. I found the topics to be interesting assignments.	4.30
10. I will continue to explore Internet technology beyond this course.	4.52

Table 1

Oral Interview Results

Learners' perspectives on using the web-based course

Analysis of the qualitative data from oral interviews revealed that the majority of students viewed the online-based learning as being a novel and beneficial communication tool for their language development. However, they made some suggestions for future improvements. The following excerpts highlight important issues that learners expressed regarding the use of "learning technologies" for FL learning.

Facebook and Collaborative Learning

The following findings indicate that students feel "connected" to people and the world's knowledge. In the classroom they can feel "disconnected" or isolated. The constant interaction among the learners was a source of motivation. Online learning promoted organization and group work in the classroom. The following quotes from the oral interviews reveal how students experienced the synchronous interaction with their peers:

- Online communication helped me stop being afraid to speak English in front of other people
- I felt quite competitive trying to impress my peers and tutor performing my best
- This method of learning has helped me realize that I am capable of organizing and carrying out group work

Feedback

The goal of online exchange through social interaction was to engage students in sharing, exchanging, and debating information relevant to their life experiences.

- The feedback the tutor gave us regarding the tasks was useful and a source of information
- The difficulties that I met allowed me to become familiar with my weak areas and try to improve them
- Perhaps, the time allotment can be amplified according to the difficulty of the task

Assessment

Although this study did not attempt to measure students' progress in L2 (Target Language) reading, writing and listening after reviewing the writing tasks that the students wrote throughout the term, the quality of their writing positively showed some improvement, especially in their use of lexical items and grammatical structures. Selecting a task that promoted meaningful use of the target language was essential. The goal was to build proficiency at the advanced level through listening to podcasts, watching videos, explaining situations and expressing opinions in different contexts. After a term of writing exchanges, the students felt that they received higher scores by their tutor.

- The assessments via interviews and interactions allowed me to evaluate how much I had learned
- I paid more attention to the corrections posted by my tutor and tried to score higher each time

Conclusion

This study examined the perspectives of Greek learners on ESL web-based instruction. .The use of Facebook as an instructional tool facilitated the development of students' language skills, reinforced their cognitive skills, and supported an active learning environment. Students benefited from online reading and writing exchanges that were tailored to their needs. The writing activities were integrated into online discussions which led to collaborative exchanges among their peers. The findings show that students were content with and motivated by the well structured online tasks and that they expanded the use of the target language to enlarge their knowledge beyond the classroom setting. Web tools, such as "You tube" videos, podcasts, texts and assignments, made learning more efficient. Most important, this study also reveals that online-based learning prompted the learners to be actively involved in the process and to be responsible for their own learning. Furthermore, the study demonstrates that CMC facilitated the interaction between the students and the instructor as the latter systematically guided, assessed and provided constructive feedback to the students. Such perceptions were also reported in other studies (Chapelle, Compton, Kon, & Sauro, 2003; Lee, 2002a)

Although a one-term research is limited in scope and depth, the project succeeded in making many students realize their potential when using a Web-based course. This research can be taken into consideration in future research concerning web-based learning environments. Aspects that should be examined are the role of the teacher, evaluation of the Computer Mediated Synchronous Interaction related to educational goals and expectations.

These results confirm the increasing motivation of students and changes in attitude toward the use of technology which have repeatedly been addressed in previous studies on online-based learning (e.g., Gonzales-Bueno & Perez, 2000).

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APPENDIX A

Task-Based Activities
SAMPLE LESSON PLAN
1. The Article (Healthy Diet) URL:http//:wwwwikipedia.org/wiki/nutrition
2. Warm –Ups
Walk around the class and talk to other students about health and nutrition. Change partners often. After you finish, sit with your original partner(s) and share what you found out.
3. Chat
-In pairs / groups, decide which of these topics or words from the article are most interesting and which are most boring.
Nutrients/obesity /heart disease / public health /dietary recommendations / cultural and psychological factors / food additives /fast food /fast diets
Have a chat about the topics you liked. Change topics and partners frequently.
-Web opinions: Which of these opinions do you agree and disagree with? Discuss with your partner(s).
-Quick Debate: Students A think eating genetically modified products is bad for your health. Students B think the opposite. Debate this with your partners. Change partners often.
4. Before Reading/Listening
-Look at the article's headline and guess whether these sentences are true (T) or false (F):
5. While Reading/Listening
URL: http/www.you tube (How to Have a Healthy Diet with a Busy Schedule : How to Develop a Healthy Eating Plan)
-Gap Fill: Put the words into the gaps in the text.
-Listen and fill in the spaces
6. After Reading/Listening
- Word Search: Look in your computer to find collocates, other meanings, information, synonyms … for the words "genetically modified food"
-Look back at the article and find some questions you would like to ask the class about
7. Student Healthy food Survey:
- Write five good questions about Healthy Food. Do this with your partners. When you have finished interview other students. Write down their answers.
8. Writing: write about healthy nutrition for 10 minutes. Correct your partner's answer.

APPENDIX B

Sample End Of Term Oral Interview Questions
1. Briefly explain your experience in using Web-based instruction for this course.
2. Describe your experience doing the online activities. What activities did you like the most and the least and why? Do you think your English skills have improved through the online activities and online discussions?
3. What was the most appealing aspect of using Facebook and why?
4. Describe the least important part of the Facebook course and why.
5. Overall, tell me how the experience of this course changed your perspectives on the Web-based instruction?

CONTRIBUTION TO THE IMPROVEMENT OF LEARNING ALGORITHMIC

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Abstract: Enormous difficulties are encountered in learning/teaching algorithmics respectively by students and teachers. In spite of the important role that play the new technologies of communication in the human learning; its use for solving such problem is still at an elementary stage. Our purpose is to enhance learning algorithmics by using new supports and methods. In this paper, we will try to discuss the results collected in a case study, which we undertook within Badji-Mokhtar University, according to the students' results. Jointly to this study, a research in the state of the art leads us to specify the computer based human-learning environment required. Finally, we will show our proposition concerning the pedagogical contents and its exploitation in such system.
Key words: learning algorithmic, pedagogical contents, ontology.

INTRODUCTION

Actually, algorithmics increases the acquisition of: methods of work and thinking, the development of analysis, abstraction, anticipation and logic ability [10].Algorithmics and programming are generally confused. We share the opinion of Duchateau, who prefers to be limited to the programming term, that he defines [2] as expressing a "make doing" in which the constraints connected to the capacities of " the performer " are essential and omnipresent. The stage of coding is not concerned in this work.
Algorithmic unit is so important, in the study of computer science that students find big difficulties in grasping its concepts. Those are initially inherent to the subject matter, they are then due to the manner with which some teachers and students apprehend the bases of this matter. Accordingly, algorithmic unit constitutes a bottleneck in such learning. A case study shows how huge these problems are.

CASE STUDY

The computer science second-year students DML (LICENCE-MASTER-DOCTORAT), from Badji-Mokhtar University of Annaba are the target population. Our study was based on the results obtained during two academic years: in 2006/2007 only the new students were considered, while in 2007/2008 only those repeating algorithmic unit were taken into account. A qualified and considered staff of teachers supervised the learning process. All of them contributed to homogenize the students' evaluation.
For this category of students, algorithmic is organized in the form of two units: algorithmic1 and algorithmic2. Considered as the most difficult to be assimilated, algorithmic1 is the unit targeted by this analysis. It is held in the first half year and covers basic notions of: the subroutines, complex data structures, recursion, pointer, tree structures, etc.
In this study, we followed the evolution of students' level via their results in algorithmic1. Then, we validated the means obtained in algorithmic1 by comparing them with those obtained in the other units learned at the same time. Finally we showed the influence of the failure in algorithmic1 on the results of algorithmic2 and their strong correlation. This study ended with a collection of notes made by the teachers.

A. Evolution of algorithmic1 students' results:

TABLE I: represent 2006/2007 results', where considering 246 new students on a total of 326 (That is 75.46 %). TABLE II: represent 2007/2008 results', where considering 143 repeating year students on a total of 427 (that is 33.48 %).

TABLE I. STUDENTS' RESULTS IN 2006/2007

Means	**Exams**		
	June	***September***	***Difference***
<5	84.55%	75.61%	-8.94%
>=5 et <10	13.41%	21.14%	+7.73%
>=10	2.04%	3.25%	+1.21%

TABLE II. STUDENTS' RESULTS IN 2007/2008

Means	**Exams**		
	June	***September***	***Difference***
<5	85.31%	74.13%	-11.18%
>=5 et <10	12.59%	23.77%	+11.18%
>=10	2.1%	2.1%	00%

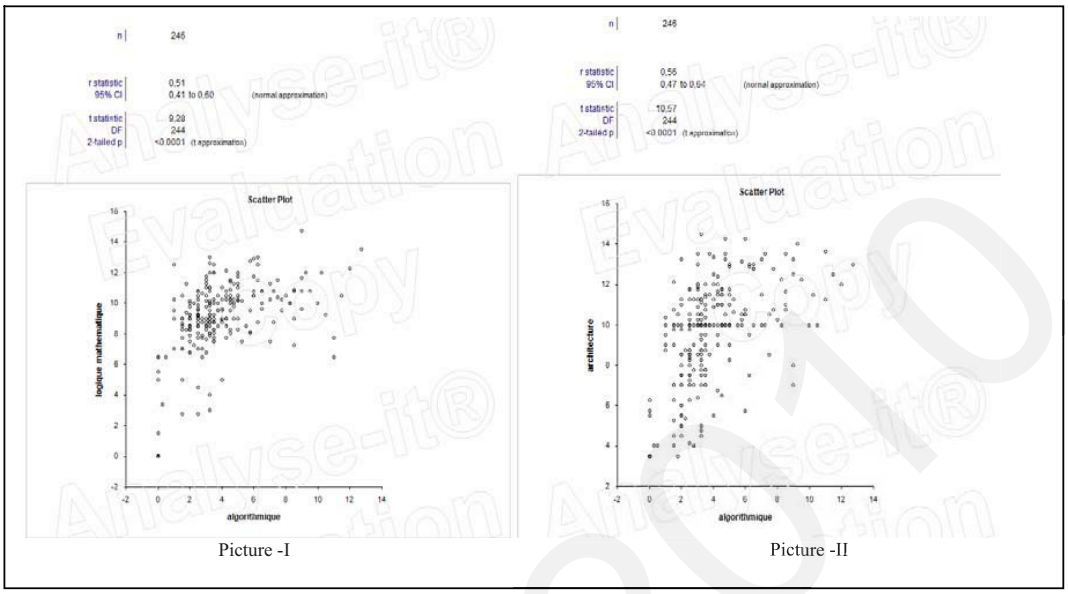
- The rate of failure is 75.61 % (5 is an average considered as critical for the unit acquisition).which is catastrophic, and joins the limits advanced by [7], on the rate of defeat or relinquishment in introductory courses of programming in first university cycle which varies from 25 to 80 % throughout the world.
- A wide range of students does not take enough advantage in the remedial exam nor from the repeated year. Their improvement rate decreases from one year to another (although being repetitive, only 2.1 % obtained the course, 8.94 % improved their marks in September 2007; representing 22 students against 16 students in September 2008). The loss of self-confidence is established and a wall builds itself between discipline and student, as the time of learning extends (fear to repeat the year for the third time!).
- Although animated by teachers, taking into account the learning time and the great number of students to be managed, the repetition does not provide great yield. Rhythm and content of repetition discourage students to continuing their learning. The results show that, the factor time plays a great part in the motivation of the students.

B. Comparison between the algorithmic 1 result's and the units learned at the same time,only for the new students of 2006/2007:

- We notice, in table III, that algorithmic1 holds the lowest rate of success among the other units.
- The results of the students obtained in algorithmic1 follow certain logic, because they mostly correlate to their results in: logic mathematic and architecture of computers, with respective 0.51 and 0.56 coefficients(as showed in picture1 and 2).

TABLE III. TRESULLTS OF DIFFERENT UNITS

Means	Units						
	Probability & statistics	***Information system***	***Logic mathematic***	***numéric analysis***	***Architecture of computer***	***Cognition***	***Algorithmic1***
<5	5.69%	6.10%	6.91%	8.94%	9.35%	12.60%	***75.61%***
>5 and <=10	18.29%	20.33%	55.28%	27.64%	33.33%	31.71%	***21.14%***
>10	76.02%	73.57%	37.81%	63.42%	57.32%	55.69%	***3.25%***



Picture -I Picture -II

C. Comparison between the algorithmic1 and algorithmic2 results for the new students in 2006/2007:

- In the second half-year, algorithmic2 contains a lighter program concerning notions (sequential file, unit…) based on the prerequisites learned in algorithmic1. An improvement in the average means is detected. The algorithmic1 average is 3.53 in front of 3.84 for algorithmic2.
- This improvement is far from being satisfactory. Because of two factors can explain partially these results: the short duration of the second half-year (the exams take the top over the time of training).The student has no time to reinstate the rhythm of the studies (after the holidays) and the effect of the discouraging results of algorithmic1 (the logic of the failure absorbs the student).

D. Analysis raised with teachers' staff who took part in the process of learning algorithmic:

- The process of evaluation is difficult. The evaluation aims firstly at raising awareness its level and its difficulties (inhibited during the learning time) then the certification of its skills. But it hardly does fill its prospects and becomes in itself a burden for the teacher and a stress for the student. The algorithmic accepts several solutions for the same problem, which constitutes challenges, both for teacher and any other solution which will come to support or replace its efforts.
- The comparison of the results of evaluation between algorithmic1 and algorthmic2 confirms the level and the acquisition difficulty of the basic concepts approached in first half- year.
- Although they know the strategy of solving problem, some students meet difficulties in writing the solutions in the form of algorithms.
- The students have not the adequate means to practise algorithmics reasoning. The multitude of tools (available on internet) is not of a big contribution for the student.
- The nature of the pedagogical contract between teacher and student reduces the importance of the matter to a mark given at the end of a half-year.
- The student became stereotyped: to remake and learn without reflection, such are the elements of preparation for the exams.
- The multitude of tools (available on Internet) deviates the student's attention of its main aim, which is learning.
- The students repeating year with the new ones, can have unverifiable effects on their result. This is due to the way in which the not controlled concepts (but already known) are approached.

These detected difficulties join those cited in[9] and illustrate how huge is the problem.

Our objective is to bring a solution improving algorithmic learning. To scaffold the learning process with the use of new technologies of communication, a computer based human-learning environment of learning algorithmic is our first suggestion. It must mainly bring:

- Algorithmic learning and flexible evaluation of learners' productions.
- Attraction (graphs and animations).
- Reinforcement of self-confidence.
- Diversification of the learning (at multi-levels and multipoint of views).
- Demythologization of the subject matter.

SPECIFICATION:

We summarize some principles and difficulties concerning algorithmic learning and environment, as follow:

Generally ([3],[5], [6],[10]*):*

- Not to cut student of his resources: the student has prerequisites, which must be used as a basis for acquisition of new concepts. If the environment of learning in which the student is placed is too artificial, this one is cut off its resources and cannot make use of it.
- Allowing student to explore the requested task relaying on him: At the very first time, it is capital that the student makes his discoveries by his own.

- Giving the student the right of making errors as well as correcting them and facilitate its comprehension: it is fundamental that the student knows that he can make a mistake, check by himself and then correct his error.
- A correct gradation of difficulties is needed.

Specifically:

- Four barriers are cited in [8], related to the defeat of novices while writing a program, even when they already know an intuitive solution: First, the problems of breaking up the gestalt of holistic concept, then the fixation on no-implementable intuitions, after that, missing connections between intuitive models and programming principles and finally misconceptions. A learning environment for practising the use of intuitions during programming can overcome these barriers.
- A visualization of algorithms in form of program-tool or of an activity play performed by the students themselves is recommended by[4],to be helpful for developing algorithmic thinking.

PROPOSITION

When algorithmic is problem solving nature, it will be appropriate to orient the learning process in that way. So, it's more adequate to give the learner more autonomy and consequently more responsibility in managing his learning. Thus, he will be more conscious about his unexploited competencies. To orient the design of the learning object by and for the learner seems to us the appropriate way to weaken some emerged problems after our study and found in this field.

Accordingly, the architecture of our environment, as shown in figure 2, includes the following principal actors:

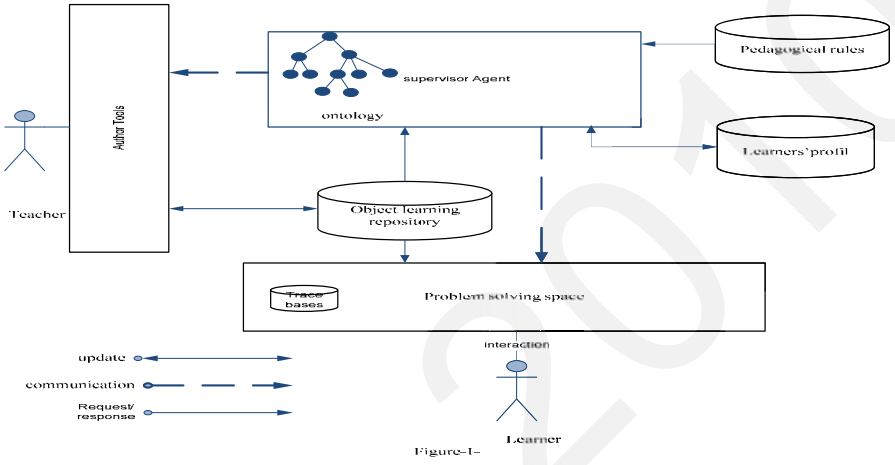


Figure-1-

The learner: The learner, who is an active actor, is at once a learner and source of learning for our system. He can:

- Initialize his profile.
- Negotiate the next learning concept with the system.
- Formulate the requests of necessary resources (reminder, example, definition…).
- Present a solution to a given problem
- Ask the evaluation of its solution

The teacher can:

- Initialize his profile
- Conceive learning objects and problems
- Handle the unsatisfied and redirected requests

The supervisor agent:

- Select a problem for a learner according to his profile, the learning concept and educational rules.
- Updates the learning profile.

Learning content:

The organization and the exploitation of learning contents is the first stone on which our system is to be building up. The educational content is an important element, necessary for the design of our system, for which the learning targets a perfect mastery of algorithmics and programming. The aimed learning is deep and complex, going from simple data structures to the complex one, iterative treatment to recursive treatment, … It exceeds by far the educational contents in the environments up to now conceived[1,11,12].

We split up the educational contents to:

- Ontology of concepts to be learned: to each concept, learning objects are linked. The relations between concepts have to be source of learning,

-The learning objects: the same resource can exist under various versions characterized by internal metadata (the first filter), distinguishable from external metadata (the second filter) which we compose from some metadata given by the LOM and by metadata specific to the domain. The selection of the candidate resources will be on the basis of these metadata.

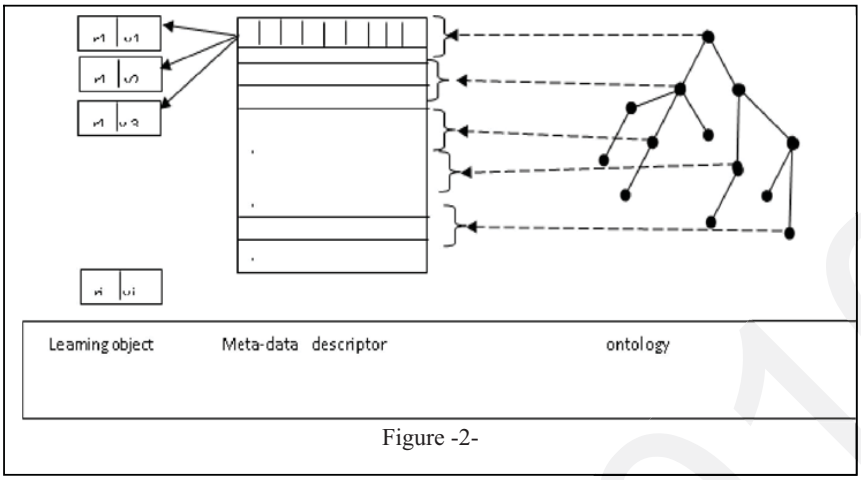


Figure -2-

CONCLUSION

This important project is ambition to improve the algorithmic learning in university of Badji-Mokhtar by proposing another approach. Based on the learning by resolution of problems, the environment which we propose has for vocation to combat the stereotypy of the students, to make the learners participate in the conception of the educational resources. This will give more responsibility to the learner. This will permit him to get rid of his passivity, the logic of failure… in which he may be drowned in. Finally, this environment brings the learner to become aware of his/her knowledge insufficiencies to understand, practise algorithmics reasoning and resolve a problem.

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CONVERT BLOGGING TO GLOGGING

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Abstract: Multimedia technologies have become indispensable for language learning in the current conditions of the teaching environment. For this reason, the aim of this research is to prepare a "Glog" to serve for the development of two receptive skills; listening and reading; particularly, among high school students. As multimedia tools, "Adobe Flash CS4" was used to create pictures, "Photo Story" was used for the episodes of storytelling process, "Glogster" was used to upload all of the educational materials and create a "glog". A "glog" is different from the blog with its property to implement more lively pages with the help of its design. So, this model is expected to meet the needs of the high school students.
Key words: Glogs, ICT in ELT, multimedia technologies in ELT, blogs

INTRODUCTION

Literature Review

ELT (English Language Teaching) has changed a lot thanks to the technology in recent years. Current English teachers tend to make use of technology in their classroom environments to meet the need in their own context, for there is an increase in the number of the English language learners in the world (Graddol, 2000).
Throughout the history of ELT methodology, there has been some integration of audio-visual tools into language teaching; particularly, with Communicative Approach, which relies on technology to a certain extent. However, ICT contributes to this methodology a different dimension: learner autonomy which can be facilitated in language learning through its tools. Little (1991) states that learner autonomy allows learners to determine their aims and work accordingly. To facilitate this, an online support would of great help for the learner who will not hesitate to consult whenever needed. In this way, as Nanjappa&Grant (2003) suggests, "a complementary relationship exists between technology and constructivism, the implementation of each one benefiting the other" (p. 1). Hence, it can be said that if technology can be integrated into language teaching, a constructivist environment which is crucial for language learning will be created.
Earlier use of technology in ELT involved video films, listening cassettes, slides that served as pioneers of the supplementary language tools while the current tools offer more varied means for self learning through the software programs designed for language teaching. As Cowie& Jones (2009) suggests ICT tools include nothing in terms of pedagogy. It is clear that one disadvantage these tools pose is that they may not serve for the right purpose unless designed in line with a curriculum; thus, for the right level.
Lund (2006) states that EFL (English as a Foreign Language) activities through multiple contexts can be provided via digital networks, and these online contexts are not separated from offline contexts. This suggestion is consistent with what Becker (2000); Capper& Freeman (1999); Schneiderman (1997) state: no matter what you do in the class to achieve the greatest success, Internet and Web will have a positive effect on your classroom teaching. However, Sutherland et. al. (2004) suggests that a balance should be struck while integrating ICT tools into school subjects so as to have fruitful results. Hence, the priority should be given to the careful integration of ICT tools. Also, Felix (1998) suggests that almost half of the students pointed that web materials were more effective when they were used as a support to classroom teaching process when asked. In addition, the students stated that they didn't like distance learning web sites that didn't have access to tutors. Hence, it would be proper to say that the ICT environments should be used as supplementary materials for classroom teaching with the guidance of a tutor.
An environment filled with authentic tasks gives chance to improve learner autonomy in two aspects of language competencies that Bachman (1990) defines: organizational and pragmatic competencies. Considering the studies about the effects of socio linguistic competence, it can be said that using technology also gives one the chance to develop this competence more than the textbooks do (Crook, 1996; Herring, 1996; Kenning& Kenning, 1990; Murray, 1995; Noblitt, 1995). Also, the emerging multimedia technologies have converted language from the list of grammatical and lexical rule based tool to an acoustic and visual tool presented within the social contexts (Kramsch& Andersen, 1999). As a result, these two competencies are likely to develop in a class supported with ICT tools.
Taking the increasing use of computer into consideration, teachers need to address to the changing learner profile in their classrooms. So, the aim of this study is to prepare a supplementary material for the present high school curriculum with an online tutor as an extra curricular help in line with the framework of socioconstructivist view.

The Aim of the Model

The aim of the model is to integrate technology into language teaching in a constructivist way. A "Glog" is designed to serve for the development of the two receptive skills; listening and reading; particularly, among high school students. Listening is accepted as the cornerstone skill by many theories of second language acquisition as it is a source of input (Krashen, 1985; Long, 1985). On the other hand, the other skill "reading" is such a skill that once you develop it, other language skills will develop for sure (Anderson, 2003). Unlike the traditional reading texts, the electronic text to be used in our study proves to introduce new supports and challenges which will affect individual's ability of reading (Coiro, 2003). The texts to be used at our research has been provided according to "Dual Coding Theory" (Paivio, 1991), which suggests that students should use the information provided in two or more formats like visually presented animation and verbally presented narration to construct knowledge (Mayer& Sims, 1994) in the multimedia learning applications . To facilitate this environment, "Adobe Flash CS4" was used to create pictures. Moreover, "Photo Story" was used to implement the episodes of the storytelling process, and "Glogster", to upload all the materials and create a "Glog". In a similar study, Sadik (2008) states that students created stories with "Photo Story", and they reported that they had enjoyed it. To sum up, the research in the field shows that ICT integration into language teaching contributes to better results in the learner achievement.

What is Glog?

A glog is a Web 2.0 tool that is created via *"www.glogster.com"*. Glogs allow students to create multimedia posters. Using this tool, students can have access to a wide variety of fields supported with creative items so as to reflect their personalities with the help of graphic designs.

As a more specific feature of glog, "EduGlogster" has been used in our study. This tool is of great use for high school students who like visual, audio and social activities within the context of real life. The environment facilitates self expression for the introverted students by writing on colorful EduGlogster, where they can poster themselves. Moreover, it gives chance to the students to record their voice and broadcast it so that it can be checked for accuracy by the tutor.

DISCUSSION

What is the superiority of glogs over blogs?

Glogs are superior to blogs in that the features of the flash content which enable the user to upload all types of files like .ppt, .doc and record their voice with an online tool. In this model, Glog is used as a web tool to implement the storytelling process. Videos have been created via ICT tools (Adobe Flash CS4& PhotoStory) and scenarios have been designed; thus, a glog has been created. The main aim of this Glog is to serve for the two receptive skills; listening and reading, and also check the level of the other skills; speaking and writing. The students will create their own glogs and sign in the Class Glog. Then, they will listen to and read the stories on the Class Glog, and will record their own summaries about the stories every week to check their speaking achievement. Also, they will take their homework via.ppt, .doc files loaded on the Class Glog.

Figure 1. Screenshot from the video that has been uploaded onto Glog page

The video of the story with the grammar function "Shall we…?" prepared via PhotoStory has been loaded onto the glog. The interactive function of the structure keeps recurring in the other episodes on the basis of the spiral syllabus.

Why did we integrate storytelling into glogs?

The reason is that both glogs and stories are keys to socialize. Storytelling, in its traditional form, proved to be effective in a lot of studies (Kamen, et.al. , 2004; Phillips, 2000; Roney, 1989). Storytelling is thought to foster listening and writing skills (Davis, 1982; Reed, 1987), and grammar in the story is also helpful for reading and writing skills (Cherry- Cruz, 2001). Even in the pre historic times, people used to express themselves with stories to socialize. Nowadays, storytelling websites are common and open to sharing thanks to technology. Tsou et. al. (2006) says that students can apply graphics, websites, and animations in line with their own wish. So, the web tool in this model is expected to fit well with storytelling process and will help to foster the language skills of the high school students.

CONCLUSION

As a result, glog is an effective tool with its features which allows for the mobility of the teacher without the time and place constraints as well as the language learner who can use this tool for extra curricular purposes. Such a learning environment can be used for the improvement of four language skills. While improving the students' skills, this model can also be used for the development of learner autonomy and make a significant change in the attitudes of high school students towards the English lesson. A study by Ateş et. al. (2006) in a similar vein states that students' attitudes to the English lesson has increased considerably after the CALL(Computer Assisted Language Learning) application. Hence, this model is expected to work well with high school students.

This research tool can be used with the other ICT tools in addition to the Photo Story and Adobe Flash Player CS4. Moreover, glogs can be used as an addition to the Moodle environment. In this way, this model can be applied in many high schools in Turkey, and its effects on language teaching can be tested.

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CREATING INTERACTIVE WEB-BASED ENVIRONMENTS TO SCAFFOLD CREATIVE REASONING AND MEANINGFUL LEARNING: FROM PHYSICS TO PRODUCTS

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ABSTRACT

With the evolution of the surrounding world market, engineers have to propose innovations in products and processes. Industrial innovation frequently results from an improved understanding of basic physics. In this paper, an approach to accelerate inventive preliminary design is presented. This method combines the main advantages of CBR (Case Based Reasoning) and TRIZ (Russian acronym for Theory of Solving Inventive Problem) to transfer physics to industrial technology. Based on this synergy, interactive web-based environments are developed. These systems are intended not only to enhance students to become familiar with basic physics, but also to support students in building meaningful links between basic physics and industrial technologies.

The evaluation was conducted in a "Special Project Design" course requiring students to design a robot that could carry out several functions. Robotics, an interdisciplinary engineering subject, has been a recurring theme in engineering education. Project-based learning provides opportunities for interdisciplinary learning. With project-based learning approaches, planning activities and investigations play a critical role in the project process. Through the web-based environments, students can explore the essence of basic physics, design technologies, and the integration of mechatronics. Further, web-based reasoning and meaningful learning modules are developed to scaffold creative design and to enhance student participation, motivation, and learning effectiveness. Quantitative and qualitative methods such as questionnaires and interviews were used to evaluate the effects of the developed system. Findings showed that inquiry modules were able to facilitate investigation and planning activities in product design stages. The responses obtained were very encouraging. Students in the course were appreciative of these on-going changes and indicated that these were indeed helping them to develop their engineering thinking and design skills, increasing their motivation to study.

Key words: Case-based reasoning, Theory of solving inventive problem, Interactive web-based environment, Creative reasoning, Meaningful learning, Project-based learning, Basic Physics, Robotics

INTRODUCTION

In every engineering field, engineers provide solutions, knowledge, and development, to improve and develop products. Consequently, all these trends and demands increase the need for innovation and anticipation of future trends in products and processes. In response, educators have developed a variety of pedagogical tools and curriculums to increase engineering student ability and competence. Robotics, being an interdisciplinary engineering subject, plays a key role in achieving this goal. Robotic design involves the application of a wide range of physics concepts. For example, to understand mechanism technology, students should have knowledge of mechanics. One of the more difficult aspects of teaching physics is helping students develop an appreciation for physics applications.

In the field of physics education, many studies developed a variety of methods to improve students' physics achievements. The consequences of the studies range from increased awareness and appreciation of good teaching and learning principles and practices, to strategic programs for increasing student interest and participation in physics (Tobias and Birrer, 1999; McDermott, 2001; Coletta et al., 2008). Many research projects have concentrated on the factors effecting students' achievements in science and physics. Reasoning ability has been established as one of the important factors in science and physics achievement (Lawson et al., 2000). In recent years, studies in physics education have concentrated on students' conceptual understandings yielding important results in physics education. One of these results is that traditional teaching does not help or improve meaningful understanding in introductory mechanics. Employing instructional strategies involving inquiry methods have proven promising in helping students construct meaningful understanding (Lawson, 2007; Lawson, 1985; Lawson, 1992; Cavallo, 1996; Enveart, et al., 1980; Cohen, et al., 1978; Clement, 1993; Kahle and Damnjanovic, 1994; Thijs, and Bosch, 1998; Marshall and Dorward, 2000; Ates and Cataloglu, 2007). The inquiry-based learning (IBL) approach engages students in exploring meaningful questions through a process of investigation and collaboration (Thomas, 2003). In the IBL environment, students build their own knowledge

through active learning, interacting with the environment as suggested by the constructivist approach, and working independently or collaborating in teams, while the teacher directs and guides and them in making a real product (Meng and Yang, 2003).

Robotic educational endeavors are widespread and diverse. These efforts represent significant advances in robotics education. However, there appears to be great demand for further study on enhancing teaching and learning effectiveness. The emergence of the Internet has reformed the concept and methods of engineering education. In this paper, we present interactive e-learning environments that increase students' creative abilities and participation levels in project-based robotic exercises. Online learning, utilizing Web features, is increasingly important for education. This approach overcomes the time and space limitations of traditional schools. In general, online learning environments have shown potential in promoting thinking skills (Saba, 2000). Furthermore, Dockrill (2003) found students through interactive teaching and learning facilitates acquisition of critical thinking skills. Despite the many benefits of e-learning, There is a risk of low motivation due to lack of face-to-face communication. In order to make the learning process effective, we need to motivate students in learning activities. Therefore, this study adopted a project-based learning model that is based on the constructivist approach, to provide motivation, self-learning, and collaborative learning for students through the Web environment. The project-based learning (PBL) approach engages students in exploring meaningful questions through a process of investigation and collaboration (Krajcik, et al., 1999). In the PBL environment, students build their own knowledge through active learning, interacting with the environment as suggested by the constructivist approach, and working independently or collaborating in teams, while the teacher directs and guides and them in making a real product (Thomas, 2003).

The internet has evolved into a universal information source. Users utilize popular web search engines such as Google Search and Yahoo! to seek information efficiently. Unfortunately, users often spend a lot of time and energy to successfully locate the needed information. This especially happens to users with limited web search experience and difficulties in efficiently defining the knowledge domain of the needed information. Panagis and Sakkopoulos (2006) present a mechanism that re-ranks and groups search results on the user's side according to his/her explicit and implicit choices. Furthermore, a caching strategy is introduced to minimize personalization effect response time. Increasing technological advances offer new paradigms for training, allowing novel forms of teaching and learning. The Semantic Web is an extension of the current Web where information is given well-defined meaning, better enabling computers and people to work in cooperation (Berners-Lee, et al., 2001). In such an approach, data on the Web is defined and linked in a way that it can be used for more effective discovery, automation, integration, and reuse across various applications. Thus, the development of an innovative e-learning system under a semantic environment is required to support a richer set of educational functions and increase their effectiveness (Aroyo, 2004; Vargas-Vera and Lytras, 2008; Lytras, and Garcia, 2008). E-learning solutions provide firms with helpful instruments for supporting an effective learning process. Most e-learning systems are still based on complex procedures and difficult interfaces, which can result in a frustrating learning experience. To reduce such risk it would be helpful to go beyond the standard interface, towards a more natural way of providing machine input. Porta (2007) studied the possibility of exploiting vision and speech as intuitive communication channels to enhance the quality of interaction between users and e-learning platforms.

APPROACH FOR CREATIVE DESIGN

There is a strong need for methodologies and tools to propose rapid and inventive solutions to any complex problem. In this study, we propose a methodology to help students accelerate complex design and propose creative ideas. Generally, when we face a new problem, we use our early experiences and try to adapt them in order to produce a solution. This analogical reasoning is the most often used process during problem resolution. In artificial intelligence (AI), case-based reasoning (CBR) is one approach to manage knowledge. The main idea in CBR is that: similar problems have similar solutions. The CBR process uses and adapts earlier successful resolutions and solutions in order to solve new problems. This method is useful for repetitive design. For inventive design, its usefulness is more limited. In inventive design, problems are totally new and require solutions that are very distant from those already known. For this reason, CBR is coupled with the TRIZ theory (Russian acronym for Theory of Solving Inventive Problem). TRIZ is a problem solving method that increases the ability to solve creative problems. TRIZ is based on the analysis of knowledge used in technical domains. TRIZ has numerous advantages but some drawbacks. Each time one faces a new problem, to the process of resolution must be redeployed, which is time consuming. The proposed synergy eliminates this drawback by coupling TRIZ with CBR. CBR brings a way to model knowledge and accelerate the resolution. TRIZ offers the ability to eliminate barriers between technical domains and propose inventive solutions.

The model is presented in Figure 1. The central notion of the proposed model is a case. The initial step is to collect data that describes the handling problem and to fill the target problem features with specific values. After filling of the target problem features, the next step is to retrieve the case or a subset of cases, stored in the case base, that are relevant to solving the target problem. We need to adjust some features of the retrieved solution in order to answer the target problem; reused step. Next, the adapted solution is implemented, tested and repaired if necessary; the revised step. If the case base does not have any similar solved case or sufficiently similar case, the system offers inventive principles associated with general physics. One advantage of this model is its ability to learn with the incorporation of new cases in the case base; retain step. Failure like success can be stored in memory, because we also learn from failures. With this step, the system evolves, enlarging its coverage of problems and increasing its performance by extending the case base.

This system allows rapid resolution of problems through the use of past experiences in the domain of application but also in other domains through TRIZ. The transdisciplinarity between domains allows access to the best solutions, methods, and practices in all technical domains, leading to more inventive solutions. With this system, the students are not restricted to a domain, but are more open-minded.

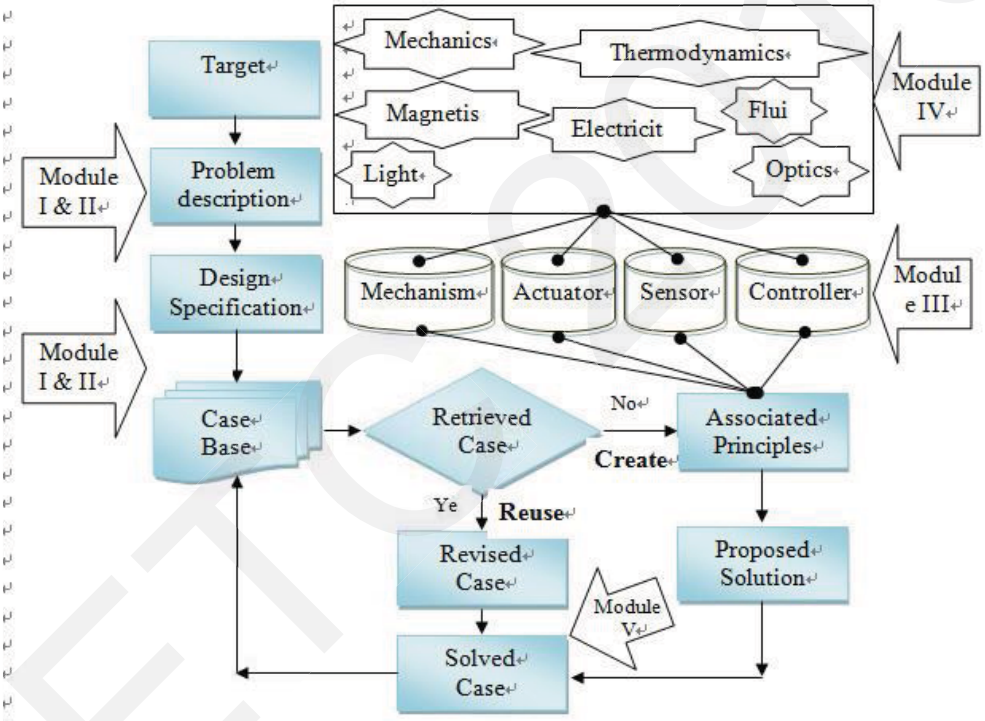

Figure 1. Elaborated framework for creative design

IMPLEMENTATION AND DISCUSSION

The goal of this section is to demonstrate how the approach works and to present its functionalities in the project-based learning of robotics. With project-based learning approaches, planning activities and investigations play a critical role. Students plan their work and create a synthesis of information retrieved from numerous resources. However, Meng and Yang (2003) pointed out that most existing search (Question and Answering) systems suffer from precision problems. Since the amount of available information is large, users waste considerable time in searching and browsing various websites to obtain the required information. Users must click and browse documents returned by keyword search to identify their desired information. When numerous documents are returned, users waste time dealing with many unsuitable documents. Studies of learner using the Web have indicated that students frequently fail to establish task-relevant, meaningful, reflective activity (Hill and Hannafin, 1997). The root problem is that keyword searches are not an ideal method for users to present their real intentions. To solve this problem, this research developed two searching methods that process problem statements in natural Chinese language and engineering drawings to uncover the intention of the user query.

This system is able to allow users to perform more activities online. The application tier side consists of a web server and a Java application server. A presentation tier consists of a client-side terminal that comprises the HTML, XML, and 3D web player plug-in. The client, which runs in a web browser, provides a student interface that handles input and output (displaying results and simulations). The web server performs actions and computations based on student input by using XML and JSP languages. The application server reads and writes to a databases through a JavaBean. The content of the course is primarily presented with Web pages that are written in HTML. In order to move courses from one system to another, and extract and/or perform automated processing on documents, standardized definitions for course structures are necessary. To meet these requirements, Extensible Markup Language (XML) is used to develop course structures. In order obtain cross-platform application, the JAVA language is used in programming of the interactive Web pages. The framework of the environment is shown in Figure 2.

The first inquiry method for describing the handling problem is developed based on the concepts of semantic web theory. Semantic approaches have become increasingly important in advanced knowledge technologies. This approach provides a knowledge infrastructure to support the management and application of scientific and engineering knowledge. The semantic approach makes Web-applications syntactic and semantic. The Semantic Web is an extension of the current Web in which information is given well-defined meaning, better enabling computers and people to work in cooperation (Berners-Lee, et. Al., 2001). It is the idea of having data on the Web defined and linked in a way that it can be used for more effective discovery, automation, integration, and reuse across various applications. The knowledge infrastructure of robotics is depicted in Figure 3. The developed semantic inquiry module (Module I) interprets a student's question (i.e., document source) to extract the semantic information (Figure 4). The system then contrasts the source documents with the existing engineering database through heuristic rules to retrieve useful and precise results that meet user expectations.

Besides the semantic inquiry module, this research developed another inquiry module (Module II), allowing students to describe their handling problem through engineering graphics. After uploading engineering drawings (2D or 3D), this module interprets the input data and extracts the engineering information from the case base to analyze designing methods (Figure 5).

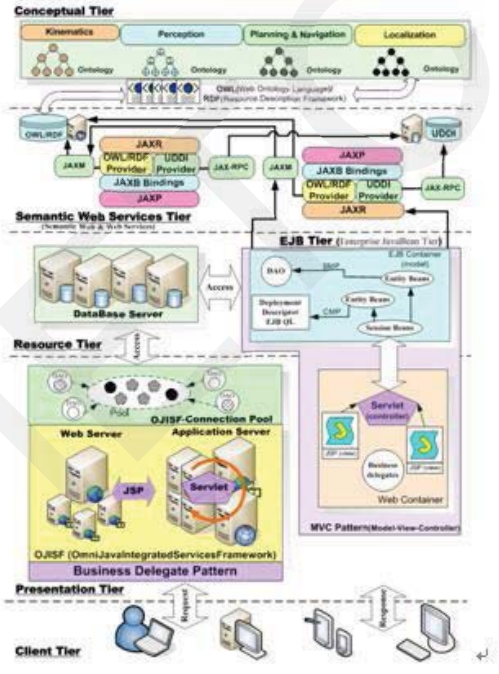

Figure 2. Framework of web-based environments

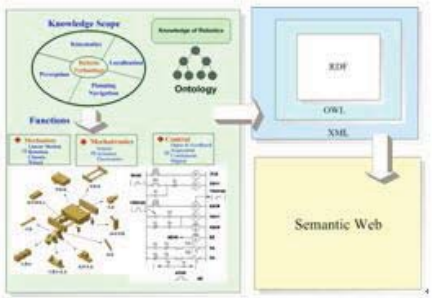

Figure 3. Knowledge infrastructure of robotics

Figure 4. Screenshot of semantic inquiry interface (in Chinese), (Module I)

Figure 5. Screenshot of graphic inquiry interface

Figure 6 and Figure 7 show the developed modules (Module III) for students to investigate robotic manipulation including mechanisms, robot motion, and path planning. Students explored the website in advance and proposed what they wished to investigate through the developed inquiry modules by using natural Chinese language or graphs. The system responded to the questions with accurate answers in the form of contextual information. Students clicked desired items and browsed detailed documents that contained text, graphics, multimedia, and interactive simulations. Furthermore, students were able to observe robot arm link inertias of motions and study trajectory generation and control.

Another function of this system is facilitating collective learning based on information obtained from associated principles of basic physics (Figure 8, Module IV). The design and development of this system allows for collection of data concerning students' design activities. This data is then analyzed by the system to promote designing activities. The system was developed to incorporate all the modules necessary to encourage creative designs. Furthermore, this system integrates asynchronous communication tools (discussion forums), a synchronous meeting tool that allows textual discussion and application sharing, and a tool for writing reports during the project.

Finally, this study provides a platform (Module V) for students to assemble mechanical parts and integrate mechatronics (i.e. sensors, actuators, and control units) in designing robots. The assembly platform can allow students to design and modify mechanical components of robots to meet the project's expected goal. The platform of mechatronics was designed to help students in learning robotic sensors, actuators, and controllers. With this platform, students can design and construct functioning models, gaining experience and insight in designing robotic mechantronics. For robotic sensors, the learning content covers proprioceptive sensors, exteroceptive sensors, sensor performance, and design criteria. For actuators, the system contains a number of motors for study. Through this platform, students confront, and learn to deal with, the realities of robotic control. Figure 9 shows the entire structure of a two-armed mobile robot designed by one of the groups in this course.

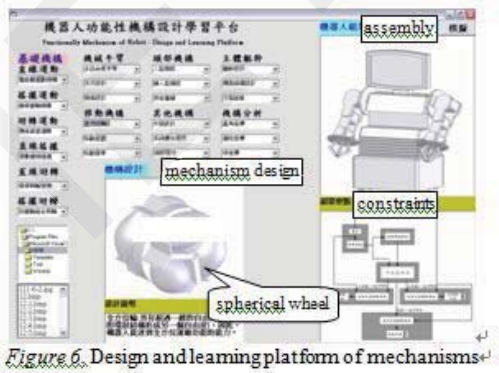

Figure 6. Design and learning platform of mechanisms

Figure 7. Design and learning platform of mechantronics

ASSESSMENT

The participants in this study were 30 sophomore students in a special project design course during the spring semester. The aim was to design a mobile robot that could perform a specific task. The participants were required to complete the course online without face-to-face instruction, working on their designs in small groups of 4-5 participants. They were encouraged to retrieve relevant information from the developed e-learning system. Following completion of the course, each group was required to submit a final technical report detailing the design process, the engineering considerations that led to the final design, a review of the relevant engineering literature, and the group's conclusions.

Figure 8. Learning of basic physics and technologies for creative design

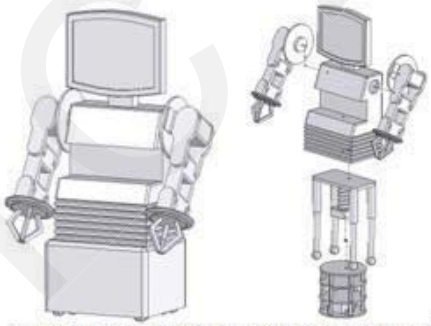

Figure 9. Assembly model of designed robot and its mechanisms

This study employed a pre-experimental approach without the utilization of control groups (Creswell, 1994). Quantitative data were collected using questionnaires, while qualitative data were collected through interviews. According to Windschitl (1998), qualitative data can capture unique phenomena of online learning. The questionnaire also measured satisfaction toward the course, perceptions of delivery method, course structure, inquiry method, interactions among participants and with materials, and participant autonomy. The questionnaires were administered to the participants before and after completion of the online course. Follow-up interviews were carried out with the participants at the end of the course.

Table 1 shows responses for two items associated with satisfaction with the interactive e-learning modules. Results showed that 93.3% of the participants agreed that the interactive e-learning modules had helped them to solve problems in project developing stages. (Mean, M=4.2; Standard deviation, SD=0.551). Furthermore, 90.0% of the participants believed that the interactive e-learning modules created a conducive learning environment (M = 4.03, SD = 0.615).

Table 1. Satisfaction with the interactive e-learning environments

Items	Responses						
	SA	A	US	DA	SDA	M	SD
The interactive e-learning modules help me to solve problems on project developing stages.	8	20	2	0	0	4.20	.551
The interactive e-learning modules provide a conducive learning environment.	5	22	2	1	0	4.03	.615

Note: SA = Strongly Agree (5), A = Agree (4), US = Unsure (3), DA = Disagree (2), and SDA= Strongly Disagree (1), M = Mean, SD = Standard Deviation

Table 2 shows perceptions of the various features in the interactive e-learning environments. Nearly 90 percent of the students agreed that the interface design was user friendly, simple, and attractive. In addition, they found the course content to be well organized. They also felt the inquiry modules facilitated investigation and planning activities in project development stages. Furthermore, these course activities were able to enhance interest in robotics. The students believed that the interactive e-learning environments not only helped them to enhance their problem solving skills, but also their technology integration ability. However, a small number of participants felt isolated while completing the online course. This can be attributed to the lack of face-to-face interaction. Interviews revealed students felt the course was challenging, stimulating, and fun. Students also showed a positive attitude toward robotics.

Student learning effectiveness was analyzed by employing laboratory exercises in robotics (Krotkov, 1996). As shown in Table 3, the mean scores for mechanism design, manufacturing, application of actuators, and selection of sensors, before and after attending the special project course with interactive e-learning environments, were satisfactory. Integration of mechatronics, shows a mean score, before attending the course, of 7.47. This score indicates a moderate level of technical skill. After the course, a mean of 7.79 shows that the level of technical skills improved to satisfactory. Construction of control systems and assembly and testing scores were between 7.37-7.89, a moderate level. Significant improvements were observed in the technical skills of mechanism design ($t(36)=-2.39$ and $p=0.022$), manufacturing ($t(36)=-2.54$ and $p=0.015$), application of actuators ($t(36)=-2.40$ and $p=0.022$), and selection of sensors ($t(36)=-2.04$ and $p=0.048$). However, there were no statistically significant increases in technical skills for construction of control systems, integration of mechatronics and assembly and testing. However, data from the interviews indicated that most students showed higher interest and motivation toward problem solving in mechatronics and testing. Although students felt the projects were difficult and challenging, they were able to use appropriate technical skills to complete them. They were able to solve the technical problems at their own pace, collaborating among themselves.

CONCLUSIONS

In this paper, we propose an interactive e-learning environment supporting creative design and design of robots at a distance. The developed inquiry modules allow students to present their problems in natural Chinese language fashion and through engineering graphics. In addition, this study developed interactive web-based environments to incorporate all the modules necessary for creative designs. This study examined the various important dimensions of web-based environments. Students generally provided positive feedback on the interactive learning environments employed in the special project course. Most students were satisfied with the inquiry modules, course activities, and interactions. In fact, they believed that these factors helped in their studies. Generally, interactive web-based environments can successfully enhance students' course achievements and technical skills.

Table 2. Perceptions of the interactive e-learning environments

Items	Responses					M	SD
	SA	A	US	DA	SDA		
The online course enhances my interests toward learning.	8	20	2	0	0	4.20	.551
It is easy to gain access to technical supports.	5	22	2	1	0	4.03	.615
I can actively involve myself in the special project.	4	18	5	2	1	3.73	.907
The course materials satisfy my learning needs.	3	17	6	3	1	3.60	.932
The interface is user friendly and attractive.	10	17	3	0	0	4.23	.626
The online course contents are well structured.	7	18	4	1	0	4.03	.718
I can obtain the materials from the e-learning system for learning.	5	19	5	1	0	.393	.691
I can complete the project assigned within the time given.	20	9	1	0	0	4.63	.556
The group size is appropriate for robotic design project.	18	12	0	0	0	4.60	.498
The inquiry modules encourage learning through questions.	12	17	1	0	0	4.37	.556
I obtain feedbacks from inquiry modules as frequent as I need.	8	21	1	0	0	4.23	.504
I could interact with the inquiry modules as frequent as I need.	10	19	1	0	0	4.30	.535
I could obtain assistance to understand the content of the robotics from e-learning systems.	5	21	3	1	0	4.00	.643
I can understand the robotic course content from e-learning systems.	7	19	3	1	0	4.07	.691
The use of materials in the e-learning systems enhances my understanding of the robotics.	3	21	4	1	1	3.80	.805
I would like to repeat the experience.	18	11	1	0	0	4.57	.568

Table 3. Dependent t-test results: Students' ability of technical skills on robotics

		M[a]	SD	t	df	p-value
Mechanism design	Pre-test	7.748	0.99	-2.39	36	0.022
	Post-test	.47	0.90			
Manufacturing	Pre-test	7.688	1.00	-2.54	36	0.015
	Post-test	.47	0.90			
Application of actuators	Pre-test	7.168	1.211.	-2.40	36	0.022
	Post-test	.05	07			
Selection of sensors	Pre-test	7.167	1.210.	-2.04	36	0.048
	Post-test	.89	99			
Construction of control system	Pre-test	7.37	0.83	-1.77	36	0.085
	Post-test	7.89	0.99			
Integration of mechatronics	Pre-test	7.47	0.90	-0.97	36	0.336
	Post-test	7.79	1.08			
Assembly and Testing	Pre-test	7.47	0.901.	-1.00	36	0.323
	Post-test	7.79	03			

[a]The maximum grade for each part of the question was 10.00, and the maximum grade for the entire question was 70.00.

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ÇEVRİMİÇİ İŞBİRLİKLİ ÖĞRENME ARAÇLARINDA YENİ BİR DALGA: WAVE

A NEW WAVE IN ONLINE COLLABORATIVE LEARNING TOOLS: WAVE

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Özet
Bu çalışmanın amacı, Google tarafından günümüzün yeni e-posta sistemi olarak tanıtılan wave'nin çevrimiçi işbirlikli öğrenme aracı olarak incelenmesidir. Çalışmada öncelikle Wave'nin genel özellikleri ve getirdiği yenilikler tanıtılmaktadır. Daha sonra Wave'den çevrimiçi işbirlikli öğrenme aracı olarak faydalanılıp faydalanılamayacağı analiz edilmekte; geliştirilmesi gereken yönlere ve uygulamaya yönelik önerilerde bulunulmaktadır.
Anahtar Kelimeler: İşbirlikli öğrenme, Google Wave, eşzamanlı etkileşim.

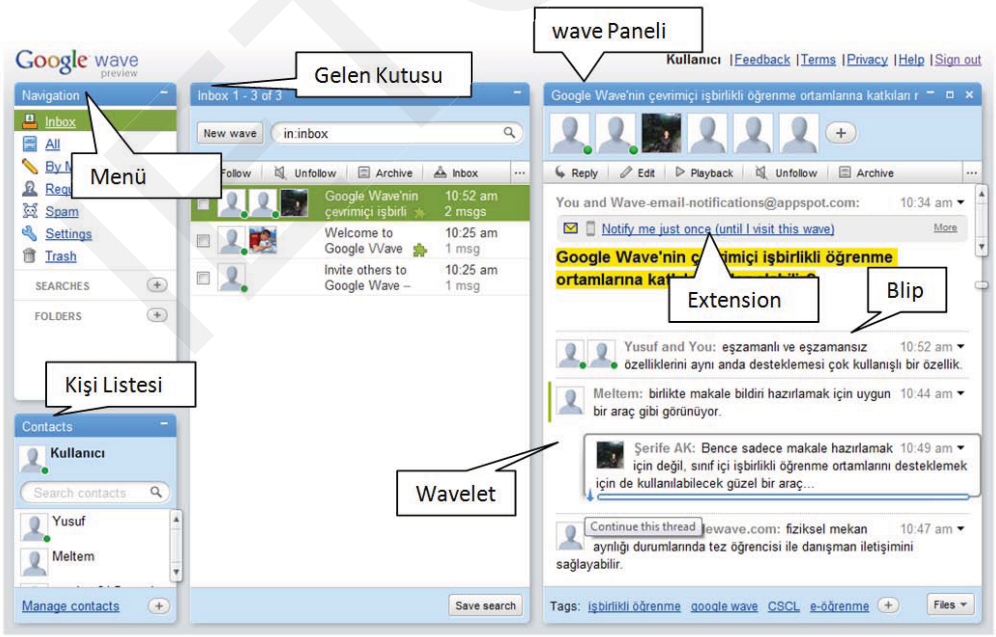
Abstract
The aim of this study is to investigate Wave as an online collaborative learning tool which is introduced as a new e-mail system by Google. Firstly general specifications of Wave and its innovations are introduced. Then whether we can benefit from Wave as an online collaborative learning tool or not is analyzed. Some suggestions are also recommended for its aspects that need improvement, and implementation.
Keywords: Collaborative learning, Google Wave, synchronous interaction.

GİRİŞ

Yeni teknolojiler (özellikle internet) öğretmenlere öğrenme-öğretme süreçlerinin geliştirilmesinde kullanılabilecek pek çok ilginç araç sunmaktadır (Kaminski, 2005; Martín-Blas ve Serrano-Fernández, 2009). Bu araçlar kullanılarak öğrenci-öğrenci, öğrenci-öğretmen etkileşimlerinin gerçekleştirilmesini kolaylaştıran bilgisayar destekli işbirlikli öğrenme ortamları oluşturulabilir.
Google tarafından geliştirilen Wave, iletişim ve işbirliği imkanı sunan bir araçtır (Hane, 2009). Bu iletişim ve işbirliği, kullanıcıların katkıları sağlanarak oluşturulur. Kullanıcıların her girdisi konuşmaya yön verir ve dalgalar halinde yayılmasını sağlar. Bu iletişim, zengin formatlı metin, resim, video, etkileşimli animasyon ve daha birçok içerik türünün Wave üzerinde paylaşımıyla gerçekleşebilmektedir. Wave aynı zamanda kullanıcılar ve geliştiriciler tarafından hazırlanan çeşitli eklentilerin kullanılabileceği bir uygulama çatısı da sunmaktadır. Bu sayede geliştiriciler tarafından hazırlanan uygulamalar Wave'ye eklenebilir ve kullanılabilir.
Wave, halen geliştirilmekte olan bir araçtır. Google, önizleme (Preview) olan bu sürümü şu anda sadece davetli kullanıcılara sunmaktadır. Önizleme olması nedeniyle bazı özellikleri tam olarak çalışmamaktadır (Rasmussen, 2009). Yavaş çalışması, bazı eklentileri tam olarak yürütememesi ve bütün internet tarayıcılarının Wave'yi desteklememesi bu sorunlar arasında sayılabilir. Ancak önizleme sürümü tamamlandıktan sonra bu tür sorunların düzeleceği ve yeni özelliklerin ekleneceği düşünülmektedir.
İletişim alanında yaşamımızda önemli bir yere sahip olması beklenilen bu yeni araçtan eğitim uygulamalarında nasıl faydalanılabileceği merak konusudur. Bu nedenle bu çalışmada Wave'nin bir eğitim aracı ve özellikle de çevrimiçi bir işbirlikli öğrenme aracı olarak analiz edilmesi amaçlanmaktadır. Bu analizin bilgisayar destekli işbirlikli öğrenme uygulamalarının tasarımı, yürütülmesi ve değerlendirilmesi açısından uygulayıcılara önemli bilgiler sağlayacağı düşünülmektedir. Bu amaçla da çalışmada öncelikle Wave'nin genel özellikleri ve getirdiği yenilikler tanıtılmaktadır. Daha sonra Wave'den çevrimiçi işbirlikli öğrenme aracı olarak faydalanılıp faydalanılamayacağı analiz edilmektedir.

WAVE'NİN GENEL ÖZELLİKLERİ

Wave'nin genel özellikleri sıralanmadan önce aracın ekran görüntüsü üzerinden ilgili terimlerin açıklanmasında yarar görülmektedir.



Şekil 1: Google Wave'nin ekran görüntüsü

Büyük Harfle yazılan "W", Wave sisteminin bütününü; küçük harfle yazılan "w", wave konuşma akışını belirtmektedir. *wave:* Bütün konuşmayı temsil eden en genel terimdir. Konuşma sürecinin tamamında yapılan bütün etkinlikleri kapsamaktadır. wave paneli içerisinde yer alan konuşma kayıtları, resim ekleme vb. bütün etkinlikler wave'yi oluşturmaktadır. w*avelet:* wave içerisinde yer alan ve ana başlıktan

türeyen alt konuların konuşulduğu küçük wave'lerdir. *Blip (İleti):* wave içerisindeki en küçük mesaj birimine verilen isimdir. Wave'ye dahil olan kişilere yollanılan her bir mesaj iletiyi oluşturur. *Doküman:* iletiyi oluşturan metin, resim, dosya eklentilerinden oluşan içeriktir. *Extentions (Eklentiler)*: Eklentiler iki kısımda incelenmektedir. Bunlar araçlar (gadgets) ve robotlardır (robots). Genel özellikler bölümünde eklentilere ilişkin ayrıntılı bilgi sunulmaktadır. *Embeded Wave*: Bu terim ise Wave içerisinde bulunan herhangi bir konuşmayı kendi web sitenize yerleştirme özelliğini anlatmaktadır (Trapani ve Pash, 2009). Wave'nin genel özellikleri başlıklar halinde aşağıda sunulmaktadır.

Eşzamanlı İletişim
Wave eşzamanlı bir uygulamadır. Kullanıcılar çevrimiçi olduklarında diğer kullanıcılar ile yaptıkları bütün etkinlikleri aynı zaman diliminde gerçekleştirebilmektedirler. Bir kullanıcı mesaj yazarken, çizim yaparken, ya da bir metni düzenlerken diğer kullanıcılar eşzamanlı olarak neler olduğunu görebilmektedir.

Eşzamansız İletişim
Kullanıcılar çevrimdışı olduklarında diğer kullanıcılar tarafından yapılan bütün işlemler veritabanında saklanmaktadır. Kullanıcı çevrimiçi olduğunda ise yapılan her türlü değişiklik ve okunmamış mesajlar kullanıcıya sırasıyla gösterilmektedir. Katılımcılar çevrimdışı oldukları süreçte konuşmadan kopmamakta, kaldıkları yerden iletişime devam edebilmektedirler.

Dallanmalı Mesajlaşma
Forumların aksine Wave içerisindeki konuşmalar doğrusal değil dallanmalı bir şekilde ilerleyebilmektedir. Wave içerisinde hangi mesaja cevap vermek istenirse, o mesajın altına tıklanarak da ileti yazılabilir. Bu sayede konuşmanın hangi kısmına cevap verilmek istenirse mesaj bu noktaya yazılabilir. Bu sayede aynı wave içerisinde yeni waveler türetilebilir, wavelet'ler oluşturulabilir.

Karakter Karakter Güncelleme
Wave eşzamanlı sohbet imkanı sunduğu için anlık mesajlaşma programlarının özelliklerini de taşımaktadır. Anlık mesajlaşma programlarında kişinin yazdığı ileti gönder tuşuna basılmasıyla birlikte karşıdaki katılımcının ekranında belirir. Karşıdaki konuşmacı bu süre zarfında kişinin sadece ileti yazdığını görür ancak iletinin ne olduğunu gönderen yollayana kadar göremez; görünen sadece "A kişisi ileti yazıyor…" şeklindedir. Fakat Wave bu anlık mesajlaşma programlarının özelliklerinin yanı sıra karakter karakter gösterim özelliği ile konuşmaya dahil olan kişilerin kimin ne yazdığını o anda harf harf görebilmesine olanak tanımaktadır.

Beyaz Tahta Uygulaması
wave içerisine dahil edilen her kullanıcı, listedeki her bireyin wave üzerinde ne yaptığını görebilmektedir. Eşzamanlı olma özelliği sayesinde her kullanıcı konuşmaya katılabilmekte ve eklentiler sayesinde resim çizme, belge düzenleme gibi etkinlikleri de eşzamanlı olarak gerçekleştirebilmektedir.

Dosya, Resim, Video ve Link Ekleme
Wave iletişim aracı olarak kullanılacağı gibi çeşitli dosyaların paylaşılması için de kullanılabilir. Wave birçok dosya formatını paylaşmaya izin vermektedir. Dosyaları eklemek için metin editörünün kullanılmasının yanı sıra istenilen dosyalar, ileti içine sürüklenip bırakılabilir. Wave, eklenen dosya formatlarını otomatik olarak tanımaktadır. Örneğin resim, pdf gibi dosyalar eklendiğinde küçük resim olarak ekranda görünmektedir. Wave dosyaları tanıyabildiği gibi linkleri de tanıyabilmektedir. Youtube gibi servislerden herhangi bir video bağlantısı ileti içerisine eklendiğinde Wave kullanıcılara iki seçenek sunmaktadır. İlki link olarak bırakmak, ikincisi video görüntüsüne dönüştürerek ileti içerisinde herhangi bir işlem yapmadan videoyu doğrudan izleme seçeneğidir.

Çevrimiçi Olan Kullanıcıları Görebilme
Wave içerisinde yer alan kişiler panelinde Wave'ye ekli kişilerin listesi bulunmaktadır. Bu kişilerin çevrimiçi olup olmadıkları burada kontrol edilebilmektedir. Çevrimiçi olan kullanıcıların profil resimlerinin sağ alt tarafında yer alan yeşil daire, kullanıcının çevrimiçi olduğunu göstermektedir ve çevrimiçi olan kullanıcılar listenin en üstünde yer almaktadır.

Özel Mesaj Gönderme
Wave içerisine yazılan her mesaj diğer kullanıcılar tarafından görülebilmektedir. Eğer diğer kullanıcıların görmeyeceği bir mesaj yazılmak isteniyorsa gizli yanıt özelliği kullanılabilmektedir. Gizli yanıta hangi kullanıcılar eklenirse bu mesaj onlara açık olacaktır.

Katılımcı Rollerini Düzenleme
wave'ye eklenen her katılımcı tam yetkiye sahip olarak, istediği düzenlemeleri yapabilir ve yeni cevaplar yazabilir. Ancak kullanıcının sadece wave takipçisi olmasının istendiği durumlarda bu yetkilerin belirlenmesi gerekebilir. Şu anda, bütün işlemleri gerçekleştirebilecek tam yetkili kullanıcı ve sadece wave'yi takip edebilen düzenleme ve yazma yetkisi olmayan salt okunur kullanıcı olmak üzere geçerli iki kullanıcı rolü bulunmaktadır. Bu rollere göre kullanıcılar wave içerisinde işlemleri gerçekleştirebilmektedir. Google tarafından duyurulan, geliştirilmekte olan yeni roller bulunmaktadır ancak şuanda kullanıma açık değildir.

İleti Düzenleme
Mesaj düzenleme çok önemli ve etkili bir özellik olarak Wave içerisinde yer almaktadır. Katılımcılar wave içerisinde yer alan istedikleri metni düzenleyebilmektedirler. Diğer katılımcılar çevrimiçi olup wave'yi açtıklarında diğer kullanıcıların yaptıkları değişiklikleri de görebilmektedirler.

Zengin Metin Düzenleme Aracı
Son yıllarda zengin metin düzenleme araçları internet tabanlı hale getirilmektedir. Bu sayede herhangi bir HTML bilgisi gerektirmeksizin yazıda istenilen görsel değişiklik yapılmasına imkan sağlanmaktadır. Bu metin editörlerini birçok sitede görmek mümkündür. Wave içerisinde de böyle bir araç bulunmaktadır. Bu sayede dikkat çekilmek istenen metne çeşitli görsel düzenleme işlemi yapılabilmektedir.

Yazım ve Dilbilgisi Denetimi
Wave'nin önemli özelliklerinden bir tanesi de, yazım ve dilbilgisi denetimi yapabilmesidir. Bu özellik ile yanlış yazılan kelimeler otomatik olarak düzeltilirken, düzeltilemeyen kelimeler için çeşitli alternatif kelimeler yazarın seçimine bırakılmaktadır. Dilbilgisi için de çeşitli önerilerde bulunması ve hataların altını çizmesi kullanıcılarına sözcük ve yazım yanlışlıklarından arındırılmış yazı yazabilme olanağını sunmaktadır.

Sürükle Bırak

Wave ile internet tarayıcısı teknolojisine sürükle-bırak özelliğinin ekleneceği düşünülmektedir. Bilgisayar işletim sistemleri, pencereler arasında bu özelliğe imkan tanımakta, ancak internete bir dosya yükleneceği zaman bu özelliği kullanmak mümkün olmamaktadır. Çünkü internet tarayıcıları böyle bir özelliği desteklememektedir. Wave ile gelen gelişmiş internet tarayıcısı ihtiyacı, sürükle-bırak işlemini bulundurulması gereken zorunlu özellik haline getirmiştir. Bu özellikten önce internete herhangi bir dosya yükleyebilmek için "Gözat"'a tıklanır ve dosya seçilerek yüklenilmeye başlanırdı. Wave'de bu özellik yerini daha pratik olduğu düşünülen sürükle-bırak özelliğine bırakmaktadır. Bu sayede Wave'ye yüklenmek istenen herhangi bir dosyayı ya da dosyaları ileti kutusuna sürükleyerek bırakmak yeterli olmaktadır.

İleri-Geri Sarma Butonu (Playback)
Wave'nin en güçlü özelliklerinden bir tanesi konuşma geçmişini adım adım tutmasıdır. Bu geçmiş konuşma içerisinde yürütülen bütün adımları kapsamaktadır. Kullanıcı ekleme, ileti ekleme, eklenti ekleme, eklentiler üzerinde yapılan her türlü aktivite, iletilerin düzenlenmesi gibi bütün işlemler konuşma geçmişinde saklanır. İleri-geri sarma butonu sayesinde bu konuşma içerisinde gerçekleşen her türlü işlem, kare kare gösterilmektedir. Bu özellik, konuşmaya sonradan eklenen kullanıcıların geçmişte neler paylaşıldığını görerek konuşmayı yakalayabilmelerine olanak tanıdığı için önem taşımaktadır.

Geri Yükleme Özelliği
Konuşmalar birden çok kişinin katkısıyla meydana gelmektedir. Ancak yeni mesaj ekleme veya mesajlarda düzenleme yapılırken yapılan yanlışlıklar olabilmektedir. Bu hatalar ileri-geri sarma seçeneği kullanılırken fark edilebilir. Wave hataların kısa yoldan düzenlenmesi için geri yükleme işlemi sunmaktadır. Bu sayede tek tuş ile bütün hatalar düzenlenebilmektedir.

Eklentiler
Wave'nin çok güçlü yönlerinden bir tanesi de eklentiler ile genişletilebilmesidir. Geliştiriciler tarafından oluşturulan uygulamalar Wave içerisine kolaylıkla eklenebilmektedir. Eklentiler iki bölümden oluşmaktadır. Bu bölümler araçlar (gadget) ve robotlar (bots)'dır. Araçlar sayesinde istenilen herhangi bir uygulama wave içerisine dahil edilebilir ve diğer kullanıcıların etkileşimine sunulabilir. Dışarıdan eklenen uygulamaların eş zamanlı olarak diğer kullanıcılar ile paylaşılmasının katılıma ve etkileşime olumlu katkı sağlayacağı düşünülmektedir. Robotlar, araçlardan farklı olarak kullanıcı listesinde bulunan ve kişi olarak konuşmaya dahil edilen bilgisayar programlarıdır. Her robot *robot-adi@ornek.com* şeklinde bir kullanıcı adına sahiptir ve kişi olarak eklenebilir. Birçok özelliğe sahip robotlar bulunmaktadır. Örnek olarak çeviri yapan robot, boş iletileri silen robot, istenilen wave'yi herkesin kullanımına açan robotlar gibi çeşitli amaçlara yönelik robotlar bulunmaktadır.

Yeni wave'ye Kopyalama
Bir wave oluşturulurken yapılan her işlem wave geçmişinde saklanır. Kullanıcıların katılımıyla oluşturulan işbirlikli bir doküman son halini alana kadar birçok değişikliğe maruz kalabilir. Bu değişiklikler bittiğinde yeni bir wave'ye kopyalama işlemi sayesinde yapılan değişikliklerin geçmişi eski wave'de kalır ve yeni wave son halini almış bir doküman olarak kullanılabilir.

ÇEVRİMİÇİ İŞBİRLİKLİ ÖĞRENME ARACI OLARAK WAVE

Wave'nin işbirlikli öğrenme aracı olarak nasıl işe koşulabileceği, işbirlikli öğrenme ortamının katılım, sosyal etkileşim, işbirlikli iletişim becerileri, destekleyici etkileşim ve performans analizi gibi özellikleri (Saller, Goodman, Linton ve Gaimari, 1998) açısından incelendiğinde şunlar söylenebilir.

Katılımın Artırılması: Wave'nin hem eşzamanlı hem eşzamansız iletişime olanak tanıyarak, kullanıcıların çevrimdışı oldukları süreçte konuşmadan kopmaması ve kaldıkları yerden iletişime devam edebilmelerine olanak tanıması; anlık mesajlaşma programlarının özelliklerinin yanı sıra karakter karakter gösterim özelliği ile konuşmaya dahil olan kişilerin kimin ne yazdığını o anda harf harf görebilmesi sayesinde yüz yüze iletişim hissi yaratması; sürükle-bırak yöntemiyle birçok dosya formatını kolayca paylaşmaya izin vermesi; kullanıcıların çevrimiçi olup olmadıklarının kontrol edilebilmesi; konuşma geçmişini adım adım tutarak konuşmaya sonradan eklenen grup üyelerinin geçmişte neler paylaşıldığını görerek konuşmayı yakalayabilmelerine olanak tanıması katılımın artırılması açısından işe koşulabilir.

Sosyal Etkileşimin Korunması: Beyaz tahta uygulaması özelliği ile wave içerisine dahil edilen her grup üyesinin listedeki diğer grup üyelerinin wave üzerinde ne yaptığını görebilmesi; grup üyelerinin çevrimiçi olup olmadıklarının kontrol edilebilmesi; eklentiler sayesinde istenilen herhangi bir uygulamanın Wave içerisine kolayca dahil edilebilmesi ve bu eklenen uygulamaların eş zamanlı olarak diğer grup üyeleri ile paylaşılması sosyal etkileşimi kolaylaştırıcı bir unsur olarak görülebilir. Wave içerisinde oluşturulan farklı wave'lere de bağlantı kurmanın mümkün olması grup içi etkileşimin yanı sıra gruplar arası etkileşim açısından da büyük önem taşımaktadır.

İşbirlikli İletişim Becerisinin Geliştirilmesi: Grup üyelerinin wave içerisinde yer alan metin, resim, video gibi ortamları düzenleyebilmelerine ve diğer grup üyelerinin çevrimiçi olup wave'yi açtıklarında bu değişiklikleri görebilmelerine olanak tanıması; forumların aksine Wave içerisindeki konuşmaların doğrusal değil dallanmalı bir şekilde de ilerleyebilmesi ve bu sayede konuşmanın hangi kısmına cevap verilmek istenirse mesajın bu noktaya yazılabilmesi işbirlikli iletişimi kolaylaştırıcı ve geliştirici bir unsur olarak görülebilir.

Etkileşimin Desteklenmesi: Wave'nin grup üyelerinin katılımıyla oluşturulan işbirlikli bir dokümanın son halini alana kadar değiştirilebilmesine ve yapılan değişikliklerin geçmişinin eski wave'de kalarak yeni Wave'de son halini almış bir doküman olarak kullanılabilmesine olanak tanıması, işbirlikli öğrenme ürünlerinin oluşturulması ve etkileşimin desteklenmesi açısından büyük önem taşımaktadır.

Sürecin Değerlendirilmesi: Wave'nin konuşma geçmişini adım adım tutarak ileri-geri sarma seçeneği ile sürecin izlenmesine olanak tanıması, etkileşimin takibi ve sürecin değerlendirilmesi açısından kolaylaştırıcı bir unsur olarak görülebilir.

SONUÇ VE ÖNERİLER

Wave bilginin yapılandırılma, saklanma ve paylaşılma biçimini değiştirecek gibi görünmektedir. Bu nedenle Wave'nin yeni bir bilgisayar destekli iletişim türü sunduğu söylenebilir. Elbette ki bu yeni bilgisayar destekli iletişim türü, işbirlikli öğrenme ortamlarının tasarımı, uygulanması ve değerlendirilmesi açısından da yenilikler sunacaktır.

Eğitim uygulamalarına yeni bir teknik aracın entegre edilerek öğretmen ve öğrencilerin çalışma biçimleri değiştirilmeye çalışılmakta (Rysjedal ve Wasson , 2005) ve bu yeni aracın benimsenmesindeki en önemli engellerden birini oluşturmaktadır. Öğretmen ve öğrenciler Wave'yi ilk olarak kullandıklarında bu yeni aracın kullanımını karmaşık olarak değerlendirebilirler. Fakat aracın kullanımının yaygınlaşması ile öğretmen ve öğrencilerin Wave deneyimlerinin artacağı ve bu yeni aracın eğitim uygulamalarına entegrasyonunun daha kolay olacağı söylenebilir.

Önizleme olan bu sürüm şu anda sadece davetli kullanıcılara sunulmaktadır. Wave'nin kullanımın yaygınlaşabilmesi için eklentiler ve düzenlemeler yapılarak davetiye gerektirmeksizin herkesin kullanabileceği yeni sürümünün yayınlanması gerekmektedir. Bu yeni araçla birlikte wave, wavelet, blip gibi yeni kavramlar da yaşamımıza girmektedir. Bu kavramlara ilişkin ortak bir dilin kullanılabilmesi için aracın kullanımı yaygınlaşmadan kavramların Türkçe karşılıklarının bulunması gerekmektedir. Wave, geliştiriciler tarafından oluşturulan eklentilerin kullanımına izin vermektedir. Bu nedenle eğitsel oyun, animasyon vb. eğitsel materyaller geliştirilirken Wave'nin standartlarına

uygun şekilde geliştirilmelidir. Wave'nin çevrimiçi işbirlikli öğrenme aracı olarak güçlü bir dalga yaratıp yaratmayacağı sorusuna cevap bulmak için örnek uygulamalara ve Wave'nin etkililiğinin incelendiği nicel ve nitel araştırma bulgularına ihtiyaç bulunmaktadır.

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ÇEVRİMİÇİ ÖĞRENMEDE PROGRAM GELİŞTİRME ve DEĞERLENDİRME YAKLAŞIMLARI

PROGRAM DEVELOPMENT AND EVALUATION APPROACHES IN ONLINE LEARNING

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Özet
Gelişen teknoloji ve değişen öğrenme anlayışlarına bağlı olarak, uzaktan eğitim alanındaki program tasrım süreçlerinde de değişimler yaşanmaktadır. Uzaktan eğitim programları, artık daha esnek, natural ve günlük yaşamı olabildiğince içerisinde barındıran süreçler olarak tasarlanmaktadır. Söz konusu bu uygulamaların değerlendirilmesi de, kuşkusuz geleneksel eğitim programlarının değerlendirilmesinden farklılıklar gösterecektir. Bu noktada, değişen değerlendirme yaklaşımlarından yararlanmak son derece önemlidir.
Uzaktan eğitim uygulamalarının, her ne kadar içinde eğitim sözcüğünü barındırsa da, geleneksel eğitimdeki uygulamalardan farklı olduğu artık bilinen bir gerçektir. Kuramda ve uygulamada, aralarında farklılıkların bulunduğu bu iki eğitim sürecinin değerlendirilmesi de, kuşkusuz birbirinden bağımsız olarak düşünülmelidir. Bu bağlamda, geleneksel eğitimdeki değerlendirme anlayışlarıyla, uzaktan eğitimde yürütülen çevrimiçi öğrenme ortamlarının değerlendirilmesinin mümkün olmadığı söylenebilir.
Bu çalışmada, çevrimiçi öğrenme ortamlarının geliştirilmesi ve değerlendirilmesine ilişkin olarak bir alanyazın taraması gerçekleştirilecektir. Bu bağlamda, öncelikli olarak uzaktan eğitimde program geliştirme ve değerlendirme yaklaşımlarından söz edilecektir. Ardından, uzaktan eğitimde çağdaş değerlendirme yaklaşımları, esnek ve eşzamansız çevrimiçi öğrenme ortamlarının tasarlanması ve değerlendirilmesi bağlamında tartışılacaktır.
Anahtar Sözcükler: Çevrimiçi öğrenme, program geliştirme ve değerlendirme.

Abstract
In accordance with developing technology and changing understandings of learning, the process of program design in the field of distance education is also undergoing various changes. Distance education programs are being designed as processes which are more flexible, natural and inclusive of daily life as much as possible. As such, the evaluation of these practices must undoubtedly differ from that of traditional educational programs. It is highly important that we take advantage of changing approaches to evaluation.
Despite the inclusion of the term 'education', it is a well known fact that distance education practices differ from traditional education. Therefore, the evaluation of these two educational processes, which differ in both theory and application, must be considered independently. As such, it can be said that the evaluation of online learning environments employed in distance education cannot be conducted using the understanding of evaluation in traditional education.
This study provides a review of literature regarding the development and evaluation of online learning environments. Different approaches in program development and evaluation in distance education will be introduced, followed by a discussion of contemporary evaluation approaches in distance education based on the design and evaluation of flexible and asynchronous online learning environments.
Keywords: Online learning, program development and evaluation.

GİRİŞ

Çevrimiçi öğrenme ortamlarının geliştirilmesi ve değerlendirilmesi sürecinin tarihsel gelişimine bakıldığında, bilgi ve iletişim teknolojilerinin yanı sıra, öğrenme paradigmalarına da bağlı olarak değişim gösterdiği görülebilir. Bu bağlamda, program geliştirme ve değerlendirmeye ilişkin tanımların da söz konusu değişim sürecine koşut olarak farklılık göstereceği kuşkusuz bir gerçektir. En genel tanımıyla, program geliştirmeyi; öğretim programının tüm öğelerini daha etkili ve yeterli hale getirme süreci olarak tanımlayabiliriz (Senemoğlu, 2001). Program geliştirmede esas olan; kurumun amaçlarının gerçekleşmesini sağlamak üzere düzenlenen içerik ve uygulamaların, uygun yöntem, teknik, araç ve gereçle geliştirilmesi sağlanırken; bir taraftan toplum sorunları ve ihtiyaçları, diğer taraftan da öğrencilerin sorunları ilgileri, ihtiyaçları ve gelişim özelikleri esas alınarak geliştirilmesine dikkat edilmelidir (Hakan, 1984).
Program değerlendirme ise, genelde programa dayalı eğitim kaynaklarını kabul etme, değiştirme ya da ortadan kaldırma kararının verebileceği bilgileri içermektedir (Demirel, 2007). Yani, program değerlendirmesinin amacının, değerlendirilecek olan şey hakkında yargıda bulunmak olduğunu söyleyebiliriz. Bununla birlikte; söz konusu tanımların, çevrimiçi öğrenme ortamlarında kullanılan teknolojilere ve öğrenme anlayışlarına bağlı olarak değişim gösterdiği savunulabilir.

Amaç

Gelişen teknoloji ve değişen öğrenme anlayışlarına bağlı olarak, çevrimiçi öğrenme ortamlarının tasarım ve değerlendirme süreçlerinde değişimler yaşandığını yukarıda da belirtmiştik. Söz konusu değişimlerin nedenlerini bilmek, çevrimiçi ortamların tasarımı ve değerlendirilmesi sürecine kuşkusuz katkı sağlayacağı gibi; gelecekte yapılacak uygulamalar için de yol gösterici nitelikte olacaktır. Bu bağlamda, çalışmada; uzaktan eğitim sürecinde çevrimiçi öğrenme ortamlarının tasarlanması ve değerlendirilmesine yönelik tanım ve yaklaşımlara değinilecektir. Bu çerçevede, öncelikli olarak uzaktan eğitim alanyazını kapsamında program geliştirme ve değerlendirme yaklaşımlarından söz edilecektir. Ardından; uzaktan eğitimde çağdaş değerlendirme yaklaşımları, esnek ve eşzamansız çevrimiçi öğrenme ortamlarının tasarlanması ve değerlendirilmesi bağlamında tartışılacaktır.

YÖNTEM

Bu çalışma; uzaktan eğitim sürecinde, çevrimiçi öğrenme ortamlarının geliştirilmesi ve değerlendirilmesine ilişkin olarak gereçekleştirilmiş bir alanyazın taramasını kapsamaktadır. Çalışmada, öncelikle çevrimiçi öğrenme için program geliştirme ve değerlendirmeye ilişkin tanımlar yapılcaktır. Daha sonra, yine çevrimiçi öğrenme alanyazınına ilişkin olarak program geliştirme ve değerlendirme yaklaşımlarından söz edilecektir.
Hızla gelişen teknolojilere bağlı olarak, uzaktan eğitim sürecinde öğrenmenin gerçekleştiği ortamlar da giderek çeşitlilik göstermektedir. Bu bağlamda, çevrimiçi öğrenme uygulamalarının da internet teknolojisinin yaygın olarak kullanılmasıyla birlikte önem kazandığını söyleyebiliriz. Yüzer ve Kurubacak (2007) çevrimiçi öğrenmenin; teknolojiye bağlı olarak hızla değişen dünyada, öğrenenlerin öğrenme sürecine daha aktif olarak katılmalarına ve söz konusu değişimleri kendi öğrenmelerine uyarlamalarında katkı sağladığını belirtir. Bu nedenle, geliştirilmek istenen çevrimiçi öğrenme ortamlarının; çağın gereksinimlerine ve öğrenenlerin beklentilerine u tasarlanması kritik bir öneme sahiptir.

Çevrimiçi Öğrenmede Program Geliştirme

Program geliştirme sürecini, açık bir sistem olan eğitimin (Sönmez, 2004) alt sistemlerinden olan, toplumun koşullarını ve değerlerini de içine alan çeşitli alt sistemlerden oluşan açık bir sistem olarak tanımlayabiliriz. Bir sistem olarak program geliştirmenin; amaç, içerik, öğrenme-öğretme süreci ve değerlendirme boyutları kapsamında;

- niçin öğretileceğine;
- ne öğretileceğine;
- ne kadar öğretileceğine ve
- ne kadar öğrenildiğine ilişkin soruların yanıtlanması gerektiğini söyleyebiliriz.

Kurubacak ve Yüzer (2006), çevrimiçi öğrenme ortamlarının tasarlanmasında; (1) toplum, (2) yönetim, (3) eğitim, (4) teknoloji ve (5) değerlendirme olmak üzere, beş makro boyutu içeren kararlar alınması gerektiğini belirtir. Bu bağlamda, çevrimiçi ortam tasarımını; bireyin, toplumun ve kurumun gereksinimleri doğrultusunda en uygun teknolojinin kullanılması; sürecin girdileri ile çıktıları göz önünde bulundurularak sürekli olarak güncellenmesi ve değerlendirilmesi süreci olarak vurgulayabiliriz. Moore ve Kearsley (2005), çevrimiçi ortam tasarım sürecini;

- öğrenen katılımının tasarlanması;
- öz-yönelimli (bağımsız) öğrenmenin tasarlanması;
- görüntüleme ve değerlendirme etkinlikleri;
- telif hakları ve
- genel tasarım ilkelerinden oluşan bileşenler olarak tanımlar.

Genel tasarım ilkeleri ise (Moore ve Kearsley (2005):

1. iyi tanımlanmış ve anlaşılabilir bir yapı;
2. açık ve net olarak ifade edilmiş amaçlar;
3. küçük modüllerden oluşan içerik;
4. öğrenen katılımının desteklenmesi;
5. çevrimiçi ortam dışında geliştirilen yardımcı materyallerin birbirini tamamlaması;
6. tekrar yapma olanağının sunulması;
7. özetler gibi, sentez yapmaya yardımcı uygulamaların yer alması;
8. çekicilik;
9. değerlendirme için açık uçlu sınav yöntemlerinin kullanılması;
10. geribildirim verilmesi olarak sıralanabilir.

Ayrıca, bir çevrimiçi ortam tasarım sürecinde; öğretim tasarımcıları, web geliştiricileri, grafik (görsel) tasarımcılar, programcı ve çokluortam yazarı yer alır (Caplan, 2004). Süreçte, ilgili kişiler; programın amaçları, içeriği, öğrenme süreçleri ve teknolojisi doğrultusunda tasarımlar gerçekleştirirler. Bunlara ek olarak; programın ne tür bir yaklaşımla tasarlanacağı da önem oluşturmaktadır. Program tasarım yaklaşımlarını ise; konu, öğrenen ve sorun merkezli tasarım yaklaşımları olarak sıralayabiliriz (Demirel, 2007). Genel bir ifadeyle, çevrimiçi öğrenme sürecinde; uzaktan öğrenenlerin güncel gereksinimlerinin göz önünde bulundurularak, var olan en uygun teknoloji kaynakları kullanılarak, öğrenenlerin bağımsız öğrenmesini destekleyecek esnek ve günlük yaşamı da olabildiğince barındıran ortamlar tasarlanmasına önem gösterilmelidir.

Çevrimiçi Öğrenmede Program Değerlendirme

Program değerlendirmenin, genellikle programın yönelik olduğu amaca göre yapıldığını söyleyebiliriz. Bu da daha çok programa girişte, süreçte ya da çıkışta yapılan değerlendirme sürecini kapsar. Programa girişte yapılan değerlendirme *tanılayıcı değerlendirme (diagnostic evaluation)*; program sürecinde yapılan değerlendirme biçimlendirici değerlendirme *(formative evaluation)* ve program çıkışında yapılan değerlendirme ise düzey belirleyici değerlendirme *(summative evaluation)*dir (Demirel, 2007).

Worthen, Sanders ve Fitzpatrick (1997), uzaktan eğitimde değerlendirmenin; yargılama kalitesi ve karar verme için standartların tanımlamasını, ilgili bilginin toplanmasını, değeri, kaliteyi, yararlılığı, etkililiği ya da önemi tanımlayan standartların uygulanmasını içeren araştırma ve yargılama yöntemlerini kullandığını belirtir. Bir açık ve uzaktan eğitim programının etkililiğinin değerlendirilmesi (Thompson & Irele, 2007);

- başlangıçtaki kaynakların yatırımlarını doğrulamak;
- amaçların karşılanıp karşılanmadığını belirlemek;
- sürecin ve çıktıların gelişimine rehberlik etmek ve
- programlara devam etme, geliştirme ya da ara vermede kararlar için bir kaynak sağlamak açısından gereklidir. Bu bağlamda, çevrimiçi öğrenmede program değerlendirmesi; geliştirilen öğrenme ortamlarının değerlendirilmesi, programın iyileştirilmesi, sürdürülmesi ve geliştirilmesi bakımından önem oluşturmaktadır.

Uzaktan eğitimde, Bates'in ACTIONS modeli ve Kirkpatrick'in dört düzey modeli olarak bilinen iki tür değerlendirme modelinden söz edebiliriz. Bates ACTIONS modelinin bileşenleri; erişim ve esneklik maliyetler, öğretim ve öğrenme, etkileşim ve kullanıcı dostluğu, yönetsel konular, yenilik ve hız olarak sıralanabilir (Thompson & Irele, 2007). Bu değerlendirme yaklaşımı daha çok, süreçte kullanılan teknolojilerin değerlendirilmesine yöneliktir. Kirkpatrick'in dört düzey modeli ise;

1. programa katılanların tepkisi,
2. öğrenme,
3. performans
4. sonuç ve etki olmak üzere dört düzeyden oluşmaktadır (Kirkpatrick, 1998). Bu bileşenler, süreçte nelerin değerlendirilmesi gerektiğini belirtir. Söz konusu modelin, değerlendirme etkinliklerini sadece sürecin sonunda gerçekleştirmesi nedeniyle eleştirele aldığı söylenebilir.

Ayrıca, çevrimiçi öğrenme için Kuzey Amerika Konseyi tarafından; (1) içerik, (2) öğretim tasarımı, (3) öğrenen değerlendirmesi, (4) teknoloji, (5) dersin değerlendirmesi ve yönetim unsurlarından oluşan değerlendirme standartları belirlenmiştir (NACOL, 2006).

Çevrimiçi öğrenme ortamlarının; öğrenme sürecinin merkezinde öğrenenin yer aldığı; standart bir planın uygulanması yerine, daha esnek ve dinamik etkinliklerin yürütüldüğü; tek bir gerçekten ziyade, çoklu gerçeklerin dikkate alındığı bir uzaktan eğitim süreci olarak düşünüldüğünde; seçilecek değerlendirme yaklaşımında bu özelliklerin dikkate alınması gerektiği söylenebilir. Ek olarak; program değerlendirme alanındaki çağdaş değerlendirme yaklaşımlarını; amaç, yönetim, müşteri, uzman, karşıt ve katılımcı yönelimli değerlendirme yaklaşımları olarak sıralayabiliriz (Worthen, Sanders ve Fitzpatrick, 1997). Bu bağlamda, çevrimiçi ortam değerlendirmelerinde, tümevarımsal düşünceye dayanan, değerlendirme sürecinde çok çeşitli verilerin kullanıldığı, standart yerine dinamik bir planın izlendiği, tek gerçekten ziyade, çoklu gerçeklerin dikkate alındığı çağdaş değerlendirme yaklaşımlarından yararlanılabilir.

TARTIŞMA ve SONUÇ

Uzaktan eğitimde geliştirilen çevrimiçi öğrenme ortamlarının tasarlanması ve değerlendirilmesi süreci, programların güncellenmesi, değiştirilmesi ve sürdürülebilmesi bakımından önem oluşturmaktadır. Çevrimiçi bir öğrenme ortamı tasarlanırken, programın amaçlarının

yanı sıra; öğrenenlerin, kurumun ve toplumun beklentileri de göz önünde bulundurulmalıdır. Bu da, program geliştirme sürecinde makro boyutta kararlar almayı gerekli kılar. Alınan kararlar doğrultusunda tasarlanacak olan programın, öğreneni bağımsız öğrenmeye ve öğrenme sürecinde kararlar almaya cesaretlendirmesi; uzaktan öğrenenlerin değişen öğrenme anlayışlarına uyum sağlamalarına katkı sağlar. Benzer şekilde, içeriğin ve öğrenme biçimlerinin desenlenmesi sürecinde de, programın amacı ve programda işe koşulan öğrenme ve iletişim kuramları son derece önemlidir. Çünkü bir sistem olarak program geliştirme ve değerlendirme sürecinde alınan her karar, bir sonraki aşamayı da etkiler.

Yukarıda anlatılanlar doğrultusunda, çevrimiçi öğrenme ortamlarının geliştirilmesi ve değerlendirilmesi etkinlikleri dinamik bir süreç olarak ele alınmalıdır. Çevrimiçi öğrenmenin, geniş ve çokkültürlü kitlelere yönelik bir öğrenme sürecini içermesi de, makro boyutta bir takım kararlar almayı gerektirir. Bu süreçte alınan kararların program geliştirmenin, başlangıcından sonucuna kadar, sürekli bir biçimde, süreçle bütünleşik olarak güncellenmesi ve değerlendirilmesi gerektiği söylenebilir. Değerlendirme sürecinde, öğrenenin, programın başında belirlenen amaçların ne kadarına ulaştığının yanı sıra; öğreticinin, kurumun, toplumun ve diğer paydaşların beklentilerinin ne kadarının karşılanıp karşılanmadığı; var olan kaynakların ve teknolojinin ne kadar etkin bir şekilde kullanıldığı da değerlendirme aşamasında belirlenir. Bu aşamada edinilen geribildirimler doğrultusunda ise sistem yeniden düzenlenir ve sürdürülür. Sonuç olarak, açık bir sistem olarak program geliştirme; sorunsuz olarak yürütülebilmesi de; söz konusu alt sistemler ile katılımcıların birbirleriyle uyumlu olarak çalışabilmesine bağlıdır. Bu bağlamda, program geliştirme; sistemin çıktıları doğrultusunda kendini yenileyen, eksikliklerini giderip güncelleyerek mevcut gereksinimlere yanıt verebilen dinamik ve sürekli tekrar eden bir süreçtir.

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DERS DESTEK WEB SİTESİNİN ÖĞRENCİLERİN BİLİŞİM TEKNOLOJİLERİ DERSİ BAŞARISI ÜZERİNDEKİ ETKİSİ*

EFFECT OF COURSE SUPPORT WEB SITE ON COMPUTER AND INFORMATION TECHNOLOGY CLASS ACHIEVEMENT

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Özet
İlköğretim öğrencileri Bilişim Teknolojileri dersinin sadece 1 saat olması nedeniyle, dersle ilgili öğrenme görevlerini yerine getirmek için bireysel olarak ve özellikle de grup çalışması gerektiren durumlarda ders saatinde yeterince çalışma olanağı bulamamaktadırlar. Bu nedenle işbirliğine dayalı çalışmayı gerektiren durumlarda güçlükler yaşanmaktadır. Bu problemden yola çıkarak, bu araştırma kapsamında öğrencilerin ders saati dışında da hazırladıkları ödevleri, bu ödevlerle ilgili görüş ve düşüncelerini paylaşarak, işbirliği içinde çalışabilecekleri Ders Destek Web Sitesinin (DDWS) tasarlanması ve uygulanarak sonuçların değerlendirilmesi amaçlanmıştır. Araştırma deneysel desendedir. Araştırmanın bağımlı değişkeni öğrencilerin "Bilişim Teknolojileri Dersi" (BTD) akademik başarısıdır. Bağımsız değişken ise öğretim yöntemidir. Deney grubu yüzyüze proje tabanlı öğrenme ile birlikte ders destek sitesinden yararlanırken kontrol grubu sadece yüzyüze proje tabanlı öğrenme yöntemine göre ders işlemişlerdir. Araştırma Sakarya Merkez İlçedeki bir okulda, 6. Sınıfta okuyan seçkisiz yöntemle 23'ü deney, 22'si kontrol grubu olarak belirlenen toplam 45 öğrenci ile yürütülmüştür. Veri toplama aracı dereceli puanlama anahtarıdır. Ayrıca deney ve kontrol grubu öğrencilerinin denkliğinin belirlenmesinde öğrencilerin Türkçe, Matematik, Fen, Sosyal ve BT dersi notları kullanılmıştır. Analiz sonuçlarına göre öğrencilerin akademik başarıları arasında anlamlı bir farklılık görülmüştür. Deney grubunun performans puanları kontrol grubuna göre anlamlı olarak daha yüksektir. Bu bulgu DDWS'nin destek olarak kullanılmasının öğrencilerin proje çalışmalarındaki başarılarını olumlu yönde anlamlı olarak artırdığı şeklinde yorumlanabilir. Bilişim Teknolojileri dersinin işlenmesinde öğretmenlerin DDWS hazırlamaları ve kullanmaları önerilmektedir.

Abstract
Computer course hour is only one peer week in K-12 schools in Turkey. The Course time is not enough for students to learn actively in class and this lead students to need extra time for learning activities especially for Project based learning. The purpose of this research is to develop a course support web site which have web 2.0 interaction tools and to find out the effects of the using this web site on students learning outcomes. This is an experimental research. The dependent variable is students' academic achievement and the independent variable is web site support to instructional method that only experimental group used the web site with project based learning. Participants are totally 45 sixth grades students from two different classes. One class was randomly selected as experiment group and the other was control. According to results experiment groups means are significantly higher than the control groups. This result could be interpreted that course support web site is a beneficial tool for students to work cooperatively and learn better. For K-12 schools computer courses teachers it is suggested to develop and use supportive web site for the students.

GİRİŞ

Bilişim Teknolojileri dersinin ilköğretim kurumlarında seçmeli ders olarak okutulması ilköğretim için güzel bir gelişme olmakla birlikte ders saatinin yetersiz olması da büyük bir sorun olmaktadır. Öğrenciler bilişim teknolojileri dersinden yeterli miktarda faydalanamamakta ve bilgi paylaşımında bulunamamaktadırlar. Bu problemi aşmak için internet teknolojisine başvurulmaktadır. İnternet teknolojisinde kullanılan etkileşim araçları (forum, e-posta, sohbet vb.), BT dersindeki zaman problemini ortadan kaldırmaya yardımcı olmaktadır. Ders saatine sığdırılamayan etkinliklere ders saati dışındaki ortamlarda da devam edilmekte böylece etkileşimli bir öğrenme ortamı sağlanmış olmaktadır.
İnternetin eğitim sistemine girmesi ile birlikte öğretmenin rolü değişmiş ve öğretmen dersin tek kaynağı olmaktan çıkıp, öğrenme sürecini yöneten gözlemci ve rehber bir rol üstlenmeye başlamıştır. İnternet üzerinden çalışan belli bir zamandan ve mekândan bağımsız internet tabanlı öğrenme programları genelde internet temelli öğrenme adıyla bilinmektedir. İnternet temelli öğrenme programları; öğrenme malzemesi, iletişim, öğrenciye destek, dönüt verme ve değerlendirme gibi eğitsel etkinliklerin elektronik yollarla yapıldığı yeni iletişim ve etkileşim kanallarından oluşmaktadır. Tartışma listeleri, ağ sayfaları, ek yazılımlar, forumlar, e-posta, ağ üzerinden çoklu ortam, sanal sınıf, video konferans, ağ üzerinden CD Rom ve DVD gibi ortamlar öğrenme faaliyetlerinin gerçekleşmesini sağlayan bazı araçlardır (Erkunt ve Akpınar, 2002). Temel olarak öğrenciye istediği zamanda, istediği yerde ve istediği kadar ilgili konuyu öğrenme avantajı sunan, internet tabanlı veya internet destekli eğitimin bazı avantajları şöyledir: (Kruse ve Keil, 2000, akt: Erkunt ve Akpınar, 2002).

- ✓ Zaman ve mekandan bağımsız öğrenme ortamları
- ✓ Hızlı ya da yavaş öğrenme gereksinimlerine yanıt veren bir öğrenme düzeneği
- ✓ Uzman bilgisine daha çok ulaşma ve onunla birlikte çalışma olanağı
- ✓ İyi tasarlanmış malzeme ile geleneksel sınıf ortamına oranla hatırlamada %25 artış ve öğrenme süresinde %40 ila %60 kısalma
- ✓ Öğrencinin kendi öğrenme gereksinimine göre istediği sırada ve yoğunlukta çalışabilmesi
- ✓ Öğrencinin kendini denetleyebilmesi
- ✓ Anında geri dönüt alma fırsatı.

Bu avantajlarla beraber Proje tabanlı öğrenme yönteminin kullanıldığı bir internet destekli sistemde "öğrenme için etkileşim" kavramı ortaya çıkar öğrenci internet üzerinden grup oluşturur ve yaptığı etkinlikleri grup üyeleri ile internet üzerinden paylaşır. Projeye dayalı çalışma, çok ileri düzeydeki bilişsel becerileri ortaya çıkartır ve öğrencilerin kendilerini, kendi öğrenmelerinden sorumlu tutar.
Bilişim teknolojileri dersinin amacı öğrencileri sadece bilgisayar okuryazarı değil bilişim teknolojilerini kullanırken etik ve sosyal değerler, tutumlar, güvenlik, sağlık, teknoloji okuryazarlığı konularını bilinçli olarak öğrencilerin hayatına geçirmeleri sağlanmaktadır (İnce ve diğ., 2007). Ders saatinin azlığı tüm bunları tam olarak gerçekleştirmeye engel olmuştur.
BT ders saatinin grup çalışması yaptırmak için yetersiz olması problemi, bu araştırmada Ders Destek Web sitesinin önemini ortaya koymaktadır. Ders Destek Web sitesi sayesinde öğrenciler zaman sınırı olmadan ders ile ilgili çalışmalarını ders saati dışında da yapabilmektedirler. Araştırma ilköğretim okullarındaki BT ders saatinin yetersizliğinden dolayı yeterli düzeyde gerçekleştirilemeyen proje çalışmalarını yürütebilecek şekilde öğrenciler arasındaki bilgi paylaşımını olanaklı kılma açısından pratik bir örnek olması nedeniyle oldukça önemlidir.

* Bu çalışma Vildan ÜNAL'ın Sakarya Üniversitesi Sosyal Bilimler Enstitüsü'nde ikinci yazarın yönetiminde tamamladığı "Ders Destek Web Sitesi Etkinliklerinin Bilişim Teknolojileri Dersindeki Öğrenci Tutum ve Başarılarına Etkisi" adlı yüksek lisans tezinin bir kısmının özetidir.

Araştırmada öğrencilerin ders destek web sitesindeki forum, sohbet, ödev ve ders kaynakları araçlarını kullanarak etkileşimli bir biçimde diğer arkadaşları ile birlikte çalışmaları ve bu çalışmanın deneysel olarak bilişim teknolojileri dersi başarısı üzerindeki etkisinin belirlenmesi amaçlanmıştır.

YÖNTEM

Araştırma, sontest kontrol gruplu yarı deneysel desende yürütülmüştür. Deneysel desen, araştırmacının kontrolü altında değişkenler arasındaki neden-sonuç ilişkilerini keşfetmek için gözlenmek istenen verilerin üretildiği araştırma alanıdır. (Büyüköztürk, 2001, Büyüköztürk, Kılıç, Akgün, Karadeniz, Demirel, 2009; Karasar, 2005). Deneysel model ile yapılan her araştırmada mutlaka bir karşılaştırma vardır. Bu belli bir şeyin kendi içindeki değişimleri ya da bu "şey"ler arası ayrımların karşılaştırılması anlamında olabilir (Karasar, 2005).
Sontest kontrol gruplu model olan yarı deneysel desende, yansız atama ile oluşturulmuş iki grup bulunur. Bunlardan biri deney, öteki kontrol grubu olarak kullanılır. Modelde öntestlerin bulunması, grupların deney öncesi benzerlik derecelerinin bilinmesine sontest sonuçlarının buna göre düzeltilmesine yardım eder (Karasar, 2005). Grupların deneysel işlemler öncesi denkliği BT dersi ve diğer ders notlarının karşılaştırılmasıyla incelenmiştir. Araştırma deseni Tablo 1'de verilmiştir.

Tablo 1. Araştırma deseni

Gruplar	Öğretim Yöntemi	Sontest
Kontrol Grubu	Yüz yüze Proje Tabanlı Öğrenme	Dereceli Puanlama Anahtarı
Deney Grubu	Ders destek sitesi ile birlikte Proje Tabanlı Öğrenme	Dereceli Puanlama Anahtarı

Araştırmanın bağımlı değişkeni bilişim teknolojileri dersine yönelik başarıdır. Bağımsız değişken ise öğretim yöntemidir. Deney grubu yüzyüze proje tabanlı öğrenme ile birlikte ders destek sitesinden yararlanırken kontrol grubu sadece yüzyüze proje tabanlı öğrenme yöntemine göre ders işlemişlerdir.

Çalışma Grubu

Araştırmanın çalışma grubunu, 2008-2009 öğretim yılında Sakarya Merkez İlçedeki bir okulda 6. sınıfta okuyan 45 kişi oluşturmuştur. Bu çalışma grubu uygulama kolaylığı nedeniyle araştırmacının çalıştığı okuldan seçilmiştir. Çalışma grubu 6A ve 6B olmak üzere iki şubeden oluşmaktadır. 6A sınıfı 12 erkek öğrenci 10 kız öğrenci olmak üzere toplam 22 öğrencidir. 6B sınıfı 12 erkek öğrenci 11 kız öğrenci olmak üzere toplam 23 öğrencidir.
Grupların akademik başarıları, Fen ve Teknoloji, Sosyal Bilgiler, Bilişim Teknolojileri, Türkçe ve Matematik dersleri not ortalamasına bakılarak birbirlerine çok yakın olduğu görülmüştür. Ayrıca öğrencilerin kendi bilgisayarlarının olup olmadığına bakılmış ve sayının birbirine yakın olduğu tespit edilmiştir. Bir sınıfta 5 öğrencinin diğer sınıfta 6 öğrencinin evinde bilgisayar bulunmaktadır. Deney ve kontrol grubu, objektif olması açısından grupları tanımayan bir kişi tarafından rastgele olarak seçilmiş, bu seçime göre deney grubu 6B sınıfı, kontrol grubu 6A sınıfı olarak belirlenmiştir. Proje çalışması için aynı sınıfta bulunan öğrenciler rastgele olarak gruplara ayrılmıştır. Buna göre kontrol grubunda 5 grup deney grubunda 5 grup oluşturulmuştur. Gruplardaki kız erkek dağılımı aşağıdaki tablodaki gibidir (Tablo 2).

Tablo 2. Gruplardaki Cinsiyet Dağılımı

Deney Grubu			Kontrol Grubu		
Grup No	f		Grup No	f	
	Kız	Erkek		Kız	Erkek
1	2	3	1	2	2
2	3	2	2	2	2
3	3	1	3	2	2
4	3	2	4	3	2
5	0	4	5	1	4

Veri Toplama Araçları

Araştırmada verileri toplamak için Bilişim teknolojileri dersi akademik başarılarını ölçmek için hazırlanmış dereceli puanlama anahtarı kullanılmıştır. Deney grubunda ders destek web sitesi kullanılmıştır. Bu araçlara ilişkin ayrıntılı bilgi aşağıda sunulmuştur.

Dereceli puanlama anahtarı

Popham (1997), performansa dayalı durum belirlemenin kritik bölümünü oluşturan dereceli puanlama anahtarını öğrencilerin, yazılı kompozisyonlarının, sözel sunumlarının veya bilimsel projelerinin değerlendirilmesinde bir çeşit puanlama ölçüsü olduğunu belirtmektedir. Popham, dereceli puanlama anahtarını, her bir çalışma için ölçütleri (ölçülecek boyutları) listeleyen ve çalışmada nelerin yapılacağını gösteren bir puanlama aracı olarak görmektedir. Popham'a göre dereceli puanlama anahtarı; değerlendirme ölçütleri, ölçüt tanımlamaları ve bir puanlama stratejisi olmak üzere üç bölümden oluşur.

1. *Değerlendirme ölçütleri:* Kabul edilebilir yanıtları kabul edilemez yanıtlardan ayırmak için kullanılır. Örneğin öğretmenler yazılı kompozisyonları değerlendirirken organizasyon, yapısal içerik, sözcük seçimi vb. gibi değerlendirilebilir ölçütler kullanırlar.
2. *Ölçüt tanımlamaları:* Öğrencilerin değerlendirilmek istenen yanıtlarındaki niteliksel farklılıkları tanımlama yolunu ifade eder. Örneğin bir kompozisyonda organizasyon değerlendirilecekse bu ölçütlerden en yüksek puanı alan öğrencinin kompozisyonu organizasyon açısından hiç hata içermemelidir.
3. *Puanlama stratejisi:* Puanlama bütünsel (holistic) ya da analitik (analitical) biçiminde olabilir. Dereceli puanlama anahtarlarından hangisinin kullanılacağı değerlendirmenin amacına bağlıdır (Popham, 1997). Bazı durumlarda yapılan bir değerlendirmeyi bağımsız etkenlere (ölçüt) ayrıştırmak mümkün olamamakta, performansın farklı düzeylerinin ortaya çıkarılması için belirlenmiş ölçütler arasında bir ayrışma bulunmamaktadır. Böyle durumlarda bütünsel puanlama anahtarı kullanılmalıdır (Brookhart,1999). Analitik puanlama anahtarı ise, ölçülen bir yetenek boyutunun öğelere ayrıştırılabildiğinde ve daha ayrıntılı puanlama yapmak istendiğinde kullanılmaktadır (Haladyna, 1997).

Dereceli puanlama anahtarı için Goodrich (2001)'in önerdiği basamaklardan yararlanılmıştır. Bu basamaklar şöyledir:

1. *Performansı belirlemede kullanılacak ölçütlerin listelenmesi:* öğrenci performansının değerlendirilmesinde kullanılacak dereceli puanlama anahtarı için üç ölçüt belirlenmiştir. Bu ölçütler bu tür bir çalışmada öğrencinin yerine getirmesi istenen performanslar göz önüne alınarak belirlenmiştir.
2. *Kullanılacak dereceli puanlama anahtarına karar verilmesi:* Performans görevlerinin uygun olması ve ürünlerin ayrıntılı puanlanması istendiğinden araştırmada "analitik dereceli puanlama anahtarı" kullanılmıştır. MEB'in Bilişim Teknolojileri Öğretmen Kılavuz kitabında yer alan konuyla ilgili DPA kullanılmıştır.
3. *Performans düzeylerinin belirlenmesi ve düzey tanımlamalarının yapılması:* Bu aşamada, en iyi ve en kötü performans düzeyleri (dereceleri) belirlenmiştir. Buna göre her ölçüt 1 ile 3 arasında derecelendirilmiştir. Gözlenmek istenen performansı gerçekleştiremeyen öğrencilerin alacağı puan 1, tam olarak gösteren öğrencilerin alacağı puan ise 3 olarak belirlenmiştir.
4. *Uzman görüşünün alınması:* Dereceli puanlama anahtarı hazırlandıktan sonra bilişim teknolojileri öğretmenlerinden, ölçme - değerlendirme uzmanlarından ve dil konusunda çalışan uzmanlardan olmak üzere toplam 4 kişiden görüşler alınmıştır.

Ders Destek Web Sitesi

Ders Destek Web Sitesi moodle Öğretim Yönetim Sisteminde okulun kendine ait web sitesi alanında dosyaları bulundurmak üzere hazırlanmış ve sitenin adı "Bilişim Teknolojileri Dersi Destek Sitesi" koyulmuştur. DDWS'nin uygunluğu ile ilgili 2'si akademisyen 1'i Bilişim Teknolojileri öğretmeni 1'i web tasarımcısı olmak üzere 4 uzmanın görüşü alınmış, sitenin kullanılabilir olduğu belirlenmiş ve deneysel işlemler gerçekleştirilmiştir.

6. Sınıfa giden Kontrol ve Deney gruplarından sadece Deney grubuna bu sistem uygulanmıştır. Toplam 23 öğrencinin bulunduğu deney grubundaki öğrencilerin her birine kullanıcı adı ve şifresi araştırmacı tarafından verilmiştir. Sitedeki etkileşim araçlarından olan forum ve sohbet platformu kullanılarak grup öğrencilerinin konu ile ilgili bilgileri paylaşmaları sağlanmıştır.

Proje gruplarının her birine bir ayrı forum açılmış ve öğrenciler hangi grupta bulunuyor ise o foruma girip metin ve resim havuzu oluşturmuşlardır.

Daha sonra bu havuzdaki bilgileri birleştirerek Microsoft Office Publisher programını kullanarak Sınıf gazetesi oluşturmuşlardır.

DDWS'de ilk açılış ekranı olarak Kullanıcı girişi ve Şifresi ekranı çıkmıştır. Öğrenciler kullanıcı girişi ve şifrelerini girdikten sonra Sitenin ana sayfasına ulaşmış ve buradan Microsoft Office Publisher adlı dersin içindeki kendilerine uygun olan grubun formuna girmişlerdir. Araştırmacı tarafından verilen izinlerle her öğrenci sadece bulunduğu grubun forumuna girebilmiş ve paylaşımda bulunabilmiştir. Böylece ayrı gruplar birbirlerinin bilgilerini görememiş ve kopya olayı gerçekleşmemiştir.

DDWS, yönetim panelinden kontrol edilmiştir. Yönetim paneli sadece araştırmacının giriş yapabildiği kısımdır. Tüm öğrenci rollerini, gruplarını ve erişim yetkilerini araştırmacı ayarlamıştır.

Deneysel işlemleri kontrol grubunun görmemesi, sadece deney grubundaki öğrencilere verilen kullanıcı adı ve şifresi ile gerçekleştirilmiştir.

Deneysel İşlemler

Araştırmada Bilişim Teknolojileri Dersi 6. Sınıf öğretim programında yer alan "Sınıf Gazetesi" konusu temel alınmıştır. Bu konunun kazanımları şunlardır:

Öğrenciler,

- ✓ Masaüstü yayıncılık programını açabilir.
- ✓ Masaüstü yayıncılık programının ne işe yaradığını söyleyebilir.
- ✓ Masaüstü yayıncılık programından çalışmasına uygun olan yayın türünü seçebilir.
- ✓ Masaüstü yayıncılık programında sayfalar arasında dolaşabilir.
- ✓ Konuya uygun görseller bulabilir.
- ✓ Oluşturulan metin ile bulunan görselleri bir araya getirebilir.
- ✓ Masaüstü yayıncılık programının özelliklerini kullanarak bulduğu görselleri ve metni sayfalara yerleştirebilir.

Bu çalışmayı yaparken Office programlarından olan Microsoft Office Publisher (MOP) programı kullanılmıştır. Proje kontrol ve deney grubunda eş zamanlı olarak yürütülmüş ve toplam 4 hafta sürmüştür. Okul dışında bilgisayarla çalışamayacak öğrencilerin ders saati dışında da çalışabilmeleri için Bilgisayar Laboratuarı 4 hafta boyunca her gün ders çıkışı öğretmen kontrolünde açık bırakılmıştır. Kontrol ve Deney grubu öğrencilerinin bilgisayar laboratuarından eşit olarak yararlanabilmeleri için günler iki gruba paylaştırılarak planlanmıştır.

Deney ve kontrol grubundaki öğrencilerin hazırlamış olduğu ürünler 1'i akademisyen 6'sı bilişim teknolojileri öğretmeni olan toplam 7 kişi tarafından, google dokümanlar web sitesinde çevrimiçi form olarak düzenlenen DPA aracılığı ile ürünlerin deney ve kontrol grubuna ait olup olmadıkları belirtilmeden, değerlendirilmiştir.

Deney Grubunda Yapılan İşlemler. Deney grubundaki öğrencilere ilk hafta uyum eğitimi verilmiştir. Projede neler yapacakları Web sitesini nasıl kullanacakları konusunda araştırmacı olan öğretmen tarafından bilgilendirilmişlerdir. İkinci hafta öğrenciler internetten yaptıkları proje ile ilgili araştırmalarını ders saatinde ve ders saati dışında da (evde veya ders saati bitişinde okulda) DDWS'de, kullanıcı girişi yaparak grup arkadaşlarıyla paylaşmışlardır. Üçüncü hafta 5 grup da yaptıkları çalışmaların ne aşamada olduğu konusunda rapor hazırlayıp öğretmenlerine forumdan mesaj olarak göndermişlerdir. Grupların raporları öğretmen tarafından incelenmiş ve eksiklikler ve öneriler eklenerek yanıt mesaj olarak ayrı ayrı gruplara gönderilmiştir. Dördüncü hafta öğrenciler birbirlerine gönderdikleri bilgileri toparlayıp Masaüstü yayıncılık programı olan MOP' ta gazete sayfası haline getirmişler ve öğretmenlerine forumdan mesaj olarak göndermişlerdir. Grupların gazeteleri değerlendirilmek üzere okula ait web sitesi alanına atılmış ve gazetelerin indirildiği internet adresleri uzmanlara gönderilerek uzmanlar tarafından DPA ile değerlendirilmiştir.

Kontrol Grubunda Yapılan İşlemler. Kontrol grubundaki öğrencilere ilk hafta Proje çalışması hakkında bilgi verilmiş ve izleyecekleri adımlar sunu programında sunulmuştur. İkinci hafta öğrenciler internetten proje ile ilgili bilgileri araştırarak yazılı olarak not etmişler ve grup arkadaşlarıyla sözlü olarak yüz yüze paylaşmışlardır. Üçüncü hafta toparlanan bilgileri, her gruptan bir öğrenci, öğretmene sözlü ve yazılı rapor olarak sunmuştur. Raporun değerlendirmesini öğretmen her gruba sözlü olarak ifade etmiştir. Dördüncü hafta öğrenciler hazırlamış oldukları metinleri ve görselleri bilgisayarda Masaüstü yayıncılık programı olan MOP' ta düzenleyip flash belleklerine kaydetmişlerdir. Öğretmenin bilgisayarına aktarılan sınıf gazeteleri değerlendirilmek üzere okul web sitesine atılmıştır. Deney grubundaki öğrencilerin gazeteleri ile birlikte aynı internet sayfası üzerinden indirilerek uzmanlar tarafından DPA ile değerlendirilmiştir.

BULGULAR

Öğrencilerin deneysel işlemler öncesi akademik başarıları arasında anlamlı bir farklılığın olup olmadığının belirlenmesi amacıyla bilişim teknolojileri, matematik, sosyal bilgiler, fen ve teknoloji ve Türkçe derslerinden aldıkları birinci dönem notları deney ve kontrol grubu açısından ilişkisiz örneklemler için t testi ile karşılaştırılmıştır (bkz. Tablo 3).

Tablo 3. Deney ve kontrol grubundaki öğrencilerin BT dersi ön akademik başarı puanları

Dersler	Grup	N	X	S	Sd	t	p
Matematik	Deney	23	64.69	18.99	43	.125	.901
	Kontrol	22	63.95	20.84			
Fen	Deney	23	81.69	17.44	43	2.5	.015
	Kontrol	22	66.090	23.60			
Sosyal	Deney	23	55.30	14.78	43	.36	.716
	Kontrol	22	53.77	13.20			
Türkçe	Deney	23	59.60	15.87	43	-.28	.778
	Kontrol	22	60.95	15.96			
Bilişim Teknolojisi	Deney	23	66.30	21.22	43	-.36	.774
	Kontrol	22	68.63	21.22			

Analiz sonuçları fen bilgisi dersi dışında diğer tüm derslerde deney ve kontrol grubu ortalama puanlarının birbirine yakın olduğunu ve anlamlı farklılık bulunmadığını göstermektedir. Fen ve teknoloji dersinde ise deney ve kontrol grubu öğrencilerinin ortalama puanları arasında anlamlı farklılık olduğu görülmüştür. Bununla birlikte fen ve teknoloji dersi dışındaki derslerde deney ve kontrol grubu ortalama

puanları arasında anlamlı farklılık olmaması ve puanlarının birbirine yakın olması öğrencilerin akademik gelişim açısından benzer oldukları şeklinde yorumlanmıştır.

Deney ve kontrol grubundaki öğrencilerin BT dersinde hazırladıkları ürünlerin değerlendirilmesi sonucu aldıkları puanların Mann Whitney U-testi sonuçları Tablo 4'te verilmiştir.

Tablo 4. DPA Puanlarının Karşılaştırılması İçin Yapılan Mann Whitney U testi Sonucu

Grup	N	Sıra Ortalaması	Sıra Toplamı	U	p
Deney Grubu Gazeteleri	5	7.60	38.00	2.00	.028
Kontrol Grubu Gazeteleri	5	3.40	17.00		

Tablo 4'teki analiz sonuçlarına göre dört haftalık bir deneysel çalışma sonucunda Deney grubu ile kontrol grubu öğrenci gruplarının performans puanları arasında anlamlı bir farklılık bulunmuştur. ($U=2.00$, $p<.05$). Sıra ortalamaları dikkate alındığında DDWs'yi kullanan deney grubu öğrencilerinin gazetelerden aldıkları puanlar, kontrol grubu gazete puanlarına göre daha yüksek çıkmıştır. Bu bulgu, DDWS'nin öğrencilerin ürünlerde ortaya koydukları performansın yüksek olmasında etkili olduğunu göstermektedir.

23 Öğrenci'nin deneysel işlem süresi toplam 4 hafta sürmüştür. İlk hafta öğrenciler Site ile ilgili bilgilendirildikleri için DDWS'ni toplam 3 hafta kullanmışlardır. DDWS'de kullanılan site araçları Forum ve Sohbet araçlarıdır. Buna göre öğrencilerin forum sohbet araçlarını; bakma, ekleme, güncelleme, değişiklik yapma eylemleri ve siteye giriş yapma sıklıkları Tablo 5' de verilmiştir.

Tablo 5. Site Araçlarının Haftalara Göre Kullanım Sıklığı

	1.HAFTA (4-10 NİSAN)	2.HAFTA (11-17 NİSAN)	3.HAFTA (18-24 NİSAN)	4.HAFTA (25NİSAN-1MAYIS)
Forum	Eylem yok	11 eylem	106 eylem	1063 eylem
Sohbet	Eylem yok	Eylem yok	210 eylem	133 eylem
Login	2 kez giriş	72 kez giriş	569 kez giriş	1796 kez giriş

Öğrencilerin DDWS araçlarını kullanımı ve giriş yapma sıklıkları 3. ve 4. Hafta artış göstermektedir. Forum aracı en çok 4. Hafta kullanılmıştır. Sohbet aracı en çok üçüncü hafta kullanılmıştır. Giriş yapma durumu ise en çok 4. Hafta siteye giriş işlemi gerçekleşmiştir. Bu bulgu öğrencilerin DDWS etkileşim araçlarını artan bir şekilde kullanarak proje ödevlerini yürütmeyi tercih ettikleri şeklinde yorumlanabilir.

SONUÇ VE ÖNERİLER

Deney ve kontrol grubundaki öğrencilerin BT dersi ürünlerinden elde ettikleri puanlar arasında anlamlı farklılık görülmüştür. Deney grubu öğrencilerinin öğrenme performanslarının daha yüksek düzeyde gerçekleştiği yani uygulanan deneysel işlemin öğrencilerin akademik başarılarını arttırdığı sonucu ortaya çıkmıştır. Yapılan araştırmalara bakıldığında internet destekli sistemlerin kullanılması öğrencilerin farklı niteliklerde projeler oluşturmalarını sağlamıştır (Çeliköz, 2001). Ders destek sitesi etkinlikleri öğrencilerin proje çalışmalarında daha nitelikli ürün ortaya çıkarmalarını sağlamıştır.

Ders Destek Web Sitesi'ndeki araçlardan olan forum ve sohbet araçlarının kullanımı ilk haftalara göre artış göstermiştir. Öğrenciler proje çalışmalarını gerçekleştirirken DDWS'yi sıklıkla kullanmışlardır. Moodle içerik yönetim sisteminin sunduğu araçlardan forum ve sohbet öğrencilerin her hafta etkinliğini ve sosyalleşmesini etkileyecek güncelleştirmeler yapılmasını sağlamıştır. Her hafta öğrencilerin bu araçları kullanarak etkinliğe ne kadar katıldığı neler buldukları sonucunda bilgi edinilmiştir (Elmas ve Diğ., 2008). Bu araştırmada kullanılan forum ve sohbet nesnelerinin kullanım sıklıkları öğrencilerin etkileşimlerinin arttığı sonucunu ortaya koymaktadır.

Araştırma sonuçları öğrencilerin fikirlerini paylaştıkları ve ders zamanı dışında da proje çalışmaları için bir araya gelebilecekleri internet destekli bir ortamın öğrencilerin başarılarını ve ürün ortaya koymadaki performanslarını olumlu yönde etkileyebileceğini göstermektedir.

Bu nedenle bilişim teknolojileri öğretmenlerinin derslerini daha iyi yürütebilmeleri ve derslerindeki öğretimin etkililiğini artırabilmeleri için öğrencilerin işbirliği içinde çalışmalarına olanak tanıyacak etkileşimli araçların yer aldığı ders destek web siteleri hazırlamaları ve derslerinde kullanmaları önerilmektedir. Gelecekte yapılacak çalışmalarda bu tür sitelerde yer alacak araçların öğrenme ürünleri üzerindeki etkisinin, kazanımlarla ve öğretim yöntemleriyle ilişkisinin belirleneceği araştırmaların yapılmasının bilişim teknolojileri dersinin daha etkili bir biçimde verilebilmesi için faydalı olacağı düşünülmektedir.

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DESIGN AND DEVELOPMENT OF A PEDAGOGICAL MODULE FOR PHYSICS SECONDARY SCHOOL CURRICULUM IN MALAYSIA

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Abstract
The main objective of this study is to describe the design and development of a pedagogical module for physics secondary school curriculum in Malaysia. Physics has always been thought of as the most difficult subject and involves abstract concepts. Research shown technology helps to increase understanding of concepts. Result of past research also shows that matching learning style strategy with certain technology able to increase student learning experience. ICT which has potential to display learning experience in variety of format is seen as one way to fulfill diversity of learning style. This study is based on the Felder Silverman Model (1988) which comprises of four dimensions (visual/verbal, active/reflective, sequential/global, sensing/intuitive. The design for the pedagogical module comprising technology tools, technique, activities and advance exercise comes from "two rounds" modified Delphi technique. The Wilcoxon Sign Rank Test shows that overall there is no significant difference on majority of the tested items between the first and the second round of the modified Delphi technique. Next, five experts review are used in the development of the pedagogical module. The experts review suggested that the pedagogical module should be developed for four learning styles such as active, reflective, visual and verbal. Therefore, the researchers suggest that a pedagogical module based on technology and learning style can be used as a teaching and learning strategy for the learning of Physics.
Keywords: *Pedagogical module, Physics, technology, learning style, curriculum, modified Delphi Technique, experts' review,*

INTRODUCTION

Past research shows that most of the students are still having difficulties in understanding concepts in Physics (Mazur, 1997; McDermott, 1993; Ramsdell, 2004). Besides that, past research shows that there are issues in Physics pedagogy, especially regarding the development of technology. The next issue is that there are fewer students who prefer Physics in secondary level which causes smaller quantity of students take Physics curriculum in pre-university. This becomes a concern in the education and economical aspects. (Owen, Dickson, Stanisstreet & Boyes, 2008). The same scenario is in Malaysia as the students have the weaknesses in mastering Physics and they assume that Physics is something that is abstract. (Abdullah Nor, 1998; Shahanom Nordin, 1994). The analysis regarding the SPM answers for Physics Paper 2 shows that the overall performance of the candidates in delivering the facts and Physics concepts is decreasing especially those students who are moderate and weak. (KPM, 2007, 2005, 2004, 2003). The Physics concepts that are found difficult for the students to master are the concept of pressure, inertia, momentum, light, waves, density, and force (KPM, 2007, 2005, 2004, 2003). In the matter that involves Physics Pedagogy, the result from the study done by Kamisah Othman, Lilia Halim and Subahan Mohd Meerah (2006) in determining the need analysis on 1690 teachers who teach Science, shows that the teachers need information on how technology should be intergrated in their teaching skills.Until now few research have been done on the design and development of a pedagogical module based on technology and learning style for Form 4 Physics curriculum. Even though there are research done on the concepts, the learning styles and technology for Biology, there is lack of the research done for Form 4 Physics curriculum. On top of that, the local research is more focus on the method of survey and only a few research on Chemistry, Biology and Science have used developmental research (Sabariah Othman, Rosseni Din, & Aidah Abdul Karim, 2000; Wong Mei Ling, 2005; Norizan Ahmad, 2005). Therefore an expert consenses using Delphi technique was done to design the pedagogical module based on technology and learning style for form 4 Physics curriculum. Later the module was developed using expert review. This article will describe the design and development of the pedagogical module based on technology and learning style Felder-Silverman secondary school Physics curriculum in Malaysia.

RESEARCH OBJECTIVE

The objective of this research is to get an expert consensus from a panel of 21 experts, in order to create an effective design for the pedagogical module based on technology and learning style which can be used by the Physics teachers. Next, the second objective of this research is to develop the pedagogical module using expert review. Based on the past research, this module has not been developed by any individual including Malaysian Ministry of Education. Therefore, the design and development of this module is important and useful to give balance towards the teaching which is based on the differences of each individual in the classroom.

RESEARCH QUESTIONS

Research questions are:
What is the design of pedagogical module based on technology and learning style for form 4 Physics curriculum?

1. What is the suitable technology tool based on learning style for form 4 Physics Curriculum according to the expert consensus?
2. What are the suitable teaching Physics strategies (activities and practice) based on technology and learning style for form 4 Physics Curriculum according to the expert consensus?

THEORETICAL FRAMEWORK

Felder and Silverman Model (1988)

Felder and Silverman (1988) have created a learning model that brings focus to the learning styles aspects among the Engineering students. After three years, a psychometric instrument which is "*Felder-Soloman's Index of Learning Styles"* is created.
This model is classified the students into eight categories based on four dimensions:
Observant Dimension: sensing or intuitive
Input Dimension: visual or verbal
Process Dimension: active or reflective
Understanding Dimension: sequential or global.

DESIGN OF THE RESEARCH

The Delphi Technique

The Delphi Technique is used in this research. The Delphi Technique is a systematic way to combine individual opinion to obtain conclusion in a group (Helmer, 1968). In addition, Tersine and Riggs (1976) believe that Delphi is a systematic technique to get, collect and evaluate

experts' opinion without having discusssin in the group. The main elements of the Delphi Technique are secretness of the panel response, number of rounds (iteration) as well as reponse that can be controlled and statistical group response (Turoff,1975). The above discussion clearly shows that the Delphi Technique is the best design to be used in order to obtain expert consensus towards the design of pedagogical modul based on technology and learning style for form 4 Physics curriculum. A number of 21 experts were purposively selected as an expert panel for this research. The expert panel comprises five criterias such as Physics master teachers, ICT master teachers, Professors and Lecturer in Physics and ICT, Ministry of Education Officers and an officer from an ICT private company. A highly structured interview was conducted among five experts to develop a Delphi instrument. The Delphi survey instrument was categorized into five criteria as follows: technology tools, electronic support, teaching technique, activities and exercise. In the first round of the Delphi Technique the listing of the suggested suitable elements under each criteria is organized using ranking scale as below:

Level of expert agreement	4	3	2	1
	Highly agree	agree	disagree	strongly disagree

In the first round of the Delphi Technique instrument, experts can also suggest new element to be in. Therefore in the second round of the Delphi Technique, these new elements were added. Prosedures in the second round is the same as in the first round. However, experts were given choice to reconsider their answers in the first round. In the second round, any difference in opinion from the majority of expert consensus is noted. Hence that different view would need to be considered by either changing it to the majority answer or stick to the view by giving reasons. The results of the second round provide the curriculum for the Physics pedagogical module based on the technology and learning style.

The expert Review

A number of five experts were purposively selected as an expert panel review for the development of the module in this research. The expert panel comprises five criterias such as two Physics master teachers, one ICT master teachers, a Professor in Physics Education and a head of department of curriculum dan ICT in a local university.

DATA ANALYSIS PROCEDURE

The Delphi Technique

The interview data with five experts has been analysed thematicly. Thematic analysis has been done based on these topics:

1) suitable technology tools based on learning style
2) suitable electronic support based on learning style
3) suitable teaching technique based on learning style
4) suitable activities based on learning style.
5) suitable exercises based on learning style.

Next, in the first and second round, the results has been analysed using mod, median and interquartile range. The mod and median have been used to identify the highly expert consensus. The interquartile range has been used to identify the difference in opinion among the experts in the panel. The degree of consensus can be determined based on interquartile range as below:

Level of consensus	Highly consensus	intermediate consensus	No consensus
Inter quartile range	0 until 1	1.00 until 1.99	2.0 and above

The Expert Review

The interview data with five experts has been analysed thematicly.

RESULT OF THE RESEARCH

From the highly structured interview, the expert panels has identified 11 technological tools that are suitable according to learning style, six suitable electronic support according to learning style, seven suitable teaching techniques according to learning style, 14 suitable activities according to learning style and 11 suitable exercises according to learning style. This result is the foundation to build the first round Delphi instrument, which was given to the panel of 21 experts. In the first round instrument, all those identified element under the five themes is listed with ranking scale 1 until 4, as being discussed in the data analysis procedure under each learning style. However the expert panel can still add their opinion on suitable element under each theme.

In the second round one new suggestion was identified under technological tools under learning style, three new suggestions were listed under electronic support, four new suggestions under suitable teaching techniques, and two new suggestions under suitable exercise based on learning style.

The results of the first round is as shown in table below:

Table 1.1. *Summary First Round Modified Delphi*

Item	High Consensus (IQR: 1.01 -1.99)	Average Consensus Sederhana (IQR: 1.01 -1.99)	No Consensus (IQR: 2.00 ke atas)	Total
Technological tools	68	11	9	88
Electronic support	38	4	6	48
Teaching technique	53	0	3	56
Activities	101	8	3	112
Exercise	79	5	4	88
Total	339 (86.5%)	28 (7.1%)	25 (6.4%)	392 (100%)

Table 1.2. *Summary of data analysis on round two of active and reflective learning style.*

Learning Style	Technological tools	Electronic support	Teaching technique	Activities	Exercise
Active	1. laptop (100%) 2. smartphone (100%) 3. PDA (100%) 4. tablet (100%) 5. video camera (100%) 6. digital camera(100%) 7. web camera (100%)	1. High speed Internet (100%) 2. Internet Sosial (100%) 3. Webquest (100%) 4. Internet Facebook Tutor (100%) 5. Realtime telekonferen (100%)	1. small group discussion (100%) 2. Project (100%) 3. Problem solving (100%) 4. practical (100%) 5. PBL (100%)	1. Edugames (100%) 2. simulation (100%) 3. Video discussion (100%) 4. blogs (100%) 5. sending mms (100%) 6. chat (100%)	1. group work (100%) 2. produce product in group (100%) 3. practical (100%) 4. role play (100%) 5. presenting assignment (100%) 6. producing web page(100%) 7. interview (100%)

Learning Style	Technological tools	Electronic support	Teaching technique	Activities	Exercise
Reflective	1. laptop (100%) 2. desktop (100%) 3. tablet (100%) 4. PDA (95.2%)	1. CDROM (100%) 2. video clip (100%) 3. High speed Internet (95.2%) 4. Cd audio (95.2%)	1. drill (100%) 2. lecture (100%) 3. Problem solving (100%) 4. PBL (90.5%)	1. wiki (100%) 2. search information from internet (100%) 3. drill (100%) 4. tutorial (95.2%) 5. quiz using komputer (95.2%) 6. blogs (95.2%) 7. read interactive notes (90.5%)	1. Producing mind map (100%) 2. Forum to write individual answers (95.2%) 3. observation (95.2%) 4. do e-folio (95.2%) 5. do working paper (95.2%) 6. produce web page (95.2%)

The *Wilcoxon Sign Rank Test* shows that overall there is no significant difference on majority of the tested items between the first and the second round of the modified Delphi technique. The experts review suggested that the pedagogical module should be developed for four learning styles such as active, reflective, visual and verbal involving two gas laws such as "Charle's Law" and "Boyle's Law". Next, the expert review suggested two modules to be developed; each for teacher and student. Further the expert review suggested that the introduction of the module should be able to guide the teachers and students independently. Further the expert review also suggested that the blog for teachers should be made according to the students learning style. Lastly, the expert review suggested the implementation schedule for the testing of the module.

SUMMARY

The elements of the Physics module based on learning style are as follows:

Table 1.3: *Active learning style elements for "Lesson 1 and Lesson 2: Gas Law"*

Technology Tools	**Electronic Digital Resource**	**Teaching Technique**	**Activities**	**Exercises**
Laptop	Webquest	Group Project	Post answers in the blog	Do group work

Table 1.4: *Reflective learning style elements for "Lesson 1and Lesson 2: Gas Law"*

Technology Tools	**Electronic Digital Resource**	**Teaching Technique**	**Activities**	**Exercises**
laptop	Video clip	Individual drill	wiki	Produce mind map

Table 1.5: *Visual learning style elements for "Lesson 1 and Lesson 2 : Gas Law"*

Technology Tools	Electronic Digital Resource	Teaching Technique	Activities	Exercises
laptop	webquest	Eksperiment/demonstration in pairs	wiki	Produce Power point

Table 1.6: *Verbal learning style elements for "Lesson 1 and Lesson 2: Gas Law"*

Technology Tools	Electronic Digital Resource	Teaching Technique	Activities	Exercises
Laptop	Video clip	lecture	tutorial	Present assignment

IMPLICATION AND SUGGESTIONS

Overall, the result of this research shows that the expert concensus had named suitable technology tools, electronic support, teaching technique, activities and exercise based on learning style for the teaching of Physics. The curriculum design based on expert concensus using Delphi Technique can help the Ministry of Education especially the Curriculum Development Devision to consider developing curriculum focusing on students' learning style. An expert review also provides a good feedback on how the module should be developed. Therefore, the researchers suggest that a pedagogical module based on technology and learning style can be used as a teaching and learning strategy for the learning of Physics.

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DESIGN ASPECTS OF ONLINE VOCATIONAL COMPETENCY TESTING SYSTEM (OVCTS) TO IMPROVE TEACHING LEARNING PROCESS AND COMPETENCY TESTING IN VOCATIONAL EDUCATION AND TRAINING (VET) IN INDIA

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Abstract
In India, learning of the students in Vocational Education and Training (VET) is determined by conducting theory and practical examinations in traditional way. Examinations are conducted less frequently, normally once or twice in a year. On the basis of annual examination a certificate is awarded to student. These examinations do not help the student to test their competencies and improve their learning capabilities. To test the performance of a vocational student it is necessary to test the competencies in the particular vocational trade. Bloom's taxonomy of learning objectives is used to define how well a skill or competency is learned or mastered. To improve the performance of the vocational students it is required to conduct the competency tests more frequently in such a manner that helps student to understand their deficiencies. It is possible to do so by using continuous testing of competencies through computer generated online test of the required specifications. PSSCIVE, NCERT, Bhopal, Govt. of India, has designed a web application called Online Vocational Competency Testing System (OVCTS) which can take up the student to undergo online test and test themselves on continuous basis while learning. This will use for self testing in a required subject as well as make the student active while learning and helps to improve the teaching learning process. The test paper generated through OVCTS contains all types of objective questions with the attribute of taxonomy level and difficulty level from all the topics of the subject in a vocational course. This will also generate a balanced test paper. In this paper, we have correlated the competency with the Bloom's taxonomy of learning objectives and discussed various issues related with design aspects of OVCTS.
Keywords: e-learning, web based evaluation system, vocational education and training, evaluation, competency testing, interactive learning system.

INTRODUCTION

Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE) is a constituent unit of National Council of Educational Research and Training (NCERT), under the Ministry of Human Resource Development, Government of India. PSSCIVE is responsible for management of Vocational Education and Training (VET) in India. PSSCIVE organizes variety of training programmes to improve their knowledge and skill which in turn will be imparted to the students to improve their performance. It revises curriculum from time to time to meet the requirements of industries. Conventionally the evaluation of all vocational courses in India is carried out through the theory and practical examinations by the respective state boards. This conventional pattern doesn't help student to improve their learning capabilities within the course. PSSCIVE as an Apex and Central body for VET is unable to gather the required information of examination of the various states which is required for building up of Information System. By considering this, PSSCIVE has undertaken a project where a facility for web based examination system will be created so that the same can be used by the students all over the India. Students can appear for test any number of times by logging into the system and the said system will also analyse the performance of the student so as to understand the weakness in a particular subject. This application will also set a standard for examinations in vocational education.
Internet nowadays is available in almost all parts of country including the rural area. Most of the schools in India are provided with computer and Internet facility. The broadband utilities can be used even in small villages of India. As a result, Internet can be used very effective tool to improve the learning capabilities of the students. This approach can be called as an Electronic Learning Approach or a Web Based Learning Approach. The greatest advantage of this system is that the evaluation is very fast and accurate. A student can get evaluated instantly with various analysis. Also, there are no restrictions on the number of attempts. The understanding levels can be improved further by using OVCTS.
There are several research work carried out by researchers, where such attempt is made (James Dalziel 1999, Hulsman R.L. 2002, Hosam F. El-Sofany 2009). But in India, and particularly in vocational education, we find that such attempt is not made so far. In this paper, we have discussed various issues which are associated with the Design Aspects of OVCTS.

Issues and Problems in VET

The vocational education programme has been designed in such a way that it prepares students in communication, entrepreneurial and vocational skills leading to suitable jobs. The various issues, problems and weaknesses that inflicted the implementation of VET in India includes the *Management Structure, Selection and Duration of Courses and Institutions, Teacher and Teacher Training, Curriculum Transaction, Examination and Evaluation, Apprenticeship Training, Vertical Mobility, Employment opportunities and Quality Control* etc.
Here we address the issue of Examination and Evaluation and bringing the quality in evaluation so as to improve the teaching-learning process in VET through a web application developed by PSSCIVE. The process of computerization also helps to touch the other issues in VET at certain extent.

About an application

On-line Vocational Competency Testing System (OVCTS) is designed to take self assessment for vocational students at +2 level. It enables students to test their competency in a particular subject area by performing repeated and varied self-assessments drawn from a large database of questions. The questions in the database are created by the subject teachers. The application supports the different objective type questions. This format allows assessments to be graded immediately, so students can see their results right away. It allows flexibility in the presentation of Computer Assisted Assessment (CAA), particularly in terms of time, place and pace. It is expected to be of growing importance in vocational education. The systems allows for the creation of balanced question paper in terms of its difficulty level and

taxonomy level as set in the Specification Table. The system has four types of users namely Administrator, Course Coordinator, Teacher and Student. Administrator is the highest authority to manage master database and the Course Coordinator. The Course Coordinator is the institute faculty from concerned discipline who is authorized to approve the questions entered by Teacher and manage the paper specification. Teacher is the registered teacher from the concerned vocational course who is authorized to enter the questions in the database. Student is the registered student of vocational course who can attempt the paper and see the progress in the subject. Repeatedly self testing by the student will improve the teaching-learning process and finding the weakness in the particular area. A teacher can improve the teaching process to meet the uniform standard. It will keep track of their progress over time, since all assessments taken through this system are recorded. The users of the system does not require any programming expertise and no special software or hardware apart from an Internet-accessible computer and web browser.

COMPUTER ASSISTED ASSESSMENT (CAA)

What is Question Bank?

A Question Bank is a collection of varieties of different types of questions in a subject. It can be defined as a *relatively large collection of easily accessible test questions. "*Relatively large" means that the number of questions exceeds by several times the number to be used in any one test. "Easily accessible" means that the items are indexed structured or otherwise assigned information that can be used to facilitate their selection for a test. With the technological advancement in computer industry various educational activities are being computerized. Examination and Evaluation is one of the challenging activity in VET.

Advantages of CAA

The CAA has so many advantages over traditional evaluation system. It becomes very difficult to assess the performance of students through poorly designed questions. Sometimes it is essential to include visuals, drawings, photographs, and normally these are avoided because it cannot be designed and printed nicely manually. Using the computer software and scanner, one can design the visuals nicely. Every vocational teacher needs to set the number of questions every now and then for use in examination. All the times the quality of questions designed by teachers may not be good. A good quality of questions can be stored in the database of the application. OVCTS is designed to manage a database of the questions that holds large number of good quality of questions with the attributes like taxonomy level, difficulty level and type of question. The questions can be entered by the teacher from their location whenever required. The questions can be edited, corrected and submitted finally into the database after approval of the course coordinator. Large number of questions are available to generate a test and decrease the concern about security as remembering the answers to all the questions without having the knowledge or skill becomes more difficult. The random generation of test reduces the cheating. Computer generated test reduces the time in setting up the question paper and also produces the test with good quality questions. Repeated questions can be deleted or modified from the bank. The questions are developed by vocational teachers and verified by the course coordinator who are the faculty from PSSCIVE and reduce the ambiguity. Online administration and evaluation tests the the student immediately.

Disadvantages of CAA

It is not easy to implement several aspects of successful question bank database such as useful collection of questions. It is necessary to have the large number of questions with different attributes like difficulty level, taxonomy level, different types of questions so that the specifications provided for test generation can get all the category of questions. Maintaining the question bank is difficult aspect. How much time will take to develop and enter the large number of questions in a Question Bank? How far the question bank is updated?, How far the question bank is edited? Limitations of the kinds of pictures, graphs, special characters or other enhancements that can be used when tests are printed by computer, the difficulty in estimating the norms when each student has a different test and measurement error emanating from violations of assumptions when questions are calibrated using response theory.

ISSUES & CHALLENGES IN COMPETENCY BASED ASSESSMENT IN VET

What is a competency?

A competency is the capability to apply or use a set of related knowledge, skills, and abilities required to successfully perform "critical work functions" or tasks. Competencies often serve as the basis for skill standards that specify the level of knowledge, skills, and abilities required for success in the workplace as well as potential measurement criteria for assessing competency attainment. One comprehensive definition of "competency" is: A cluster of related knowledge, skills, and attitudes that affects a major part of the job, that correlates with performance on the job, that can be measured against well-accepted standards, and that can be improved via training and development."

What is Competency Based Training (CBT)?

In a traditional educational system, the unit of progression is time and it is teacher-centred. In a CBT system, the unit of progression is mastery of specific knowledge and skills and is learner-centred. Two key terms used in CBT are:

Skill A task or group of tasks performed to a specific level of competency or proficiency which often use motor functions and typically require the manipulation of instruments and equipment.

Competency A skill performed to a specific standard under specific conditions. CBT should be used as opposed to the "medieval concept of time-based learning." Using the traditional "school" model for training is inefficient. Competency Based Instruction has tremendous potential for training in industry.

A competent clinician (e.g., physician, nurse, midwife, medical assistant) is one who is able to perform a clinical skill to a satisfactory standard. CBT for reproductive health professionals then is training based upon the participant's ability to demonstrate attainment or mastery of clinical skills performed under certain conditions to specific standards (the skills then become competencies). Five essential elements of a CBT system are:

1. Competencies to be achieved are carefully identified, verified and made public.
2. Criteria to be used in assessing achievement and the conditions under which achievement will be assessed are explicitly stated and made public in advance.
3. The instructional program provides for the individual development and evaluation.
4. Assessment of competency takes the knowledge, skills and attitudes into account.
5. Participants progress through the instructional program at their own rate by demonstrating the attainment of the specified competencies.

Evaluation and Assessment in CBT

Evaluation in traditional courses typically involves administering knowledge based tests. While knowledge based assessments can certainly be used in CBT to measure mastery of information, the primary focus is on measuring mastery of skills. The decision to recognize a performance as satisfactory and to determine competence should be the basis for success of a Competency Based Assessment (CBA). CBA is

a process where an assessor works with a trainee to collect evidence of competence, using the benchmarks provided by the unit standards that comprise the national qualifications. The principles of CBA states it should be *Current, Valid, Accurate, Reliable, Flexible, Fair, Safe.*

Quality of Assessment

The quality of assessment directly correlates to the quality of learning. If there are clear learning objectives that are reflected in the assessment material then the student has a clear understanding of what they have to learn to what depth they have to understand what they are learning and how they are expected to demonstrate their knowledge and understanding.

RELATIONSHIP OF COMPETENCY WITH BLOOM's TAXONOMY

The Three Types of Learning Domains or Bloom's Taxonomy

There is more than one type of learning. A committee of colleges, led by Benjamin Bloom, identified three domains of educational activities. The three domains are cognitive, affective, and psychomotor. Cognitive is for mental skills (Knowledge), affective is for growth in feelings or emotional areas (Attitude), while psychomotor is for manual or physical skills (Skills). Trainers often refer to these as KAS, SKA, or KSA (Knowledge, Attitude, and Skills). This taxonomy of learning behaviours can be thought of as "the goals of the training process." That is, after the training session, the learner should have acquired these new skills, knowledge, or attitudes.

This compilation divides the three domains into subdivisions, starting from the simplest behaviour to the most complex. The divisions outlined are not absolutes and there are other systems or hierarchies that have been devised in the educational and training world. However, Bloom's taxonomy is easily understood and is probably the most widely applied one in use today.

Competencies Verses Learning Objectives

Education has its own set of vocabulary that sometimes is enhanced by terms used in business. Learning objectives have been around for a while, but competencies are becoming a popular concept to include in curriculum. Sometimes the two terms are used interchangeably, but they are not the same thing.

What is a Competency?

Competency is an educational term relating to the skills, behaviours and knowledge that are necessary to be successful. This can be applied to successful completion of a course or success in a chosen career field. Competencies are more qualitative than quantitative, thus are less easily adaptable to a grade scale.

What is a Learning Objective?

Learning objectives are more specifically targeted to the educational outcomes of a lesson or a course. They are typically written using Bloom's Taxonomy for educational objectives and are tailored for the specific lesson. When collected together, the learning objectives of a course support the competencies.

Learning objectives are often provided by textbook publishers as part of their curriculum package. They might also be adapted or completely written by a school, department or learning team to reflect the specific needs of a school.

Activities at Various Cognitive Levels of Learning (LoL)

Bloom's taxonomy of learning objectives is used to define how well a skill or competency is learned or mastered.

1. At Knowledge Level of Learning a student can define terms,
2. At Comprehension Level of Learning a student can work assigned problems and examples what they did,
3. At Application Level of Learning a student recognizes what methods to be used and then use the methods to solve problems,
4. At Analysis Level of Learning a student can explain why solution process works,
5. At Synthesis Level of Learning a student can combine the part of a process in new and useful ways,
6. At Evaluation Level of Learning a student can create a variety of ways to solve the problem and select the solution method best suited for the problem.

DESIGN ISSUES OF OVCTS

In earlier version of the application on Question Bank, developed by PSSCIVE in 2004-05 in the form of CD have some disadvantages. So the question arises to choose the electronic form of the application. The main choice of medium at that time was CD-ROM and the application tools used to develop was Visual Basic as front end and Ms-access as a bank end database. Due to the dissemination problem it was thought of to develop a web application for the same. After taking advice from the experts, it was concluded that the balance of advantage lay with the Web. Designing a web application on Question Bank for testing the competency of vocational students was a crucial issue. The issues are how to test the competency of a student which requires to test both knowledge and skills and how to disseminate the application to the users. Developing a software of Question Bank on CD-ROM was a static medium and required distribution to users either via some channel who would need a CD-ROM drive on their work-station. The Question Bank would progressively expand its content continuously, which will require to update the CD continuously.

The web based application offer more flexibility, provided an application could be established satisfactorily and the necessary skills should be imparted to teachers to develop and enter the questions in the database as well as to use the system effectively. The application may be placed on the website, and progressively expanded over a time without having to modify and cutting the CD again. The web application would be available to the users with an Internet connection and a web browser, so that it will be free to authorized users as intended. At first, it seems an obstacle to potential users in vocational schools who did not have any Internet access, including government and private schools, but this situation appears to be rapidly changing with expansion of Internet in rural region and increase in bandwidth. Accessibility from a CD-ROM would be quicker in some situations than relying, for instance, on Internet. On balance, however, we concluded that the web technology was evolving, and was more likely to offer longer-term solutions than CD-ROM. The accessibility of the Internet and WWW media are *cheap to use, user friendly, ease of navigation, ease of retrieval, rapid technological advance, and a future oriented.*

What would be the nature of web application on Question Bank? The specific features and the modules of the application and user interface are discussed here. The application like Question Bank hold the lot of information of questions in different vocational courses in electronic form. The problems of storing and making available such large amount of information is considerable. To make available such a dynamic information to users, the task of facilitating access is a considerable challenge.

Technology used

It was decided by the group of experts to design this application by using the open source software which are platform independent and freely available. It was planned to develop the application in J2EE and any of the open source RDBMS as back end. As far as deployment policy is concerned we need to deploy it on National Informatic Centre (NIC), Government of India's web server. PostGreSQL, the most reliable RDBMS was available under the open source for deployment on NIC web server.

J2EE: To develop a web application, we used the J2EE technology which consists of Java Servlet, JSP and RDBMS PostGre SQL. The development tool Eclipse is used for Java development. An Apache Web Server is used for running the web application. The J2EE platform is designed to provide server-side and client-side support for developing distributed, multi-tier applications which are typically configured as a client tier to provide the user interface, one or more middle-tier modules that provide client services and business logic for an application, and back-end enterprise information systems providing data management. With features designed to expedite the process of developing distributed applications, the J2EE platform offers several benefits such as *Simplified architecture and development, Freedom of choice in servers, tools, and components, Integration with existing information systems, Scalability to meet demand variations, Flexible security model*

PostgreSQL: PostgreSQL is a powerful, open source object oriented RDBMS. It has a strong and proven architecture for reliability, data integrity, and correctness. It runs on all major operating systems, including Linux, UNIX (AIX, BSD, HP-UX, SGI IRIX, Mac OS X, Solaris, Tru64), and Windows. It is fully ACID compliant, has full support for foreign keys, joins, views, triggers, and stored procedures (in multiple languages). It includes most SQL:2008 data types, including INTEGER, NUMERIC, BOOLEAN, CHAR, VARCHAR, DATE, INTERVAL, and TIMESTAMP. It also supports storage of binary large objects, including pictures, sounds, or video. It has native programming interfaces for C++, Java, .Net, Perl, Python, Ruby, Tcl, ODBC, among others. It supports international character sets, multibyte character encodings, Unicode, and it is locale-aware for sorting, case-sensitivity, and formatting. It is highly scalable both in the sheer quantity of data it can manage and in the number of concurrent users it can accommodate. There are active PostgreSQL systems in production environments that manage in excess of 4 terabytes of data. Some general PostgreSQL limits are shown below.

Limit	**Value**
Maximum Database Size	Unlimited
Maximum Table Size	32 TB
Maximum Row Size	1.6 TB
Maximum Field Size	1 GB
Maximum Rows per Table	Unlimited
Maximum Columns per Table	250 - 1600 depending on column types
Maximum Indexes per Table	Unlimited

Feasibility Study

It was decided to develop the web application within a very short span of time of about six months by using commonly available hardware and software platform. There will not by any special requirement of hardware or software for development of the system to keep the cost of the project minimum.

Waterfall Model for Software Development Life Cycle

In the discussion with the various experts, it was decided to apply Waterfall Model of Software Development Life Cycle, as it is more systematic approach that begins at the system level and progress through Analysis, Design, Testing, Coding and Support.

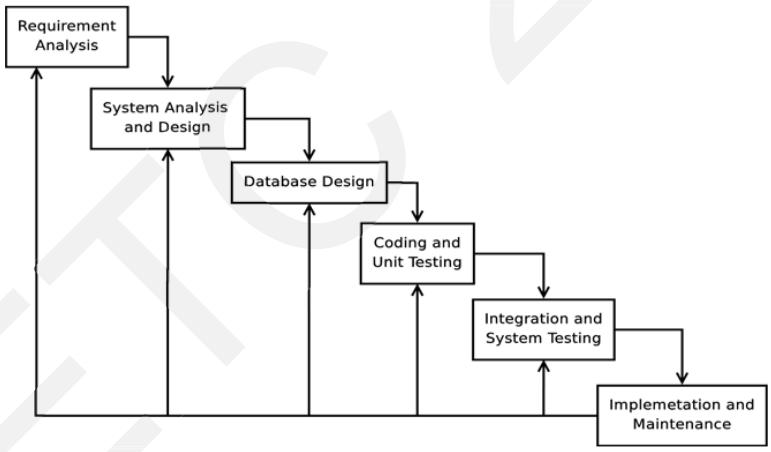


Figure 1. Waterfall Model for Software development Life Cycle

Initially, the requirements, constraints, and goals are established by making consultations with various experts, teachers and students of vocational education. The system design and its architecture is prepared in such a manner that it fulfils the requirements of various users. There are seven main modules of of this web application. They are:

1. ***Student Registration Module:*** This module will register the student with the approval of teacher to utilize the system.
2. ***Teacher Registration Module:*** This module will register the teacher. The teacher play two fold role in this application. On one hand a teacher is a contributor in developing and entering the questions in the database and on the other hand s/he is using the system for monitoring the progress of the students, helps in school registration and student registration.
3. ***Login Module:*** Login Module is an entry point to the system from which all the four types of users namely Administrator, Course Coordinator, Teacher and Student can enter into the system and use the system as per their defined roles.
4. ***Administrator Module:*** An Administrator is the highest authority of the system, responsible for managing the master database and managing the course coordinator of the system.

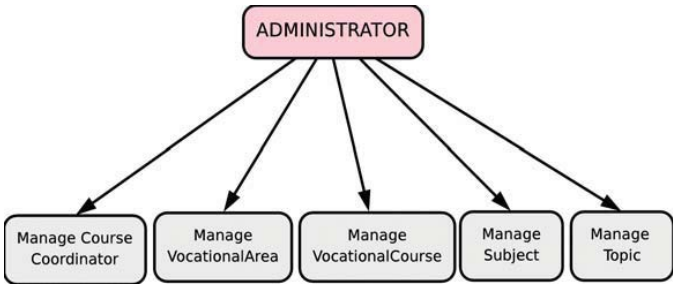


Figure 2. Administrator Module

5. ***Course Coordinator Module:*** A Course coordinator is responsible to manage teachers and question database. A Course Coordinator can approve or disapprove the teacher registration and the questions entered by teachers. Another important task to be performed by the course coordinator is to manage the paper specification in the specification table.

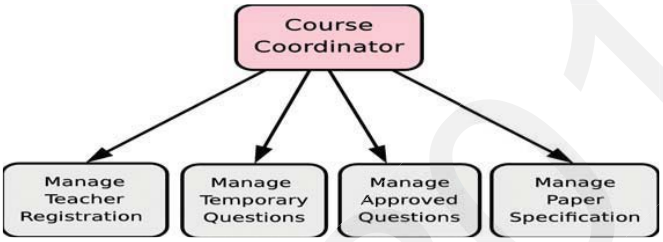


Figure 3. Course Coordinator Module

6. ***Teacher Module:*** The Teacher Module manages Student Registration, Manage the Course Registration, Manage questions, View and Update the profile and View the Reports of their interest.

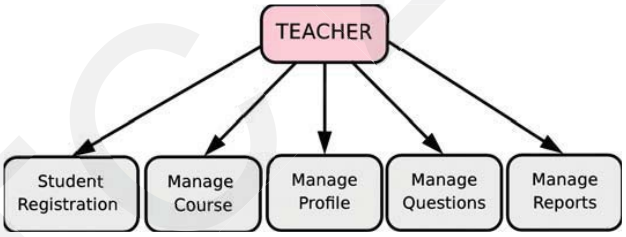


Figure 4. Teacher Module

7. ***Student Module:*** The ultimate user and beneficiary of this system is the vocational student who will test her/his competency by attempting the test in a vocational course. So, it was felt necessary to develop a separate Student Module which will help the student to manage her/his profile, attempt online test and view result of the test immediately after submission.

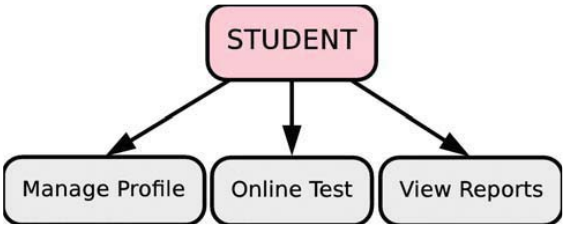


Figure 5: Student Module

Participants and their roles

The main purpose of OVCTS is to store the information of teachers and students of vocational education in India and also to allow them the access it on-line. So, the participants of OVCTS are identified as: (1) Administrator, (2) Course Coordinator, (3) Teacher (4) student.

An Administrator is an highest authority to be appointed by the PSSCIVE for working, updating of OVCTS. It is expected to identify and manage various vocational areas, vocational courses, subjects in the courses and topics of the subjects. An Administrator can add, update, delete and modify the contents, approves and manage the Course Coordinators as per the requirement of vocational courses.

A Course Coordinator, who is normally a PSSCIVE faculty from the concerned discipline, is the higher level in OVCTS. The Course Coordinator can authorizes various vocational teachers, can approve the questions entered by the teacher through out the nation and manage the paper specification. The Course Coordinator can also approve the teacher registration, approve the question and view all the data related with teachers and question bank.

A Teacher is a authentic appointed vocational school teacher in India. A Teacher can register for the vocational courses of his or her expertise in a particular vocational area. After registration only s/he can enter question in the Question Bank and also can update and view their profile.

A student is a registered student of vocational course in India. A student can register in vocational courses of his or her choice or in which s/he has taken the admission and attempt the online test any number of times. The student can see the performance by looking at marks obtained and also can get a complete analysis of the performance, thereby understanding their weaknesses in particular subject. A student can also update and view their own profile.

Information Flow of various users

The information flow for **Administrator** and its access to various field is is given in Figure 7. For example when the administrator selects the vocational area and click the add button, vocational area gets added to the system. After clicking a view button, the vocational areas will get displayed. The vocational areas can be removed from the system just by selecting it and then clicking the remove button. Such operations can be performed for vocational course, subjects, topics and Course Coordinator as well.

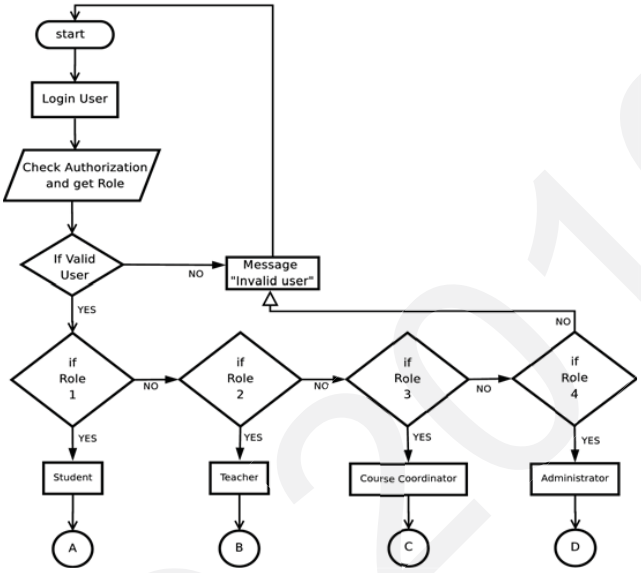


Figure 6. System Flow Chart

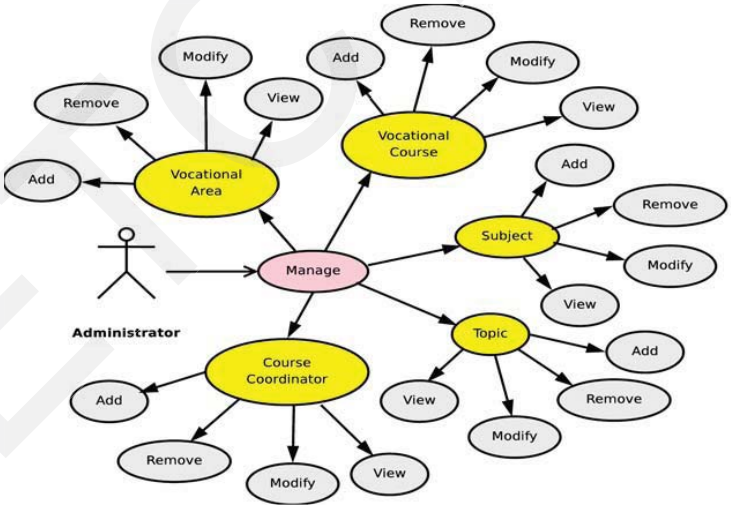


Figure 7. Information flow for the Administrator

The information flow for **Course Coordinator** and its access to various field is as: :

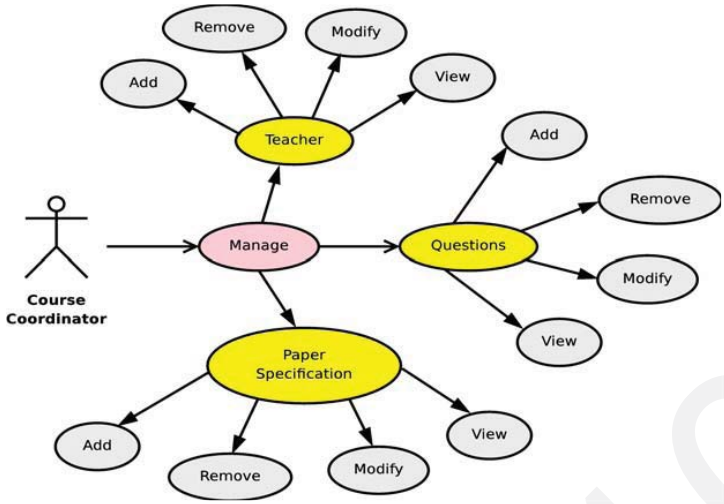


Figure 8. Information flow for Course Coordinator

A Course Coordinator can manage the temporary questions entered by the teachers, can approve the questions or reject them. A Course Coordinator can approve the teacher registration for the registered course. A course coordinator can also mange the specification table to prepare a blue print for online test.

The information flow for **Teacher** and its access to various field of the system is as:

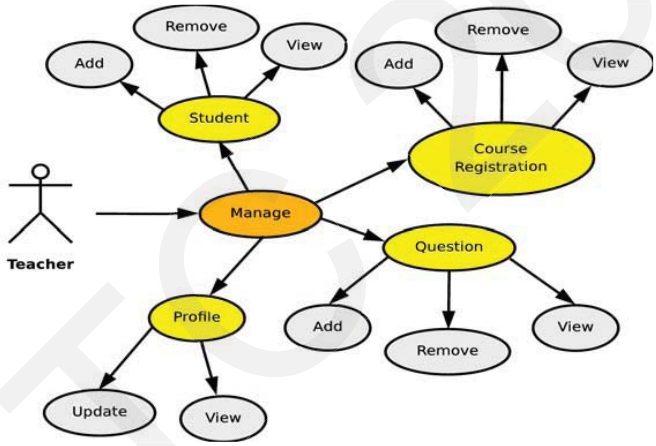


Figure 9. Information flow for Teacher

A teacher can add, remove and view a question and he can register himself for the various courses based on his expertise.

A student can register for a course and attempt an on-line test. The information flow for student and its access to various field of the system is given below:

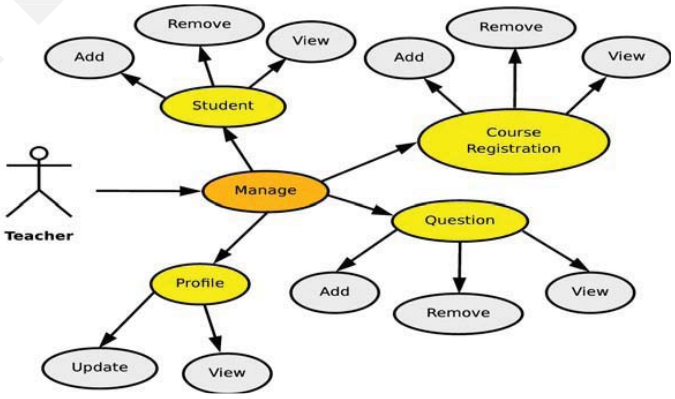


Figure 10. Information flow for Student

Various Activities

The various activity diagrams for the activities performed by the Administrator, Course Coordinator, Teacher and Student are given below:

Activities performed by the Administrator

(1) Login
(2) Add Vocational Area
(3) Modify Vocational Area
(4) View Vocational Area
(5) Add Vocational Area
(6) Delete Vocational Area

Some of these activity diagrams are given below:

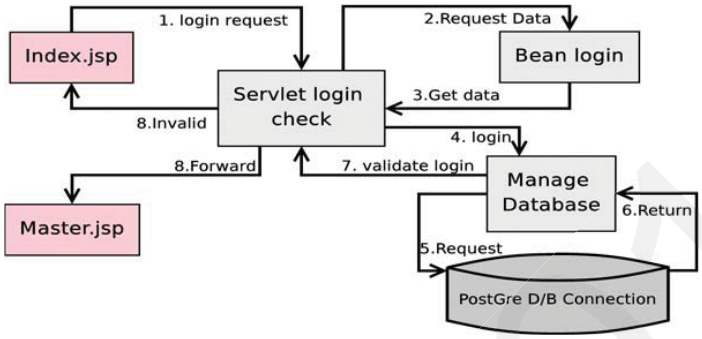


Figure 11. Administrator Login Activity Diagram

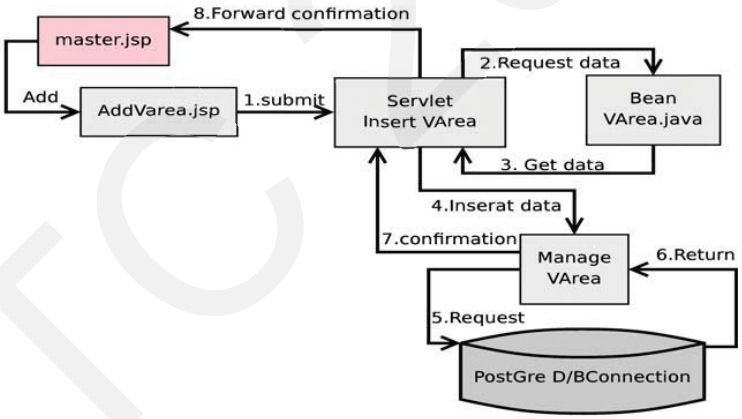


Figure 12. Activity Diagram to Add Vocational Area by the Administrator

Activities performed by the Course Coordinator

(1) Login
(2) Approve Questions
(3) Mange Teacher Registration
(4) Manage Unregistered Teacher
(5) Remove Approved Questions
(6) Remove Temporary Questions
(7) Manage Specification Table

Some of these activity diagrams are given below:

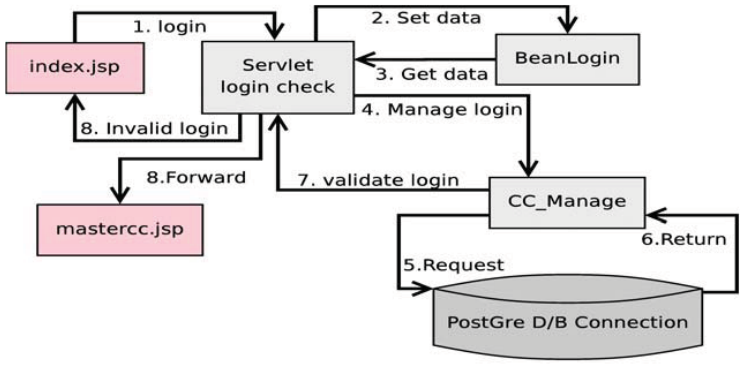


Figure 13. Course Coordinator Login Activity Diagram

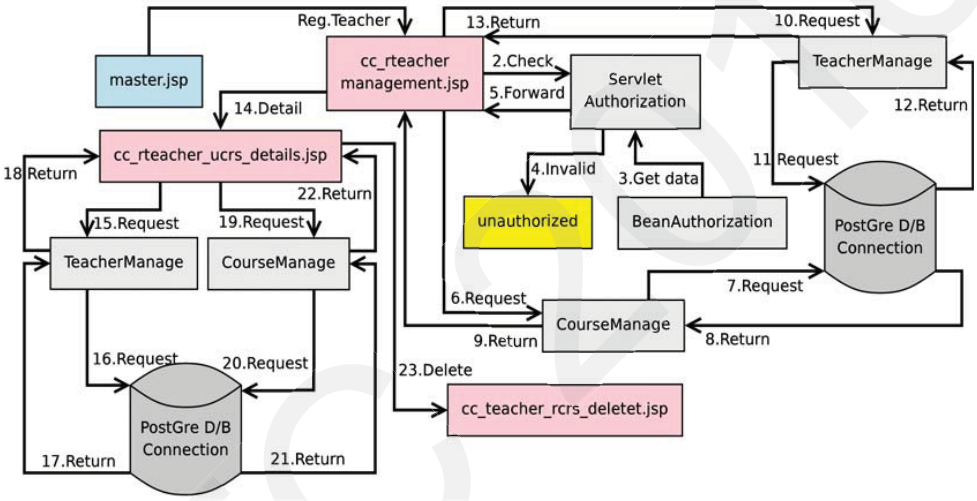


Figure 14. Activity Diagram to Manage Registered Teacher

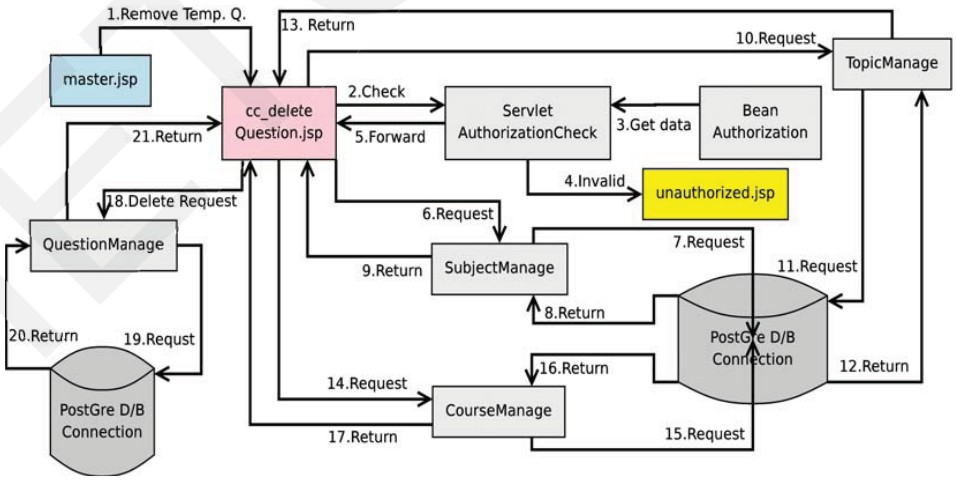


Figure 15. Activity Diagram to Remove Temporary Question

Activities performed by the Teacher

(1) Login
(2) Teacher Add Course
(3) Teacher Remove Course
(4) Teacher View Course

Some of these activity diagrams are given below:

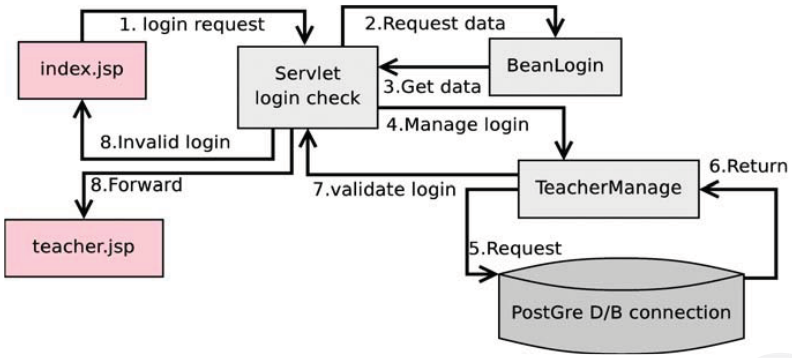


Figure 16. Teacher Login Activity Diagram

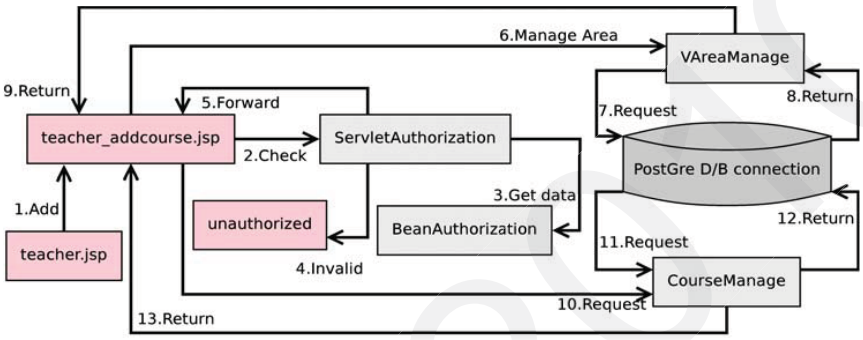


Figure 17. Teacher Activity Diagram to Register for New Course

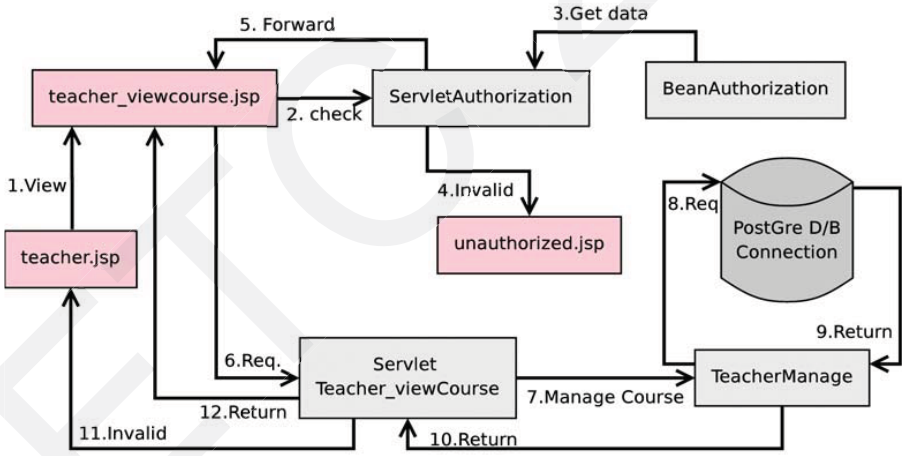


Figure 18. Teacher Activity Diagram to View Course

Activities performed by the Teacher

(1) Login
(2) Student View Profile
(3) Student Update Profile

Some of these activity diagrams are given below:

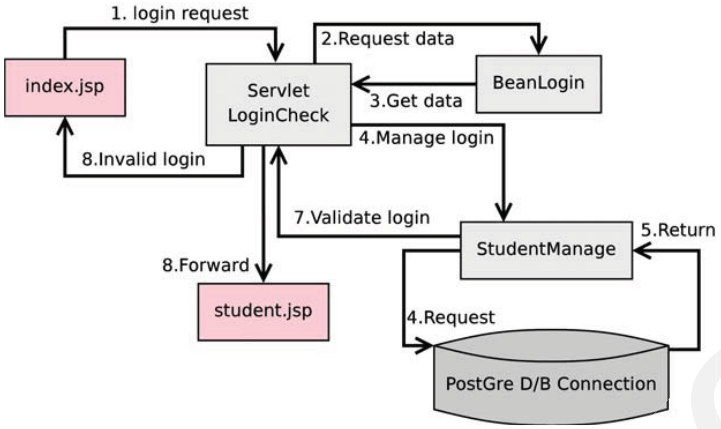


Figure 19. Student Login Activity Diagram

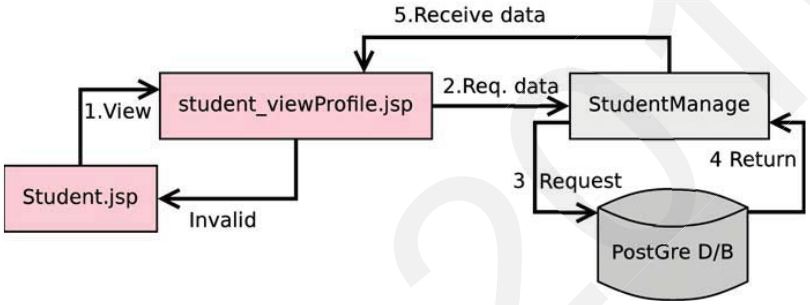
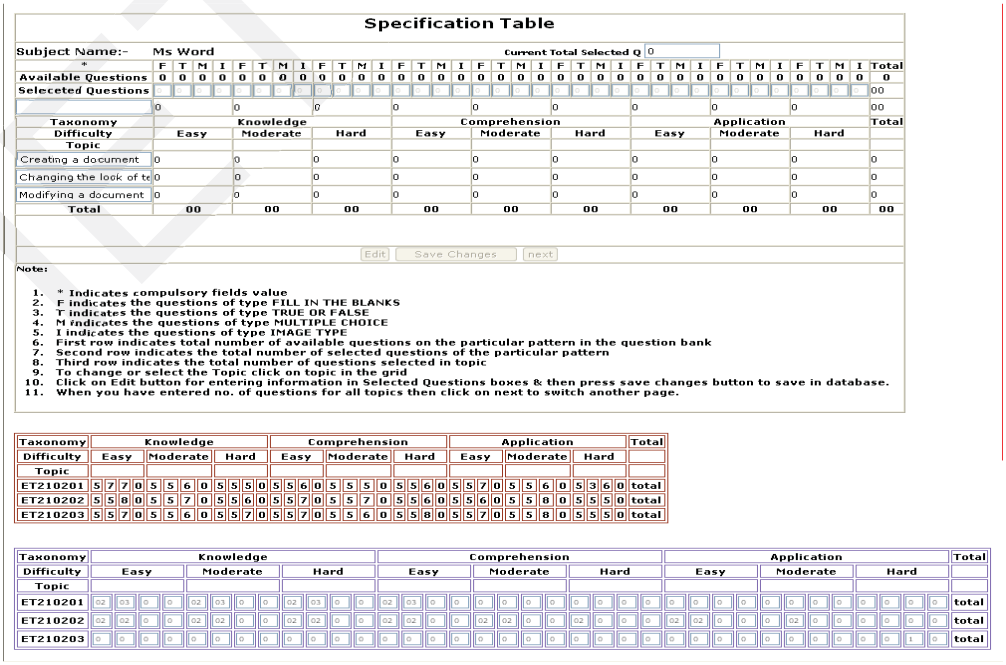


Figure 20. Activity Diagram to View Student Profile

SPECIFICATION TABLE

A Specification Table is the heart of OVCTS. In the specification table, we decide the type of the question to be selected, its difficulty level and taxonomy table. The Taxonomy level is classified into three categories such as Knowledge, Comprehension and Application. The Difficulty level is classified into three categories such as Easy, Moderate and Hard. A Course Coordinator is an authority to access the specification table, can change the specifications as per the requirements. The format of specification table is given below.



Specification Table

Subject Name:- Ms Word Current Total Selected Q 0

*	F	T	M	I	F	T	M	I	F	T	M	I	F	T	M	I	F	T	M	I	F	T	M	I	Total
Available Questions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selecected Questions																									00
	0				0				0				0				0				0				00

Taxonomy	Knowledge			Comprehension			Application			Total
Difficulty	Easy	Moderate	Hard	Easy	Moderate	Hard	Easy	Moderate	Hard	
Topic										
Creating a document	0	0	0	0	0	0	0	0	0	0
Changing the look of te	0	0	0	0	0	0	0	0	0	0
Modifying a document	0	0	0	0	0	0	0	0	0	0
Total	00	00	00	00	00	00	00	00	00	00

Edit | Save Changes | next

Note:

1. * Indicates compulsory fields value
2. F indicates the questions of type FILL IN THE BLANKS
3. T indicates the questions of type TRUE OR FALSE
4. M indicates the questions of type MULTIPLE CHOICE
5. I indicates the questions of type IMAGE TYPE
6. First row indicates total number of available questions on the particular pattern in the question bank
7. Second row indicates the total number of selected questions of the particular pattern
8. Third row indicates the total number of questions selected in topic
9. To change or select the Topic click on topic in the grid
10. Click on Edit button for entering information in Selected Questions boxes & then press save changes button to save in database.
11. When you have entered no. of questions for all topics then click on next to switch another page.

Taxonomy	Knowledge			Comprehension			Application			Total
Difficulty	Easy	Moderate	Hard	Easy	Moderate	Hard	Easy	Moderate	Hard	
Topic										
ET210201	5	7	7	0	5	5	6	0	5	total
ET210202	5	5	8	0	5	5	7	0	5	total
ET210203	5	5	7	0	5	5	6	0	5	total

Taxonomy	Knowledge			Comprehension			Application			Total
Difficulty	Easy	Moderate	Hard	Easy	Moderate	Hard	Easy	Moderate	Hard	
Topic										
ET210201										total
ET210202										total
ET210203										total

Figure 21. Specification Table

CONCLUSION

The various issues associated with the designing of Online Vocational Competency Testing System (OVCTS) are discussed in this paper. OVCTS facilitates a student to generate a automatic, balanced question paper that contains different types of objective questions with the different taxonomy and difficulty level. It is possible to test the competency of the vocational student by taking an on-line test through OVCTS as the student is going to attempt the questions of knowledge and skill type which is related with the competency. The performance of an on-line test is evaluated on different parameters immediately. The students can take the test several times so as to understand their weaknesses to improve further. The teachers can also take corrective measures to improve the teaching-learning process in VET.

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DESIGN OF A BASIC COMMUNICATION LABORATORY ON VIRTUAL MEDIUM

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Abstract:
The rapid progress of scientific and technological development has caused the birth of modernity on education, and picking up speed of already existing modern instruments. Laboratory studies are the important complementary components of educational programs. Experimental studies also help to strengthen the theorical study in addition to earning practical talents. Lack of equipment capacity used on application laboratories of education quality and quantity has brought up the alternative application labs. In the light of the rapid progress of internet and computer technology, virtual lab application which establishes an alternative to the traditional labs has become attractive. Consequently with virtual lab applications, it has been possible to make experiments without the limitation of place, time and device. Moreover, it has been found that simulation tools make students who are less talented on maths and has had difficulty in complex circuit analysis conceive the underlying scientific facts easily. It is also been encountered that by the usage of simulation equipment in the lab environment, the application performance has increased in the simulation surroundings. Since it has been focused on subjects instead of the components and the connection between them, the rise of motivation is another development. In this study, by the usage of Pspice software, in the basic communication experiments, the realization of a virtual learning environment has been aimed. The designed virtual learning environment, together with its complementary role to formal education has provided the usage of different approaches in education.
Keywords: Communication, simulation, virtual laboratory, Pspice, Internet

INTRODUCTION

Today, computers are the most useful tool for us and this is valid in the field of electrics and electronics as well. Simulation of a system means that the process of building a model represents this system itself. Simulation ensures a experience that can be obtained by real practices for long time to gain and learn by doing and living in a exactly safe environment animated by a computer. Firstly, considered circuits are tested in a computer program and then production is started. This not only saves time but also provide us to see and correct probable mistakes before they come up. Currently, Pspice is the most preferred simulation program by either professional or beginners. Two reasons of that, first Pspice has a peripheral designed well and very wide-ranging component library. Second and the most important one, it makes various kinds of analysis of simulation possible (TOBIN, 2007). Pspice enables users to explore topics freely with features of high visual quality, fast simulation and comprehensible circuit theories, etc. (MCKINNEY, 2006).
Two kinds of electronic simulation programs are used to research behaviors of test systems. First kind uses function blocks to test a system. Second kind makes system analysis possible by saving us from functional blocks. Pspice is a second kind software package and a world Standard investigating circuit design. Besides, Pspice permits users to convert difficult mathematical operations into understandable circuits. (TOBIN, 2007).
The general aim of this study is to implement basic experiments in the field of communication by way of virtual medium and make topics well comprehensible. These experiments are prepared by using Orcad Capture and supported by process steps. In case simulation tools are used in a lab environment, performance of application is increased as known. Moreover, since it would rather enable us to focus on topic than components and links among components, motivation is increased.

METHOD

Modulation and Demodulation

In order that information signals can be sent away, information signal is added on high-frequency carrier signal by changing its amplitude, phase and frequency. Therefore, it is transferred and carried by a signal with higher frequency than its own. Information signals adding on carrier are transmitted to space by sprawling. (ÇOLPAN, 2004). This change in frequency is achieved via modulation between high frequency signals and low frequency signals. Information signal to be superimposed over the carrier signal is called modulation.
Information signal to be changed due to the carrier signal is called amplitude modulation. Amplitude modulation is examined in this study with four different applications. In this way, the work can be done using different elements have been proved. As a first, amplitude modulation of transistor circuit is investigated. The information and carrier signal are observed on a computer screen by this circuit, the resulting modulated signal is examined. Second, the amplitude modulation is carried out using mult element. Mult element multiplying two signals at its own inputs transfers the result of this process to its own single output. Fourier transform curve was shown in the simulation screen by this application and lower, upper and edge bands have been observed. Calculated value was compared with bandwidth value in the simulation screen.
Signal to noise ratio in high-power transmitters has to be small. Signal to noise ratio in high power amplitude modulated transmitters is large enough to cause problems. Frequency modulation (FM) is improved so as to avoid the problem. According to the amplitude of the information signal, frequency of carrier signal varies in frequency modulation (TORUNLAR, 2006). Frequency modulations with two different circuits are investigated. First, simulation is carried out by means of using eval function. The modulated signal and frequency spectrum of it were analyzed. Bandwidth values calculated are compared with the

results values from simulations. In the second, frequency modulation is investigated by using sub-block creation logic. For different values of the information signal, the frequency spectrum is investigated.
Analog signals are converted to digital signals using Analog-Digital Converter (ADC) as we know. Digital information is in the form of pulses. There are three features of a pulse can be changed. These are amplitude, width and location features. The most widely used communications with the pulses first code is Morse Alphabet. Letters and punctuation marks in the Morse code are described using points, lines and spaces. Morse code is not suitable for use in digital computers. This is because the number and width of symbols of the characters to be sent are not equal. Digital information in modern digital communication systems consists of digital codes equal width and based on binary. General communication systems in which this method used are called Pulse Code Modulation (PCM) (KARACAN, 2003). Switching modulation with Amplitude Shift Keying (ASK) is a form of information signal that is square and carrier signal that is sinusoidal. Implementing it is not different from the methods we know. Resulting signal at the modulator output by that information signal and carrier signal applying to the modulator inputs are passed through a band-pass filter and ASK modulated signal obtained at filter output. With this application, the use of square wave in amplitude modulation is investigated. Different output signals resulting from the simulation are compared with each other.
The purpose of this application is to constitute pulse code modulation circuit and examine waveform of output signals. In addition, sampling and coding phases are investigated through graphics obtained. Analog input signal and digital output signal are approximately the same, from beginning to the end, PCM system works the same as in daily life has been seen in consequence of simulations.
The process, the information signal is separated from modulated signal, is called demodulation or detect. The circuits in which this process is done are called demodulator or detector. The detector with diode is examined in the practice. Since there is the message signal at both sides of modulated signal, one of positive or negative sides is enough for us. In general, positive side is used. This choice is related to total circuit design without a special reason. Carrier signal in this signal is still there and useless. Because frequency of carrier signal is high, it doesn't need anyway. The part of it needed is the message signal with low frequency. Due to the fact that this total signal consists of two signals with high and low frequencies, when it has been passed through low-pass filter, the message signal needed is obtained. The structure of low-pass filter used is very important at this stage. If the capacitor in the circuit is kept at high capacity, best results are obtained for message signal with high frequency and bad results with low frequency. Namely, there is deformation in the message signal obtained again. If the capacitor in the circuit is kept at low capacity, there is deformation in the message signal in the opposite direction. This deformation in information signal can be safely ignored in some cases. This has not got any importance at the communications containing only speech. Listening person can understand what speaking person talk, there is not any problem. For example, radio talks or voice of news readers can be given. But in some cases, the rate of deformation is important. In the most simple, while listening to music, always preferred the sound is closest to reality. The modulated message signal can never be obtained with %100 purity whichever method is used. How close to reality, the better it is. Finally, the aim of this application is to constitute amplitude modulation circuit with transistor and examine output signal waveforms.

Phase Locked Loop - PLL

PLL is a closed-loop frequency control system in simple. Especially, the size and cost advantages thanks to integrated circuit technology, this method has become widely used in the fields of telecommunications and industrial electronics. PLL technique was developed in the 1940s in order to ensure stability of local oscillators used in superheterodyne receiver. Currently, PLL technique is used in stable frequency synthesizers, FM demodulators, stereo demodulators and decoders.
In this study, PLL circuit is also examined. Data and the Voltage Controlled Oscillator (VCO) signals were obtained as scaled. When the system is started, it is seen that frequencies are not equal, but after a certain time they are equal. Besides, frequencies locked to each other in a shorter period through increasing the input frequency was obtained from simulation results.

Dual Tone Multi Frequency – DTMF

Information technology used in digital communication, digital information is obtained from the analog information. Information in electromechanical communication is the form of pulses that relay contacts produce within a certain logic chain and it is processed as analog. Owing to the fact that digital information to be processed in digital communication systems is absolutely binary "digital", the information applied to inputs of digital system has to be converted into digital. The pulses produced in rotary dial and Dial Pulse (DP) type telephone machines means numbers translated. These pulses are converted into digital information before applied to digital telephone exchange. In DTMF system, all ten numbers used in both telephone exchange and electronic telephone machines are converted into binary numbers in the form of sum of certain two frequencies. In this conversion, frequencies between 697Hz and 1633Hz are used. Every number used is obtained from high-low combination of the two frequencies. DTMF, means that multi-frequency pairs, indicates that the presence of a frequency pair corresponds to each key on the keypad (GÜRKAN, 2005). Because communication is fast, the system is fully electronic form, the repetition of signals and each key has a different ton, process occurs much faster.
Purpose of this application is to compose keypad decoding circuit and examine output signal waveforms. As a result of the application, simulation results were obtained for different key values. A mixture of two different signals applied to input was obtained from the output.

Filters

In telecommunications systems, the sound energy in the mouth during a normal conversation is converted into electric power. Power level, normally heard with headphones and understood, is accepted as reference. Electrical reference power was selected 1mW as the reference in telecommunications. Audio band used for telephone communication was chosen as the 300-3400Hz. This bandwidth for communication provides sufficient opportunity, intelligibility and distinguishing it belongs to whom (KURUN, 2001). Filters, very useful structure, come out at the beginning of analog circuits in electric and electronic circuits. Filter structures are used so as to form frequency spectrum of electrical signals. Filters in electronics and communication systems find a wide application area. In particular, filters are used to pass only desired frequencies among ones applied to system. Low-pass, high-pass, band-pass and band-stop filters can be designed depending on that implemented transfer function can be changed

with frequency. The filter output signals were obtained and examined in this study, too. It is seen that the curve of band-pass filter is as overlapping of curves of low and high pass filters. Values, calculated and obtained from simulation results, were compared with each other and observed same as each other.

Material

An interface was created using Dreamweaver™ and have been transferred onto the internet to implement applications in computer lab. Links were given in relation to documentation and circuit applications in this interface. Web site (Figure 1) used in the study has been designed by researchers. The site's design and the characteristics of the study group have been made by taking into account the results of similar applications in the formal education. Fonts used on the site are sure to be large in size. Any guidelines, links, images and pattern not suitable for this study have not been used. www.haberlesme-deneyleri.com is used as the domain name in the study because of suggestive and qualifying the study. Desired course and experiment can be chosen from experiments belongs to relative course by using the menu bar. In the test menu, ten questions are randomly asked from forty questions prepared. If user wants, he or she can see how many questions are answered correctly and correct answers of questions. Experiments and the other necessary software can be downloaded from the download menu. User takes necessary information about courses over Web site and then can download desired experiment and perform it on a computer. Experiment can be implemented by following the process steps given in Web site.

Application

This study was applied to branch of communication students in Şişli Vocational High School. One of two classes have examined the subject with classical methods, on the other hand the other class have used simulation program, too. 20-question knowledge test were prepared by researchers to measure students' factual knowledge. The distinguishing feature of the test has more difficult questions than normal. This test is used as front-end test in the study. The education began after knowledge test was applied to classes. The education is given to each two group in same class by the same teacher. Knowledge test was applied again to both groups at the end of education.

Figure 1. Laboratory interface constituted on virtual medium.

RESULTS

Circuit modeling and analysis have been achieved by Orcad™ program in this study. As a consequence of the study, using of Orcad Capture component libraries, building of circuit schemes and analyzing of them are carried out in sequence. Circuits previously prepared in a different program using block diagrams can be easily implemented with Orcad Capture as well and Orcad Capture program is powerful tool in terms of analyzing circuits are proved. The study reveals us how useful Orcad Capture program is in this kind of experimental works. The study also verifies that, how effective the simulation is in terms of learning a topic if it is used in education.

SUGGESTIONS

In this study, basic experiments related to communications are given. If required, other communication experiments can be applied in the same way. If component libraries aren't enough while working in Orcad Capture program, more models can be reached from http://www.cadence.com/products/orcad/pages/downloads.aspx address and different circuits can be analyzed. The benefits of improved features can be used by examining Orcad Capture 16.3 version Some applications can be extended to a statistical study. Many different applications related to virtual medium constituting an important pillar, can be discussed. Today, many virtual learning environments are developed. Some commercial software such as Blackboard, WebCT and Moodle have came out in order to support learning at highest level, give students and teachers some rights and make virtual learning enriched. It is clear that, if this work is transferred to such a virtual learning environment, it will have the advantages mentioned above.

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Design of a Dynamique Web Site

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Abstract-*A dynamic Web site sends the information in the form of lists and tables. Approaches have gainst high accuracy of dynamic website in order to solve the problem of static websites that take time for their updates, as long as the latter is done manually. A dynamic programming algorithm to extract lines and columns from a database data achieves high performance with minimal user input.*

INTRODUCTION

In recent years, Internet applications will grow more after the traditional Client / Server, since the C / S does not meet their needs. In this direction, a structure of three layers seems to be more potential. The three layers are the client layer, application layer and data layer [1]. Because of this dynamic pages consist of a list or table become extensively used. The data contain ed in the list or table are typically extracted from a database based on a user issue. The process is adapted to a human user is the interface with a database.
The process of form filling (to enter the question) and viewing the resulting lists or tables takes time, and it would be desirable to automate, especially when this process must be repeated several times, when it comes to track information over time, or to obtain data for a large number of issues. If the website does not change, then it is quite important to tailor a program to the needs of the user to extract the information from a particular web site [2].

TECHNOLOGY WEB

TECHNOLOGY DYNAMIC SERVER SIDE

Active Server Page (ASP) :
The ASP is a scripting environment server or "embed script" that runs on the Internet Web server Information Server (IIS) from Microsoft. Forerunn er of the JSP or PHP, ASP h as revolutionized Web programming and the new generation. NET goes beyond by allowing full integration of programming client / server. It is in terpreted, ie it need not be compiled. The ASP can generate on the fly HTML pages dynamically. Th e ASP commands are includ ed directly in an HTML document. The commands are written in script first performed by the processor ASP. Th e default script language is VB script (derived from Visual Basic). Th is mean s that th e ASP offers a multitude of features th at HTML does not. Dynamic content updated in the handling of databases, a variety of transactions that the client did not perform. The disadvantage of cou rse is that server resources are greatly arrested unlike an HTML page that is executed by th e client browser

PHP (Hypertext Preprocessor):
Th e language PHP (Hypertext Preprocessor) is now in a few years of existence, the programming language dynamic websites most popular. Just as the Apache Web server, the Linux platform and database manager MySQL, PHP uses Op en Source software free an d unrestricted, and thus remain s the most economical Internet application at a cost minimum.PHP is a scripting language running main ly server side. PHP, like ASP (Active Server Pages) from Microsoft, are incorporated directly with th e HTML markup within a Web page. Combined with MySQL, PHP language allows to develop powerful web applications related to n ecessary databases. Borrowing concepts from languages such as Perl or C, PHP is a scripting language capable of running any platform. Indeed, each of Microsoft's operating systems, Unix, Linux or Mac OS X, can become a support for Internet applications written in PHP by hosting a special module which integrates with the web server in place. Thus, most web servers just like Microsoft IIS (Internet Information Server), Netscape Enterprise Server or Apache, PHP technology can withstand. In addition, PHP has many tools that facilitate connectivity to databases not only as the RMSDB (Management System Relational Database) preferred, MySQL, but almost all other such as Sybase, Oracle, SQL Server or dBase.
We can accept that PHP has grown from a scripting language to a basic but practical platform complete development and used on larger professional sites. It is important to know the strengths of a language before starting to ensure that it responds well to needs of the web project. Here is a list of features of PHP that make it an unavoidable and easy access to the web:
PHP is a scripting language. It is interpreted, therefore it does not need to be compiled for a object, an executable file before being usable (as in C for example).
PHP is a module supported by the web server Apache, the most prevalent worldwide (over 70% of web servers), it is designed to be easily usable via th is server (it obvi ously works with other web servers as IPlanet , IIS ...).
PHP can easily exploit numerous databases like Oracle, MySQL, dBase, Sybase, PostgreSQL MSQL .... an d can connect to any database with an ODBC driver (Open Database Connectivity). PHP can connect with on line payment systems: Verisign, Cybercash, Credit Mutuel ...
PHP recognizes the essential protocols and formats on the Internet and Intranet: TCP, HTTP, SMTP, LDAP, IMAP, POP, SSL, SOAP, XML, PDF ...
PHP is free and efficient as MySQL, why the duo PHP / MySql is very easy to set up and offered at moderate prices in the hosts.
PHP / MySql is widely documented as more and more prevalent especially on professional sites (Free, Wanadoo, Le Monde, Le Figaro, Yahoo, TF1 ...).
PHP is cross platform: Windows, UNIX, LINUX and MAC OS.
PHP (version 4 and 5) runs quickly with a solid stability[4] .

JSP (Java Server Pages) :
JSP (Java Server Pages) is a stan dard for developing interactive Web applications, whose content is dynamic. That is to say that a web page (JSP identifiable by the extension. Jsp) have content th at may be different depending on certain parameters (in formation stored in a database, th e preferences of the user .. .) web page while "classic" (with extension. Htm or. html) continuously display the same information.
Java servlets (JSP pag es are ultimately con verted into servlets), allow the full power of Java and its APIs used to implement dynamic websites and effective. In fact, the Java language to be being compiled, the Java servlet processing is more effective than some technologies for the same purpose, but rely on interpreted languages: ASP or PHP include. First, he should know that to be terminated, your Web application needs a server providing a number of services (including an HTTP service). Th e J2EE (Java 2 Enterprise Edition) provides one.
Indeed, for a servlet can be triggered by an HTTP request, which must be deployed on a server J2EE applications. SUN Microsystems

specifies a standard application server. Any other company, if it wishes to develop a J2EE-compliant application server must meet th e standard. The J2EE, provided by SUN, contains an application server and a testing tool to archive and deploy your application on the server. We will use these tools to test our servlets.

TECHNOLOGY DYNAMICS OF CLIENT SIDE

Dynamic HTML:
Dynamic HTML is not an extension of conventional HTML form of new HTML tags. It is n ot a new language.
Dyn amic HTML is rather a concept of group ing together different solutions that allow the author of a WWW page dyn amically ch ange elements of th e choice of the WWW page for display.

Client Scripts:
Th e computer program that does not require compilation before execution. To work, the scripts must be interpreted by a program or a dedicated server to th e language in which they were written. Programming languages can be classified into two families: the compiled languages and interpreted languages.
Compiled languages (like C / C + +, COBOL, Lisp, and many others) need to be compiled executable on a computer. This compilation is tantamount to translate a program into machine language pure, so that a computer can understand the following statement. Programs written in an interpreted language, or scripting language (such as JavaScript, PHP, ASP, Python, etc..) Do not require compilation before bein g executed. However, they require that th e mach in e intended to execute h as an interpreter, a program that can understand all instructions in th e program.

VB Script:
VB Script (also known as Visual Basic Scripting Edition) is a subset of Visual Basic for Applications (VBA), a proprietary language from Microsoft designed to be integrated with Microsoft Office products, the VBA language itself being a subset of Visual Basic. The VB Script allows you to interact with the objects of the environment in which it is embedded.

java script:
JavaScript is a scripting language that can be integrated directly within Web pages, to be executed on the client. Th en the Web browser that supports th e execution of these little bits of programs called scripts. typically, JavaScript is used to control the data entered intoTypically, JavaScript is used to control the data entered into HTML forms, or to interact with the HTML documen t via th e DOM interface provided by the browser (it is sometimes called dynamic HTML). It is also used to perform dynamic services, sometimes frivolous or purely cosmetic.

Java Applets:
Java is a powerful language and with opportunities graphics easy to implement and allows the animation html pages which is the main reason for its success. Java allows the development of either conventional application with access to all features of eith er language Applets are programs to be executed in a web browser. For security reasons, an applet can not handle the memory or files of the host machine. An applet is a program written in Java th at can be included in an HTML page. Wh en you load a Java applet through a browser if it supports Java, the code is transferred to a Java virtual machine that runs it. Java is both a programming language and an execution platform. The Java language has th e peculiarity mainly to be portable across multiple operating systems such as Windows or Linux. This is the platform that ensures the portability of applications developed in Java.

the Active X:
The Active X software componen ts are varied to th e Windows world, they are defined by their values attributes, the operations they can perform, they can trigger events, etc.. All models comply with the COM / DCOM set by Microsoft. Sometimes specified "Active X" to signify that the component is small in size and can easily integrate into an application or in an HTML page (like a countdown, calen dar or an electronic directory). But th e concept of Active X con flates all COM components that provide an interface dynamically publishable. Thus, applications of size may be imposing Active X: Word and Excel, to name a few, are examples.

DATABASES

INTRODUCTION
Databases are the heart of dynamic Web applications. Often databases that the Web server gets th e updated nformation for Web pages created on the fly. One database is a collection of data whose structure reflects the organization observed in the real world. The contents of th ese data is a common basis of current information available to all users of a scope [3].

SMDB
All operations on a database are allowed through to the SMDB: System Management Database, which defines, manipulates an d controls the data. Different models of SMDB exist, but for many years, the relational model (R SMDB) that has become standard. The software's most famous markets are all of th is type (Access, Oracle, SQLServer, Informix, Sybase, FileMaker, MySQL, DB2, Paradox, etc..).

THE RELATIONAL MOD EL
In the relational model, data is stored in two- dimensional tables: lines (Records) and columns. Th ese tables can be sorted and linked according to specific criteria. This structure avoids data redundancy and facilitate their management and update. To communicate with the relational database, using a data manipulation language called SQL (Structured Query Language). SQL functions: language definition and validation of data: to create, modify and delete tables in a database, or to define default values for certain areas an d control rules for coding, language data manipulation: select, modify, insert, combine, sort, or delete data in tables in a database or to link tables between them using the key areas, language access control to data: to identify permissions granted to different users of the database. Thus, our contribution is to develop a dynamic website Lab STIC to facilitate the management of students, teachers to give their online courses, exams notes remotely, and monitor any changes in Laboratory, all this must be done in a dynamic way in which the interests of our project development of such a tool is th us accompanied a MERISE method, it is a method of design and development Information Systems, covering the needs of both government and business, this method has been developed by a group of service companies, under th e direction of Technical Computing Center (TCC) of Ministry of Industry[6].
Our work is with the scheduling of a dynamic website using

- The dynamic programming language PHP

- Th e MySQL database server (database)
- The APACHE web server which will be defined later.
- Th e Macromed ia Dreamweaver. [5]

The main aspect of this program is to make the website as flexible as possible in order to reduce the latest day as caused repeated static web sites, and the occupation of large memory, time CPU time admin istrator, and non -use of dyn amic databases.

THE WEB SERVER:

Ap ach e HTTP Server software, often called the Ap ach e HTTP server is produced by th e Apache Software Foundation. This is the most popular HTTP server on the World Wide Web. This is a free software with a type specific license, named Ap ach e license. Th e web server software (HTTP server) referen ce developed originally built around the UNIX to improve the functionality and security of the NCSA Web server, the team now more of an In ternet server two! This success, th e Apache has at least two factors th at make the success of software: First Apach e as open source software is free (as two other hits such as the browser Netscape or Linux OS). On the other hand Apache is a powerful system, reliable an d constantly chan ging.

ARCHIT ECTURE IMPLEMENTATION

Our application of the STIC laboratory site is based on a three-tier architecture. This architecture is characterized by the presence of an in termediate between two other levels, these three levels are defined as follows:

Level 1 "The Client" is the user (or surfer). Its role consists primarily of requ ests and search for information to Level 2.

Level 2 "server application" that server has questioned turn to another server called "server level 3" or "server database" to provide the answer (Resource) to the clien t level 1.

Level 3 "Data Server" is th e server that queries a database to provid e the resource requested by the client application server for transmission in turn has th e client.

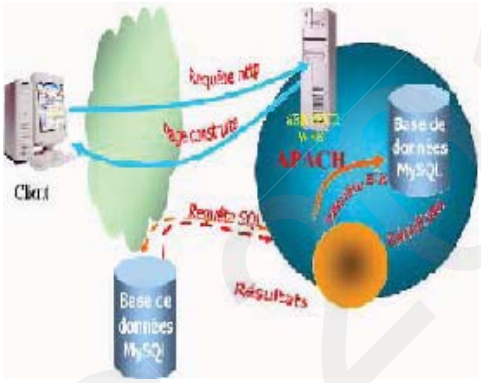


Fig.1. Structure Of the application

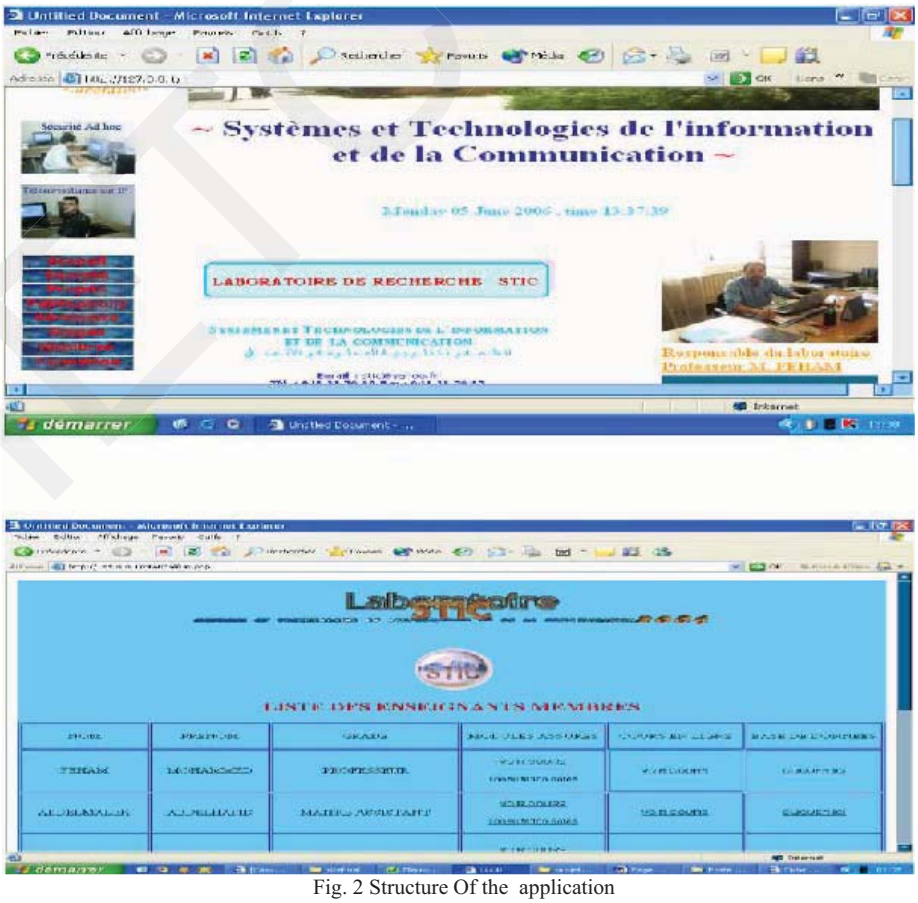
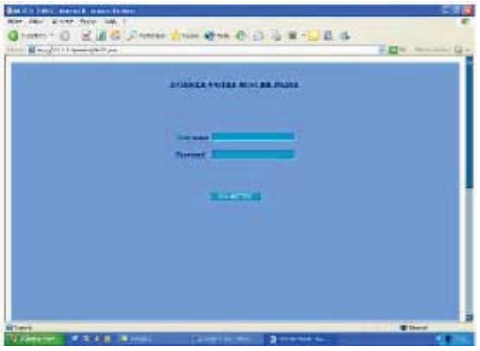


Fig. 2 Structure Of the application



Who can:
- See the list of students.
- Provide notes exams.
- Changes in notes.
- See the list of modules.
- The addition of courses provided.
- Can cellation can exist.
- Th e addition of online courses.
- Th e removal of online courses.
- Close the session

Fig 4 Card-index Teaching Password.
Fig 4 for Login and Teaching Password

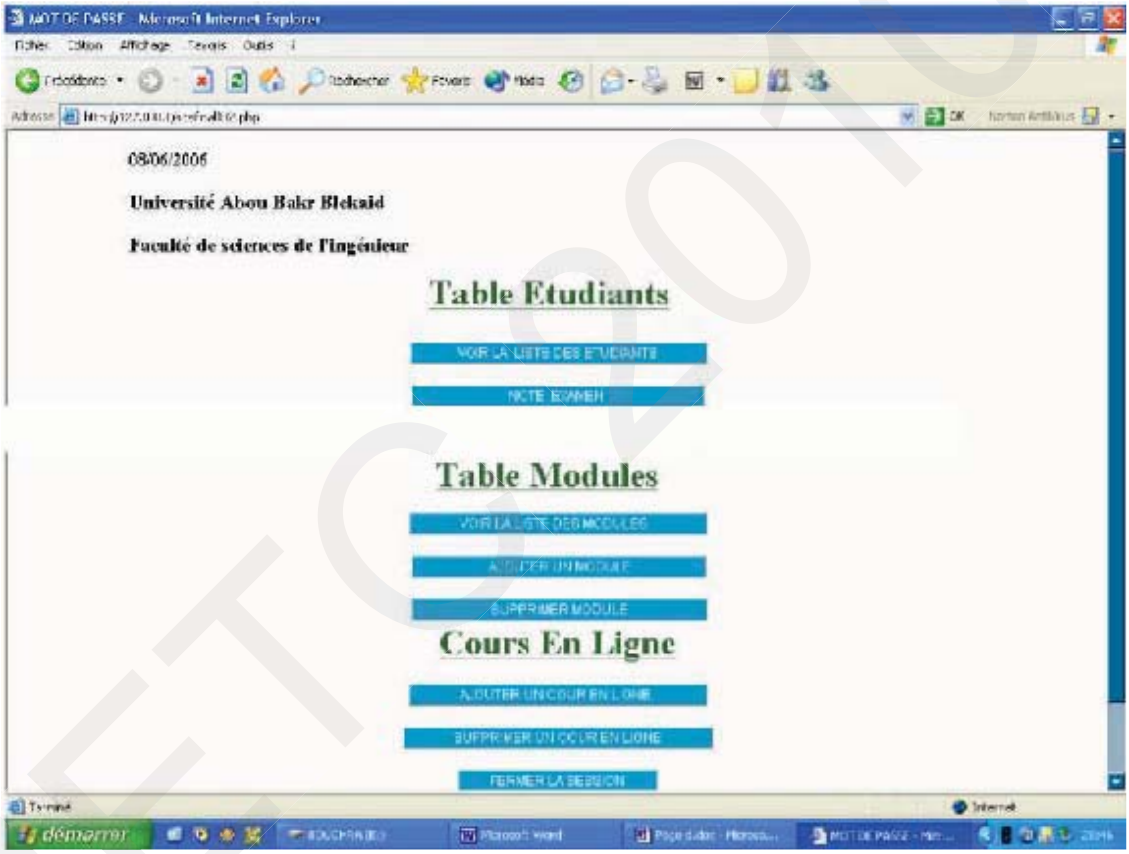


Fig 5. Card-index Session Teaching

For each button we have a sp ecific script:
- A script for each teacher to see his students (make a selection after each promo and after the password and username for each teacher).
- A script to insert a test score (according to the student code, code teach ing, code review, promo). Script to edit a note given to a review (by bringing the student code).
- A script for all the modules provided by the teacher.
- A script for addin g a module provided.
- A script for deleting it.
- A script to add an online dating.
- A script for deletin g an onlin e dating.
- A scrip t to close th e session each teach er to protect their data.

Fig 6: Interface Administrator.

The scripts used are:

- An authentication script (based on his username and password).
- A script to add student (his code name, promo).
- A script to change Student (by entering its number).
- A student removal script (by number).
- A script to add teacher (his code name, rank, nickname, password).

The Edit button is used to change a student contact a student already registered in the database data entered by its code different from those operations that we have created using the database as: The addition, deletion, change details of a student, add the inclusion of a new teaching laboratory in the STIC, Add, delete courses provided by staff of th e laboratory, Add, delete current lin e, insert a test score of a student and modify if necessary, Here is an example of the structure of the table Teachers in the database and the SQL query used for its
Created:
Teacher:

Champ	Type	Attributs	Null	Défaut	Extra
id	smallint(6)		Non		auto_increment
nom	varchar(20)		Non		
prenom	varchar(20)		Non		
grade	varchar(25)		Non		
pseudo	varchar(25)		Non		
motdepasse	varchar(20)		Non		

```
CREATE TABLE `enseignants` (
`id` SMALLINT(6) NOT NULL AUTO_INCREMENT PRIMARY KEY,
`nom` VARCHAR(20) NOT NULL,
`prenom` VARCHAR(20) NOT NULL,
`grade` VARCHAR(25) NOT NULL,
`pseudo` VARCHAR(25) NOT NULL,
`motdepasse` VARCHAR(25) NOT NULL
);
```

CONCLUSION

Th is site mainly covers aspects "ped agogy" and "research" of the university and acts as a site Web Momen tum for the lead, coordination tool for exchange of relevant in formation and channeled and a reliable source of information for various stakeholders of the university.
The various applications (Internet / Intranet) has built this site enact the "website" efficient, functional, and has multiple uses, respondent has different needs of the university, about the technologies used for development of this site, they give it an ap pearance "site dyn amic and adaptive, can be used are other universities.

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DESIGN OF A LABVIEW BASED GRAPHICAL USER INTERFACE FOR REMOTE CONTROL OF A COMPUTER CONTROLLED DIESEL ENGINE TEST UNIT

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Abstract

Diesel engine test units should be established to support research and education according to the developing technology. There are vibrations, noise and injury problems in manually controlled units. It is possible to curtail noise and injury problems by using improved electronic systems in the control room of engine test units.

In this study, long distance controlled diesel engine test unit providing tests of diesel engine performance, alternative fuel technologies and exhaust emissions was designed. This yields to carry out the tests using an internet explorer on a computer connected to network. Measurements of cylinder pressure, rpm, torque, power, air flow/temperature and fuel flow as well as controls of throttle, power, engine start/stop can be done. The graphs of pressure-crank degree and cylinder volume-crank degree can be plotted and live view of the engine can be seen. The user can record all measurements' results on the computer.

Keywords: DIESEL Engine Test Unit, Labview, Measurement, Distance Education, Distance Control

INTRODUCTION

The developments on diesel engines are mainly focused on lowering the fuel consumption, increasing performance and controlling exhaust emissions. Effects of decreasing toxic emissions on diesel engine performance or effects of performance as well as effects of using environmental friendly fuel on the performance and an engine's mechanical parts have become important research topics recently. There is a need for a highly sensitive and reliable engine test bench in order to carry out scientific research and education on these areas (Mert at al., 2009)

Although basic engine test rigs have similar measuring techniques, they differ depending on the test requirements and technological developments. A basic engine test rig consists of: test engine, dynamometer and sensors which measure torque, speed, air consumption, fuel consumption, engine temperatures. On the other hand an advanced engine test rigs have cylinder pressure sensor, exhaust emissions analyser, vibration measurement systems and electronic devices to log the data and control the engine (Plint, 2002).

Internal combustion engines are tested with dynamometers which converts mechanical energy to electrical energy. This provided torque and power tests (Williamson, 1989). Later, computer controlled engine test rigs are developed for doing complicated automotive engine transient experiments. Mini computer was used for closed loop data acquisition. Real time data acquisition and implementing control algorithms for data logging and displaying by using computer facilities, provides very flexible and functional possibilities (Rillings at al.,1973). Turley and Wright (1997) aimed to improve their engine test automation system which was designed for airplane engine tests with the help of LabView graphical programming software, due to the technological developments. LabView programming software's measuring, data acquisition, powerful interface and user-friendly structure provided fast prototyping. After this study a flexible and practical measuring and automation system was created by using LabView . Campbell and Galbraith (1985) studied to design a computer aided engine test bench for students' research. As a loading device electrical motor and a hydraulic dynamometer was used and all the data are saved to a PC . A study was concluded at Marmara University Technical Education Faculty to measure a 1.6 l 16V Ford Zetec gasoline engine's air consumption, air inlet temperature, cooling water temperature, engine speed, top dead centre position, valve timings, throttle position and exhaust emissions. These data were acquired and saved by a PC (Yurdagül at al, 2005). A computer controlled engine test bench was established at Karaelmas University Technical Education Faculty in order to support theoretical classes and researchers. Data acquisition and control was made by a computer. Data acquisition card, control boards, sensors, diesel engine and dynamometer costs was kept as minimum as possible (Çelik at al., 2007). Piri Reis University developed a computer controlled diesel engine test rig in order to improve the research activities on marine education. The engine room and control room were separated to reduce the injuries and noise. In this test rig, software was developed using LabView for measurement, analysing, indicating and logging purposes. All measurements were maid by data acquisition card, several sensors, electric motor and a diesel engine (Mert at al., 2009). Elen and Bayır developed software at Karabük University to run an engine test rig from internet. The test rig was controlled real time by the help of this software which was programmed on .Net platform using C# programming language. This system eliminates all the injury possibilities (Elen at al., 2009).

A LabVIEW based interface was developed at Piri Reis University to control the diesel engine test rig remotely. The server computer with data acquisition card is in the control room and the client computer connects to that server to control the engine test rig. All the controlling, indicating and logging processes can be made by the client computer without requiring an extra software or hardware. Engine start/stop, engine load and throttle controls, engine speed, air consumption, fuel consumption, engine power, engine torque, cylinder pressure measurements can be made remotely. Measurement results can be saved in .xls format to the server or client computer. Also camera views and sound are used to improve the reality and checking the engine condition.

TEST RIG AND MATERIAL

Sensors, actuators, electronic circuits and a data acquisition card were used to provide long distance measuring, indicating, recording and controlling the diesel engine test unit. Laboratory was separated into two rooms including engine room and control room. There are, a single cylinder internal combustion engine named Antor 4LD820 coupled to 15 kW shunt DC generator, load resistances, fuel tanks, exhaust emission devices, mass air flow meter, fuel level sensor, micro stepping motor with linear actuator, solenoid valve, incremental encoder, contactors, cylinder pressure sensor and amplifier, load cell and drivers in the engine room. The control room consists of AC control panel, a computer which the data acquisition card was mounted. The engine room's view is shown in Fig. 1.

Fig. 1. Engine room view

Signals from sensors and amplifiers which are in the engine room are transferred to the data acquisition card in the control room. Measurements of the engine values are acquired by connecting suitable cables to analogue and counter inputs. Control of the engine was made by connecting digital inputs and outputs to drivers and actuators. Computer controlled diesel engine test unit's block diagram is given Fig. 2.

There is a graphical user interface which was prepared using LabVIEW in the server PC. The algorithm in the graphical user interface enables the data acquisition card to generate control signals, read analogue and pulse inputs, show measurement results on the screen. All measurement, recording and control operations can be done by using server PC or a distance computer connected to the network.

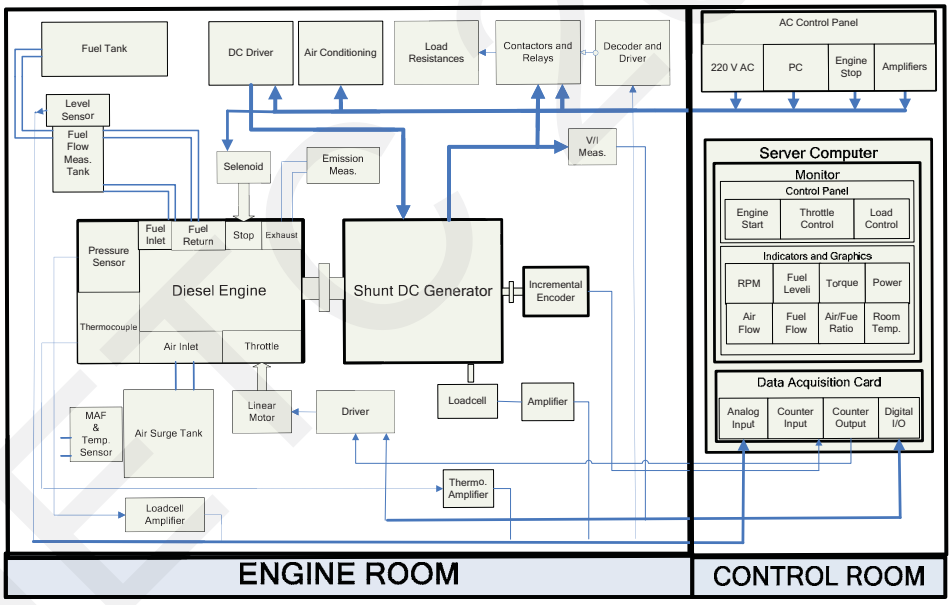

Fig. 2. Computer controlled diesel engine test unit's block diagram

A shunt DC generator coupled to the diesel engine shaft is used to load the engine. Load ratio is adjusted by changing the number of resistances connected to the generator with the help of contactors&decoders. Cylinder pressure is measured by using piezoelectric pressure sensor and its charge amplifier. For fuel flow measurement, a level sensor was mounted in a fuel tank with 5 cm diameter. A mass air flow meter (MAF) which is used in automobiles was used to measure air flow rate. An incremental encoder was coupled to the generator's shaft to measure rpm, a S type load cell was mounted between generator's body and floor to measure the engine torque. 16 bit PCI-6221 model data acquisition card was used to transfer all the measurements into digital computer system. A micro stepping motor with linear actuator was used to control the throttle. After mounting the mechanical system to move the throttle, it is possible to move the throttle sending pulse and direction data. Engine is started pushing the button on the user interface and the algorithm in the interface stops the starter turning relays off. A solenoid valve was used to stop the engine. When the solenoid is energized, it pulls the stop valve of the engine. Wiring diagram of Measurements and controls connected to the DAQ is shown Fig. 3.

GRAPHICAL USER INTERFACE

The graphical user interface was designed using object oriented LabVIEW programming language. LabVIEW was selected due to its powerful graphical features as well as flexible data acquisition and general algorithm capabilities (Travis and Kring, 2007).

User interface consists of a control panel, an indicator panel and a graphics drawing panel. All controls, measurements and graphics on the control, indicator and graphics drawing panels are given in Table 2. It was aimed to increase motivation and efficiency with graphical, user friendly and remarkable user interface for students and researchers.

User starts the engine by pushing start button on the interface. After start motor is energised, it's stopped by the algorithm in the user interface automatically when the engine is started. Load and throttle are adjusted and cycle number of measurement, measurement file path is typed. There are two options for measurement and logging. Continuous measurement choice provides measurement procedures to start automatically after every load and throttle control, this procedure continues in a loop. When user requires starting measurement after adjusting necessary throttle and load control, single measurement should be selected. User starts the measurements pushing start single measurement button. Clicking start single log button, measurement results are recorded. When continuous log is selected, every result after measurement procedures is recorded in .xls file.

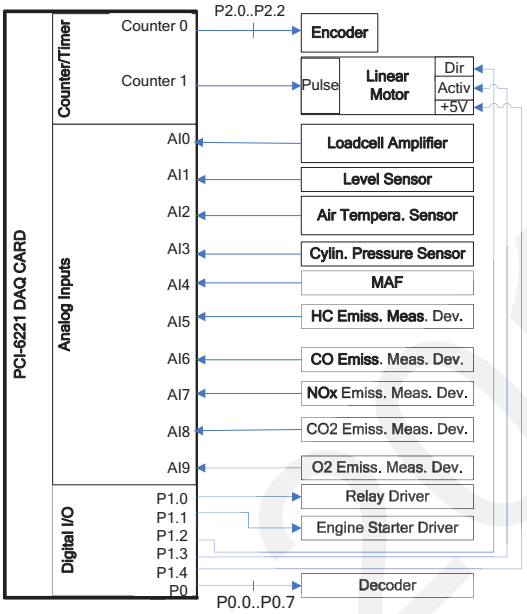

Fig. 3. Wiring diagram of measurements and controls connected to the DAQ

Numeric indicators were added under analogue type indicators to show exact numeric value. On graphic drawing panel, crank shaft position&cylinder pressure is sampled in every 0.1 CA and they are plotted on the panel. The graphical user interface running on the server PC is shown in Fig. 3.

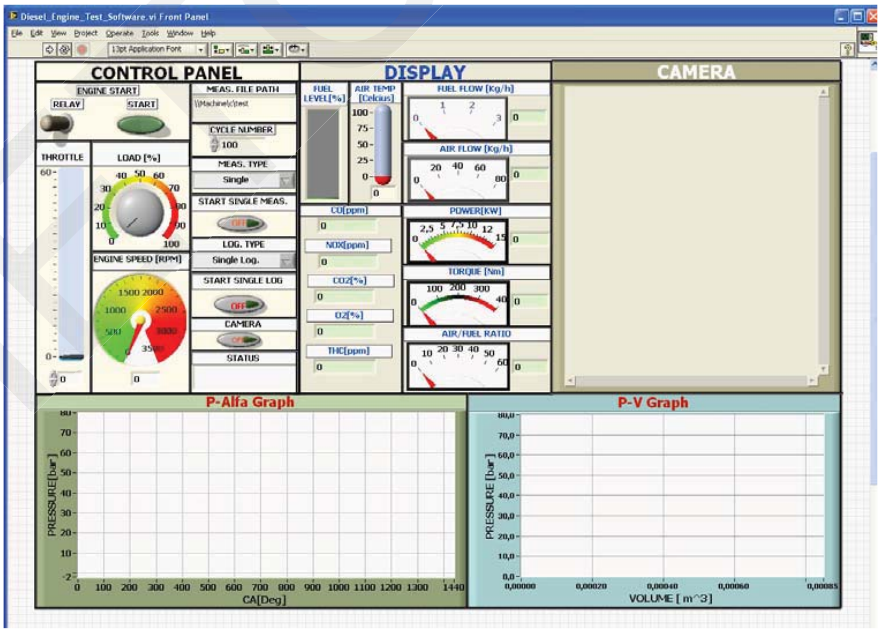

Fig. 3. The graphical user interface running on the server pc

REMOTE CONTROL

The graphical user interface on the server PC is also able to web publishing to provide distance control, measurement and recording. Therefore, it is possible to access the user interface using a computer connected to local network via internet browser without installing any programs.

The web publishing feature of the interface is prepared using LabVIEW 2009 to provide distant computers with access. The address given in Fig. 4. is typed in an internet browser on a client computer.

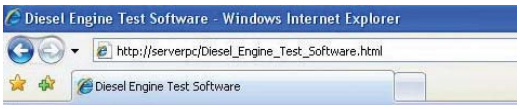

Fig. 4. Internet browser address

The graphical user interface is seen on the browser after loading. The user interface's control is passed to client computer by clicking right mouse and selecting "Request Control of VI".

Run button is clicked on the menu displayed on client computer's internet browser. After typing username and password, user can start measurements. The distant user can start engine, type cycle number and file path, adjust throttle and load and finally measure. The log file in .xls format can be stored in server or client PC.

RESULTS AND CONCLUSIONS

Distant control of the computer controlled diesel engine test unit was carried out at Piri Reis University. Diesel engine tests were made by using a computer which was connected to local network. All measurements, controls and records can be done using any internet browser on a client computer without installing any software. Remarkable and colourful graphical user interface was designed to operate by mouse click. The view of the test unit and sound was transferred to the user interface to increase reality and motivation.

Flexible graphical user interface and web application was concluded. The user interface running on the server computer controls, measures, records and publishes the html codes for distant control. The effects that reduces the quality of education environment such as injury, toxic gases, vibration and noise problems prevented by carrying out the tests by a client A view of a test done by client computer is shown Fig. 5.

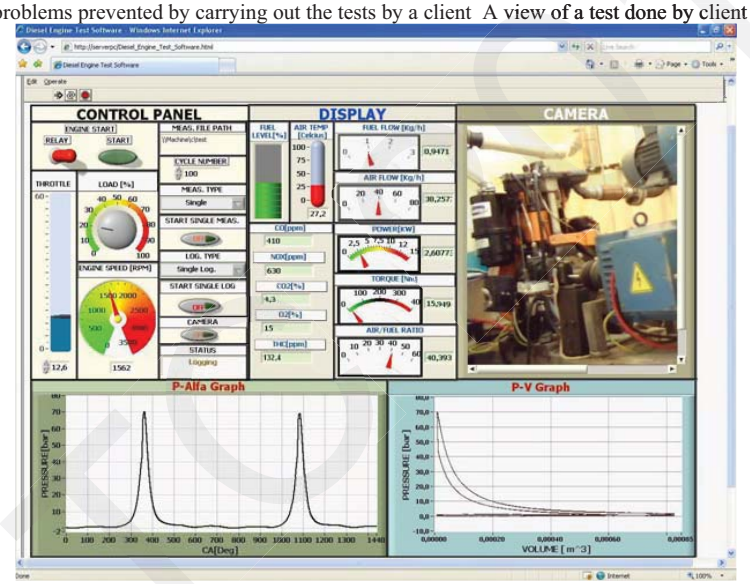

Fig. 5. A view of test results done by using client computer

Further analysis and research can be done using log file in xls format. A sample log file in xls format is given Fig. 6.

	Cylinder Pressure [bar]	Crank Shaft Degree[°]	Speed [rpm]	Torque [Nm]	Power [kW]	Air Flow [kg/h]	Fuel Flow [kg/h]	Air /fuel Ratio	Air Temp. [°C]	CO [ppm]	NOx [ppm]	CO_2 [%]	O_2 [%]	THC [ppm]
1														
2	0	0	1561,6	15,949	2,608	38,26	0,947	40,39	27,214	410	630	4,3	15	132,4
3	0,002	0,1												
4	0,009	0,2												
5	0,033	0,3												
6	0,09	0,4												
7	0,206	0,5												
8	0,412	0,6												
9	0,745	0,7												
10	1,243	0,8												
11	1,944	0,9												
12	2,886	1												
13	4,098	1,1												
14	5,607	1,2												
15	7,429	1,3												
16	9,574	1,4												
17	12,041	1,5												
18	14,821	1,6												
19	17,895	1,7												
20	21,236	1,8												
21	24,81	1,9												
22	28,576	2												
23	32,489	2,1												
24	36,499	2,2												
25	40,554	2,3												
26	44,603	2,4												
27	48,593	2,5												
28	52,475	2,6												
29	56,203	2,7												
30	59,733	2,8												
31	63,03	2,9												
32	66,061	3												
33	68,8	3,1												
34	71,229	3,2												
35	73,336	3,3												
36	75,113	3,4												

Fig.6. Log file in xls format

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DESIGN ASPECTS OF ONLINE VOCATIONAL COMPETENCY TESTING SYSTEM (OVCTS) TO IMPROVE TEACHING LEARNING PROCESS AND COMPETENCY TESTING IN VOCATIONAL EDUCATION AND TRAINING (VET) IN INDIA

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ABSTRACT

In India, learning of the students in Vocational Education and Training (VET) is determined by conducting theory and practical examinations in traditional way. Examinations are conducted less frequently, normally once or twice in a year. On the basis of annual examination a certificate is awarded to student. These examinations do not help the student to test their competencies and improve their learning capabilities. To test the performance of a vocational student it is necessary to test the competencies in the particular vocational trade. Bloom's taxonomy of learning objectives is used to define how well a skill or competency is learned or mastered. To improve the performance of the vocational students it is required to conduct the competency tests more frequently in such a manner that helps student to understand their deficiencies. It is possible to do so by using continuous testing of competencies through computer generated online test of the required specifications. PSSCIVE, NCERT, Bhopal, Govt. of India, has designed a web application called Online Vocational Competency Testing System (OVCTS) which can take up the student to undergo online test and test themselves on continuous basis while learning. This will use for self testing in a required subject as well as make the student active while learning and helps to improve the teaching learning process. The test paper generated through OVCTS contains all types of objective questions with the attribute of taxonomy level and difficulty level from all the topics of the subject in a vocational course. This will also generate a balanced test paper. In this paper, we have correlated the competency with the Bloom's taxonomy of learning objectives and discussed various issues related with design aspects of OVCTS.

Keywords: e-learning, web based evaluation system, vocational education and training, evaluation, competency testing, interactive learning system.

INTRODUCTION

Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE) is a constituent unit of National Council of Educational Research and Training (NCERT), under the Ministry of Human Resource Development, Government of India. PSSCIVE is responsible for management of Vocational Education and Training (VET) in India. PSSCIVE organizes variety of training programmes to improve their knowledge and skill which in turn will be imparted to the students to improve their performance. It revises curriculum from time to time to meet the requirements of industries. Conventionally the evaluation of all vocational courses in India is carried out through the theory and practical examinations by the respective state boards. This conventional pattern doesn't help student to improve their learning capabilities within the course. PSSCIVE as an Apex and Central body for VET is unable to gather the required information of examination of the various states which is required for building up of Information System. By considering this, PSSCIVE has undertaken a project where a facility for web based examination system will be created so that the same can be used by the students all over the India. Students can appear for test any number of times by logging into the system and the said system will also analyse the performance of the student so as to understand the weakness in a particular subject. This application will also set a standard for examinations in vocational education.

Internet nowadays is available in almost all parts of country including the rural area. Most of the schools in India are provided with computer and Internet facility. The broadband utilities can be used even in small villages of India. As a result, Internet can be used very effective tool to improve the learning capabilities of the students. This approach can be called as an Electronic Learning Approach or a Web Based Learning Approach. The greatest advantage of this system is that the evaluation is very fast and accurate. A student can get evaluated instantly with various analysis. Also, there are no restrictions on the number of attempts. The understanding levels can be improved further by using OVCTS.

There are several research work carried out by researchers, where such attempt is made (James Dalziel 1999, Hulsman R.L. 2002, Hosam F. El-Sofany 2009). But in India, and particularly in vocational education, we find that such attempt is not made so far. In this paper, we have discussed various issues which are associated with the Design Aspects of OVCTS.

Issues and Problems in VET

The vocational education programme has been designed in such a way that it prepares students in communication, entrepreneurial and vocational skills leading to suitable jobs. The various issues, problems and weaknesses that inflicted the implementation of VET in India includes the *Management Structure, Selection and Duration of Courses and Institutions, Teacher and Teacher Training, Curriculum Transaction, Examination and Evaluation, Apprenticeship Training, Vertical Mobility, Employment opportunities and Quality Control* etc.

Here we address the issue of Examination and Evaluation and bringing the quality in evaluation so as to improve the teaching-learning process in VET through a web application developed by PSSCIVE. The process of computerization also helps to touch the other issues in VET at certain extent.

About an application

On-line Vocational Competency Testing System (OVCTS) is designed to take self assessment for vocational students at +2 level. It enables students to test their competency in a particular subject area by performing repeated and varied self-assessments drawn from a large database of questions. The questions in the database are created by the subject teachers. The application supports the different objective type questions. This format allows assessments to be graded immediately, so students can see their results right away. It allows flexibility in the presentation of Computer Assisted Assessment (CAA), particularly in terms of time, place and pace. It is expected to be of growing importance in vocational education. The systems allows for the creation of balanced question paper in terms of its difficulty level and

taxonomy level as set in the Specification Table. The system has four types of users namely Administrator, Course Coordinator, Teacher and Student. Administrator is the highest authority to manage master database and the Course Coordinator. The Course Coordinator is the institute faculty from concerned discipline who is authorized to approve the questions entered by Teacher and manage the paper specification. Teacher is the registered teacher from the concerned vocational course who is authorized to enter the questions in the database. Student is the registered student of vocational course who can attempt the paper and see the progress in the subject. Repeatedly self testing by the student will improve the teaching-learning process and finding the weakness in the particular area. A teacher can improve the teaching process to meet the uniform standard. It will keep track of their progress over time, since all assessments taken through this system are recorded. The users of the system does not require any programming expertise and no special software or hardware apart from an Internet-accessible computer and web browser.

COMPUTER ASSISTED ASSESSMENT (CAA)

What is Question Bank?

A Question Bank is a collection of varieties of different types of questions in a subject. It can be defined as a *relatively large collection of easily accessible test questions. "*Relatively large" means that the number of questions exceeds by several times the number to be used in any one test. "Easily accessible" means that the items are indexed structured or otherwise assigned information that can be used to facilitate their selection for a test. With the technological advancement in computer industry various educational activities are being computerized. Examination and Evaluation is one of the challenging activity in VET.

Advantages of CAA

The CAA has so many advantages over traditional evaluation system. It becomes very difficult to assess the performance of students through poorly designed questions. Sometimes it is essential to include visuals, drawings, photographs, and normally these are avoided because it cannot be designed and printed nicely manually. Using the computer software and scanner, one can design the visuals nicely. Every vocational teacher needs to set the number of questions every now and then for use in examination. All the times the quality of questions designed by teachers may not be good. A good quality of questions can be stored in the database of the application. OVCTS is designed to manage a database of the questions that holds large number of good quality of questions with the attributes like taxonomy level, difficulty level and type of question. The questions can be entered by the teacher from their location whenever required. The questions can be edited, corrected and submitted finally into the database after approval of the course coordinator. Large number of questions are available to generate a test and decrease the concern about security as remembering the answers to all the questions without having the knowledge or skill becomes more difficult. The random generation of test reduces the cheating. Computer generated test reduces the time in setting up the question paper and also produces the test with good quality questions. Repeated questions can be deleted or modified from the bank. The questions are developed by vocational teachers and verified by the course coordinator who are the faculty from PSSCIVE and reduce the ambiguity. Online administration and evaluation tests the the student immediately.

Disadvantages of CAA

It is not easy to implement several aspects of successful question bank database such as useful collection of questions. It is necessary to have the large number of questions with different attributes like difficulty level, taxonomy level, different types of questions so that the specifications provided for test generation can get all the category of questions. Maintaining the question bank is difficult aspect. How much time will take to develop and enter the large number of questions in a Question Bank? How far the question bank is updated?, How far the question bank is edited? Limitations of the kinds of pictures, graphs, special characters or other enhancements that can be used when tests are printed by computer, the difficulty in estimating the norms when each student has a different test and measurement error emanating from violations of assumptions when questions are calibrated using response theory.

ISSUES & CHALLENGES IN COMPETENCY BASED ASSESSMENT IN VET

What is a competency?

A competency is the capability to apply or use a set of related knowledge, skills, and abilities required to successfully perform "critical work functions" or tasks. Competencies often serve as the basis for skill standards that specify the level of knowledge, skills, and abilities required for success in the workplace as well as potential measurement criteria for assessing competency attainment. One comprehensive definition of "competency" is: A cluster of related knowledge, skills, and attitudes that affects a major part of the job, that correlates with performance on the job, that can be measured against well-accepted standards, and that can be improved via training and development."

What is Competency Based Training (CBT)?

In a traditional educational system, the unit of progression is time and it is teacher-centred. In a CBT system, the unit of progression is mastery of specific knowledge and skills and is learner-centred. Two key terms used in CBT are:

Skill A task or group of tasks performed to a specific level of competency or proficiency which often use motor functions and typically require the manipulation of instruments and equipment.

Competency A skill performed to a specific standard under specific conditions. CBT should be used as opposed to the "medieval concept of time-based learning." Using the traditional "school" model for training is inefficient. Competency Based Instruction has tremendous potential for training in industry.

A competent clinician (e.g., physician, nurse, midwife, medical assistant) is one who is able to perform a clinical skill to a satisfactory standard. CBT for reproductive health professionals then is training based upon the participant's ability to demonstrate attainment or mastery of clinical skills performed under certain conditions to specific standards (the skills then become competencies). Five essential elements of a CBT system are:

1. Competencies to be achieved are carefully identified, verified and made public.
2. Criteria to be used in assessing achievement and the conditions under which achievement will be assessed are explicitly stated and made public in advance.
3. The instructional program provides for the individual development and evaluation.
4. Assessment of competency takes the knowledge, skills and attitudes into account.
5. Participants progress through the instructional program at their own rate by demonstrating the attainment of the specified competencies.

Evaluation and Assessment in CBT

Evaluation in traditional courses typically involves administering knowledge based tests. While knowledge based assessments can certainly be used in CBT to measure mastery of information, the primary focus is on measuring mastery of skills. The decision to recognize a performance as satisfactory and to determine competence should be the basis for success of a Competency Based Assessment (CBA). CBA is

a process where an assessor works with a trainee to collect evidence of competence, using the benchmarks provided by the unit standards that comprise the national qualifications. The principles of CBA states it should be *Current, Valid, Accurate, Reliable, Flexible, Fair, Safe.*

Quality of Assessment

The quality of assessment directly correlates to the quality of learning. If there are clear learning objectives that are reflected in the assessment material then the student has a clear understanding of what they have to learn to what depth they have to understand what they are learning and how they are expected to demonstrate their knowledge and understanding.

RELATIONSHIP OF COMPETENCY WITH BLOOM's TAXONOMY

The Three Types of Learning Domains or Bloom's Taxonomy

There is more than one type of learning. A committee of colleges, led by Benjamin Bloom, identified three domains of educational activities. The three domains are cognitive, affective, and psychomotor. Cognitive is for mental skills (Knowledge), affective is for growth in feelings or emotional areas (Attitude), while psychomotor is for manual or physical skills (Skills). Trainers often refer to these as KAS, SKA, or KSA (Knowledge, Attitude, and Skills). This taxonomy of learning behaviours can be thought of as "the goals of the training process." That is, after the training session, the learner should have acquired these new skills, knowledge, or attitudes.

This compilation divides the three domains into subdivisions, starting from the simplest behaviour to the most complex. The divisions outlined are not absolutes and there are other systems or hierarchies that have been devised in the educational and training world. However, Bloom's taxonomy is easily understood and is probably the most widely applied one in use today.

Competencies Verses Learning Objectives

Education has its own set of vocabulary that sometimes is enhanced by terms used in business. Learning objectives have been around for a while, but competencies are becoming a popular concept to include in curriculum. Sometimes the two terms are used interchangeably, but they are not the same thing.

What is a Competency?

Competency is an educational term relating to the skills, behaviours and knowledge that are necessary to be successful. This can be applied to successful completion of a course or success in a chosen career field. Competencies are more qualitative than quantitative, thus are less easily adaptable to a grade scale.

What is a Learning Objective?

Learning objectives are more specifically targeted to the educational outcomes of a lesson or a course. They are typically written using Bloom's Taxonomy for educational objectives and are tailored for the specific lesson. When collected together, the learning objectives of a course support the competencies.

Learning objectives are often provided by textbook publishers as part of their curriculum package. They might also be adapted or completely written by a school, department or learning team to reflect the specific needs of a school.

Activities at Various Cognitive Levels of Learning (LoL)

Bloom's taxonomy of learning objectives is used to define how well a skill or competency is learned or mastered.

1. At Knowledge Level of Learning a student can define terms,
2. At Comprehension Level of Learning a student can work assigned problems and examples what they did,
3. At Application Level of Learning a student recognizes what methods to be used and then use the methods to solve problems,
4. At Analysis Level of Learning a student can explain why solution process works,
5. At Synthesis Level of Learning a student can combine the part of a process in new and useful ways,
6. At Evaluation Level of Learning a student can create a variety of ways to solve the problem and select the solution method best suited for the problem.

DESIGN ISSUES OF OVCTS

In earlier version of the application on Question Bank, developed by PSSCIVE in 2004-05 in the form of CD have some disadvantages. So the question arises to choose the electronic form of the application. The main choice of medium at that time was CD-ROM and the application tools used to develop was Visual Basic as front end and Ms-access as a bank end database. Due to the dissemination problem it was thought of to develop a web application for the same. After taking advice from the experts, it was concluded that the balance of advantage lay with the Web. Designing a web application on Question Bank for testing the competency of vocational students was a crucial issue. The issues are how to test the competency of a student which requires to test both knowledge and skills and how to disseminate the application to the users. Developing a software of Question Bank on CD-ROM was a static medium and required distribution to users either via some channel who would need a CD-ROM drive on their work-station. The Question Bank would progressively expand its content continuously, which will require to update the CD continuously.

The web based application offer more flexibility, provided an application could be established satisfactorily and the necessary skills should be imparted to teachers to develop and enter the questions in the database as well as to use the system effectively. The application may be placed on the website, and progressively expanded over a time without having to modify and cutting the CD again. The web application would be available to the users with an Internet connection and a web browser, so that it will be free to authorized users as intended. At first, it seems an obstacle to potential users in vocational schools who did not have any Internet access, including government and private schools, but this situation appears to be rapidly changing with expansion of Internet in rural region and increase in bandwidth. Accessibility from a CD-ROM would be quicker in some situations than relying, for instance, on Internet. On balance, however, we concluded that the web technology was evolving, and was more likely to offer longer-term solutions than CD-ROM. The accessibility of the Internet and WWW media are *cheap to use, user friendly, ease of navigation, ease of retrieval, rapid technological advance, and a future oriented.*

What would be the nature of web application on Question Bank? The specific features and the modules of the application and user interface are discussed here. The application like Question Bank hold the lot of information of questions in different vocational courses in electronic form. The problems of storing and making available such large amount of information is considerable. To make available such a dynamic information to users, the task of facilitating access is a considerable challenge.

Technology used

It was decided by the group of experts to design this application by using the open source software which are platform independent and freely available. It was planned to develop the application in J2EE and any of the open source RDBMS as back end. As far as deployment policy is concerned we need to deploy it on National Informatic Centre (NIC), Government of India's web server. PostGreSQL, the most reliable RDBMS was available under the open source for deployment on NIC web server.

J2EE: To develop a web application, we used the J2EE technology which consists of Java Servlet, JSP and RDBMS PostGre SQL. The development tool Eclipse is used for Java development. An Apache Web Server is used for running the web application. The J2EE platform is designed to provide server-side and client-side support for developing distributed, multi-tier applications which are typically configured as a client tier to provide the user interface, one or more middle-tier modules that provide client services and business logic for an application, and back-end enterprise information systems providing data management. With features designed to expedite the process of developing distributed applications, the J2EE platform offers several benefits such as *Simplified architecture and development, Freedom of choice in servers, tools, and components, Integration with existing information systems, Scalability to meet demand variations, Flexible security model*

PostgreSQL: PostgreSQL is a powerful, open source object oriented RDBMS. It has a strong and proven architecture for reliability, data integrity, and correctness. It runs on all major operating systems, including Linux, UNIX (AIX, BSD, HP-UX, SGI IRIX, Mac OS X, Solaris, Tru64), and Windows. It is fully ACID compliant, has full support for foreign keys, joins, views, triggers, and stored procedures (in multiple languages). It includes most SQL:2008 data types, including INTEGER, NUMERIC, BOOLEAN, CHAR, VARCHAR, DATE, INTERVAL, and TIMESTAMP. It also supports storage of binary large objects, including pictures, sounds, or video. It has native programming interfaces for C++, Java, .Net, Perl, Python, Ruby, Tcl, ODBC, among others. It supports international character sets, multibyte character encodings, Unicode, and it is locale-aware for sorting, case-sensitivity, and formatting. It is highly scalable both in the sheer quantity of data it can manage and in the number of concurrent users it can accommodate. There are active PostgreSQL systems in production environments that manage in excess of 4 terabytes of data. Some general PostgreSQL limits are shown below.

Limit	**Value**
Maximum Database Size	Unlimited
Maximum Table Size	32 TB
Maximum Row Size	1.6 TB
Maximum Field Size	1 GB
Maximum Rows per Table	Unlimited
Maximum Columns per Table	250 - 1600 depending on column types
Maximum Indexes per Table	Unlimited

Feasibility Study

It was decided to develop the web application within a very short span of time of about six months by using commonly available hardware and software platform. There will not by any special requirement of hardware or software for development of the system to keep the cost of the project minimum.

Waterfall Model for Software Development Life Cycle

In the discussion with the various experts, it was decided to apply Waterfall Model of Software Development Life Cycle, as it is more systematic approach that begins at the system level and progress through Analysis, Design, Testing, Coding and Support.

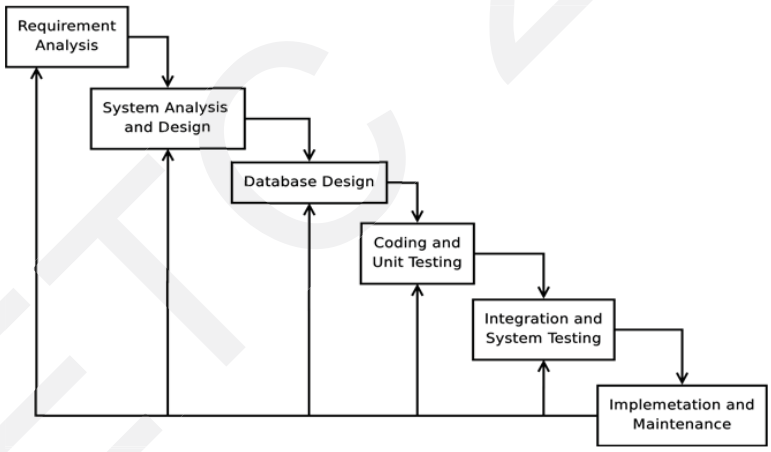


Figure 1. Waterfall Model for Software development Life Cycle

Initially, the requirements, constraints, and goals are established by making consultations with various experts, teachers and students of vocational education. The system design and its architecture is prepared in such a manner that it fulfils the requirements of various users. There are seven main modules of of this web application. They are:

1. ***Student Registration Module:*** This module will register the student with the approval of teacher to utilize the system.
2. ***Teacher Registration Module:*** This module will register the teacher. The teacher play two fold role in this application. On one hand a teacher is a contributor in developing and entering the questions in the database and on the other hand s/he is using the system for monitoring the progress of the students, helps in school registration and student registration.
3. ***Login Module:*** Login Module is an entry point to the system from which all the four types of users namely Administrator, Course Coordinator, Teacher and Student can enter into the system and use the system as per their defined roles.
4. ***Administrator Module:*** An Administrator is the highest authority of the system, responsible for managing the master database and managing the course coordinator of the system.

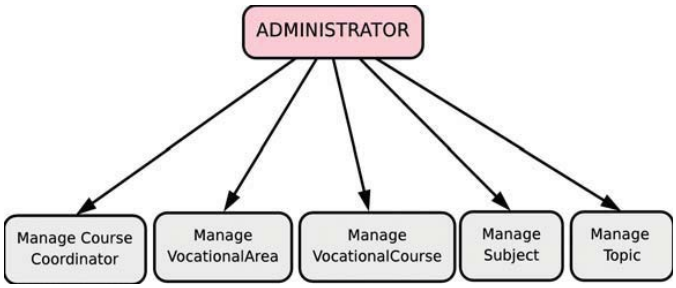


Figure 2. Administrator Module

5. ***Course Coordinator Module:*** A Course coordinator is responsible to manage teachers and question database. A Course Coordinator can approve or disapprove the teacher registration and the questions entered by teachers. Another important task to be performed by the course coordinator is to manage the paper specification in the specification table.

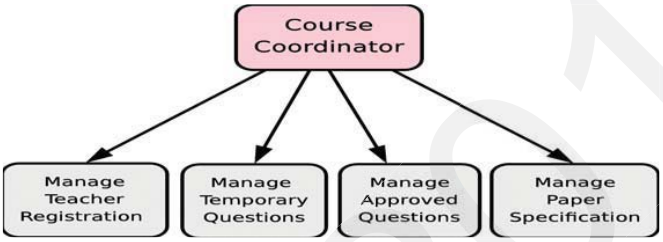


Figure 3. Course Coordinator Module

6. ***Teacher Module:*** The Teacher Module manages Student Registration, Manage the Course Registration, Manage questions, View and Update the profile and View the Reports of their interest.

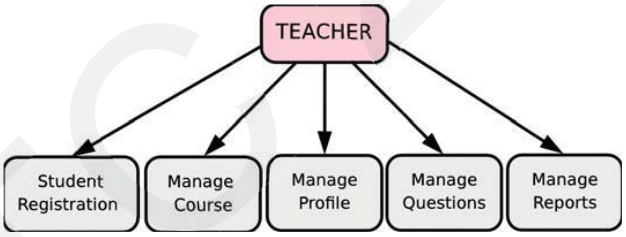


Figure 4. Teacher Module

7. ***Student Module:*** The ultimate user and beneficiary of this system is the vocational student who will test her/his competency by attempting the test in a vocational course. So, it was felt necessary to develop a separate Student Module which will help the student to manage her/his profile, attempt online test and view result of the test immediately after submission.

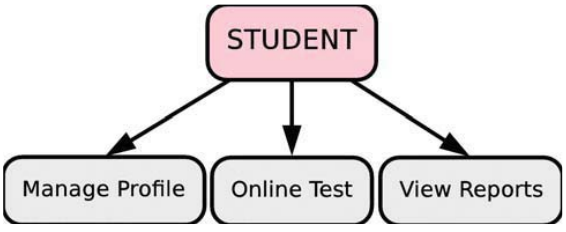


Figure 5: Student Module

Participants and their roles

The main purpose of OVCTS is to store the information of teachers and students of vocational education in India and also to allow them the access it on-line. So, the participants of OVCTS are identified as: (1) Administrator, (2) Course Coordinator, (3) Teacher (4) student.

An Administrator is an highest authority to be appointed by the PSSCIVE for working, updating of OVCTS. It is expected to identify and manage various vocational areas, vocational courses, subjects in the courses and topics of the subjects. An Administrator can add, update, delete and modify the contents, approves and manage the Course Coordinators as per the requirement of vocational courses.

A Course Coordinator, who is normally a PSSCIVE faculty from the concerned discipline, is the higher level in OVCTS. The Course Coordinator can authorizes various vocational teachers, can approve the questions entered by the teacher through out the nation and manage the paper specification. The Course Coordinator can also approve the teacher registration, approve the question and view all the data related with teachers and question bank.

A Teacher is a authentic appointed vocational school teacher in India. A Teacher can register for the vocational courses of his or her expertise in a particular vocational area. After registration only s/he can enter question in the Question Bank and also can update and view their profile.

A student is a registered student of vocational course in India. A student can register in vocational courses of his or her choice or in which s/he has taken the admission and attempt the online test any number of times. The student can see the performance by looking at marks obtained and also can get a complete analysis of the performance, thereby understanding their weaknesses in particular subject. A student can also update and view their own profile.

Information Flow of various users

The information flow for **Administrator** and its access to various field is is given in Figure 7. For example when the administrator selects the vocational area and click the add button, vocational area gets added to the system. After clicking a view button, the vocational areas will get displayed. The vocational areas can be removed from the system just by selecting it and then clicking the remove button. Such operations can be performed for vocational course, subjects, topics and Course Coordinator as well.

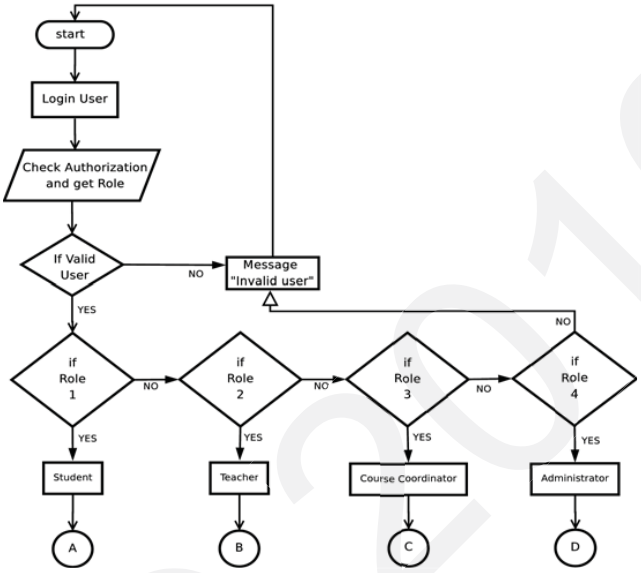


Figure 6. System Flow Chart

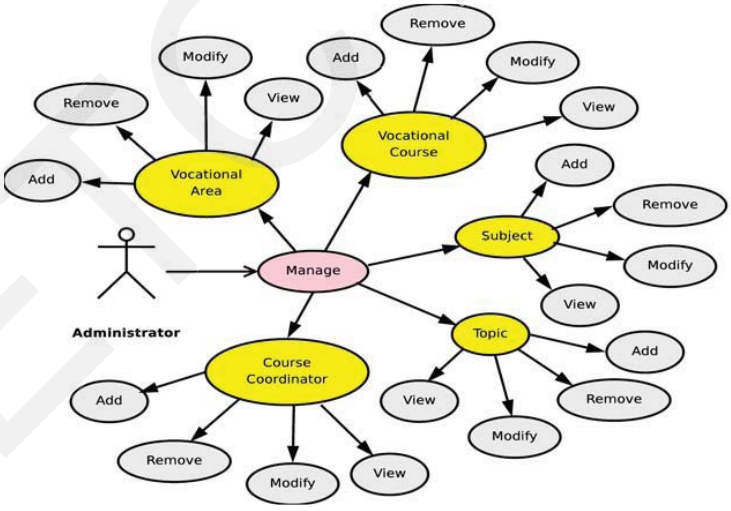


Figure 7. Information flow for the Administrator

The information flow for **Course Coordinator** and its access to various field is as: :

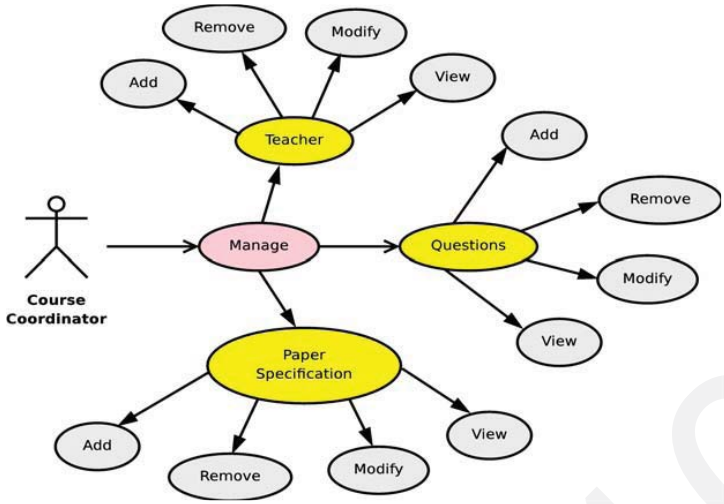


Figure 8. Information flow for Course Coordinator

A Course Coordinator can manage the temporary questions entered by the teachers, can approve the questions or reject them. A Course Coordinator can approve the teacher registration for the registered course. A course coordinator can also mange the specification table to prepare a blue print for online test.

The information flow for **Teacher** and its access to various field of the system is as:

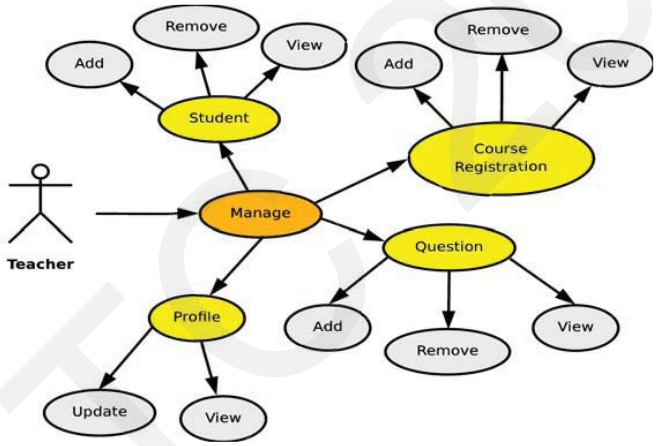


Figure 9. Information flow for Teacher

A teacher can add, remove and view a question and he can register himself for the various courses based on his expertise.

A student can register for a course and attempt an on-line test. The information flow for student and its access to various field of the system is given below:

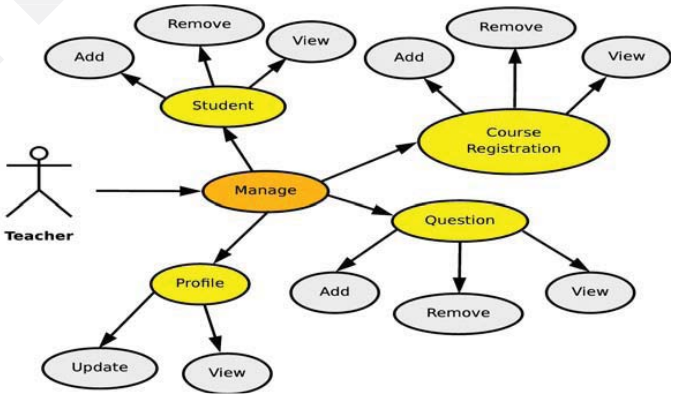


Figure 10. Information flow for Student

Various Activities

The various activity diagrams for the activities performed by the Administrator, Course Coordinator, Teacher and Student are given below:

Activities performed by the Administrator

(1) Login
(2) Add Vocational Area
(3) Modify Vocational Area
(4) View Vocational Area
(5) Add Vocational Area
(6) Delete Vocational Area

Some of these activity diagrams are given below:

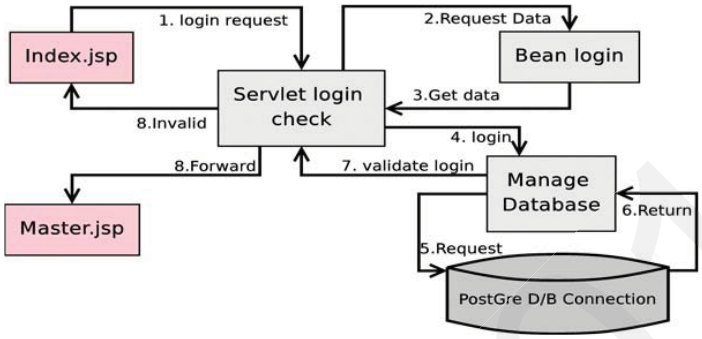


Figure 11. Administrator Login Activity Diagram

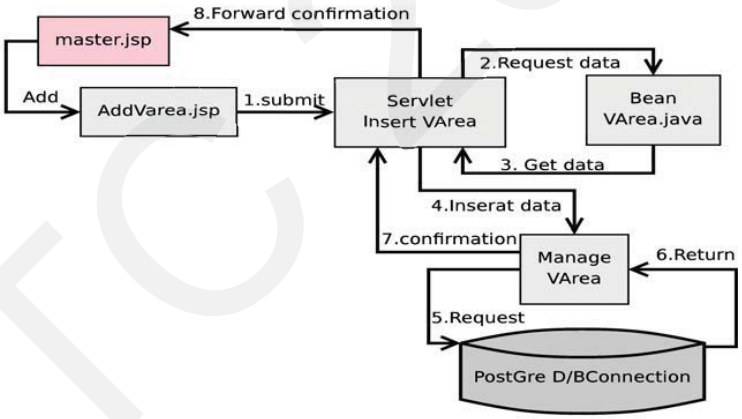


Figure 12. Activity Diagram to Add Vocational Area by the Administrator

Activities performed by the Course Coordinator

(1) Login
(2) Approve Questions
(3) Mange Teacher Registration
(4) Manage Unregistered Teacher
(5) Remove Approved Questions
(6) Remove Temporary Questions
(7) Manage Specification Table

Some of these activity diagrams are given below:

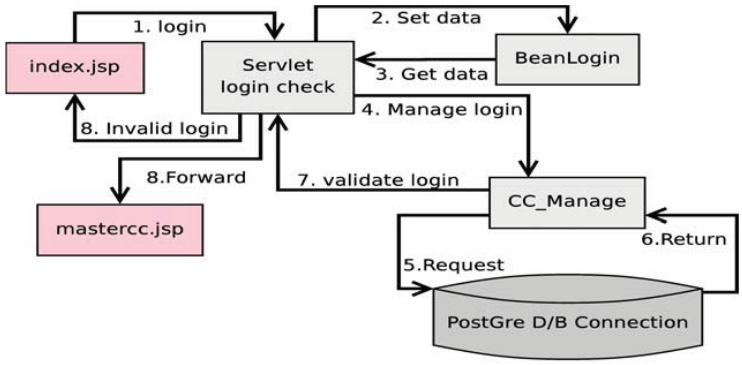


Figure 13. Course Coordinator Login Activity Diagram

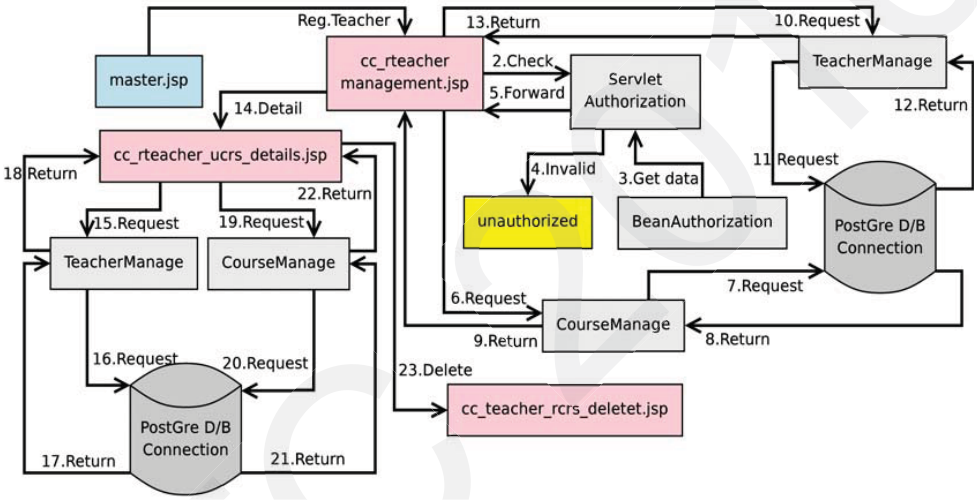


Figure 14. Activity Diagram to Manage Registered Teacher

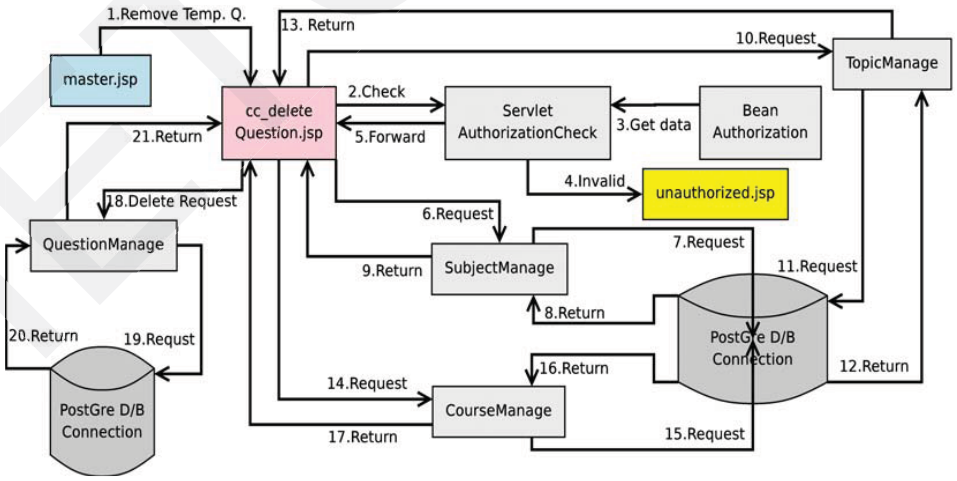


Figure 15. Activity Diagram to Remove Temporary Question

Activities performed by the Teacher

(1) Login
(2) Teacher Add Course
(3) Teacher Remove Course
(4) Teacher View Course

Some of these activity diagrams are given below:

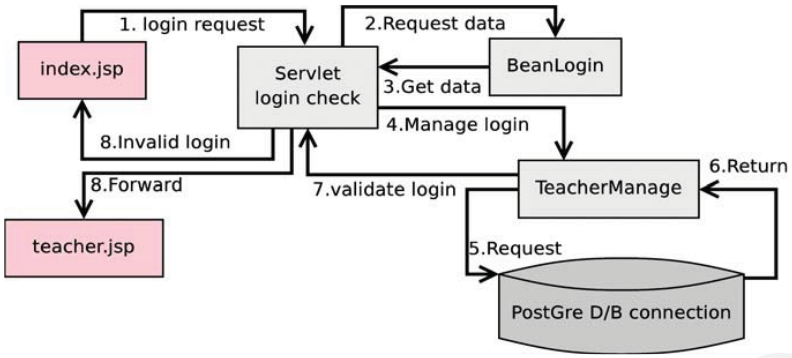


Figure 16. Teacher Login Activity Diagram

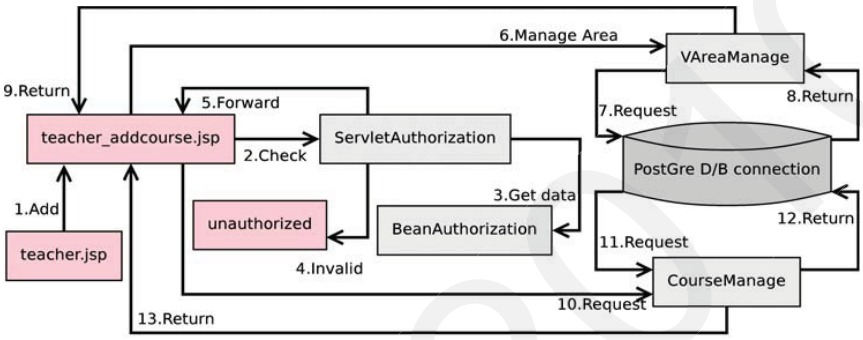


Figure 17. Teacher Activity Diagram to Register for New Course

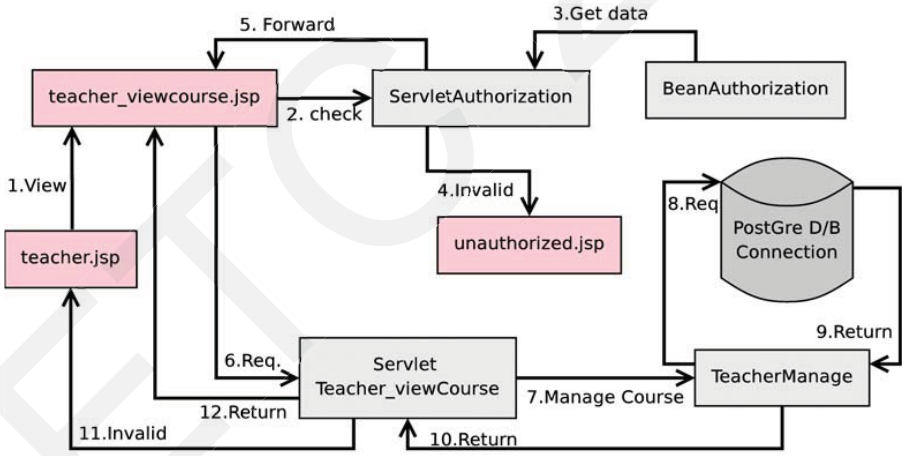


Figure 18. Teacher Activity Diagram to View Course

Activities performed by the Teacher

(1) Login
(2) Student View Profile
(3) Student Update Profile

Some of these activity diagrams are given below:

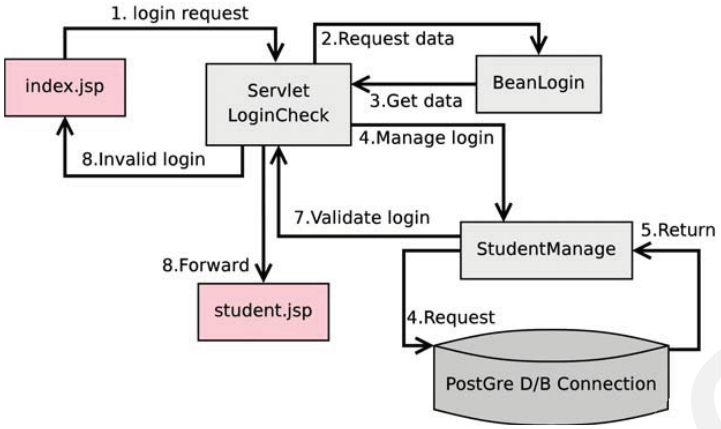


Figure 19. Student Login Activity Diagram

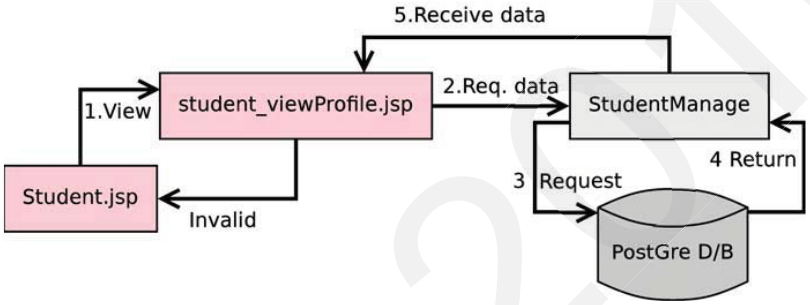
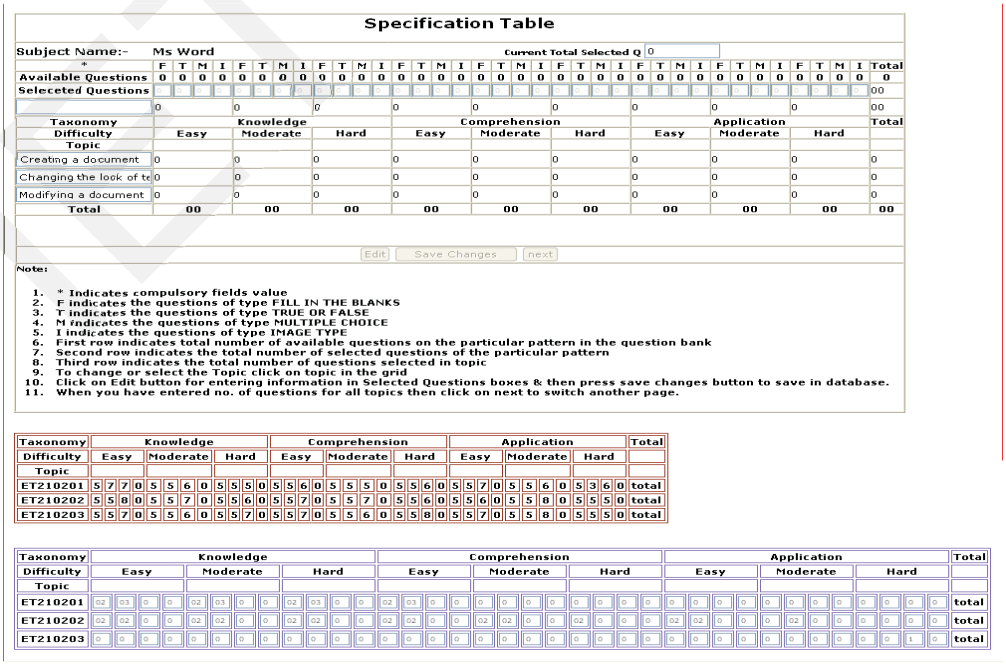


Figure 20. Activity Diagram to View Student Profile

SPECIFICATION TABLE

A Specification Table is the heart of OVCTS. In the specification table, we decide the type of the question to be selected, its difficulty level and taxonomy table. The Taxonomy level is classified into three categories such as Knowledge, Comprehension and Application. The Difficulty level is classified into three categories such as Easy, Moderate and Hard. A Course Coordinator is an authority to access the specification table, can change the specifications as per the requirements. The format of specification table is given below.



Specification Table

Subject Name:- Ms Word Current Total Selected Q 0

*	F	T	M	I	F	T	M	I	F	T	M	I	F	T	M	I	F	T	M	I	F	T	M	I	Total
Available Questions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selecected Questions																									00
	0				0				0				0				0				0				00

Taxonomy	Knowledge			Comprehension			Application			Total
Difficulty	Easy	Moderate	Hard	Easy	Moderate	Hard	Easy	Moderate	Hard	
Topic										
Creating a document	0	0	0	0	0	0	0	0	0	0
Changing the look of te	0	0	0	0	0	0	0	0	0	0
Modifying a document	0	0	0	0	0	0	0	0	0	0
Total	00	00	00	00	00	00	00	00	00	00

Edit | Save Changes | next

Note:

1. * Indicates compulsory fields value
2. F indicates the questions of type FILL IN THE BLANKS
3. T indicates the questions of type TRUE OR FALSE
4. M indicates the questions of type MULTIPLE CHOICE
5. I indicates the questions of type IMAGE TYPE
6. First row indicates total number of available questions on the particular pattern in the question bank
7. Second row indicates the total number of selected questions of the particular pattern
8. Third row indicates the total number of questions selected in topic
9. To change or select the Topic click on topic in the grid
10. Click on Edit button for entering information in Selected Questions boxes & then press save changes button to save in database.
11. When you have entered no. of questions for all topics then click on next to switch another page.

Taxonomy	Knowledge						Comprehension						Application						Total
Difficulty	Easy		Moderate		Hard		Easy		Moderate		Hard		Easy		Moderate		Hard		
Topic																			
ET210201	5	7	7	0	5	5	6	0	5	5	5	0	5	5	6	0	5	5	0	5	5	6	0	5	3	6	0	total
ET210202	5	5	8	0	5	5	7	0	5	5	6	0	5	5	7	0	5	5	7	0	5	5	6	0	5	5	8	0	5	5	5	0	total
ET210203	5	5	7	0	5	5	6	0	5	5	7	0	5	5	7	0	5	5	6	0	5	5	8	0	5	5	7	0	5	5	8	0	5	5	5	0	total

Taxonomy	Knowledge						Comprehension						Application						Total
Difficulty	Easy		Moderate		Hard		Easy		Moderate		Hard		Easy		Moderate		Hard		
Topic																			
ET210201	02	03	0	0	02	03	0	0	02	03	0	0	02	03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	total
ET210202	02	02	0	0	02	02	0	0	02	02	0	0	02	02	0	0	02	02	0	0	02	0	0	0	02	02	0	0	0	02	0	0	0	0	0	0	total
ET210203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	total

Figure 21. Specification Table

CONCLUSION

The various issues associated with the designing of Online Vocational Competency Testing System (OVCTS) are discussed in this paper. OVCTS facilitates a student to generate a automatic, balanced question paper that contains different types of objective questions with the different taxonomy and difficulty level. It is possible to test the competency of the vocational student by taking an on-line test through OVCTS as the student is going to attempt the questions of knowledge and skill type which is related with the competency. The performance of an on-line test is evaluated on different parameters immediately. The students can take the test several times so as to understand their weaknesses to improve further. The teachers can also take corrective measures to improve the teaching-learning process in VET.

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DESIGNING ONLINE LANGUAGE COURSES THROUGH MOODLE

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Abstract

Many educational settings have been attempting to enrich, strengthen, and update their curriculum and learning systems by integrating new generation e-learning platforms: learning management systems (lms). Moodle is a remarkably functional learning management system in which thousands of learners, teachers and courses can be used to make learning enhanced and interactive. This study aims to explore and exemplify how moodle can serve as a basis to create an interactive online platform to the language learning settings. In this study, the rationale under promoting the moodle as one of the most preferable lmss can be depended on the issues of: practical features, design and development philosophy, innovations and accomplishments, design, development, configuration management practices, websites, and support. The study both analyzes a sample site, developed by one of the researchers, focusing on data-driven learning (ddl) and recommends a pathway to incorporate moodle into language courses.

Keywords: Moodle, E-Learning, Foreign Language Pedagogy, Computer Assisted Language Learning, Data-Driven Learning

Introduction

Due to the enormously increasing popularity of the Internet in recent years, the delivery of learning programs has shifted from desktop to online-based applications. Respectively, many educational settings have been attempting to enrich, strength and update their curriculum and learning systems by integrating new generation e-learning platforms as learning management systems. This term has many other synonyms like Virtual Learning Environment (VLE) or Content Management System (CMS). Driscoll (2002) defines the learning management system (LMS) as 'any use of web technology to plan, organize, implement, and control all aspects of the learning process' (p.332). *Learning Management Systems* (LMS) are typically web-based systems that allow a teacher to create a course consisting of structured links to relevant websites, and add their own contents. The students register and use these resources, communicate with each other in virtual seminars, upload assignments, comment on each other's work, etc. LMSs are supposed to include software applications that label, track, and manage learning objects and then organize them for delivery in various combinations. They provide the instructional designers with the opportunity of integrating all type of learning objects which are modular building blocks that can be interchangeably used to create new courses from a common set of blocks. Thanks to rapid developments in both learning theory and computer technology, the domain of computer assisted Language Learning have been receiving interest from various stakeholders including many learners, teachers and researchers. This paper aims to purport the pros of Moodle as an LMS and crystallize the ways of using it to design online language courses by focusing on a sample site developed at Ankara University in 2008-2009 academic year.

Learning Management Systems and MOODLE

There have been dozens of Learning Management Systems (LMS) including both purchasable and open source ones serving for various settings' educational objectives. With the use of this type of software, it is possible to arrange the enrolled users' access to the system, to create course catalogs, to track and to report of the learners' activities, and to provide summative evaluation products to the unit administering the learning process. LMSs are seen as tools to automoticize learning management applications (Itmazi and Megias, 2005). Besides, LMSs are capable of developing course contents, orientating classroom activities, providing interaction models for the learners via chat and forum tools (Önal, Kaya and Diraman, 2007).

As stated by Alessi and Trollip (2001) "a great part of the learning psychologists, curriculum developers, and instructional designers have been trying to combine various principles of behaviorist, cognitive and constructivist paradigms into one approach or learning activity (p. 17). This perspective is consistent for both traditional learning environments and online learning environments. The most crucial criteria for sustaining success in e-learning applications is the ability of rapid, easy and well access to the wide information. The strong interaction between the user and the system, being able to respond user's questions, support of multimedia and utilization of internet are the indispensable factors affecting e-learning process. Respectively, it is highly recommended in e-learning to provide the learners with the feeling of closeness although they are separate and at a distance by using novel technology tools such as Multilanguage support aids and make them able of attending the same course from various countries. The software allowing the learners to upload and deliver their documents through the net are in favor of e-learning environments. Current developing mentalities of LMSs have been taking necessities of the theories mentioned above into consideration and also aiming to support the other learning theories, approaches and models. Those theory, principle, and approaches not only want to make the learning active, productive, and functional via LMSs but also focus on the use of innovative aspects of the online learning. While interrogating the traditional role of the teacher as a knowledge imparter, they also underline the vitality of learner centeredness and learners' taking responsibilities of their learning.

Moodle is one of the most popular open source LMSs in the world which was developed according to constructivist learning philosophy with a very functional content. The name Moodle stands for 'Modular Object Oriented Dynamic Learning Environment'. All of the words in the concept symbolize Moodle's design and development philosophy and try to deliver messages to the software programmers and educational theorists. Moodle is a remarkably functional learning management system in which thousands of learners, teachers and courses can be used to make learning enhanced and interactive. Martin Dougiamas, a former WebCT administrator with postgraduate degrees in Computer Science and Education, has triggered the initiative of Moodle system throughout the world open source software users. As a software package using for internet based course or web sites Moodle has been used by more than 100.000 users in 138 countries with the opportunity of 70 language support including Turkish. Since it is a totally php based software, it is possible to use Moodle with various servers of Linux, UNIX or Windows platforms. It is compatible to MYSQL and POSTEGRESQL based database systems. Every user of Moodle has an account on the server and authorization is done in this way. The essay module allows open-ended questions with built-in comment boxes for instructors to provide feedback. Particularly noteworthy is the workshop module, which is designed on the basis of peer assessment. All of these assessment types can be made time and password restricted, and can be set to allow for limited or multiple retakes (Chapman, Bryant, Montier and Wetzel, 2007).

Since there are many ambiguities and complexities of making a list of criteria to adopt an LMS, learning practitioners are in a need of more and contextual knowledge. In this study, the reasons under promoting the Moodle as the preferred platform to design online language courses can be depended on the issues of: practical features; design and development philosophy; selection trends; innovations and accomplishments; business expansion and partnerships; Websites and support (Cavanaugh, Gillan, Kromrey, Hess and Blomeyer, 2004; McDowell, 2006; Önal, Kaya and Diraman, 2007).

Practical Features

Moodle was designed to allow teachers or course participants to provide feedback in qualitative or quantitative form. For instance, both the assignment and journal module can be utilized to provide comments in a feedback box by the teachers. *Moodle* allows for the integration of a wide range of resources including any kind of text-based or html-formatted documents, multimedia resources such as graphics, video or audio, SCORMs, *PowerPoint*, *Half-Baked* exercises or *Flash*-based applications. It provides questionnaire, reporting, chat, discussion forum applications to the users. Users of Moodle have the chance to access their pages as an information portal. *Moodle* also allows for a wide range of assessment techniques. The quiz module includes: fill-ins, multiple-choice, multi-choice (more than one answer can be selected), true-false, matching, short-answer (exact matching) response types (Brandl, 2005).

Design and Development Vision

Comparing to Moodle, nearly none of the open source LMSs has such compatibility to the modern learning philosophy. The vision and theoretical design perspective of Moodle system is depended on the learning theory of social constructivism. *The* Moodle system and social constructivism share a common view on putting the emphasis on the question of 'How' in the process of human beings' learning story. This theory claims that human beings construct the new knowledge individually as they have encountered with various situations and contextual environments in their lives. According to Bruner's constructivism, this theory provides a perspective to be used in learning based on the study of cognitive developmental learning (Ornstein & Hunkins, 1998). Cognitive constructions as mental models help the learners to use techniques and strategies for taking decisions, developing hypothesis, selecting and transferring the knowledge. Constructivism believes that everything read, seen, heard, felt, and touched by learners is tested against prior knowledge, and transfer of knowledge is strengthened. Embracing constructivist view, Moodle recognizes that online learning can not be confined to just navigation through web pages and receptively absorption of the information (Cavanaugh et al., 2004). As it is in the experiential learning, constructivist pedagogy underlines the importance of learning by making and doing and put the emphasis on hands-on activities in the e-learning environments. Learning philosophy utilized to develop Moodle system is related to Berger and Luckman's (1996) social theory of the knowledge and points out that the crucial aspect of the learning process is the shared meanings among the learner groups and transforming the newly constructed knowledge into new situations. This is what social constructivists call 'scaffolding ' (Bonk and Cunningham, 1998) – and it works when you put learners together in close proximity to one another, in what is called the Zone of Proximal Development (Brandl, 2005). Respectively, Vygotsky's social constructivism attempts to find an answer to the question of how do the interactive learning activities and collaboration among the learners influence the depth of learning. Brook and Oliver, (2003) posit that social phenomenon of community may be put to use in the support of online learning and also underline the role of social interaction in the construction of knowledge.

Selection Trends

Throughout the world, lots of institutions like colleges, universities, companies, governments etc. have gradually started to use Moodle System instead of commercial systems. Instances to these are Athabasca and Bilkent Universities, which are the leading universities of Canada and Turkey, have started to use Moodle System as an official content delivering method a bit time ago. Briton, (2005) lecturer of the Athabasca University, indicates that after long debates and estimation processes, by taking account of not only technological components but also political, philosophical and cultural issues Moodle was considered as the most convenient learning management system to our university's philosophy. Moodle has been started to use by many institutions in Turkey within the last a few years. To exemplify, Hacettepe, Anadolu, Ataturk, Kirikkale Universities have initiated to transform their course contents to Moodle based online platforms. Briton also expresses that while improving management systems of open code education, notions that must be paid attention are that flexibility, innovation, robustness and naturalness.

Innovations and Accomplishments

The success of Moodle System and the growing popularity of the system have been determined by a great part of literature. Valenza (2006) considers Moodle System as one of the most important 10 technology components that affected education in the year 2005. In addition, Graf and List (2005) in their quantitative research have stated that Moodle System has reached far more value than all of other open code systems and it comes first in adaptation category. These and suchlike all scientific studies take place in the Moodle Buzz section of Moodle's Website.

Business Expansion and Partnership

Nowadays, cooperation about the commercial extent of the Moodle project is in discussion among the education companies pursuing their commercial activities through Moodle around the world. These collaborators, including qualified experts, are trying to improve corporate services for Moodle System. These services consist of hosting, support, counseling, establishment, schedule, themes and education. While contents are being transmitted through Moodle around the world, Moodle Cooperation becomes widespread and improves. Too few open code systems have reached such a different and widespread use level.

Websites and Support

Moodle versions gradually being developed and systematized have been competing with their commercial rivals in terms of design, development and configuration management concepts. All Moodle partners and academic users providing developmental support can easily utilize the novel components and applications plugged on the platform. Besides, another on site advantage of Moodle is that all users can share and express their opinions, suggestions and problems they have faced about software to system developers. These applications and free communication methods supports continual development of Moodle system. Another superiority of Moodle system is the opportunity to utilize it in different operating systems such as Microsoft, Macintosh, and Nowell. This feature directly enhances the development of Moodle and its growing popularity through the world.

In Moodle's own web site and its web service it can be seen that system is supported with professionalism and social spirit. These web sites present information about system and including intuitional circulation opportunity. Moodle's main site also contains support, program transfer, news, statistic information, e-lessons, detailed presentation for users, establishment instructions, development information, sites, users and discussion forums. Among Moodle users helping one another is a quite important phenomenon.

Language Learning and MOODLE

The question of what can and can't technology do in terms of language learning has led many stakeholders of the language pedagogy into various research for decades. Moreover, the advent of technologies in computer networking has enabled language teachers to shift their practice in using computers and Internet for their teaching. Thus, a growing body of research is gradually emerging that provides concrete suggestions on how to exploit instructional online tools effectively or how to integrate the Internet for different language learning goals (Brandl, 2002; Gonzalez-Lloret, 2003; Maugalian & Salazar, 2006).

Figure 1. Language Instruction Continuum. (Stevens, 2002)

Era	Milestone	Language teaching	CALL
1970's	**How languages were taught before computers & early days**	behaviorist: audio lingual, transformations as a way of understanding syntax	IDF, copying book exercises into computer, shooting movies on theater sets
1980's	**The move into humanism**	cognitive, learner centeredness, communicative competence, community language learning, silent way, TPR ...	humanism in CALL, tools based approaches, culminating in networked computers and student scaffolding in business college at SQU, computer in my classroom
1990's	**Tutor / Tool distinction**	communicative approaches	Internet; at the MLI - text manipulation to projects based curricula
This century	**Communities of Practice**	constructivist approaches	Webheads communities online, Learning Management Systems

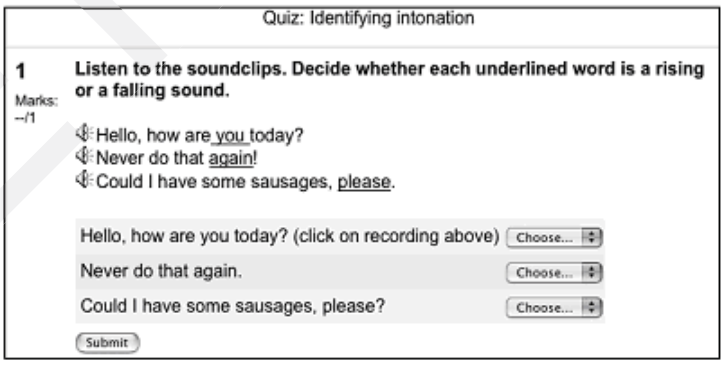
As can be viewed from the figure above, in the last years, computer assisted language learning (CALL) methodologies have improved to cover not only the new technology, but also methods and techniques brought about by the use of computers, the Internet, and virtual learning environments. The exploitation of the new tools available as well as student-centered, constructivist, collaborative and meaningful learning theories and approaches is being sought with a paradigm not only to foster students' language and communicative skills. Currently, online language learning becomes free from informal and independent individual learning. Cause, many language education settings have adopted online language learning systems that provides them opportunities to have learners from various locations. Similarly, teachers publish their materials on their web and communicate with students using emails. Moreover, course outlines are commonly uploaded on web sites (Britain & Liber, 1999). Some others also integrated commercial learning management systems (LMSs) into their language programs.

Since the current commercial LMSs are designed for distance education in general, they are not directly matching the use in Second Language Acquisition (SLA) contexts. SLA contexts in distance learning requires an LMS that includes "not only input and output of the character set of the target language, but also some other learning tools such as discussion boards, vocabulary activities, grammar clinics, online dictionaries, and writing draft books, feedback and assessment tools; all organized around the learning activities and communicative practice in all four language skills" (Sawatpanit, Suthers, & Fleming, 2003, 2004).

There are various modules embedded into Moodle that can be incorporated into language education. By using Quiz module, students can complete a gap-fill while listening to the lyrics of a song. Via Forum module, students may listen to model pronunciation of language they are learning. Mediacenter module lets Students listen and repeat at normal or slower speeds. OUwiki module helps students to listen to one speaker in a conversation and play the part of the other speaker. Lesson module is used to make students listen to a recording and notice grammar. Students may utilize Lesson or Wiki modules to listen and transcribe what they hear. Web page or Book Students listen and read at the same time. Hot Potatoes JQuiz module supports students to investigate the meaning of song lyrics, and then listen to the song (Stanford, 2009).

Varieties of activities that help learners to learn new words, review and recycle vocabulary, and learn different ways of keeping vocabulary records can be designed through Moodle. These activities may help students get better at their speaking ability using the add-on Nanogong recorder, which exemplifies activities that look at pronunciation, intonation, fluency, stress, and discussions. Moodle may be used to create a wide range of activities for presenting grammar, practicing its use, and keeping grammar records. It is also possible, to embed flash audio players and YouTube video on your Moodle to make language learning more fun. Language teachers may encourage their learners to read and interact with texts by Moodle. Setting up collaborative writing tasks and tasks with different types of feedback to help students to structure sentences to create longer texts and building short stories using key vocabulary. You can make your materials look more engaging and attractive by enhancing their visual design. Language teachers should consider the importance of roles, groups, and outcomes as well as the add-ons to make the most of Moodle for language teaching (Stanford, 2009). Creating activities that help students learn and practice to write effectively online may be an important contribution of the Moodle LMS to the language learning environments (Mougalian and Salazar, 2006).

Figure 2. A Moodle course screenshot of a sample listening activity

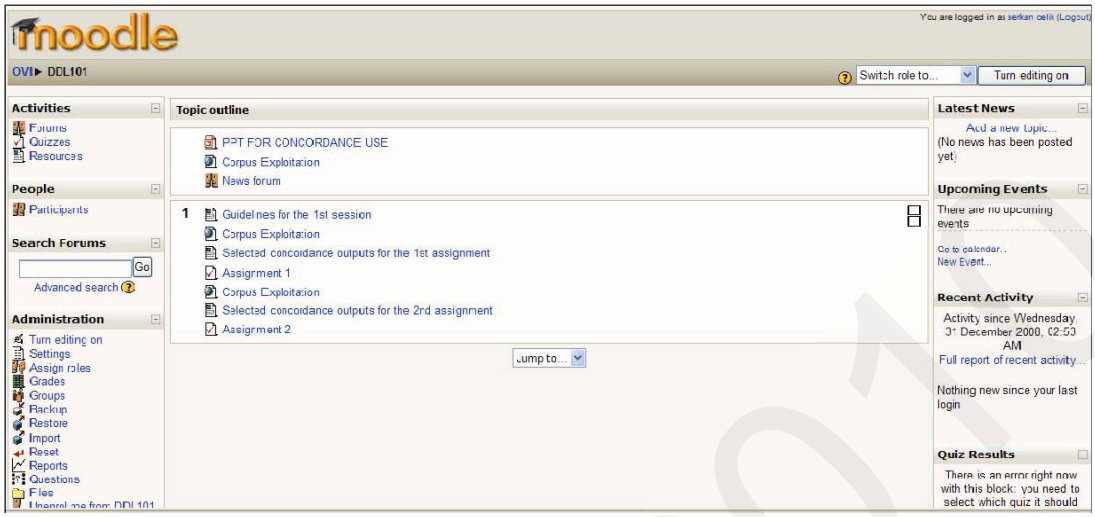


Moodle also provides the language teachers with the opportunity of setting up useful listening activities via student-made recordings, forum discussions and authentic texts, which may motivate learners to listen. It aids learners to interact with recorded texts through tasks such as gap-fill, text prediction, matching, and ordering events. It is also possible to benefit from gradebook statistics to generate unique language tests. Making language learners' experience more effective by checking the quality of the text, images, and audio and learn the importance of clear navigation paths is one of the other features of Moodle learning management system.

A Sample Language Course on Moodle

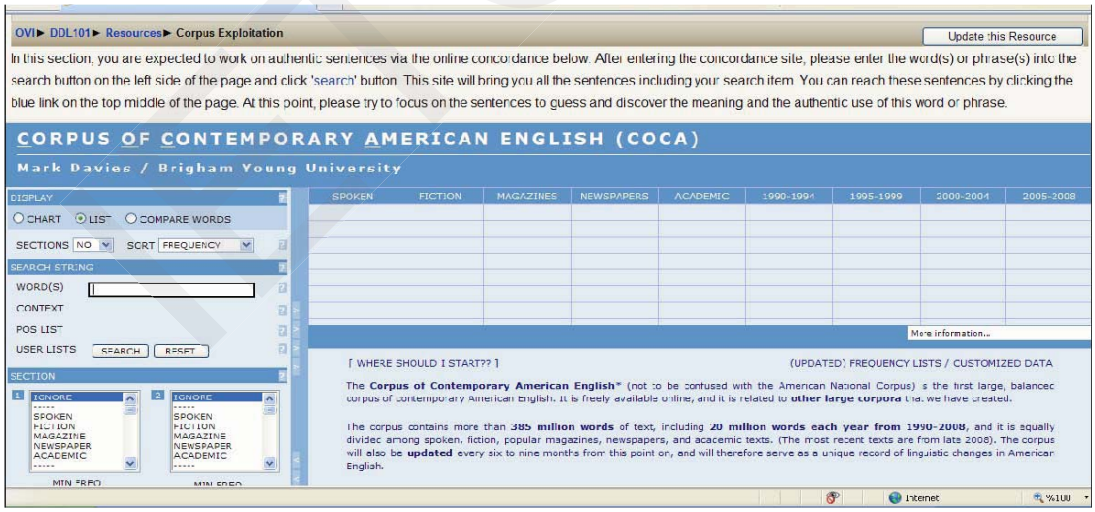
Celik, (2009) designed and developed a language course aiming to investigate the effects of data-driven learning on learners' achievement of lexical and collocational competence. Instruction was delivered through Moodle learning management system. The participants of the course were 34 students enrolled at Ankara University, School of Medicine. These learners were supposed to have an English course which was two hours per week and the online DDL course was administered within these time and at the faculty lab designated very accordingly.

Figure 3: A Screenshot of introduction Page for Data-driven Learning (DDL) Course



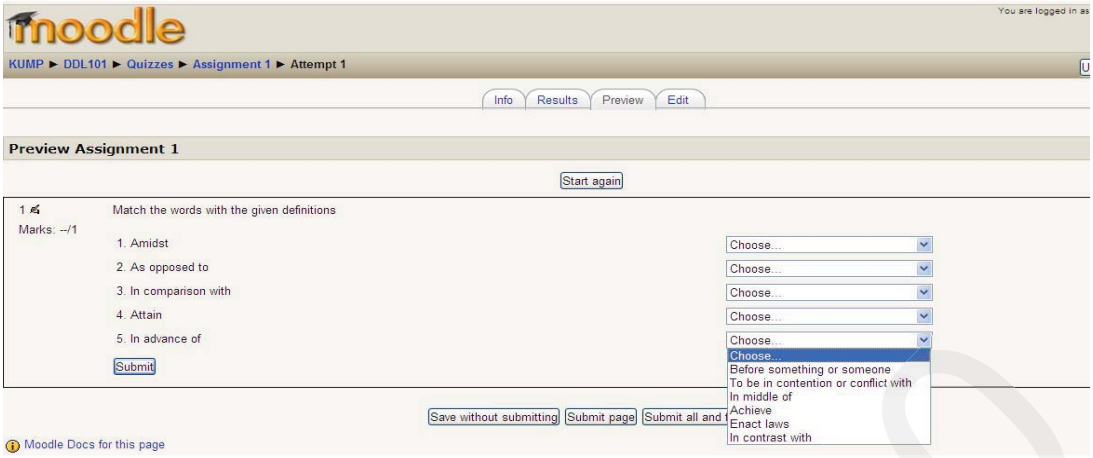
DDL course was designed to be taught for five weeks and that's why there were five sub sections or sessions in the overall course program. At each of these sessions, 10 identical words were aimed to teach by the help of specific vocabulary activities. All sub sections required nearly 80 minutes to cover all the specific activities. Each of these weekly programs includes three main activity types. The initial part of the sessions was a learner guideline describing what the learner are supposed to do through the session and giving them the list of the words they should study on. Moodle allows its users to link any sites from the Internet. Thus, the second part of the sessions was a concordance web page designed by Mark Davies, a corpus linguist working in States. There were a bunch of corpora embedded into the web page but the learners were requested to work with only Corpus of Contemporary American English which is probably the biggest corpus in the world. This web page is also a significant example of data-driven learning model because it provides users and language researchers with a lot of linguistic search opportunities.

Figure 4: A Screenshot of Corpus-Concordance Page



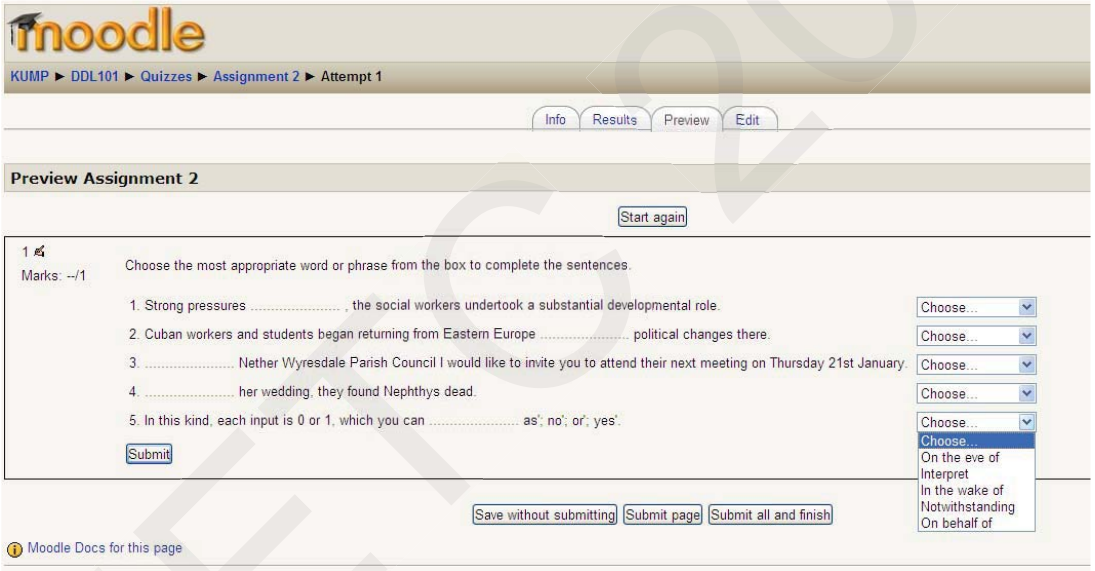
The third part of the sessions was designed to assess the students in terms of two vocabulary knowledge types which are definitional and productive. It should be noted that all reliability and validity issues of these tests were covered before putting them in use. For definitional knowledge, a matching exercise was developed and implemented into Moodle via quiz module. The second exercise was a cloze test and aimed to evaluate learners' vocabulary knowledge transfer skills into new contexts. Through the vocabulary knowledge test, learners are expected to match the given words with the correct definition. Since they had studied on these words at the corpus-concordance page previously, the overall success of recognizing was at a satisfactory level (Group Mean:4.03 at 5.00).

Figure 5. A Screenshot of Definitional Vocabulary Knowledge Test



The second quiz type was vocabulary knowledge test and learners are asked to find correct word to fill the sentences. Here again, they had delved into these words' meanings while studying with concordance outputs, the overall mean of the group was observed as 4.36 at 5.00. All of the test scores of the learners were stored via grades section of the Moodle and converted into excel files to pursue further analysis.

Figure 6. A Screenshot of Productive Vocabulary Knowledge Test



Conclusion

As a learning management system, Moodle has some words to say for supporting traditional classroom instruction, for instance, to do extracurricular activities, to become the delivery platform for hybrid courses. On the other hand, getting the learners involved in the learning process is vital to efficient language learning. The Moodle course management system presents an environment that enhances student input and collaboration. In terms of language pedagogy, learners will find that they are as much a resource to each other as the teacher is to them through the collaboration. Implementing Moodle in a language learning setting supports the organization and observation of the progress the learners are making on an individual, group, and whole class level toward the desired outcome of the class. Due to the implications of both technology (i.e. Moodle) and computer assisted language learning, educators are advised to review the roles of teachers, learners, and technology in the language class. Along with the ability to strengthen the technology with learning theory, language instructors need to learn new ways of assessing the students' process, not just their product. In order to get a productive language learning environment through learning management systems, language teachers should delve into second language acquisition theory, update their teaching methods, and perceptions of assessment.

To sum up, this online course delivered through Moodle was run with 34 tertiary level language learners and revealed a significant and quantitative difference in terms of vocabulary acquisition. When learners are asked about the delivery method and course content, they expressed their positive attitudes and approved the attempt of incorporating Moodle into language learning settings.

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DETERMINING LEARNING OBJECTS' DEVELOPMENT ISSUES

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Abstract

This study is aimed to determine the issues in developing learning objects. For this purpose, a new course was designed where students (n=49) were instructed to develop learning objects (los) for cognitive skill instruction. Students were grouped in 12 project groups to develop los for a term period time (14 weeks). During this period researchers accompanied project groups and collected qualitative data regarding their lo development process. Issues found in the study can be summarized in three dimensions: "content development", "project management" and "copyright". Some suggestions to solve these issues were suggested at the end of the study.

Introduction

It is implicated that learning objects (LOs) have an unquestionable big potential in education (Laverde, Cifuentes ve Rodriguez, 2007). However, it is emphasized that due to the lack of a design methodology for LO development process (Wiley, 2006), most LOs do not confirm with standards and cannot be considered as an LO. It is possible to say that people who want to make LOs a part of learning-teaching process, don't know the answers of some essential questions like "What is a LO?", "How can you use an LO?", "How an LO can be designed?" (Laverde, Cifuentes ve Rodriguez, 2007). This situation can be assumed normal considering that LOs are relatively new for instructional designers and research on LOs increase recently (Wiley, 2000). This is also a sign of a scarcity of research in the field.

LO development and use require three types of user. These user types are "authors (content writers)", "teachers" and "learners" (Di Nitto, Mainetti, Monga, Sbattella, & Tedesco, 2006). Teachers and learners can be content developers in the process. At the department of computer education and instructional technology, we are at the position of training prospective teachers, who would be potential content writers, teachers, and learners; therefore, this study aims to find out difficulties and handicaps in developing LOs process from teacher trainees' perspectives.

Method

Design based research (DBR) is applied for this research. DBR is not a method that is used often because of its background and application difficulties, on the other hand, in research where artifacts are produced, especially in educational field, DBR is considered as an effective and efficient method (Wang & Hannafin, 2004).

Study Group

Study group of this research consisted of 8th term students at the department of computer education and instructional technologies program in Hacettepe University, Ankara, Turkey. This group is determined by convenience sampling in order to give researchers to have advantage of being in a high interaction and collaboration with study group (Brown, 1992; Cobb, et al., 2003). The group took courses on instructional design, software development, and educational software development in their previous terms. Therefore, it is assumed that they have appropriate background in authoring and instructional process to be LOs developers.

Research Process

During the research process, design, analysis and redesign (Shavelson, Phillips, Towne, & Feuer, 2003) steps are followed recursively. In order to follow these steps in developing LOs process, a new course, "Design, Development and Evaluation of Educational Software" (DDEES), was designed and offered in the 8th term in the program.

In DDEES, it is decided to use learning by design strategies (Han & Bhattacharya, 2001) and ADDIE design model for LO development process. In the process, teacher trainees (N=49) are divided into 12 project groups which is a common practice in DBR researh (Enkenberg, 2001; Han & Bhattacharya, 2001). Each group was instructed to develop LOs by the end of the term. Groups were also provided assignments that they had to follow during this development process.

The objects and scope of LOs are determined according to Altun and Aşkar's (2008) "Learning Space" metaphor. The metaphor implied that each instructional expectation could be deconstructed as concepts and skills. Therefore, separate instructional materials could be developed for skills and concepts to be combined in the learning space eventually. For the task in this process, skills are determined and students were asked to develop LOs for instructional purposes. Each project group developed their LOs at the primary school level; and, the skills were chosen from math, science, social sciences and Turkish courses objectives in the curricula.

Data Collection Tools and Applications

Data collection process and applications is summarized in table 1.

Research Question	Study Group	Process	Time	Data Collection
What are the difficulties and	N=49	• Defining expectations and aims	14	• Observation

handicaps that teacher trainees as LO developers live in the LO developing process?		• Choosing skills • Building project groups • LO training • Designing story papers • Designing flow charts • Arranging schedules • Evaluation • Development • Evaluation • Packaging • Evaluation • Interaction, feedback and evaluation during the process	weeks	(166 pages) • Interview(124 minutes with 26 students) • Artifacts (135 LOs)

Table 1: Data collection process

Qualitative data collection was used during the process. During all theoretical and laboratory courses the researchers were with study group in same environment, having interaction and making observations and interviews.

DDEES course was carried out with a blended approach, both face to face and online by the help of MOODLE LMS system. MOODLE gave opportunity to make online interviews and collect data about LO development process.

Members of study group were able to contact researchers on behalf of themselves or their project group to get help during the process. Records of these communications were also used as data sources.

Findings

The data collected during the LO development process are analyzed/coded based on three basic themes articulated in the literature (ADL, 2004, Di Nitto, Mainetti, Monga, Sbattella, & Tedesco, 2006; Laverde, Cifuentes and Rodriguez, 2007; Churchill, 2007; Mavrommatis, 2008). It was onbserved that data are merged into these three braod themes. Table 2 shows the themes schema.

Basic Theme	Sub Theme	Theme	Criteria
Content Development		**Development Software and Environments**	About software and environments to develop LOs with and deployment
		Content Packaging and Repository	About packaging LOs into SCORM packages and repository (metadata, RELOAD)
	Determining Content	**Determining End Users**	About artifacts being usable by end user
		Determining Scope Range	About LOs' size and scope
	Subject Field Knowledge	**Subject Field Knowledge**	About how to teach that is aimed with LOs
		Lack of Recourses	About lack of recourses on LOs and skill instruction
Project Management		**Collaboration, Communication and Interaction**	About human relationship
		Project Planning	About project development and management
Copyright			About using materials that developed by someone else

Table 2: Theme schema to analysis LO developers data

Table 3 gives descriptive statistics according to theme schema given in table 2. The statistics includes coding counts and percentages in all coding.

Themes	Coding Count	Percentage (%)
Development Software and Environments	31	17
Content Packaging and Repository	13	7
Determining End Users	11	6
Determining Scope Range	11	6
Subject Field Knowledge	61	33
Lack of Recourses	14	7
Collaboration, Communication and Interaction	12	6
Project Planning	23	12
Copyrights	11	6
Total	187	100

Table 3: Counts and percentages of coding themes

Results, Discussion and Suggestions

The biggest percentage in LO development process issues belongs to "subject scope knowledge" theme with 33%. This fact takes attention in LO developers' summative evaluation impressions. In this study students (ya da teacher trainees) developed LOs for skill instruction with LO approach, which was an unfamiliar concept for them. Therefore, it is suggested that in studies like this, it is better to design a workshop or a seminar for developers to train them (Boot, van Merrienboer, & Theunissen, 2008) to raise awareness about the process. Developers need to be trained both in theoretical and practical aspects of LO design before the process. It would be a better approach to teach all phases of developing an LO at the very beginning of the instruction.

LO development software and the environment where these LOs will be played has a significant contribution to the issues. The content in LOs is simply digital educational software. The causes of this issue are mostly about developers not being familiar with the term, approach nor process. The suggested training should address to this issue too.

Packaging and uploading the LOs in a repository is an easy yet one of the most problematic issues. c. In order to store and make it ready for reuse, it is essential to supply metadata and apply proper packaging procedures. In this study, students used the RELOAD editor with a very brief instructional guidance. Suggested training should contain such a software application for this purpose.

Lack of recourses about LOs and LO development and confliction and contradiction between existing recourses are another issue that came about during this research. Therefore, more research studies about LOs and LO development processes are needed. Also, almost all LO developers in this study only know Turkish and used recourses in Turkish. , More Turkish recourses are needed on LOs and LO development.

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DETERMINING STUDENTS' READINESS LEVEL IN GUIDANCE EDUCATION WITH THE USE OF ARTIFICIAL INTELLIGENCE (AI) METHODS

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Abstract

Rapid advancements in information technologies have been affecting many areas including education as well. Information technologies play important role in improvement of education process. Modern communities need to follow all the advancements in information technologies and adapt themselves accordingly. It becomes inevitable that information technologies which plays important role in improvement of education process and quality should get into education institutions. Today, the most effective and modern approach to be used in the field of education is artificial intelligence technologies which constitutes intelligent tutoring system (its) when composed with instruction software technologies. In this study, an intelligent tutoring system (its), in which artificial intelligence methods are used, in order to orientate students to the subjects they are supposed to learn and to determine their level of readiness for guidance training. The structure and functioning of the system are presented focusing on system's different and superior sides than the traditional education.

Keywords: Artificial İntelligence, Intelligent Tutoring System, Expert System, Machine Learning System Design

INTRODUCTION

Artificial Intelligence (AI) and Intelligent Tutoring System (ITS)

Use of compuetrs in education process includes an experimental process of more than 50 years approximately. Those studies are stil continuing with all speed. The purpose and functioning of computers in the field of education change in accordance with education policies of countires and there are many questions left unanswered regarding this issue nowadays. One of those is the determination of students' level of readiness before the instruction starts. There are some important points to be taken into consideration before using the computer as a means of education. First of all, the items to be taught need to be determined and then how they will be taught to the students should be ascertained. Last but not the least, today's and future technological opportunities should be assessed carefully to give the necessay education with the best method (Castellan 1987). Computers' playing important role in education system has brought new dimensions to the information flow, instruction programmes and education process and has caused radical changes in education system which relies on stereotype information flow. One of these is the use of artificial intelligence (AI) in education. In a study conducted by Keleş, Ocak, Keleş, and Gülcü (2009) it was revealed that intelligent tutoring systems (ITS) significantly promoted the level of learning compared to classic instruction systems.

As Minksy (1995) defined, artificial intelligence (AI) is "the science of making machines exhibiting intelligent behaviors which is thought and designed by human beings".

Different definitions of artificial intelligence (AI) could be made as follows :

- It is a science which designs machines that identify and judge with processes such as learning and comprehension.
- Computer softwares that try to imitate human intelligence.
- It is a branch of science which deals with development of intelligent computer programmes that think like human (Keleş, 2007).

Learning is one of the most important research subjects of AI. Generally speaking, learning can be thought as increase in knowledge and development of skills in AI. Learning function contains apprehension of technical and theoretical knowledge, common sense and definitions

and determinations. Considering this information, improving skills contains organization of the knowledge and an effective ability of execution. AI, which brings out new methods to the programme software styles, imitates fundamental process of learning that depends on obtaining new knowledge pertaining learning and making use of it in future.

Modelling learning function in computer environment, can also be defined as machine learning. There are two basic thoughts in machine learning resaerch science. One of these is enabling learning and comprehension abilities with the help of the computers. For many years, the main objective of AI researchers has been the making of thinking computer systems. With the advancement of technology developed after understanding the nature of learning, it has been confirmed that new developments on promoting the machine learning to the highest level could be managed. Besides, another goal of machine learning could be thought as acquiring knowledge and making abilities perfect (Öztemel 1992).

Along with its different definitions given above, learning can be defined as "the process of constituting necessary changes within the direction of realizing a job or other jobs in a more productive and effective way than the previous attempts when systems do the same or similar jobs" (Simon 1983).

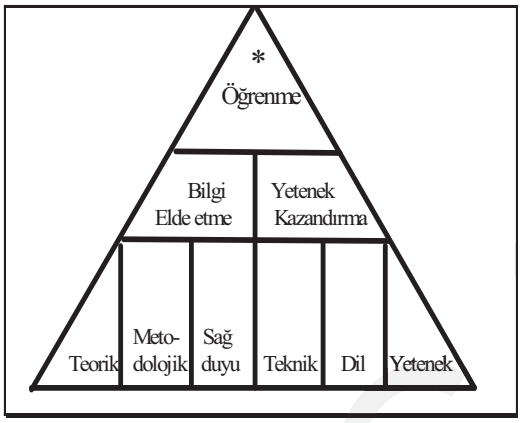

Figure 1. Fundamental Elements of Learning

The structure of AI which is used for education purposes is called Intelligent Tutoring System (ITS). Nkambou, Frasson, and Gauthıer, G. (1998) defined ITS as a computer system designed by profitting from the techniques taking place in common form of AI that knows what to teach, whom to teach and how to teach.

ITS is more succesful than traditional class or other systemsin terms of learning when compared (Doğan ve Kubat 2008). It is aimed to present a correspondent learning environment with students knowledge level in ITS. In a study conducted in Carniage-Mellon University, ITS was compared to Computer Based Instruction (CBI) systems and it was revealed that ITS promotes the quality of learning up to 43% and shortens the time spent for learnind as down as 30% (Nwana,1990).

Shaping and producing oriented evaluations are intended to determine the maximum level students achieve considering planned goals in education. At this stage, the test results get analyzed and make-up educational activities o related subject of the unit is arranged (Taşdemir, 2003; Demirel, 2004). Readiness is student's efficiency on fulfilling the learning task which is given to him for achieving the pre-determined goal (Altincik, 2008). According to Başaran (1997), the actual learning begins when readiness is managed. Along with physical maturity of the individual, preparation studies such as making him interested in the subject is required for fulfilling the learning. The same thing can apply to all learning context.

The main goal of intelligent tutoring system is to suggest a model on assessing the readiness level of a student before the education process begins and to offer knowledge and educational activities which are suitable for student's level within the light of this model. Considering an individual's having to have pre-experince on the lives he needs to learn about at a desired level; the ITS that is suggested in this study will give an important viewpoint to the interested people.

The main purpose of this study is to design an Intelligent Tutoring System (ITS), in which artificial intelligence (AI) methods are used, to orientate the students towards the topics they need to learn by determining students' level of readiness on guidance before the guidance instruction begins.

METHODS

Guidance Education With ITS :

Importance of guidance services is being more distinct day by day in modern education. Its being multidisciplinary makes it more difficult to determine the exact limit of the knowledge in guidance. In this context, guidance education comprises rather inclusive and flexible activities. An ITS is tried to be designed which consists of intelligent computer softwares to solve the above mentioned integration problem in guidance education.

Today, guidance education is given in almost the same in all interested education institutions. Because the readiness level of students is unknown and there is no such a thing as individual education, all of the students are supposed to take the same programme in the same time within the education period. However, students' behavioral, cognitive, affective and existential characteristics are distinctive. An individual-centered guidance education would be able to be planned in an effective way with the ITS designed in this study.

For a successful guidance education, first, the determination of students' level of readiness about the subject and then deciding on how and in which order the items and concepts should be given is of utmost importance.

In this study, a system is designed by making use of AI methods. This system determines the readiness level of students on guidance education. After that, it informs the students about the education process he'll be going through to plan the overall education process. System introduces a new approach and evaluates and orientates students on individual basis.

Determining Student's Readiness Level With ITS Before The Guidance Education Begins

ITSs are AI programmes. These programmes are either designed especially or a general purpose ITS is adapted into the specific topic of the instruction. There is no system designed to ascertain initial information especially before the beginning of the guidance instruction. This study is supposed to make up for the mentioned deficiencies.

From the computer engineering perspective, the most important side of the ITS is the use of AI methods in guidance education. Considering the studies conducted, it was found out that some AI methods such as *decision trees*, *neural networks*, *belief netwoks*, *expert systems*[1]. The important thing here is to include one or some of those algorithms or items into ITS that is in a web-based design (Keleş 2007).

Within the scope of this study, a web-based ITS software determining the readiness level of students before the guidance education begins is designed at *figure 2*. The subjects of the instruction are introduced to the system that is developed by software developing engineers and web designers. Those subjects are prepared by guidance experts. Together with the theoretical instruction about guidance services given in guidance research centers, schools and special guidance counselling centers, practical application oriented real environments for gaining experiences are provided to the students with ITS. With the help of this new design, personal information about the individual would be kept in compliance with secret terms and thus they could be tranferred into the education environments. Thus, the student who gets educated in this system would be able to give decisions considering real examples.

ITS creates a problem related to the guidance subject and receives student's answer. Then, system compares student's answer with the actual answer and froms a library of errors. In parallel with the increase in personal information in database, system gets to know the student in time. Orientates the student about the subjects he should get tutoring on. System can determine student's place (level) in general as well as deciding on his efficiency level considering guidance topics only. Thus, he could learn the subject with other students who are at the same level with him. ITS makes some recommendations on the topics and concepts the student should learn before the instruction begins and ends the process.

[1] http://bm-dergi.emo.org.tr/index.php?option=com_content&task=view&id=34&Itemid=74

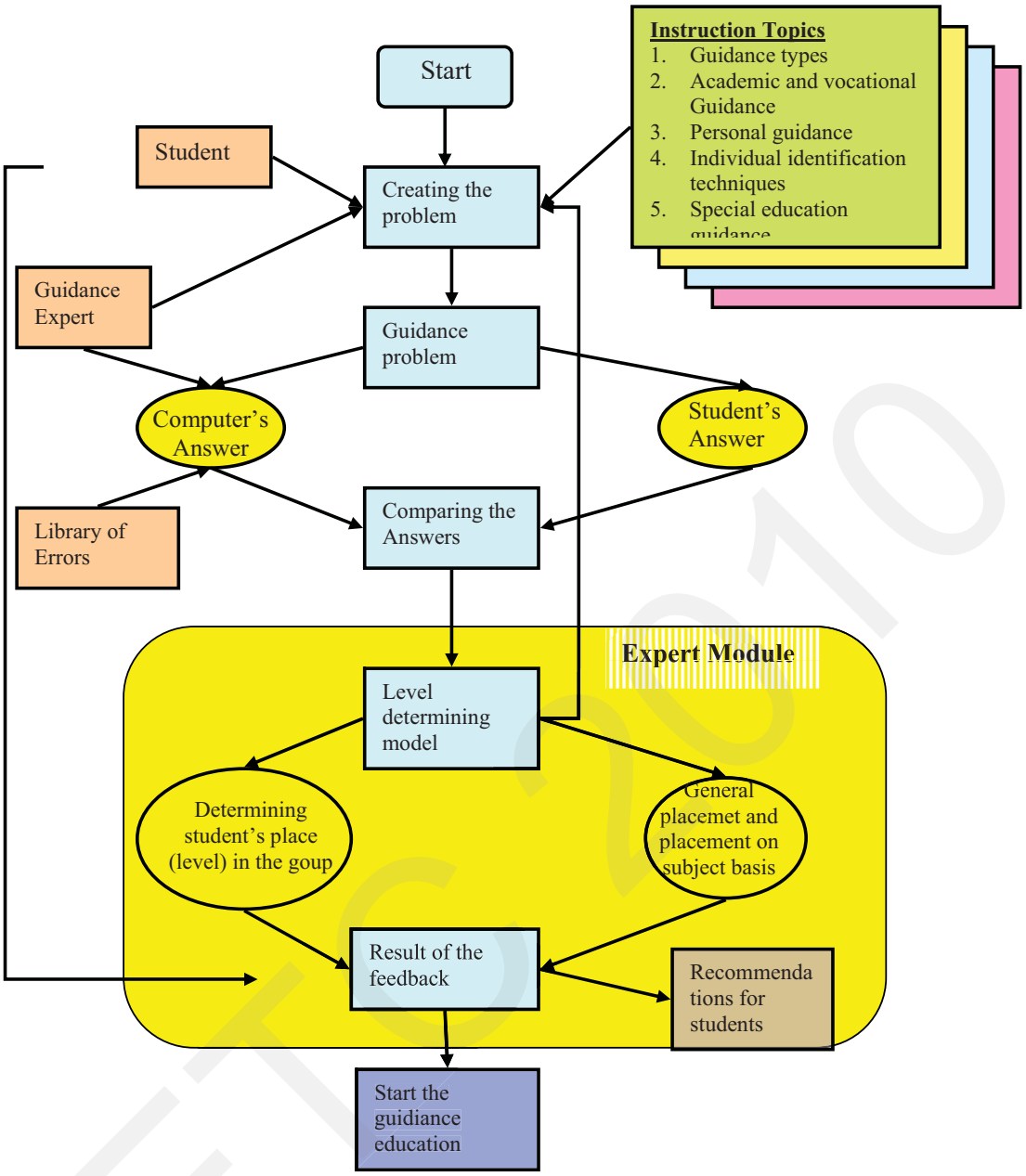

Figure 2. General Structure of ITS determining the level in Guidance Instruction

Expert Module **:**

Expert system is one of the oldest tools AI. It is a computer programme which reflects the expertise, knowledge, experience and thinking style and explanations of a field expert and come up with solutions and suggestions to the cases in an expert approach. This is also caled as *knowledge based system.*

Expert module, that is to be used in guidance education, is a decision making mechanism which is designed to determine the level of students' readiness before the instruction begins. Expert module structure of the system is given at figure 3. The expert module here is a computer programme based on knowledge and inference that is designed to realize the complicated mission held by people having expertise on guidance. Expert module of the system has an efficient decision making mechanism, just as an education expert has knowledge on how to manage instructions in guidance field. The expert module comes to a conclusion by making inferences based on the gathered information.

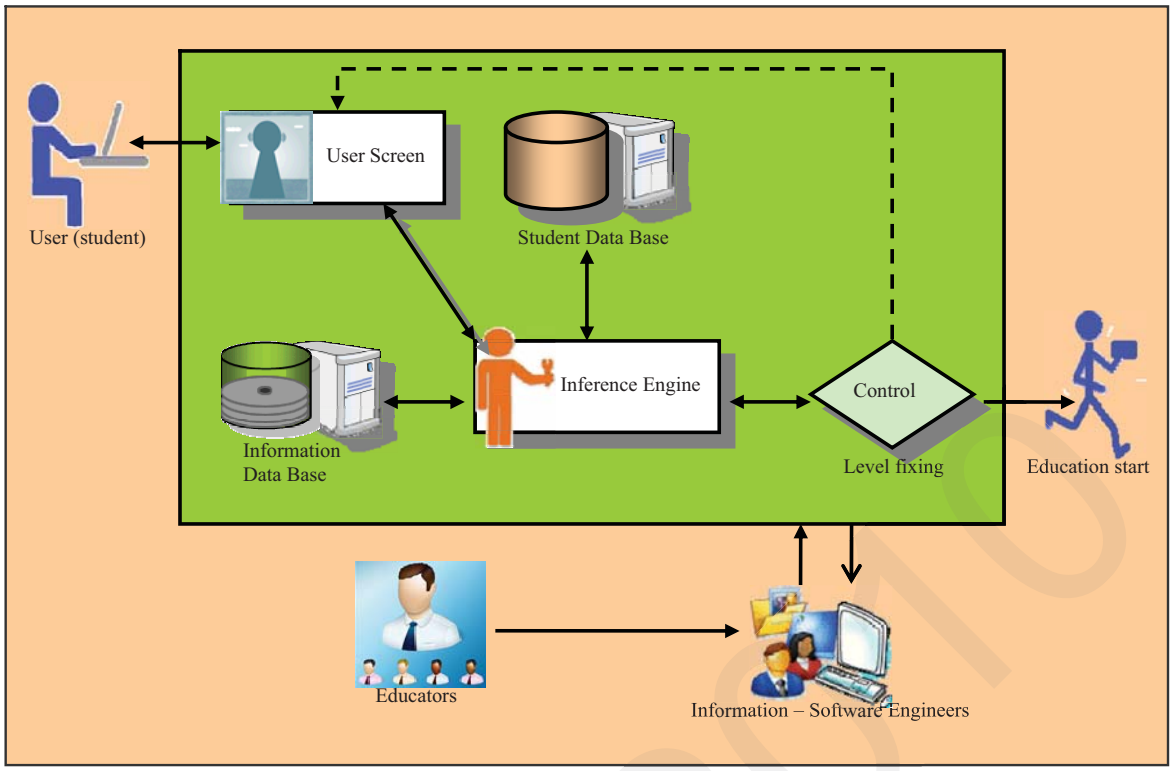

Figure 3. Expert module of the system

An expert system is generally designed by knowledge engineers or software developing engineers. The expert module of this study consists of four elements. Those are:

1. **Acquiring the information :** It contains obtaining and compiling of information relevant to guidance education and the studies conducted to change the cases for appropriate use in software. Necessary information is mostly obtained through the tutors who have expertise in guidance.
2. **Information database :** It is the place where relevant information on guidance in expert module is kept. It consists of the rules (if… . then…..), knowledge frames, knowledge class and procedures. They depend on realities known or ascertained by experts about field of guidance expertise.
3. **Students database :** It is the place where information about students who use the system is kept in expert module. The answers to the questions such as *which student, when, how he solved the (which) problem* are kept here. System gets to know the student with the information gathered here in time.
4. **Inference engine :** It is a mechanism which searchs for, filters and interpretes and deduce from (producing solution) the guidance knowledge in knowledge base. There are two types of inferences in general.

a) forward chaining: In this type, regarding the realities about the problem one reaches to a conclusion.

b) backchaining: In this type, on the other hand, considering a conclusion reached, the answer to the question of "Are there realities supporting this result?".

As a result, student's present knowledge could be determined by the two methods and thus his level group for the guidance topic would be confirmed.

5. **User interface :** The communication between system users and expert module is established by user interface. This unit explaines how the solutions to the problems are produced and why the conclusion is reached. Expert module's being perceived as an expert depends on the strength of user interface and expressing ability (Keleş 2009). Student can see here the answers given by the system. Furthermore, with the help of this unit, student knows which topic, then and how to learn and which instruction level group he'd be included into.

DISCUSSION

In order to understand the contributions and and facilities provided by this system designed on evaluation of instruction process and effective management of it, a discussion on comparison between traditional instruction methods and the method suggested in this study is made.

In classical method:

Before the placement;

1. Relevant guidance lesson is scheduled fort he semestre.
2. All of the students are taught the subjects of the lesson content.
3. Assessment & evaluation is done by exams.
4. Tutoring is ended.

For the placement before guidance education in classical method;

1. A general test for placement is on guidance is prepared.
2. This test is applied once to all of the students.
3. Level (the place) of the student is determined according to the score he gets from the test.
4. Tutoring is done in accordance with level groups.

In designed ITS;

1. Every student is taken into consideration on individual basis.
2. System recognizes (gets to know) each student in time.
3. Placement (level determination) programme can be prepared also in accordance with learning requirements of the student.
4. Cases which are difficult and expensive to experiment in laboratory environment can be simulated and thus, they could be given to the students in an easier way.
5. In this system student learns on his own and the process is within the control of the student. On the other hand, the tutor can follow and supervise the student and intervene when necessary.
6. This system could make a remarkable contribution to the students' guidance education process by presenting information, making special tutoring, contributing to improvement of a skill, making simulations, providing problem solving data and making statistical assessments (Dilekmen, Ada & Keleş, 2008).
7. System can determine student's academic standing in general as well as deciding on his efficiency level considering guidance topics. So, he could learn the subject with other students who are at the same level with him. (He receives education with the most successful students in some topics in the class whereas, he gets educated with ineffective students in other topics).
8. System makes a set of suggestions to each student on the education he'll be given on individual basis.
9. System determines the subjects in which the student is good at and in which he is having trouble with more detailed by dividing them into sub-subjects and sub-concepts so as to make a more detailed evaluation of the student.
10. This system can successfully be applied to other education processes other than the guidance education.

CONCLUSION

In this study web-based Intelligent Tutoring System (ITS) which determines and plans the subjects that the students should be taught before the instruction process begins is designed. The subject area of the instruction is appointed as the guidance field in this system. Positive contributions of this system could be specified under three titles as stated below :

1-Contributions with material dimensions:

- Saving of time;
- Saving of work-force;
- Human resource planning;
- Time and place independent flexible use;
- Added-value intended to promote the quality of education;
- Saving of money.

2- Contribution intended to promote the quality of education

- An effective instruction planning could be managed before the instruction starts under the favor of the determination on which student knows what, when and why.

- Students learn by taking more active role in guidance education.
- Actualizing the instruction, the system gives the students the opportunity to study on new instruction methods and strategies. Results obtained by the studies conducted by Nwana (1990); Keleş, Ocak, Keleş, and Gülcü (2009) correspond to this contribution.

3-Scientific added-value

- Information technologies would be used at ultimate level.
- A comprehensive database would be established in time on the subjects to be taught (in this study; guidance) by means of this system.
- This database could be used in researches of educational sciences.
- This web-based system contains *distant education* and *computer based education* as well.
- System gives the opportuniy to monitor each student on individual-basis before the instruction starts, during the instruction and after the instruction ends.

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DETERMINING THE ISSUES IN THE PROCESS OF LEARNING OBJECT DEVELOPMENT

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Abstract

This study aims to determine the issues in developing learning objects. For this purpose, a new course was designed where students (n=49) were instructed to develop learning objects (los) for cognitive skill instruction. Students were grouped in 12 project groups to develop los for a term period time (14 weeks). During this period researchers accompanied project groups and collected qualitative data regarding their lo development process. Issues found in the study can be summarized in three dimensions: "content development", "project management" and "copyright". Some suggestions to solve these issues were suggested at the end of the study.

Introduction

It is implicated that learning objects (LOs) have an unquestionable big potential in education (Laverde, Cifuentes ve Rodriguez, 2007). However, it is emphasized that due to the lack of a design methodology for LO development process (Wiley, 2006), most LOs do not confirm with standards and cannot be considered as an LO. It is possible to say that people who want to make LOs a part of learning-teaching process, don't know the answers of some essential questions like "What is an LO?", "How can you use an LO?", "How an LO can be designed?" (Laverde, Cifuentes ve Rodriguez, 2007). This situation can be assumed normal considering that LOs are relatively new for instructional designers and research on LOs increase recently (Wiley, 2000). This is also a sign of a scarcity of research in the field.

LO development and use require three types of user. These user types are "authors (content writers)", "teachers" and "learners" (Di Nitto, Mainetti, Monga, Sbattella, & Tedesco, 2006). Teachers and learners can be content developers in the process. At the department of computer education and instructional technology, we are at the position of training prospective teachers, who would be potential content writers, teachers, and learners; therefore, this study aims to find out difficulties and handicaps in developing LOs process from teacher trainees' perspectives.

Method

Design based research (DBR) is applied for this research. DBR is not a method that is used often because of its background and application difficulties, on the other hand, in research where artifacts are produced, especially in educational field, DBR is considered as an effective and efficient method (Wang & Hannafin, 2004).

Study Group

Study group of this research consisted of 8th term students at the department of computer education and instructional technologies program in Hacettepe University, Ankara, Turkey. This group is determined by convenience sampling in order to give researchers to have advantage of being in a high interaction and collaboration with study group (Brown, 1992; Cobb, et al., 2003). The group took courses on instructional design, software development, and educational software development in their previous terms. Therefore, it is assumed that they have appropriate background in authoring and instructional process to be LOs developers.

Research Process

During the research process, design, analysis and redesign (Shavelson, Phillips, Towne, & Feuer, 2003) steps are followed recursively. In order to follow these steps in developing LOs process, a new course, "Design, Development and Evaluation of Educational Software" (DDEES), was designed and offered in the 8th term in the program.

In DDEES, it is decided to use learning by design strategies (Han & Bhattacharya, 2001) and ADDIE design model for LO development process. In the process, teacher trainees (N=49) are divided into 12 project groups which is a common practice in DBR researh (Enkenberg, 2001; Han & Bhattacharya, 2001). Each group was instructed to develop LOs by the end of the term. Groups were also provided assignments that they had to follow during this development process.

The objects and scope of LOs are determined according to Altun and Aşkar's (2008) "Learning Space" metaphor. The metaphor implied that each instructional expectation could be deconstructed as concepts and skills. Therefore, separate instructional materials could be developed for skills and concepts to be combined in the learning space eventually. For the task in this process, skills are determined and students were asked to develop LOs for instructional purposes. Each project group developed their LOs at the primary school level; and, the skills were chosen from math, science, social sciences and Turkish courses objectives in the curricula.

Data Collection Tools and Applications

Data collection process and applications is summarized in table 1.

Research Question	Study Group	Process	Time	Data Collection

What are the issues that teacher trainees as LO developers live in the LO development process?	N=49	• Defining expectations and aims • Choosing skills • Building project groups • LO training • Designing story papers • Designing flow charts • Arranging schedules • Evaluation • Development • Evaluation • Packaging • Evaluation • Interaction, feedback and evaluation during the process	14 weeks	• Observation (166 pages) • Interview(124 minutes with 26 students) • Artifacts (135 LOs)

Table 1: Data collection process

Qualitative data collection was used during the process. During all theoretical and laboratory courses the researchers were with study group in same environment, having interaction and making observations and interviews.

DDEES course was carried out with a blended approach, both face to face and online by the help of MOODLE LMS system. MOODLE gave opportunity to make online interviews and collect data about LO development process.

Members of study group were able to contact researchers on behalf of themselves or their project group to get help during the process. Records of these communications were also used as data sources.

Findings

The data collected during the LO development process are analyzed/coded based on three basic themes articulated in the literature (ADL, 2004, Di Nitto, Mainetti, Monga, Sbattella, & Tedesco, 2006; Laverde, Cifuentes and Rodriguez, 2007; Churchill, 2007; Mavrommatis, 2008). It was onbserved that data are merged into these three braod themes. Table 2 shows the themes schema.

Basic Theme	Sub Theme	Theme	Criteria
Content Development		**Development Software and Environments**	About software and environments to develop LOs with and deployment
		Content Packaging and Repository	About packaging LOs into SCORM packages and repository (metadata, RELOAD)
	Determining Content	**Determining End Users**	About artifacts being usable by end user
		Determining Scope Range	About LOs' size and scope
	Subject Field Knowledge	**Subject Field Knowledge**	About how to teach that is aimed with LOs
		Lack of Recourses	About lack of recourses on LOs and skill instruction
Project Management		**Collaboration, Communication and Interaction**	About human relationship
		Project Planning	About project development and management
Copyright			About using materials that developed by someone else

Table 2: Theme schema to analysis LO developers data

Table 3 gives descriptive statistics according to theme schema given in table 2. The statistics includes coding counts and percentages in all coding.

Themes	Coding Count	Percentage (%)
Development Software and Environments	31	17
Content Packaging and Repository	13	7
Determining End Users	11	6
Determining Scope Range	11	6
Subject Field Knowledge	61	33
Lack of Recourses	14	7
Collaboration, Communication and Interaction	12	6
Project Planning	23	12
Copyrights	11	6
Total	187	100

Table 3: Counts and percentages of coding themes

Results, Discussion and Suggestions

The biggest percentage in LO development process issues belongs to "subject scope knowledge" theme with 33%. This fact takes attention in LO developers' summative evaluation impressions. In this study students (ya da teacher trainees) developed LOs for skill instruction with LO approach, which was an unfamiliar concept for them. Therefore, it is suggested that in studies like this, it is better to design a workshop or a seminar for developers to train them (Boot, van Merrienboer, & Theunissen, 2008) to raise awareness about the process. Developers need to be trained both in theoretical and practical aspects of LO design before the process. It would be a better approach to teach all phases of developing an LO at the very beginning of the instruction.

LO development software and the environment where these LOs will be played have a significant contribution to the issues. The content in LOs is simply digital educational software. The causes of this issue are mostly about developers not being familiar with the term, approach nor process. The suggested training should address to this issue too.

Packaging and uploading the LOs in a repository is an easy yet one of the most problematic issues. c. In order to store and make it ready for reuse, it is essential to supply metadata and apply proper packaging procedures. In this study, students used the RELOAD editor with a very brief instructional guidance. Suggested training should contain such a software application for this purpose.

Lack of recourses about LOs and LO development and confliction and contradiction between existing recourses are another issue that came about during this research. Therefore, more research studies about LOs and LO development processes are needed. Also, almost all LO developers in this study only know Turkish and used recourses in Turkish. More Turkish recourses are needed on LOs and LO development.

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DEVELOPING A COMPUTER GAME ATTITUDE SCALE FOR ELEMENTARY SCHOOL STUDENTS

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Abstract:

Since elementary school students are easily exposed to computer games, it is very important to understand their attitudes toward these games. We adapted the computer game attitude scale (cgas) developed by chappell and taylor in 1997. The reliability alpha coefficient was 0.88. After a principal component factor analysis, it was found that both comfort and liking factors account for 44% of all variability in this scale, which is lower than 50% and should be validated further. Therefore, for the purpose of revising this cgas based on elementary school students as subjects, a 60-item questionnaire was designed and presented, using a four-point likert scale, to a group of taiwanese elementary school students. For the sake of being representative, 210 grade 6 students, about 13 years old, from elementary schools of different counties or cities were selected. The questionnaires received were processed and subjected to statistical analyses to verify the validity and reliability, and further to assess the mean differences among the five factors and three subscales. The formal questionnaire was comprised of different components of the students' attitudes toward computer games, including learning, confidence, liking, participation, and leisure, which can be grouped into three subscales: cognition, affection and behavior. The students scored high on learning, liking and leisure items, but low on confidence and participation items. The students scored the highest on the subscale of affection, followed by the subscale of cognition and the lowest on the subscale of behavior. We hope this questionnaire will serve as a reference for researchers and teachers in elementary school in the future.

Keywords: Computer Attitude, Computer Game Attitude, Computer Game, Reliability, Validity

DEVELOPING WEB BASED CONTENT OF MICROCONTROLLER COURSE FOR DISTANCE EDUCATION

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Abstract:
Distance education is an institutional educational activity that students, teachers and teaching materials which are in different places are brought together through information and communication technologies. This training process which starts by mail has been gradually developed in the course of time to create virtual classrooms in internet. Modern educators give lessons via internet with establishing necessary infrastructure. In this study, pic16f628a from microcontroller family is described with multimedia components as pictures, graphics, schemas, tables, videos etc. Pic16f628a microcontroller was preferred because it is cheap, ensured easy, and used in many commercial projects. Pic16f628a microcontroller course contents were prepared according to teaching principles that from concrete to abstract, from easy to difficult, currency etc. Sounds, images and videos were used for providing effective learning. Instruction process is enriched with fluent text content and interactive visuals. The aim of this study is to provide benefit to university students, person who developing electronic applications.

Keywords: Distance Education, Microcontroller Course Instruction, Web Based Instruction, Pıc16f628a

1. INTRODUCTION

Human's wonder of facilitating the daily life and exploring life is so being effective that closing an age and opening a brand new age. With this learning attitude, education has not been shut in. When computer and communication technologies become cheaper, computers are used at homes. Thus education platform became larger and interactive. People in various ages and groups of jobs join lifelong learning. According to Vygotsyk who is important representatives of contemporary approaches to learning, interactivity between humans is the basic of learning. This activity between humans provides researching existing information and reaching new theories. Previously physical places as classrooms, schools or courses were used for interactive education atmosphere (Öğrenci Merkezli Eğitim (Yapısalcı Öğrenme ve Teknoloji), 2009). However traditional education features of same teaching methods, same period of time, same speed and etc lost validity (Karaağaçlı ve Erden, 2008). Traditional education system has limitations as places, time, etc. Thus distance education has become more popular rapidly because of place free, time free, answerable for personal talents and skills.

In this study, preparing of web based course of PIC16F628A from microcontroller family is explained. Microcontrollers are programmed as producer and model. Microchip Company called chips as PIC (Peripheral Interface Controller). Course contents were prepared according to teaching principles, from concrete to abstract, from easy to complex, from simple to complex, currency etc. Text contents supported by pictures, audios and videos used for raising students' motivation and effective learning. Generally microcontroller courses are educated on technical high schools, vocational schools and universities. Explained 16F628A in this study is preferred by developers because it is easy ensured, well-price/performance rate in 16 series microcontrollers and useful for basic applications. Thus distance education aim of self-learning is supported with web based contents for microcontroller course.

In literature; Commands and program architecture of PIC16F84 is explained with sample animations prepared with java in Göktaş's and Kurat's study (2001). 8051 microprocessor is teached in Microcomputer Systems and Assembly Language Course in Gazi University Distance Education Vocational High School.

The difference of this study from others; before theoretic part of course is explained with multimedia components and then solving of sample problems are supported with animation, video and simulation. In addition web pages are designed interactively and user-friendly.

2. METHODS

Developing of web based learning is provided suitable content presentation with considering student's individual difference, prerequisite learning and goals (Brusilovsky, Eklund, Schwarz, 1998) . For this reason composing of web based contents are important part of system's general workload. After preparing cms (content management system), it may be used for different application and new modules may be integrated into cms.

It is difficult to say same things for instruction contents. (Al and Madran, as cited in Pahl, 2003, Song, K., Hu, X., Olney, A., Graesser, A.C., 2004). Currently learning style concept that speeds human's learning up, is improved (Numanoğlu & Şen, 2006). It must not be forgotten that; contents which is prepared with analyzing perception process of new learning atmosphere of and learning style, is quite important to increase students' accomplishment level (Lee, 2001).

2.1. Preparing and Presentation of Microcontroller Course Contents

This study was started determining educational goals and composing course content. Course content includes general goals, contents table, chapter goals, topic expressions and evaluation questions. Content tree was composed with a word processor program. Subject topics that determined ten chapters are like that:

- Introduction to Microcontroller
- Hardware Features of PIC Microcontroller
- PIC16F628A
- PIC Assembly
- PIC Programming with MPLAB and IC-Prog
- Data Transferring and Decision Process
- Loops
- Delay Timing and Sub-functions
- Bitwise and Logic Processes

- Arithmetic Process on 8 bits and 16 bits

Course contents were prepared with using Microdenetleyiciler ve PIC Programlama PIC16F628A (Altınbaşak, 2008), MEGEP Bilişim Teknolojileri Mikrodenetleyiciler 1 (MEB, 2007), datasheets of PIC16F628A (MICROCHIP, 2004) and MICROCHIP MPLAB IDE Users' Guide (MICROCHIP, 2008). Besides text contents were prepared considerably as open and easy-comprehensible for audience.

Process of preparing contents tree provided composing presentation storyboard of whole learning interactivities and course contents easily. Storyboard prepared by Power point program, is a document that prepared for courses contents producing and defined detailed on each of web page screen (Özarslan, Kubat, Bay, 2007). The sample slide is shown figure 2.1.

Figure 2.1: Storyboard slide design

As shown in figure 2.1, location of text and visuals are designed. Generally visuals are on students' left and texts are on students' right. If text is short and content will explain with visual, visual will be bottom of text. In that kind of pages, location of multimedia components as picture, graphics, schema, table, animation, video etc. in text is specified by description line. Topics are arranged by content tree. After composing of contents tree and storyboard, HTML type web pages are prepared for each of chapters that will be presented on www. The sample web page is shown in Figure 2.2.

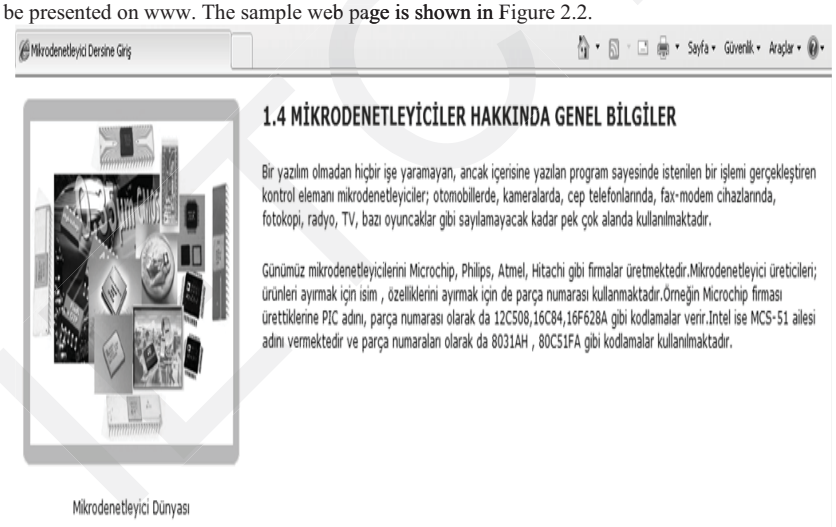

Figure 2.2: The web page that is supported with picture

While visuals were preparing, firstly multimedia components that are determined depend on contents of text. Instructions of how to use visuals are explain as it will be top of the visual if visuals are video and animation, it will be bottom of the visual if visuals are picture or other visuals. As shown figure 2.2 description lines were added under the picture or other multimedia components.

In this study, Macromedia Flash MX 2004 and Microsoft GIF Animator were used for animations , SnagIt8 and Adobe Captivate 3 were used for videos, Macromedia Dreamweaver 8 was used for designing web pages. All of animations' resolution is 572x400 pixels.

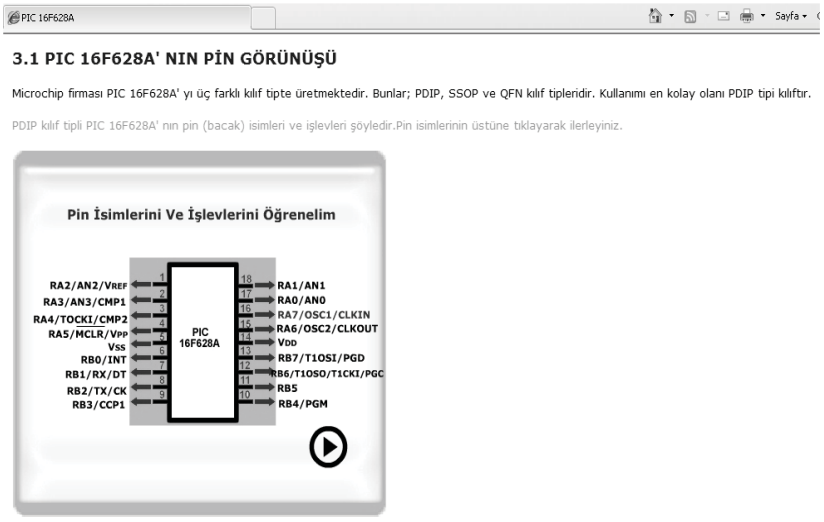

Figure 2.3: The web page that is introduces pins functions of PIC16F628A with using animation

When click on PIC's pins, there will be shown new animation that shows feature of pin as shown in figure 2.3. If forward button is used, pins feature is shown sequentially, too.

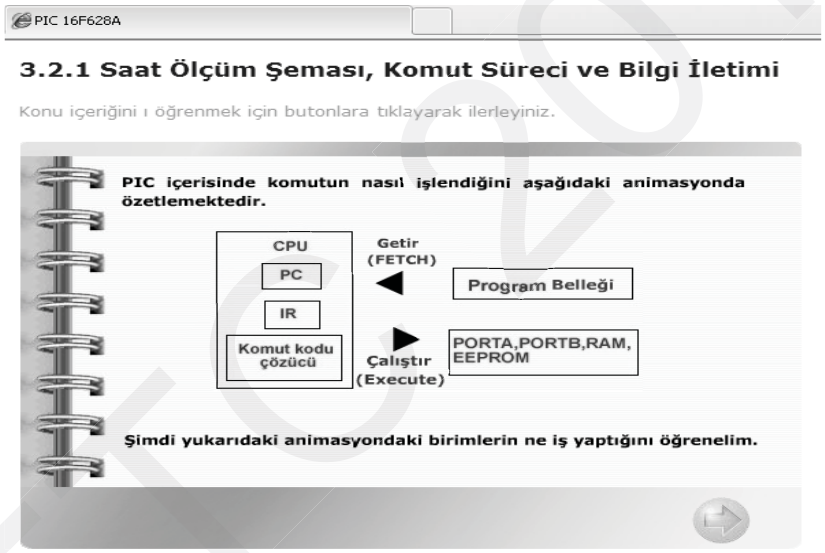

Figure 2.4: The web page that shows command process of PIC16F628A with using animation

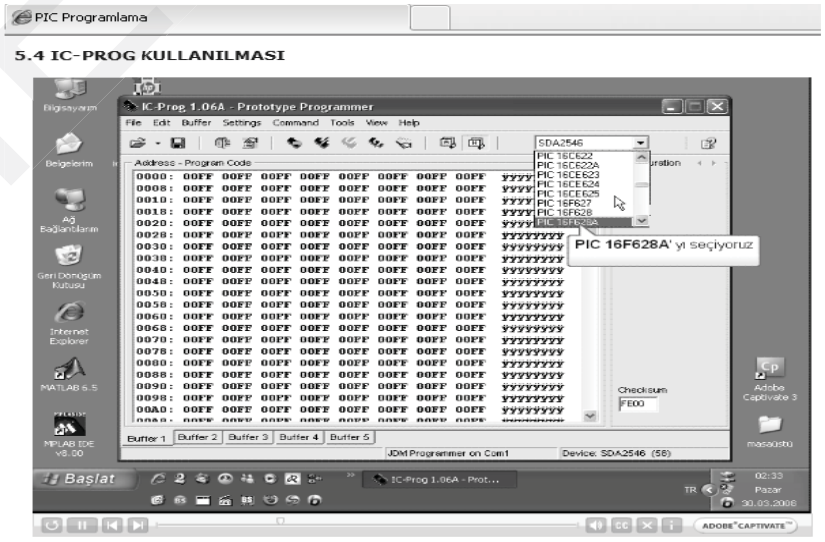

Figure 2.5: The web page that shows how to use IC-PROG with using video

Each of process step was explained in videos and video resolution is 800x600 pixels. While playing videos, students can forward, backward, pause, re-play, change sound range on control bar. This feature is given effective learning chance to students.

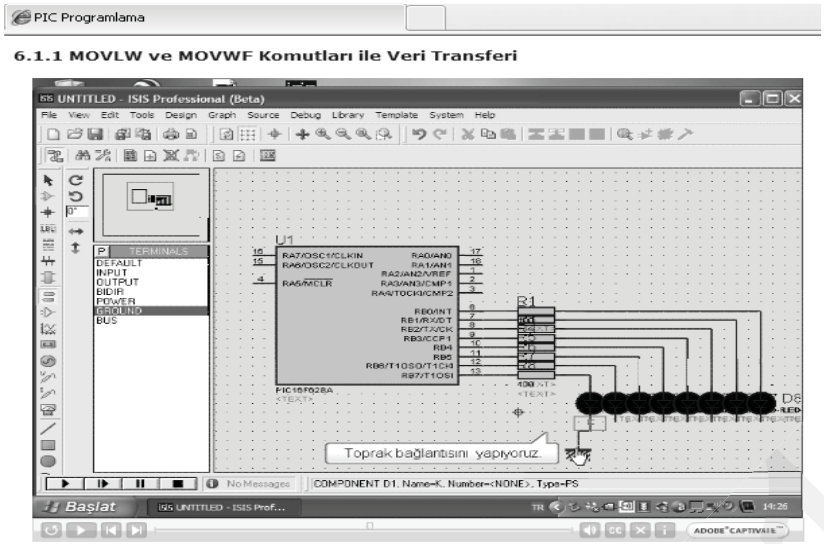

Figure 2.6: The web page that shows designing circuit in ISIS Professional with using video

3. CONCLUSION

In this study, while preparing microcontroller course contents; educational goals are specified about course contents, web pages are designed as user-friendly, color harmony is considered and course contents are supported with visual components for effective learning. Course contents are prepared as interactive web pages to make learning easy. This study can be integrated learning management systems as flash application. However, technical courses like microcontrollers cannot be learned well without practice. To improve learning activity, web-based remote access e-lab application can be done as Çimen, Yabanova, Nartkaya & Çinar (2008); Richardson, Adamo-Villani, Carpenter & Moore (2006); Taşdelen, Kutlu, Küçüksille (2005). However, they used 8051, so e-lab application must be prepared on PIC16F628A for this study.

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DEVELOPMENT AND VALIDATION OF A CHECKLIST FOR ANALYZING THE STS ELEMENTS OF PALESTINIAN SCIENCE TEXTBOOKS

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Abstract
One of the aspects science education should focus on is learning about science. Achieving a good understanding of this aspect requires, among others, the use of sts of science. There is some evidence that teachers rely heavily on textbooks to select the sts content they include in their science lessons. On the other hand, palestinian science textbook are not very explicit about the teaching of the science. Therefore, textbook writers may not feel compelled to give enough importance to the sts of science in their textbooks and consequently little sts elements of science will pervade the science lessons. This paper aims to present a theoretically grounded checklist developed for analyzing the sts elements of science textbooks. Six textbooks that are different with regard to sts elements were analyzed. Inter-rater agreement was used in order to validate the checklist. The results of the analysis show that the checklist is able to reveal differences among textbooks and that the sts elements included in the textbooks is not enough to satisfy students' needs.
Keywords: Science, Technology, And Society.

1. Introduction

Science-Technology-Society (STS) has been an example of needed reform in Science Education for over 25 years (Bybee, 1985; Solomon & Aikenhead, 1994; Yager, 1996). STS continues as a major reform initiative in the U.S. and around the world during the decades that have followed. It is used most often at the middle school level and exemplifies a coordinated curriculum and constructivist teaching.
In this paper we shall focus on learning science and learning about science. The understanding of some fundamental concepts and principles is one of the major objectives of science education. However, it should be noticed that learning about science is mentioned in most definitions of scientific literacy and became a hoped-for part of the education of all citizens (Mathews 1998).

Thus, if there were no other reason to include STS Elements of science in science education, the case for scientifically literate citizens would be a strong enough reason for the use of the STS of science, as it helps to understand the contemporary social issues of science (Shortland &Warwick 1989). In addition teaching and learning through STS approach provide students a positive attitude towards science and empower them to solve their real world current and personal problems, develop concept and process skills mastery and make high level of creativity skills (NSTA, 1990; Yager, 1990; Akcay, 2008; Mia, 2009).

However, there is a lack in the included STS topics or issues in materials of the Palestinian school science textbooks for the higher elementary stage. According to Alzannien (2002) there are necessities to change the present science curriculum by including topics such as the Environment, Energy, Agriculture techniques, technological communication, information technology, food production, education population, Astronomy, and Physical science. All these fields are significant areas of STS. The results of Alolols study (2004) shows that the environment, energy, genetic engineering and agricultural science have not been given enough attention in the Palestinian curricula.

Therefore, the researcher formed a list of STS Elements according to the needs of the Palestinian society and investigated the extent to which the science textbooks in higher elementary schools contained the STS Elements. In addition, the researcher determined the experts' and teachers' priorities of the STS Elements. Furthermore, this study measured the extent to which these textbooks contain these STS Elements and drew a comparison of the overall inclusion of all STS Elements between the different science textbooks from grad 8 to 10.

2. Developing a science, technology and society (STS) elements inventory for analyzing Palestinian science textbooks (Checklist)

The content analysis focused on the definition of STS elements. The objective of the content analysis was to discover, whether selected general science textbooks in the Higher Elementary Level in Palestine contained STS elements that encourage an interaction between science, technology and society, or provide mere descriptions of science. Moreover, the benefit of science to the society was evaluated in the content analysis. A list of Science, technology and Society elements related to Palestinian society is essential for analyzing the textbooks, and therefore first of all it was necessary to determine which STS elements should be chosen to conduct the content analysis.

2.1 Preparing the list

Priorities of STS differ from one country to another, according to the level of development and the setbacks faced as a result of the interaction between science, technology and society. The aim of identifying the STS elements list is to determine the themes, issues, skills, values, practices, concepts related to STS and science technology and society (STS) activites.

To set a list of STS elements, the researcher reviewed related literature. The literature was mainly concerned with the Science, Technology and Society issues (Bybee & Mau, 1987; Al-Nemer 1991; May, 2009; Mihi, 1993; Trojok & Norwist, 1997; Al-Rafi, 1998; Robinson, Robinson, & Bowen, 2000). Some of this literature concentrated on the Science, Technology and Society activities (Ali, 2000). The researcher found it important to add new elements such as skills related to STS, values related to STS, concepts that describe the interaction between STS, as well as accepted practices of science and STS activities.

Knowledge and application of the accepted practices of science was also listed; in addition, knowledge and application of the concepts that describe the interaction between science, technology and society which are very important to understand the relationships between science, technology and society in historical and contemporary contexts were added. Furthermore, values and skills cannot be ignored when talking about STS, because Palestinians live in an Islamic society controlled by certain values in all of life domains, and teaching and learning Science is one of these domains. Moreover the Science, Technology and society (STS) are meaningless without STS activities (Akcay, 2008 and Ali, 2000).

2.2 The dimensions of STS elements

1. STS themes are included in 34 issues

There were 34 issues that were identified to be included in the textbook STS checklist. These were as follow; The effects of using technology on human health; Infectious and noninfectious diseases; Medical technology and rising health care costs; Organ transplants; The electronic information explosion; Using new technology in manufacturing; The digital revolution and new electronic products; The technology of communications; Using the satellite in television and its effects; Ground water contamination; Remnants of settlements; the absolute of Jewish on water supply; The acceptance of using nuclear weapons in the middle east; Using laser in a new technology; Chemical weapons (e.g. Radioactive Phosphorus was used in Gaza war); The use of technology to increase food (plants and animals) production; The industrialization of agriculture; How to store crops; Abuse of neutral resources of power; Neutral resources of power and the struggle in the world; Energy conservation and rationalization of consumption; Mining technology; Metallic and non metallic minerals; The peaceful benefits of the nuclear power; Nuclear waste management and disposal; Nuclear reactors - acceptance and reject; The study of outer space; Noise and its effect on the environment; Global warming; Construction of the apartheid wall; Soil contamination of settlement remnants; Soil contamination of pesticides and poisons; constructing building (house) in agriculture land.

2. Skills related to STS are included in 14 sub skills

There were 14 sub skills identified to be included the textbook STS checklist. These were; Gathering, organizing and communicating scientific information; Listening; Industry tools and equipment that can be maintained; How to use the tools and home appliances; Manipulating laboratory materials and equipment; provide related problems to students' and schools' condition; Linked to the problem with the aims of lesson; Dealing with information technology; Using scientific instruments and devices; Using global information network and local; Preparation topics from technology source; Maintaining the technology equipment; Holding technology scientific exhibitions making students; Training on the removal and installation of various scientific equipment.

3. Values related to STS are included in 16 sub values

There were 16 sub values identified to be included in the textbook STS checklist. These were; Belief in God, faith and practices; Respect for law and order; Cooperation and e development of collective spirit; Provide the public interest to private interest; Faith, justice and equality; Listening and respecting the opinion of colleagues; Love of work; Estimating the value of time; Assessment of manual work; Estimate the value of the home; Estimating the value of science; Importance of innovation and creativity; Assess the efforts of scientists and their role in life; Diffusion of science and scientific methodology; Maintaining a clean environment; Maintain the integrity of the community.

4. Concepts that describe the interaction between STS are included in 7 groups of concepts.

There were 7 groups of concepts identified to be included in the textbook STS checklist. These were; Common scientific instruments (e.g. thermometer, balance, computer); Transportation, medicine, agriculture, sanitation, communication occupation; Reduce, reuse and recycle materials; Antibiotics, steam engine, digital computer; Highways dams, buildings, communication network, power plants; Energy consumption, landfills, water quality; and internet access.

5. Accepted practices of science are included in 4 practices

There were 4 practices identified to be included in the textbook STS checklist. These were; Safety practices (e.g. not tasting materials without permission; Reduce potential hazards in science activity (e.g. ventilation, handling chemicals; Keeping accurate and detailed records is important; and Estimating the errors in measurements.

6. STS activities are included in 7 aspects

There were 7 aspects identified to be included in the textbook STS checklist. These were; An examination of the historical development of science ideas (e.g., the development of the current model of the atom);An examination of societal issues or problems that involve science knowledge (e.g., the "greenhouse" effect of industrial societies); An examination of the technological applications of science knowledge (e.g., the use of plastics to create artificial body parts, Investigation of the technical and medical aspects of dialysis machines; Design models (e.g. Electrical and electronic circuits); Writing the research and reports; Collection of information; Data Analysis (Designing schedules, graph, account some Material.

The initial list of STS elements developed based on literature review can be described as a descriptive instrument. The validity of the STS elements list was determined by the following procedures:

Measuring the validity of the initial STS elements list by presenting the STS elements initial list to a panel of experts.

- Determine if the items reflect STS elements related to science.
- Examine the appropriateness, clarity and brevity of the language.
- Adding important and suitable sub-elements by experts' opinion.

2.3 The Validity

The term validity has been used in a variety of ways in the methodology literature (Weber, 1985). The researcher checked the operation against the relevant content domain for the construct. A panel of experts in science education and curriculum were trusted to establish content validity for the instrument. The panel consisted of 18 members, selected based upon their experience in teaching science. All of them were Ph.D holders. The researcher selected the panel of experts of this study from a group of professors and doctors from different universities in different countries in the field of science education and curriculum. They determined the items for their relevance to science, and if they reflected elements related to science, technology and Palestinian society.

The researcher forwarded the STS elements list to the panel of experts; to decide whether the items reflected STS elements and whether the list of elements were related to science technology and society or not (the researcher interviewed most of the experts and hand delivered the list in addition to discussing further about the elements). They were free to respond positively by writing "√" or negatively by writing "X". They had also the choice to suggest any alternatives to the items content and to write any comments about the items. The researcher analyzed the data, whereby a score of 1was given for the item if the panel of experts determined that it was related to science , technology, and society, and 0 if it was not. The researcher accepted any items with a score of 80% or above. The researcher reviewed the items that scored 70%, and deleted any items that were scored at 60% or less (Maiy, 2009).

The researcher introduced the modified list of STS elements once again to the panel of experts mentioned in the previous step in the form of a poll. The researcher used a 3-point scale ranging from 1 to 3 :(1= "unimportant", 2="important", 3= "very important "). And a 2-point scale ranges 0 to 1: (0= "unsuitable", 1= "suitable").

This poll was also introduced to different groups of science teachers and supervisors. The aim of this step was to understand the teachers' view about the importance of the STS elements for the higher elementary grade. The poll revealed that teachers thought that STS elements are important and are suitable for higher elementary science textbooks in Palestine.

2.4 The Reliability of STS elements list

The researcher used reliability by Consistency method to obtain the reliability estimate of the list of STS elements. the Cronbach's alpha coefficient and ratio of agreement between the arbitrators (Cooper formula) were used to obtain the reliability estimate of the instrument

The results indicate that the Cronbach's alpha coefficient reliability test of the importance domain was found to be 81.2, and the suitable domain was found to be 83.6.

Cooper determined the reliability in terms of agreement ratio. He mentioned if the agreement ratio reached 85% or above indicates a high reliability but if the agreement ratio is only 70% then it indicates a low reliability (Almegdade 2005). It was clear from the results that the instrument (list of STS) was reliable and could be used to analyze the science textbooks.

3. Analysis of the Textbooks Based on the Checklist

Content analysis is defined as an objective and systematic technique for analyzing message content and message handling (Ahuvia, 2001; Budd, Thorp, & Donohew, 1967; Holsti, 1969). The goal of content analysis is to make valid inferences from text (Weber, 1990) from essentially verbal, symbolic, or communicative data (Krippendorff, 1980, 2004).

3.1. Recording unit

One of the most fundamental and important decisions was concerning the determination of the basic unit of text to be classified. The theme was used as the recording unit for analyzing textbooks. Holsti (1963, p. 136) defined a theme as a unit of text. In the current study, the text equals lessons' "themes". The numbers of these themes are 42 for the first semester and 36 for the second semester.

3.2. Evaluating the Coding Form

The purpose of evaluating the coding form was to establish the validity and the reliability of the form. If there are problems in using or interpreting the form, the data collection process may be unreliable. In order to foster the reliability of content analysis, the methodology required the independent coders or judges to collect the data (Holsti, 1969; Weber, 1985). The content analyst should design the forms in such a way that anyone who reads the directions, follows the coding rules, and is trained can accurately and reliably code the data. The Coders must be familiar with the nature of the material to be recorded as well as capable of handling the categories (Krippendorff, 1980).

Content analysts needed to evaluate the coding form for readability, reliability, face validity, and content validity. For this study the researcher introduced the instrument to the panel of experts to obtain their ideas and opinion. This was to ensure that the instrument has comprehensive coherent categories that include the elements available in the science textbook content. After that, the researcher conducted the necessary modifications and adjustments needed for the purposes of the research.

To evaluate the coding form for validity and reliability, it was necessary to conduct a trial coding. The purpose of conducting a trial coding is twofold. First, the trial coding allows the researcher and the coder to test the form. This trial coding process is one way for the researcher to check whether the coding categories and the coding form are objective and clearly written. Second, the reliability can be measured by the amount of agreement reached in the coding decisions. The researcher and an additional coder conducted the pilot test of the coding process for this study. The researcher and second coder coded a sample from one textbook. (7th grade) the pilot test coding revealed any unanticipated problems with the coding form, and these problems were resolved prior to coding the actual data.

3.3. Coding the Data

The coders should be able to record the data essentially the same way, and the results should be replicable (Krippendorff, 1980, 2004). In this study, the researcher was the coder and reader/coder was selected for their familiarity and experience with teaching science.

To maintain a high degree of objectivity and integrity in the data collection process, a qualified reader/recorder was selected and the researcher gave him explicit instructions containing all the information necessary to replicate the data collecting process. Each textbook was read and coded by researcher and reader/coder working independently but using the same procedures and one month later it was repeated by the researcher and compared with the analysis done by another science educator to whom the checklist was explained. The final results were reached by consensus between the latter separate analyses.

4. DISCUSSION OF THE RESULTS

Based on the literature and Palestinian society needs, a checklist was developed. The dimensions and sub dimensions were defined and the results of the analysis of the STS Elements of six Palestinian science textbooks were reached by consensus between two readers/coders. Besides, the textbooks analysis based on the items of the checklist enabled us to make evident the differences that exist among the textbooks. Therefore, these results give support to the validity of the checklist.

Our major concern was not the comparison of the textbooks but rather the validation of the checklist. However, the results of the analysis show which STS Elements of science are included in the textbooks, and how much is included. There were a number of interesting findings:

Thus the results of the study showed that there is a lack of interest in providing students with STS elements. This conclusion is also supported by many previous studies such as, Alolols (2004) and Wahibi, (2004).

Content analysis of science textbooks in Palestine reveals the fact that the textbooks are suitable for integrating STS elements within the existing content. However, the authors of the textbooks are not interested in infusing the standards related to the STS elements in the higher elementary grades science textbooks content.

There are limited numbers of STS sub-elements available in the current science textbooks such as, the electronic information explosion, using scientific instruments and devices, and safety practices. In addition, it is concluded that some STS elements are not found in science textbooks namely, infectious and noninfectious diseases, using new technology in manufacturing, remnants of settlements and the effect of occupation, which are particularly related to the Palestinian society. Furthermore, there are absences of historical, social, and technological activities, which represent the basis of the STS.

5. Concluding Remarks

The checklist presented in this paper seems not only to cover the main aspects mentioned on the theoretical framework section but also to be adequate for the analysis of the STS Elements of textbooks from different school levels. Besides this, the analysis carried out in order to validate the checklist indicates that differences among textbooks can really be determined through the checklist, meaning that it is a valid checklist for analyzing the STS Elements of Palestinian science textbooks.

The validation of the checklist with Palestinian science textbooks only is a limitation of the study. Therefore, further theoretical and empirical studies, namely with textbooks from other subjects and nations should be regarded as opportunities to improving it and/or to acquire stronger support for its validity.

Finally, it should be pointed out that besides being useful for textbook analysis within a research context, the checklist developed can also be used (and it was already used) as a guide for the analysis of the STS Elements included in deference textbooks(what is this marwan?). In fact, the checklist offers to the STS of science non-specialist teacher, opportunities to become aware of the diversity of issues to be considered. In doing so, it becomes a tool to promote reflection upon the teaching materials that teachers use and the teaching practice they do, leading teachers

to better judge and select them. The checklist may have similar utility for textbook writers as it can guide them in the analysis of the STS Elements of their textbooks or help them to decide on the historical content to be included in the textbooks to come. These are the major short term contributions the checklist can give to improving science teaching.

However, for developing countries such as Palestine it is important that STS Elements should be integrated in the materials of the school textbooks to introduce and develop the citizen that is aware of STS elements and problems and trained to solve interrelated society problems. In this regard, the significance of the results of this study is as follows:

- Introduce science, technology and society (STS) Elements inventory relevant to Palestinian society
- Result of content analysis addressed weaknesses in the content of the science textbooks related to the STS Elements which will useful for reviewing, evaluating, designing and developing the science curriculum.
- Evaluators of the science textbooks for Palestine can benefit from the results of this study in evaluating the materials of science school curricula and inserting the STS Elements of the proposed inventory in these materials as well
- Science textbook authors can also benefit from this inventory.
- Teachers i.e. science teachers may benefit from the results of this study by planning their lessons related to STS Elements.

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DISTANCE EDUCATION STUDIES OF FIRAT UNIVERSITY

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Abstract

Distance education is offered by a number of educational institutions and universities using modern and contemporary information technological tools. Some of these universities offer online courses without obeying the rules of the educational technology methods where these programs have the target to earn financial support from the students and distribute diploma without providing adequate teaching.

To conduct distance education, a local television broadcasting institution was established at Firat University in 1991. Later, a distance education center was created for providing a qualified synchronous and asynchronous distance education.

In this study the pilot distance studies of Firat University will be discussed. The weaknesses and distinguished sides of the distance education at firat university will be investigated. Finally some recommendations in the sense of distance education are offered.

Keywords: Distance Education, Expanded Learning, Firat University.

1. INTRODUCTION

The expanded learning is another teaching method which is offered by a number of educational institutions in the world. Educational technology has developed very quickly in the last few decades. After foundation of the internet, web based distance education has often applied for lifelong education. Time and place independencies of the web based distance education are the most attractive part for the adults who do not have opportunities to continue traditional classes.

The quality of some of the expanded learning is questionable because the tools that are used do not have differences from the books. In other words, the course material prepared for the distance education is only an electronic copy of the book. However, to attract students, multimedia specifications should be added into the online course materials.

In the rest of this paper, the distance education studies and related tools are investigated for Firat University.

2. NATIONAL INFORMATICS COMMITTEE

Between 1999 and 2002, a National Informatics Committee was established by the Higher Education Council of Turkey. The aims of the committee were;

- To deploy distance education to whole country,
- To establish an academic and educational relationships between Higher Institutions in Turkey,
- To evaluate and accredit the courses that are submitted to the committee,
- To organize quality and flexible distance education events offered by different educational institutions.

3. THE TYPES OF DISTANCE EDUCATION AT FIRAT UNIVERSITY

Firat University was one of the first eight universities in Turkey which used EARN (Europe Academic Research Network) network system in 1988. The first attempt of distance education had begun in 1990 via e-mail. Some of the faculty used e-mail facilities between USA and Turkey to supervise and complete the master thesis of their students. At that time, a number of master students completed their thesis using EARN opportunities (İsbir, E., G.; Varol, A., 1997).

A project numbered FÜNAF 56 and titled “Steering a Satellite Dish Using Microcomputers and Broadcasting TV Programs” was proposed to the Research Fund of Firat University on March 25, 1991 which resulted in the first university local television in Turkey (Varol, A.; Kunç, Ş., 1993). The second distance education experiences of Firat University began using this local television institution (Figure 1). Some certificate programs were offered as a live or as a re-diffusion program on TV to the citizens of Elazig. This kind of distance education could be counted as one way communication technique. However, people could connect to the television studios using public phone systems and could ask their questions to the faculty. The people who followed these computer literacy, computer skills and database management related courses on TV attended the final exams at the university. After passing the written and applied exams, the students earned a certificate that can be used to find a computer related job on official institutions.

Firat University met with Internet because of a project titled “The Internet Connection of Firat University and Establishing Web Pages of the University” that is submitted to the Research Fund of Firat University (FÜNAF 183) in 1995 (Varol, A., 1996). Because of this project the web page of the university was prepared and published in the internet. The connection was on leased line, which yielded to have very slow internet speed and not flexible software support.

Figure 1. Studio of Firat TV

3.1 Robotics Course at a Distance

In 2001 and 2002, a web based distance education course named Robotics was prepared and offered to the students of two different universities. Some students of Kahramanmaras Sutcu Imam and Sakarya University took robotics course via Internet (Varol, A., 2003). The course materials were prepared using Firat University's television facilities. The videos of the course were established by Firat TV studios. The animations and simulations of the course were developed using up-to-date software.

The robotics course that prepared at Firat University was one of the first sixth courses that were accredited by the National Informatics Committee of Higher Education Council (Varol, A., 2002). The content of the course was in the field of applied sciences. Therefore it was questionable whether a technical course can be taught as a web based distance education or not?

The robotics course material was prepared using different animation and simulation software. The specifications of the multimedia, such as animation and simulation, were used in robotics course to eliminate the difficulties of the technical subjects. In addition, the course was taught at the universities (Kahramanmaras Sutcu Imam and Sakarya Universities) face to face to students during two weeks time period using portable robotics sets to teach the applied contents of the course. The students who followed the theoretical contents via internet could mount the robot sets easily (Figure 2). The faculty who was responsible to teach the robotics course supervised the applications of the robot sets during the two weeks lasted education.

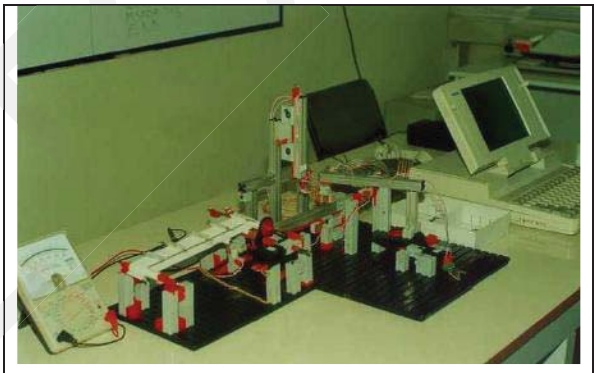

Figure 2. Portable robot set

The exams were divided into two parts. One of them was online exams on theoretical subjects. The main server was located at Firat University. There were established smart IT classes at the Kahramanmaras Sutcu Imam and Sakarya Universities. During the exams the students used the IT classes and these classes were observed by cameras. The smart classes could be followed by the faculty at Firat University where the main server was located. In addition, a research assistant was ready in the smart classes as proctor. The type of the exams was multiple choices. Although the questions were same for all students, the hierarchy of the questions and choices were randomly distributed for each user. Therefore, possibility of plagiarism is decreased. The exams were conducted at the same time and after a certain time of period the system closed the questions that were being asked, and provide the exam result to the student. However, during the exam period there were occasional internet connection speed problems between the host and computers in the IT smart classes.

The second part of the exams was applied at the target institution face to face. The students mounted robots using Lego parts and wrote necessary coding for automation systems. After completing the theoretical and applied parts of the exams successfully, the students passed from this course.

3.2 Distance Education Centre of Firat University

In 2002, a Distance Education Center was established at Firat University to create distance education opportunities for the students in the regional universities which did not have enough faculties. Only a few faculty members at Firat University prepared their courses online at that time, since the faculty did not have any special advantages with holding their courses in the internet. At the end, because of lack of the numbers of online courses, this central unit could not expand distance education courses.

Firat TV can be considered as part of the Distance Education Center. Firat TV has broadcasted cultural, social and educational programs since 1991. All symposiums and conferences that organized by Firat University have broadcasted live to Elazig via Firat TV. The audience of the television sometimes asked their questions directly to the panel managers.

4. LAW ON THE ESTABLISHMENT OF RADIO AND TELEVISION ENTERPRISES AND THEIR BROADCASTS

The Firat TV is a legal university television broadcasting system which was powered with the Law (3984) on the Establishment of Radio and Television Enterprises and Their Broadcasts. According to the article 24 of this law "Communication High Council may approve the plans as prepared or may ask for the necessary amendments. National, regional and local frequencies and channels shall be allocated with free of charge to the radios and televisions of the Turkish Radio and Television Corporation, Meteorology Radio broadcasting under the structure of General Directorate of Meteorological Affairs, Police Radio broadcasting under the structure of General Directorate of Security and local frequencies and channels shall be allocated with free of charge to the Communications Faculties which have radio and television departments (Law 3984, 1994)". Firat University has used this right to continue broadcasting its programs.

Firat TV has been broadcasting its programs for more than 19 years. However, a new draft law was prepared to change the Law (3984) on the Establishment of Radio and Television Enterprises and Their Broadcasts. This new draft law will cancel the broadcasting rights of the universities. This is the violating of the rights that was granted before.

5. TELEVISION AND RADIO INSTITUTIONS OF THE UNIVERSITIES IN TURKEY

There are four university television institutions which broadcast their programs to the local areas. Firat University's television was established in 1991. In 1998, Selcuk University has begun its distance education programs using television facilities. In 2002, Erciyes University has begun distance education using TV opportunities. Ataturk University is the fourth university which has television institution that broadcast educational programs.

Also, there are a number of universities which broadcast radio programs. Because of the newly introduced draft law, the voices of these institutions will be silenced. A good amount of investigations have been done to establish television and radio institutions. If these new law put into action, all investigation, counted millions of dollars, will sweep into trash. Moreover, some universities have trained students in the field of Journalism at School of Communication. The studios of the television and radio institutions are the physical application locations for the students, where the students were able to apply their theoretical knowledge. The stopping of the broadcasting opportunities of these schools has a meaning of obstructing the distance education developments in the country.

6. CONCLUSIONS

Firat University has conducted pilot studies for distance education using its own television broadcasting, video conferencing and web based facilities. However, the development of distance education at the university could not be developed enough, because of low interest level from the faculty.

The online course materials in Turkey should be evaluated as a book, and a copyright fee should be allocated to the authors to increase the number of the distance education materials.

The Distance Education Center of Firat University should be renovated. Moreover, this center should help to faculty by preparing the course materials.

A new draft law is prepared by the Turkish Radio and Television Supreme Council. This draft law will be sent to the Turkish National Assembly soon. But if this law accepted by the parliaments, the way of the distance education in Turkey will be choked. Therefore, the existing of the sentences "…and local frequencies and channels shall be allocated with free of charge to the Communications Faculties which have radio and television departments" of the Law (3984) on the Establishment of Radio and Television Enterprises and Their Broadcasts should be protected by this new law, too.

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DOES COLLABORATIVE AUTHORING OF LESSONS CAN IMPROVE THE KNOWLEDGE LEVELS OF STUDENTS?

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Abstract
In this paper, we want to know if the collaborative editing of courses can improve the knowledge levels (i.e. Cognitive) of learners. In order to verify this hypothesis, we have implemented an authoring system, which takes into account the collaboration between the teachers for the construction of training subjects. This system can be used by any higher education institution (university, high school, etc.). The main aim of this system is to provide the teachers with a set of tools to conceive their courses (shared text editor, search engine of courses, etc.). These courses are those of the licence regime. Our research work aims at studying the effects of collaboration process among teachers on one side and among learners on the other side. This system was implemented and tested by a sample of university students where we recorded good results. All the details concerning this experiment as well as the obtained results will be presented and discussed at the end of the paper.

KEYWORDS: Collaborative Authoring, Collaborative Learning, Shared Text Editor, Training Subject, Cognitive Profile.

1. Introduction

In higher education field, most of the organization (universities, institutes, schools, etc.) are very interested in the development of their own distance learning frameworks or the adoption of the ones already available. These teaching environments have a set of tools allowing the various human actors to realize their tasks in good circumstances. The main beneficiaries of these environments are the learners who follow a set of subjects designed by teachers (i.e. authors). These learners can learn together by asking questions, explaining, justifying their opinions, articulating their reasoning or elaborating the knowledge of the others. Several researchers showed the efficiency of the collaborative learning on the cognitive and behavioral profiles of the learners (Serce et al., 2006; Roberts, 2005; Smith, 2005; Lonchamp, 2006).

Teachers can collaborate to design together a subject or any other pedagogical resource (presentation, demonstration, practical work, etc.). The collaboration can range from asynchronous, where an interactive activity is separated by long periods of time (e.g. e-mail, discussion groups), to synchronous, where an interactive activity is simultaneous and in real-time (e.g. video conferencing). Synchronous collaborative systems are not so common as asynchronous systems. One of the most widely used synchronous collaborative technologies is telephony, where two or more people can remotely talk to each other in real-time. Computer based synchronous collaborative systems like shared whiteboards, collaborative editor, etc. are only beginning to emerge recently (Zafer, 2001).

The goal of this paper is to test if the collaboration among teachers for the design of courses can improve the cognitive profile of learners. For answering this question, we conducted an experiment with university students. These students used an authoring system that allows the teachers to cooperate in order to build lessons.

This paper is organized as follows. In section 2, we present some related works. Then, we present in section 3 the main objectives of the authoring system. In section 4, we present all the details about the realized experiment. Furthermore, we give main problems faced by the participants. At the end of the paper, we give a conclusion and some perspectives.

2. Related works

In Computer Aided Instruction (CAI) field an authoring system is used to create pedagogical environments that are extremely complex with diversified software. Generally speaking, authoring systems create supports of numerical courses. If authoring systems are not initially intended for only pedagogical world, we can consider that the realization of tutorials is one of their main outlets. Some researchers define "authoring systems as tools of pedagogical software development" (Talhi, 2007).

During the last years, several tools have been developed in order to support the process of web-based authoring and several learning systems have been implemented and tailored to specific pedagogical approaches (Karampiperis et al., 2004). According to (Karampiperis al., 2004), several existing systems support the process of web-based authoring for providing active learning, constructive learning, collaborative learning, intentional learning, contextualized learning, reflective learning, etc. (Jonassen et al., 1999; Marra et al., 2001; Car, 2001; Constantino-Gonzales et al., 2003).

Shared editors as well as Calliope (Mitchell, 1996) are among the tools used to support the collaboration. The latter is a shared editor, which provides a main shared text workspace and a number of tools to enhance collaborator awareness. Also, (Pinheiro et al., 2001) have developed a cooperative environment for e-learning authoring, which allows the cooperation between educators and technical people in order to create material for e-learning courses. The core of their approach was to use mainly web standards, like XML, SMIL, SVG and WebDAV, and open software.

Another category of authoring systems is Learning Management Systems (LMS). They allow managing a set of learning objects/resources that can be used for teaching/learning purposes. Each system provides a set of tools according to its context, functionalities and users. There are many systems that belong to this category of systems. For instance, SERPOLET (Système d'Enseignement et de Recyclage Par Ordinateur Liant Expertise et nouvelles Technologies: System of Education and Recycling By Computer Linking Expertise and new Technologies) (Serpolet, HTTP) is a complete and adaptable platform to organize, plan, learn, follow and administer. It provides editors of courses, sequences, hypertext and multimedia. Furthermore, it uses a synchronous and asynchronous pedagogical approach (Oubahssi, 2005).

In higher education field, WebCT is one of the most learning management systems used on Internet and around the world because its interface allows the use of more than about ten different languages. It does not require much investment and is simple to install and to use (WebCT, HTTP).
As for Claroline (classroom on-line), it allows teachers to create, administer and build their courses through the Web. This platform allows students to follow their courses. It holds some tools and features such as: forum, publication of works, calendar, sharing of documents, management of links, quiz, etc. It is at present available in several languages, it is also Open-Source software, and its use is thus completely free (Claroline, HTTP). Furthermore, (Virvou et al., 2000) developed a web-based authoring tool for Intelligent Tutoring Systems. The tool aims to be useful to teachers and students of domains that make use of algebraic equations.

There are some authoring systems that are based on standards such as IMS-LD, SCORM and LOM. For instance, Karampiperis and Sampson (Karampiperis & Sampson, 2004) had developed ASK-LDT, an authoring system based on SCORM. (Hernández-Leo et al., 2006) developed Collage, a high-level IMS-LD compliant authoring tool that is specialized for CSCL (Computer-Supported Collaborative Learning). Collage is intended to be used by teachers. It helps teachers in the process of creating their own potentially effective collaborative learning designs by reusing and customizing patterns, according to the requirements of a particular learning situation.

3. Objectives of the system

In collaborative learning, learners work together to reach common objectives. Beyond academic profits, we distinguish social profits (improvement of social attitudes), economic (economy of time) and materials (equipments). These advantages encouraged the researchers to spread the study domain of individual learning to group learning, where multiple agents interact with each others.

Our system offers an environment of double collaboration, between learners on the one hand and between the teachers on the other hand (Lafifi, 2008). The teachers collaborate to realize a common product (the learning objects) and the learners collaborate to learn together. The Figure 1 shows the main interface of the system. It is used by three human actors: the teacher, the learner and the administrator of the system.

The main objective of this authoring system is to support the collaboration among the lessons designers by proposing a shared text editor. This component provides to the users a set of features that facilitate theirs tasks. Another objective of this system is supporting the collaboration activities of learners. These learners can use a semi-structured interface for the collaboration process. In addition, this system provides a set of features such as: auto-assessing tool, search engine, etc.

4. Experiment

4.1. Participants

An experiment was conducted at the University of Guelma (Algeria). It allows testing the effects of the collaboration between teachers on the cognitive level of learners. For doing that, we divided the students (n=44) into two groups that follow the same subject. The students are those of 2nd year (computer science speciality). The first group (control) (n=22) followed the concepts of the subject ("Language theory") in printed form realized by one teacher. The second group (experimental) (n=22) uses the authoring system and followed the subject, which was conceived by the collaboration of several teachers.
After one month of use, an examination was submitted to all the learners (control and experimental groups). This examination was prepared by two teachers and composed of twenty questions.

4.2. Results and faced problems

Among the aims of this experiment is to verify the following hypothesis:

H0 (null hypothesis): collaborative construction of learning objects has not any effect on cognitive levels of learners.
H1 (alternative hypothesis): collaborative construction of learning objects has good effects on cognitive levels of learners.

To verify the null hypothesis, we compared the averages obtained from the marks of the examination done by both groups (experimental and control). To know if the difference is significant between both averages, we used the test of t (t-Student). After using the R software (R-project, HTTP), which is a freeware, we obtained the following results with a threshold of 95 % confidence (α =0.05):

t-Student (t_{score})= 4.1745
P_{value} = 0.0001047

Group	N	Standard deviation	Minimum	1st quartile	Median	Average	3rd quartile	Maximum
Experimental	**22**	**2.3**	6.00	10.00	12.00	**11.47**	12.75	16.00
Control	**22**	**1.98**	5.00	8.00	9.00	**9.13**	10.00	13.00

Table.1: t-test statistics.

According to t-test table, $t_{0.975}$ = ± 2.04, then $t_{score} > t_{0.975}$ (4.17 > 2.04), the difference is very significant. Thus, the hypothesis H0 is not proved and we can assert that collaboration between teachers to build concepts to be presented to learners has a positive effect on the learners' cognitive levels (alternative hypothesis).

The difficulties that are mentioned by the teachers are the following:

- Lack of tools for saving traces of conversations made between them,
- Not record for the interactions realized between teachers in the case of the chat tool in particular,
- Some teachers mentioned the problem of the insertion of video sequences, and
- Some teachers indicated the problem of respecting the time of courses realization by other colleagues of the same group.

Concerning the difficulties cited by the students, we can cite:

- No possibility to send parts of courses or exercises from learning space,
- Lack of tools for saving conversations realized between them,
- Refusal by some learners of collaboration demands, and
- Knowledge assessment tool is less efficient.

5. Conclusion

A Web-based course does not only provide access to local documents, but has also the function of a gateway, allowing access to educational materials or full courses elsewhere in the world. These changes have a direct impact on the courseware authoring process. Authoring web courses means authoring environments implicitly or explicitly open for sharing (Dicheva et al., 2002).

In this paper, we presented an authoring system which supports the collaboration among courses designers in order to conceive theirs lessons. This system has some interesting features. It provides to its users a shared text editor, learning objects manager, lessons search engine and many communication tools (chat, forum per group, public forum, etc.).

In order to determine its efficacy, we conducted an experiment with university students. After one month of use, many results are found. From the results of this experiment, we can say that the collaborative construction of lessons (learning objects, assessment exercises, presentations, etc.) can improve the cognitive levels of students of higher education organizations. An important attention was given to the shared text editor reserved to the collaborative construction of lessons. All the teachers were very satisfied with this tool.

As future work, we propose to conceive a search engine of co-authors, which holds several search types and adopts many search criteria. Furthermore, we plan to conduct another experiment with a students sample higher than the first.

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EDUCATIONAL ASPECTS OF CONNECTING TECHNOLOGY AND IT RESEARCH IN UAE

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Abstract

Information technology boundaries are continuously challenged to create employment opportunities for high skilled it professionals. There are many factors such as diverse learner cohort, resources, time, and learner background that may limit professional teaching experience when it comes to developing highly skilled it educators in uae. It is important to analyze the role of technology in it research. The aim of this study was to investigate the implication of technology-enhanced research in current teaching practices in information technology and how it positioned itself towards the context of teaching. The research used a qualitative framework based on semi-structured interviews, to discuss ways in which educators employ teaching experiences to connect technology and it research to enhance the technical capabilities of their learners. Eleven cases were registered from a few universities across united arab emirates. The teaching experiences employed by educators are variations of technology-enhanced research or learning and were presented through electronic environments, and blended courses. Educators prepare research questions and hypothesis; critical analysis of ideas and observational design, communicating statements, and coactions. Educational technology has been used to enhance electronic education, asynchronous communication, integration of immediate learner activity, and has been used in plentiful ways to enhance the learning practices. While the level of effectuation was varying, there were some interesting convergences in approaches.

INDEX WORDS: Technology-Enhanced Research; Learners; It Educators; Blended Learning.

Introduction

The traditional way of becoming an information technology (IT) educator was by obtaining a doctoral degree, after the completion of a master and undergraduate degrees. The inception of an IT education has been likened to entry into technology-enhanced learning and education, a standard model where graduate students enjoyed an individual practice to learning their major. This model of gaining experience is associated with the notion of traditional academic preparation where interdisciplinary associations were established between colleges, universities to oversee the certification of new professionals (Wenger, 1998). Information technology boundaries have expanded at both academic and industrial fields that have challenged new employment opportunities for skilled IT graduates. Today's IT instructors still follow the traditional way via university degrees to become IT educators that could restrain good teaching experiences to fade.

This study was prompted by two aspects. The first aspect was the recognition of my acquaintance with the available literature on learning and teaching of the socio-psychological-driven practice to learning and teaching (Malcolm and Zukas, 2001). Much of the available literature in the area of information technology tends to underline intentions, teaching methods and strategies, which has become the role model for learning and teaching appeared inadequate to reflect the IT research in blended education. Studying the context of teaching experience rather than cognitive procedures at work in the course of teaching (Entwistle and Walker, 2002) provided a clear insight in the world of teaching in the communities of learners in their context of study.

IT skills are expanding and continue to promote new academic goals so that outcomes cannot be fitted into existing priorities. There is a need for broader professional experience and employment opportunities for skilled IT graduate students. At the IT program, many factors may prevent good teaching methods and experiences to apply when it comes to developing IT skilled learners. For example, IT education is characterized by small learner numbers, resulting in low learner-educator ratios and diverse learner cohorts with a much expanded range of skills, education, and motivational resources and time may affect the nature of the IT blended experience for learners. Therefore, fewer IT graduates will have the technical skills required for employment in a real-life professional context.

There is a lack of reports from UAE on the role of IT research in the area of developing future IT specialists. It is important to underline the fact that the face-to-face classes experienced by learners often do not represent the encouraging and motivating experience and may dissuade some learners from following effectively the IT programs that may lead to enhanced experiences in IT. This finding is not explicitly interpreted yet in the UAE, which is to become the aim of this research. Learners and IT staff from IT departments and universities in UAE are interviewed to ascertain their views and perceptions of IT education. A coherent statement heard from learners and educators in several classes was that the interesting and significant work happens along the academic program in third and fourth year, which of course is late for these IT learners who have no need of further learning of IT or these who have become discouraged. A similar message was sensed by learners about the basic and boring course content during the first year and that the fun doesn't start till second or third year (Rice, Thomas, and O'Tolle, 2009). This suggests a discord between educators' traditional perceptions of teaching and the broad practical experience for learners.

There was a remarkable note by an interviewed educator about the learning experiences that were fostered to stimulate learner engagement, such as collaborative tasks, where groups of learners design and practice their own construction of knowledge, have resulted in higher marks in exams enriched. Introducing and bestowing learners with the experience to contribute to the original research project at undergraduate level have played an important role in valuable and original research. The new teaching methods employed by educators are to help learners to incorporate credible research activities into traditional teaching. Universities are providing opportunities for IT learners to enhance their conceptual perceptions of analytical comprehension.

For example, some universities in UAE offer online education to learners and interdisciplinary modules where learners are instructed on basic logic, the use of research methods and the use of assertive learning. The teaching module was elaborated to discuss gaps in learners' conceptions,

such that the aesthetics support their accountability is not always absolved. The core of the module is based on the teaching day-to-day analytical comprehension, rather than an abstract aspect. Research-based learning in undergraduate classes has been enhanced with the increased use of technology. There are many examples in the literature on how computers are used for research-based activities and blended learning using different support tools such as teaching learners to gather, interpret, visualize, and organize data. While education is a technology-enhanced research, learners communicated and shared ideas and data in an established mode that helped them to better learn and understand the difficult concepts. Efforts have also been placed to develop cognitive pedagogy for electronic environments to support learners through the research process (de Jong, 2006). Evidence shows that supported electronic environments are useful modes for blended learning (van Joolingen, de Jong and Dimitrakopoulou, 2007). Within the context of IT education, it is important to examine the methods the educators employ in online and blended education in developing the next generation of IT specialists. This paper aims to describe the findings about examining current research-based teaching experiences in IT and to identify new approaches that are employed by educators to enhance the IT research of their learners. It has a specific focus on the role played by educational technologies in developing learners' skills.

Research Methods

A case study practice was selected. This study used a qualitative framework to document teaching methods currently employed by IT educators to teach undergraduate research-based IT skills. The research studies a wide variety, rather than a statistically representative sample of traditional methods. Human research ethics approval has been obtained. Semi-structured method was used to gather data, interviews by phone and via email, which asked participants to describe the teaching practices the educators employed to teach research-based IT skills. Educators were selected for the study by calling for participants at conferences, following up team members' professional contacts and random sampling, where participants suggest other potential participants. Twenty four participants were identified and submitted an email describing the research and inviting participation. The email was followed by a phone call or an email to confirm availability, suitability and willingness to describe teaching practices. As a consequence, eighteen participants took place where the priority to teach research-based IT skills had influenced the design of the teaching methods.

The participants were requested to define in a suggestive manner the research-based IT skills such as: problem investigation, preparation of theory; anticipation of logical conclusions; research, gathering data; conveying results, and presenting conclusions. Participants were asked to clearly define the meaning of research-based IT skills with their reflection on the subject. Other questions to interviewed participants would include inside information on: subject area; grade level; cohort; learner-educator proportion, number of learner;, learning goals; learning environments; use of technology; attainment of learning objectives. Interviews were sent via emails using notes that were sent back to the interviewed participant for verification. Additional data was gathered from resources used by learners, manuals, lectures and documents. Interview transcripts were studied using the software to ascertain important themes. Rational motives were used to the analytic thinking, which was molded by recent 2009 UniServe Proceedings. The importance of undergraduate publications was marked by Wilson (2008) to encourage and motivate the development of research-based IT skills in early undergraduate years.

Results

A broad scope of educator practices for teaching undergraduate IT research has been ascertained from universities across UAE and US. These practices have been used in a wide range of research-based IT skills. In general, they can be accounted as fluctuations of inquiry or research-based learning and have been presented through electronic environments, lectures and traditional education. In order to expose the learner with the teaching IT practices employed by educators, an integration of a few widespread categories from the literature were used such as: abstract understanding of IT skills; motivating development of research-based IT skills in undergraduate classes; implementation of real-life IT research; use of technology in IT learning; learning of research methods. Each group has been represented using particular illustration to point major characteristics and changes. Subject areas from where the teaching practice were identified, were also presented.

Conceptual understanding of IT skills in information technology

Educators use lectures to explain the concept about IT research and visualize it through examples. One educator stated that it is important to give some history to point out the inquiry that leads to this decision. And so if there is a really valuable information that is appropriate for first year, it is to explain it, to show the learners what the importance was at the time, with the available technology they had then, how they were able to support it. And then one could have proceeded in more details accordingly to the advancement of technology to offer a refinement of meaning and importance. This is important for young learners to understand the concept and the importance of the computer technology. Educator lecturing is used to motivate learners to engage in IT research and learning, with the educator taking on different teaching approaches. The IT online education challenges educators' assumptions and beliefs about the IT research in front of the learners to demonstrate the consideration of their place. These processes model the oral stand of a piece of IT research and illustrate the examination of novel research finding by learners. In another case, the educator makes diagrams with input from learners, as a way of visualizing the overall IT research process that learners perform in a subsequent course.

Motivating development of research-based IT skills in undergraduate program

Learners perform a full IT research in class according to an established IT event or a constructed outline. Teaching may begin with a traditional practical discussion to introduce learners with the research problem and equipment used for the research. In this way, the teaching practice is coherent with de Jong's (2006) averment about the program to combine variety of forms of IT teaching; both research learning and direct teaching depending on the intent. Over the course of ten weeks, teams of learners elaborate an IT research, design it to explore the theory used in it, work the problem, gather preliminary data, elaborate research design, analyze data and construct conclusions. Learners write up their results in a professional paper format. Modifications to this research include learners preparing a poster of their results and delivering an oral presentation to their team participants. Online resource and technology-based research tools and analysis software were used in these research-driven lectures as support tools.

Implementation of real-life IT research in undergraduate program

One particular example in this group uses an original initiative altered for the learners' context. Learners add to an original research problem and perform a full research inquiry; examine the problem, develop a theory, plan and execute research study, findings and conclusions, execute the impact to online discussions boards and work together with other researchers. The approach allows learners to gain practical research experience and to use advanced technology. Modifications embrace learners concentrating on real-life experiences under the supervision of a facilitator, participating in real-life IT projects, reading additional text books and literature and writing up their research and project experiences in a professional scientific format.

Use of technology in undergraduate IT learning

The example in this group was largely used to promote critical and analytical thinking in learners and to show the magnitude of the use of blended discussions for IT researchers. The educator stated the learners need to develop skills on how to communicate to others about the matters of importance and to be able to separate the valuable information they are discussing from the irrelevant, skills that IT researchers need to develop to collect information and critically analyze it. Groups of learners participated in to electronic discussion boards used for the actual IT research and it was conducted to learners at the beginning of the undergraduate program by the educator. The educator would like the learners to use some research logical thinking. Learners were just starting on the course of becoming an IT researcher. Most of the learners would be in one way or another IT researcher at the end of this. Or at least this is their hope. Learners were in need to initiate research in specific area to solve a problem in this case or a question that had not been previously answered. Learners were appointed to contend groups and assigned a research topic. The educator recommends different ideas to get the research process started (i.e. what? What would be the outcome? What is the aim? What is the goal?) and then leaves the process. Learners were evaluated on their apprehension of the research topic in their assessment. While this particular case was directed towards research components, such as critical and analytical thinking and communication, other cases were identified where learners performed a 'virtual' full research online during a particular technology-based research session.

Learning of research methods

This particular group is similar to IT research learning in blended undergraduate program, however, rather than running for ten weeks, the IT research program is incorporated into the undergraduate program over one year of the course, with staging that is moderately reduced over this time period. For instance, in first half of the year, learners read information, develop theories and bring forth research questions. In the second half of the year, learners broaden their research, gather, analyze, and validate data, and associate findings with these published in the literature. There is also an accent on the critical and analytical study of literature – the exploration of different research conclusions done by different research groups. The educator stated that learners asked lots of questions that they came up with at the end of the lecture. Learners would be interested to learn more about their research and technology tools they use. A modification of this teaching practice is the effectuation of a year long, IT research for learners, which is closely combined with subjects being discussed in lectures and practical laboratory.

Discussion and Conclusions

UAE educators are planning to use different strategies to introduce IT research at early levels of the core curriculum. In an effort to motivate and retain junior year learners in IT, some educators have reclaimed junior year IT core curriculum so that learners could progressively start to actively participate in IT research from the beginning of their core IT program. Learners provide other learners with the chance to impart to authentic research, in first and second years of their careers. Thirdly, educators are introducing prospects of the discovery process into lectures by either illustrating the steps that an IT research has been through, demonstrating the novelty in unanswered research questions, or disputing the content of lecture to learners. Some practices have integrated technology-enhanced IT research to help learners in research-based issues, and three universities are taking major steps of fundamental challenges to course restructure to blend the IT research process over the one or three years of undergraduate program.

The findings in this research match those of the literature about the function of undergraduate education in the event of future IT research. Data gathered by the study to date, recommends that the growth of IT research potential in learners can be perceived as a continuous process, which is to motivate the progressive increase of learners' IT research skills and after to enable learners to advantage these skills by practicing them until they become proficient. The advance towards creative, research-based IT education, promotes the idea that IT research should be ushered in to the junior years of the learners undergraduate degrees.

It is important to indicate the ways the educational technologies are being incorporated in the education context to encourage the advance of research-based IT skills in learners. Specific technology-enhanced research tools, such as online discussion boards and electronic environments, are blended together with advanced IT practices, into the traditional lecture context and classroom. IT research learning in undergraduate education is being promoted and encouraged by electronic resources such as technology-enhanced research resources, electronic books and tools and software. Blended and online learning environments were established for the specific intent of encouraging learners to the construct of IT research as a frequent procedure, the use of technology-enhanced research as a delivery practice was also seen as part of the answer to high learner to educator ratios, and to furnish blended education. Future IT research targets to investigate and define IT research from the point of view of real-life industrial experience and recommends ways to study the effectiveness of learning in creating research-based IT skills in learners.

Recommendations for learner communities and educational development

Procedural directions for the educational IT research development function can be presumed from this study. It recommends that IT research in undergraduate programs needs to further develop to levels of IT teaching practices with the scope of interventions and theoretical positions that are likely to be useful than these with no same scope. At levels of IT practice where structures are not amenable to teaching, it is likely that the IT teaching policy making would be more useful as described:

- Educators need to encourage the development of IT research mode of operation to provide scope for undergraduate learning activities involving the innovative teaching practices.
- Educators need to provide background for change to fit the views of colleges in IT research implementation considering that colleges have been tagged as a crucial venue for the legislation of innovation.
- The impact of IT research on undergraduate learning and teaching is considerable and can hinder good teaching experience.

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EDUCATIONAL TECHNOLOGY FOR CHILDREN WITH AUTISM

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Abstract:
Computer and internet are increasingly indispensable tools for children and have many advantages in several areas, mainly in education. They have also great potential for education of children with autism. Autism is a disorder of neural development characterized by deficit in social interaction and communication. Intellectual capacity of children with autism is mostly inferior to that of the children who don't have developmental disorders. So these children's opportunity to take advantage of formal education is limited. With educational technology, it can be possible to create suitable educational environments to support enjoyable experiences and effective learning for children with autism. In this study, educational technology used in education of children with autism was examined and discussed according to the related literature. It was found that there are moderate number of research papers dealing with teaching social and communication skills to the children with autism and transferring these skills to natural environments by using video technology. In a few number of researches, multimedia environments (sound, video, text and animation), video conference technology, virtual reality environments and educational computer games were used to increase quality of life and functional independence and to teach skills like reading, writing, etc. To the children with autism. As a result, educational technology for children with autism is a relatively new field and open for improvement.
Keywords: Educational Technology, Autism, Education Of Children With Autism.

Introduction

Computer and Internet is becoming a natural part of education for almost all students. Also educators in the field of special education are considering the use and integration of technology into the curriculum and teaching to increase students' learning outcomes.

Computer and Internet provide increased access to educational tools and environments, enabling students with disabilities to participate with their peers, and to learn and grow socially, academically, and functionally. They have also great potential for education of children with autism.

Autism is a disorder of neural development characterized by deficit in social interaction and communication. Children with autism have difficulties in interpreting social messages in the same way as children without autism. Also intellectual capacity of children with autism is mostly inferior to that of the children who don't have developmental disorders. So these children's opportunity to take advantage of formal education is limited. With educational technology, it can be possible to create suitable educational environments to support enjoyable experiences and effective learning for children with autism.

Summarizing the literature about educational technology used in education of children with autism can be helpful for researchers dealing with the same field. In this study, educational technology used in education of children with autism was examined and discussed according to the related literature.

Autism

Autism is a neural developmental disorder that interfere the brain development and causes deficit in social interaction and communication skills as a result (Laushey & Heflin, 2000; Myles & Simpson, 2001; Dawson, Toth, Abbott, Osterling, Munson, Estes & Liaw, 2004; Shukla-Mehta, Miller & Callahan, 2010). Intellectual capacity of children with autism is markedly below the average. Prevalence of autism is estimated at 1.3 in 1000 children and prevalence of autism spectrum conditions is estimated at 6.0-6.5 in 1000 children (Fombonne, 2005).

Researchers have continued efforts toward the development of effective interventions for teaching social and communication skills to individuals with autism spectrum disorder (ASD) (Shukla-Mehta, Miller & Callahan, 2010). One of the most important outcomes of education of children with autism is the functional independence skills. Few of them can live independently when they become adults. Effective instructional techniques and methods are immensely important for children with autism to improve their functional independence skills.

Most of children with autism show the similar indicators. Türkbay (2003) expressed the indicators of autism and characteristics of children with autism as follows.

- One of the major characteristics associated with autism spectrum disorders is delayed language and communication development. Even if they can talk, they do not try to communicate by talking (Noens, van Berckelaer-Onnes, Verpoorten & van Duijn, 2006).
- They try to communicate by holding hands instead of talking (Volkmar, Chawarska, Klin, 2005).
- Some of them may repeat words of others immediately or later like a parrot (Landa, 2007).
- They have difficulties to control their tone, speed and emphasis of voice. They make explicit grammatical errors while talking.
- They do not make eye contact with others. Even though they make eye contact, they arouse a feeling of looking at far away (Volkmar, Chawarska, Klin, 2005).
- When they called by name, they can behave like not hearing (Volkmar, Chawarska, Klin, 2005).
- They are not interested with the people around. They do not participate in the play activities of fellows. Whatever their intellectual level is, they show observable social disorder in contrast to children with intellectual disability (Volkmar, Chawarska, Klin, 2005).
- They do not understand the emotional states of other people. They do not have instincts about other people.
- They may be unconcerned to the hugging and loving.
- Their play skills are impaired. They generally play by turning and lining up objects and rotating the wheels of toys.
- Their interest areas are highly limited. They may be extremely interested with the topics which other people find meaningless. For example, they may watch only advertisements and music videos on TV, they may listen to the same song repeatedly for a long time.

- They can be fascinated by rotating objects. They are interested with washing machine, cassette player, and mechanical objects. They can be interested with the same object for hours. They can treat other people as objects.
- They may cry for a long time if they do not get what they want. They may scream and roar meaninglessly.
- They may display behaviors like turning around themselves, vibrating, clapping their hands, twisting their hands, complex body movements, flapping, etc.
- Very few of them may show extraordinary superior ability in the arithmetic processes or memorizing unnecessary information.

It is realized that the best treatment method for autism is education according to previous researches. Therefore, education of children with autism should begin in early years. The easy to hard sequence is used while teaching skills like preparation for learning (eye contact, sitting, and attention), communication, and self-care to children with autism. Techniques like helping and rewarding are used often to teach positive behaviors, to decrease negative behaviors, and to make the positive behaviors permanent. The other methods used in education of normal children can also be used in education of children with autism. But generally behavioral approaches like programmed instruction are used.

Characteristics of children with autism limit their opportunity to take advantage of formal education. Autism is not known well in Turkey. Besides, facilities like social works, social assistance and special education for children with autism are highly limited (Koçbeker, Saban, 2005). Ministry of National Education has started to work on education of children with autism in 1995. Education of children with autism has been carried on in the center for education of children with autism (OÇEM).

Educational Technology for Children with Autism

Studies about Educational technology for children with autism mostly focused on the use of video technology. There are quite a lot of studies in literature which used video technology to teach social and communication skills and transfer these skills to the natural environments (Shukla-Mehta, Miller & Callahan, 2010; Charlop-Christy & Daneshvar, 2003; Hine & Wolery, 2006; Paterson & Arco, 2007).

There are several techniques in video instruction which are video modeling (VM), video self-modeling (VSM), and point-of-view video modeling (PVM). VM is described as a process where a student watches a video and then imitates the behavior of the model or skills in the video. There is also an instructor who reinforces the student for attending (Bellini & Akullian, 2007).

VSM is described as a process where a student who is instructed for a skill or a behavior watches his/her own adaptive behavior in the video. After watching oneself engaging only in the appropriate behavior, the student's actual behavior also tends to change (Hitchcock, Dowrick, & Prater, 2003; Buggey, 2005; Bellini, Akullian, & Hopf, 2007).

PVM has been defined as the process of videotaping elements of the environment or activity context from the visual perspective or vantage point of the student who needs to acquire and/or master the target responses (Hine & Wolery, 2006; Shipley-Benamou, Lutzker, & Taubman, 2002). When students review the videotape, they see exactly what they are supposed to do from the beginning until the end of the task or routine.

Recent researches have shown that video technology can be used effectively (McCoy & Hermansen, 2007; Delano, 2007; Shukla-Mehta, Miller & Callahan, 2010) to teach a variety of skills to the children with autism. This technology can be used as an intervention tool (MacDonald, Clark, Garrigan & Vangala, 2005), as a reinforcement tool (Keen, Brannigan & Cuskelly, 2007; Murzynski & Bourret, 2007; Reeve, Reeve, Townsend, & Poulson, 2007), or as a self-management tool (Reeve, Reeve, Townsend, & Poulson, 2007).

Differently from video instruction, Lee & Vail (2005) used educational multimedia software which is comprises of sounds, videos, texts and animations to teach skills of reading and reading comprehension. Their participants were 4 mentally retarded children and one of them had autistic-like characteristics. They stated that educational multimedia software can be used effectively to teach skills to the mentally retarded children. Similarly Cullen & Richards (2008) concluded that educational software can be used to improve writing skills of mentally retarded children as a result of their research.

Stromer, Kimball, Kinney & Taylor (2006) performed a literature review about the use of multimedia computer supported activity schedules in education of children with autism spectrum disorder. They concluded that multimedia computer supported activity schedules can be an effective way to teach students to manage their work, play, and skill-building activities independently. Computer can provide videos, sounds, dialogs, pictures and words as stimulus to children with autism. This can result in engagement of children in learning.

Social Stories which is a teaching method are used as an intervention to improve social interactions for children with autism. This method has some advantages that they are not requiring involvement of an expert. It is not time-consuming and there is no need to be intrusive (Scattone, Tingstrom & Wilczynski, 2006). Social Stories are short stories written for individuals with social deficits. They describe and explain cues in each situation to assist the child in understanding the why and how of appropriate behaviors pertaining to the social context. Social Stories can be used with or without technology. Mancil, Haydon & Whitby (2009) compared effectiveness of Social Stories with technology and without technology in their studies. They prepared a paper version and a Power Point version of Social Stories. As a result they indicated that PowerPoint format can be easily implemented, and students liked the computer-assisted format.

Furthermore, Gibson, Pennington, Stenhoff & Hopper (2010) used desktop videoconferencing to deliver functional communication training (FCT), which is an intervention for increasing behavioral and academic outcomes for students, to a preschool student with autism. FCT involves determining the function of the problem behavior through a functional behavioral assessment and then replacing the behavior with a communicative response that serves the same function. The results indicated that FCT applied in a desktop videoconferencing environment was effective in reducing elopement in a young student with autism attending an inclusive preschool classroom.

Herrera, Alcantud, Jordan, Blanquer, A., Labajo & De Pablo (2008) examined the effectiveness of virtual reality environments in education of children with autism. The aim of the virtual reality environment used in the research was to teach pretend play ability. There were two participants in the research. They showed a marked improvement in pretend play ability. Also students were able to transfer the learned ability in a high degree to different environments.

Moreover, Sehaba, Estraillier & Lambert (2005) dealt with the design issues of development of educational computer games within the scope of an autism project for early diagnosis of autism and mental retardation and education of children with autism and mental retardation. According to their findings, educational computer games should be flexible enough to accommodate the individual differences of every child with autism. These games should include the child's own world and beliefs. Computer games used in the research were played with objects

which were determined whether child was interested with. To insure flexibility and modularity, they used multi-agent architecture. As a result they expressed that their findings were promising. They also emphasized that new researches should be performed to check the validity of the findings and used model. Another study about educational computer games in education of children with disabilities was performed by Shaffer (2007). Shaffer (2007) indicated that epistemic computer games can be played by children for a practicum for career preparation and transition planning. Therefore epistemic games might benefit students with disabilities who are preparing to enter the work force.

Another application of technology use in education of children with autism is robots. Robotic technologies can be effective in engaging children with autism in several ways: in learning in social behaviours, by facilitating or mediating social interaction; and in playful activities (Barakova, Gillessen & Feijs, 2009).

Differently from educational technology, assistive technology (AT) term is used to describe assistive and adaptive devices for people with disabilities. For example, a hearing aid device for people who are hard of hearing is considered as an assistive technology. AT are effective in enhancing the skills and abilities of students with disabilities in several functional areas (Quinn, Behrmann, Mastropieri & Chung, 2009).

Cognitive prostheses term is used to describe an assistive technology that may enhance existing or nascent abilities. For instance, cognitive prosthesis may help people to remember or think in difficult situations. Similarly assistive technology may be used as a social prosthesis during social interaction. For instance, virtual reality environment may be used in such a way allowing children with autism, through their avatars, to communicate more fruitfully with other people (Davis, 2008). DynoVox is a company which produces touch screen devices as an assistive technology for people with speech impairment. These devices offer simplified concrete communication and interaction system. With this device, individuals with speech impairment touch the pictures on its screen in an appropriate order, and device makes the speech sounds. These devices are also used by individuals with autism and speech impairment.

Conclusion

As a conclusion, it was found that there are moderate number of research papers dealing with teaching social, communication, and functional living skills to children with autism and transferring these skills to natural environments by using video technology. The acquisition of these skills is vital for children with autism. Literature supports that video technology is an effective way to teach and improve these vital skills. Video technology is not new. Researchers have been using televisions and computers to provide students with video models and video-based instruction for decades (Ayres & Langone, 2008). With rapid development of technology, video technology is going to become more accessible and easy to use for researchers and teachers. Therefore researches and usage area of video technology will probably continue to increase. There are already research papers about the use of video in portable DVD players and touch screens for education of children with intellectual disabilities (Mechling, Gast & Fields, 2008, Mechling, Gast & Cronin, 2006).

In a few number of researches, multimedia environments (sound, video, text and animation), video conference technology, virtual reality environments and educational computer games were used to increase quality of life and functional independence and to teach skills like reading, writing, etc. to the children with autism. It can be said that there was little software written specifically for children with autism (Davis, 2008).

It is generally assumed that universal design principles can also be used to design effective software and technology for people with intellectual disability. However, Wehmeyer, Palmer, Smith, Davies & Stock (2008) performed a meta-analysis study and found that this assumption is wrong and people with intellectual disability can use relatively limited number of technology and software which were developed for people without disabilities.

As a result, educational technology for children with autism is a relatively new field and open for improvement. Educational technology carries great promise for enhancing autism research. Collaborations between educational technologists and specialists in the field of autism can produce quality research projects (Kimball & Smith, 2007; Goodwin, 2008).

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EDUTAINMENT: IS IT EQUALLY MOTIVATING FOR ALL LEARNERS?

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Abstract

This article attempts to look beyond the common sense discourse of "strong motivation qualities of edutainment software for **all learners**." It argues that there is lack of data based research showing the impact of such materials on various types of learners differing in terms of their existing knowledge and experience, their style of learning, and their motives to use the software. The study suggests that we need to conduct a learner analysis to identify such essential characteristics of our learners since edutainment software would affect different groups of students differently. The discussion begins with a brief definition of edutainment and motivation. Then it broadens to a critique of problems with the relationship between motivation and learner differences drawing on the findings of educational psychology.

KEY WORDS: Edutainment, Motivation, Educational Technology, Learner Differences

1. INTRODUCTION

Since the early 1990s interest has surged in developing edutainment software, namely applications that possess the allure of electronic games while achieving educational goals. To Buckingham and Scanlon (2000) 'Edu-tainment', is a hybrid genre that relies heavily on visual material, on narrative or game-like formats, and on more informal, less didactic styles of address. The purpose of edutainment is to attract and hold the attention of the learner by engaging their emotions through a computer monitor full of vividly coloured animations. It involves an interactive pedagogy and, in Buckingham et al's words, totally depends on an obsessive insistence that learning is inevitably 'fun'.

Through explicit educational claims parents are encouraged to believe that this software is beneficial in developing children's skills in a variety of subjects. The parents are frequently told that investing in computers means investing in your children's future since computers give children access to worlds of knowledge that would otherwise be denied to them (Buckingham and Scanlon (2003). By means of an unscrupulous marketing of information and communications technology, teachers are also persuaded by promises that technology is capable of transforming the teaching and improving students' academic and vocational performance. Among these promises, a strong motivation quality of edutainment software for all learners has been an important one. It is assumed that with its capacity to individualize instruction to meet the specific needs of the learner, edutainment software can motivate the learners through rich, interesting and engaging learning experiences. They can choose from a variety of educational software packages offering self-paced instruction, content presented in a variety of ways (e.g., text, video, sound, graphics), in realistic and stimulating learning environments.

As to what extent this software has been able to match its promises, Kirriemuir & McFarlane (2004) find edutainment programs have not been particularly successful. Reasons for this might be that the games have been too simplistic, that tasks are repetitive and poorly designed in the sense that activities are limited to isolated skills or content, and, hence, they do not afford any active exploration (Kirriemuir & McFarlane, 2004; Mitchell & Saville-Smith, 2004). Denis & Jouvelot, (2005, p. 464) point out that edutainment games follow a *skill and drill* format in which players either practice repetitive skills or rehearse memorized facts. However, research on edutainment also demonstrates that certain programs might have positive effects (see Egenfeldt-Nielsen, 2005 for a recent and very comprehensive review).

2. EDUTAINMENT AND MOTIVATION

The over-riding reason for interest in this field is that computer games seem to motivate young people in a way that formal education doesn't. There are a number of instructional design theorists trying to figure out just what it is that makes computer games motivating. Malone and Lepper (1987), for example, have identified four major factors, challenge, curiosity, control, and fantasy. They suggest that any instructional programme designed to maintain and promote an intrinsic interest in learning should first create a sense of challenge and a degree of uncertainty. Activities should also promote a sense of control on the part of the learner, that is, a feeling that learning outcomes are determined by the learner's own actions. Finally, one can engage the learner in make-believe activities (or fantasy contexts) to allow the learner to experience situations not actually present.

A similar effort that is influential in the educational technology community is represented by Keller's ARCS model (1987). ARCS is an acronym for the four points in his model: Attention, Relevance, Confidence and Satisfaction. Attention involves the arousal of interest in learners, the stimulation of an attitude of inquiry and the maintenance of attention. Relevance refers to tying instruction to make it relevant to the students' personal interests or goals. Confidence refers to the students' expectations for success, and Satisfaction refers to the process or results of the learning experience. Keller (1999) has suggested applying his ARCS model to CAI as well as to traditional learning environments. This model includes strategies for increasing value and personal investment in learning tasks by explaining how it relates to prior experience, explaining present worth and future usefulness.

Several researches examine motivation in computer games in the light of the above mentioned models. However, not all researchers entirely agree on the source of this motivation. Some attribute the compelling nature of games to their narrative context (Dickey, 2005, 2006; Fisch, 2005; Waraich, 2004) while others find motivation is linked to goals and rewards within the game itself or intrinsic to the act of playing (Denis & Jouvelot, 2005; Jennings, 2001). Nevertheless, all find that educational software generates motivation through effective game design.

Much of this research, however, fails to recognise the social contexts in which games, fun and learning take place. They examine the characteristics of the activity itself or design issues without giving any consideration to who the learners are on the receiving end. The question of 'how much of motivation is dependent upon context as well as upon activity? is rarely asked. Draper (1999) argues that we need to develop a more complex understanding of what makes things 'fun'. To him, 'fun is not a property of software, but a relationship between the software and the user's goals at that moment' (p121).

Similarly, while technology provides the learner with flexibility and freedom in learning in their own ways, it also presents problems for some learners. When the learners, for example, are forced to decide their own navigation strategies, some might find it frustrating if they lack the skills of independent study. (Ford & Chen 2000; Last et al. 2001). This suggests that not all types of learners appreciate the flexibility and freedom offered by computer technology and that the individual differences among learners are therefore important factors to be considered in the development of such systems. Research has shown that these differences range from gender differences (e.g., Schumacher & Morahan-Martin 2001) to cognitive styles (Chen & Macredie 2004), and to prior knowledge (Holscher & Strube 2000; Last et al. 2001). Here we will examine only a few of them.

3. LEARNER DIFFERENCES

3.1. Computer Skills

Assessing learners' computer skills is essential to improve the motivational appeal of edutainment software. Some learners may feel confused by computer jargon and feel frustrated if they are unable to follow complicated technical steps.

Although computer skill development now starts in kindergarten classrooms, instructors can not assume that every learner is computer literate. While they might have significant exposure to computers, their use of technology may be limited. "Until the use of technology is as innate as listening, reading, and writing, we cannot assume students are 'tech-ready' " (Duncan & Wallace, 2002, p. 29). Researchers have indicated that early intervention to compensate for limited technical skills is important (Hannafin, Hill, Oliver, Glazer, & Sharma, 2003, p. 247). There are a number of methods for assessing students' computer needs such as introductory email observations, focus groups, student interviews, and survey instruments.

3.2. Prior Knowledge

If there is one thing that all psychologists can agree on, it is the level of prior knowledge skills, beliefs, and attitudes that the learner brings to the situation, which influence how they attend, interpret and organize in-coming information. How they process and integrate new information will, in turn, affect how they remember, think, apply, and create new knowledge.

Najjar (1996) agrees that characteristics of the learner including the learner's current skills, knowledge, and attitudes can have an impact on learning. He argues that multimedia is most effective for people with low prior knowledge or aptitude in the domain being learned. This may be because experts use their prior knowledge to understand and integrate the new information, but novices are deprived of this advantage. Also, novices may not know which information is important and on which information they should focus their attention.

Fischer and Mandl (1990) maintain that multimedia programs can support instruction only when learners perceive and interpret them. To them, the skills and experience students have with the medium determine the quality of interaction in a learning environment. They argue, "just as an academic library void of intelligent faculty and students capable of utilising its resources is merely a warehouse, multimedia without the interpretative acts of learners is only a collection of textual, graphical, and audio elements."

Entry behaviours (Dick & Carey, 1996, p. 91) must be identified prior to instruction. There is not much an instructor can do to guarantee homogeneous backgrounds among the learners, but the range can be found out and and remediation for learners whose backgrounds are below standard can be offered (Mitchell et al., 2005; Hannafin, et al., 2003). There are several different methods to assess pre-existing knowledge and skills in learners. Some are direct measures, such as tests, concept maps, portfolios, auditions, etc, and others are more indirect, such as self-reports, inventory of prior courses and experiences, etc.

3.3. Learning styles

Edutainment software has the potential as an instructional medium to individualise the learning process (Rasmussen and Davidson, 1996). However, it may be more beneficial to some learners than others. For example, graphics and visually active instruction helps field dependent learners. Ross and Schulz (1999) found that abstract, random learners might be at risk for performing poorly with certain forms of computer-assisted instruction (CAI). Motivated learners, who require specific instruction in a sequential format and enjoy frequent feedback, will generally benefit for CAI. Kinaesthetic, peer-oriented

learners will not gain as much from CAI (Dunn and Dunn, 1979) as there are limitations regarding what a learner can physically do with a computer (at least with the current technological restrictions).

Therefore, as Anderson (2004) suggests, "developing quality education systems requires that educators have a deep understanding of how individuals and groups of students learn" (p. 239). Although "learning style characteristics do not typically predict whether the student will succeed or fail in a distance environment" (Hannafin, et al., 2003, p. 249), assessing learning styles can help instructors recognize that each student learns in a variety of ways. Consequently the learning style assessments can help instructors integrate an assortment of activities that match various learning styles.

4. CONDUCTING LEARNER ANALYSES

No two individuals think or learn in the same way or at the same pace. Even in traditional classroom instruction, some learners are able to keep up with instruction and excel academically, while others struggle to keep pace with those 'high-achievers'. Still other learners are unable to keep up, no matter how hard they try and may be labeled by themselves and their peers as 'the dumb kid.' Most of the time it is not the fault of the student but the method of instruction or lack of enrichment activities that impede a lower-achieving student's academic progress. Therefore, before talking about the potential of educational software on increasing the motivation of the individual learner, we need to conduct learner analysis.

The following questions may act as a first step to have a closer look at learners:

1. What are the general characteristics of your target population? Examples include age, grade level, topic area, etc.
2. Are there any entry behaviors that are not specific to your goal, and yet you feel are required for your intended learners to possess? (Entry Behaviors)
3. Do the learners already know something about the topic? (Prior Knowledge)
4. Do they have a positive attitude towards the content and the delivery system? (Attitudes Toward Content and Potential Delivery System)
5. Is it reasonable to expect them to want to learn what needs to be learned? Is the topic likely to interest them? (Academic Motivation)
6. Is it reasonable to expect that they can learn what needs to be learned? (Educational and Ability Levels)
7. Do they have any general learning preferences? (General Learning Preferences)
8. Do they have a positive attitude regarding the organization providing the instruction? (Attitudes Toward Training Organization)
9. Are there any important group characteristics? How similar or diverse are they? (Group Characteristics)
10. How did you obtain this information regarding the learner characteristics? (From *www.itma.vt.edu/modules/spring03/instrdes/lesson5.htm)*

For instructors who wish to conduct learner analysis and modify their use of educational software to improve its motivational appeal to individual learners, Table 1 summarizes main categories and methods and the kind of data they can obtain from their analyses.

Table1 Learner Differences, Data, and Methods

Learner Differences	Data to Obtain	Methods of Assessment
General characteristics	Learners' age, gender, personal interests, goals, previous educational background	Biographic profiles, observations, anxiety and attitude surveys
Computer skills	Equipment available for each learner Learners' current technical knowledge and skills	Checklists, entry-level assessment, interviews
Prior knowledge	Ability to decode visual messages, cognitive processing styles, navigation behaviours	Learner self-report, observation
Learning styles	Cognitive, metacognitive, affective styles etc.	Learning style inventory performances in particula settings

5. CONCLUSION

The rationale behind the design, implementation and evaluation of edutainment software is based on commonsense assumptions and highly inflated expectations from the new technology to transform learning and teaching. It is tacitly assumed that such software produces high motivation for all learners, and thus, enhanced learning is automatically ensured.

"Motivation by itself is not an educationally sufficient argument *for* anything" (Sloan 1994). Merely having high motivation is not enough since many things –sound, colour, animation, can motivate learners, for example. Relegating motivation to merely making learning fun through such sensory rich learning environments does not only weaken the role of motivation in education, it also underestimates the complex relationship between motivation and cognition. Rather, for motivation to serve as an agent of cognition requires that it should direct students to initiate learning activities and maintain an involvement in learning as well as a commitment to the process of learning (Ames 1990).

While many view computer-assisted instruction as the panacea for providing training to all people, there is an inherent problem in this assumption (Ross and Schulz, 1999, p. 21). The use of educational software is not conducive to all content areas and to all learners. While it might be potentially appealing to all learners, it must be at the same time the product of a more thorough learner analysis. Attention must be given to the elements of a learner analysis as presented here. If these elements are considered during the learner analysis phase, then not only the design, but also the development phase of computer-assisted instruction will differ greatly from traditional instruction. With such a learner-based analysis, it can reach the greatest number of students, and significantly impact the learning event.

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EFFECTS OF LANGUAGE PROFICIENCY ON LANGUAGE PRODUCTION IN ONLINE TASK-BASED LANGUAGE LEARNING ENVIRONMENT

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Abstract
This study examines the effects of language proficiency on language production by non-native speakers (nnss) of english in an online task-based language learning (tbll) environment. Twelve nns-nns dyads collaboratively completed four communicative tasks, using an online tbll environment specifically designed for this study and a chat tool in webct-vista. Six dyads were advanced- and six dyads were intermediate-level english as second language learners in a southern university in the united states. Language production was investigated in terms of fluency, accuracy, and complexity including lexical and syntactic complexity. The data from the chat-scripts showed that advance-level nnss produce more fluent, more accurate, and lexically more complex language than intermediate-level nnss.

INTRODUCTION

Language Production for SLA

Language production especially within a meaningful context and through interaction has been demonstrated to assist second language acquisition (Ellis & He, 1999; Nagata, 1998; Ohta, 2000). According to Swain's output hypothesis, language production within a meaningful context and through interaction a) provides the opportunity for 'contextual' use of linguistic resources, which leads to 'automaticity' in language use, b) forces 'syntactic processing', where students pay more attention to syntax when listening in order to use them in their own language production later on, c) helps students to 'recognize what they do not know or know only partially' (Swain, 1993, p. 159), d) provides opportunity for 'testing out hypothesis' in order to see the linguistic features that work (Swain, 1985, pp. 248-9; Swain, 1993, p.159). Accordingly, several research studies showed that language production in meaningful context resulted in improvements in language acquisition (Ellis & He; Nagata).

TBLL for Language Production

Task-based language learning (TBLL) method promotes conversationally modified input using 'meaning focused' 'communicative' task completion activities (Doughty & Long, 2003, pp. 58-64; Willis, 1996), and language production opportunity within meaningful context and through interaction. Through the communicative task completion activities, students engage in the 'authentic,' pragmatic, and contextual use of language (Doughty & Long), where language production is not the aim but 'the vehicle for attending task goals' (Willis, p.25). While completing the tasks, students have the chance to practice language extensively within a meaningful context facilitating language acquisition (Anderson, 2000, p.186) as also suggested by the connectionist theory.

Accordingly, many variables have been investigated by researchers in task-based language learning research in order to examine the effect of its features in enhancing language production. Among other variables, "it is important to investigate how proficiency may impact on the quality and quantity of learner interaction so as to provide the optimal opportunity for learning." (Iwashita, 2001, p. 270) Consequently, the effects of language proficiency on language production have been investigated by many researchers. However, there has not been sufficient amount of studies to make conclusive remarks and some of the studies have been contradictory.

Previous Studies with Regard to the Effect of Language Proficiency on Language Production

Studies about the effect of language proficiency on language production have been insufficient and inconclusive. In one study Porter (1986) reported that the accuracy of language produced by advanced level student dyads is the same as the accuracy of the language produced by intermediate level student dyads. In the same study Porter also stated that there is no significant difference between the fluency of language produced by the advanced and intermediate level student dyads. Porter claimed that "advance learners and intermediate learners bring comparable skills of interaction to their discussions and there is no clear advantage of one level over another." (Porter, 1986, pp. 212-212) However, Porter found that advanced level dyads produced more total words than intermediate level dyads. In another study, on the other hand, Iwashita (2001) reported that there was no significant difference between the amount of c-units, a measure of language quantity, produced by high-high proficiency dyads and low-low proficiency dyads.

The purpose of this study

The purpose of this study is to explore whether advanced-level dyads or intermediate-level dyads produce better language in an online task-based language learning environment (OTBLLE). The research questions for this study is as follows,

1. Is the fluency of language produced by advanced-advanced dyads better than the fluency of language produced by intermediate-intermediate dyads in an OTBLLE?
2. Is the accuracy of language produced by advanced-advanced dyads better than the accuracy of language produced by intermediate-intermediate dyads in an OTBLLE?
3. Is the complexity of language produced by advanced-advanced dyads superior than the complexity of language produced by intermediate-intermediate dyads in an OTBLLE?

METHODS

Participants

Participants in this study were 12 non-native intermediate-level and 12 non-native advanced-level students in an English language institute in the southern United States during the fall semester of 2006. The intermediate-level students were recruited from two sections of an intermediate-level composition course, and had been taking other intermediate-level English courses for the previous three months. The advanced-level students were randomly recruited from all advanced-level English courses offered in the English language institute. The advanced- and intermediate-level students represented a variety of first language backgrounds, including Korean, Mandarin, Arabic, Spanish, and Japanese. The participants ranged in age from 18 to 29, with the majority in their early twenties. The intermediate-level participants were placed in the intermediate-level composition course and the advanced-level participants were placed in the advanced-level courses by the institute at the beginning of the semester based on a combination of their scores on TOEFL (Test of English Foreign Language), ELPE (English Language Proficiency Exam administered by the University), two in-house assessments consisting of an interview with the director of the institute and a composition test (K. Clark, personal communication, November 7, 2006).

Online TBLL Environment.

An online TBLL environment was developed for this research study (see Figure 1). The environment was designed to present four tasks for students to complete in dyads. The control button labeled "Your Task" was used to display the instructions for each task. The button labeled "Similar Tasks" was used to display subtitled similar task videos. The environment did not have an embedded chat tool; therefore, dyads used the chat tool provided by WebCT-Vista to complete the assigned tasks.

a Tasks: Four tasks were developed for this study. These are named "Compare the Maps," "Christmas Break Trip," "Gifts for a Family," and "Garage Sale". In "Compare the Maps" task (see Figure 2), both students in a dyad are provided with the same map containing 15 buildings along with trees, roads, and vehicles. Six of the buildings are clickable. Upon clicking one of the six clickable buildings, one activity in each building is displayed. Three of the displayed activities are the same for both members of the dyads, and three of them are different. Descriptions of the same activities are (1) a person repairing his TV, (2) a lady studying, and (3) a child feeding her dog. Descriptions of different activities are (1) a child playing with two different toys in two different ways, (2) a lady shopping for clothes versus another lady shopping for notebooks, (3) two teams playing basketball versus three people running. Dyads were asked to identify the similarities and differences between the activities occurring in the six buildings using the chat tool. In "Christmas Break Trip" task (see Figure 3), dyads were asked to imagine that they have decided to take a trip together during Christmas break. Each member of a dyad was provided with information about attractions, hotels, activities, and flights to three different cities. Dyads were asked to exchange information on the chat tool and decide which city to visit during Christmas break. In the "Gifts for a Family" (see Figure 4) task, using the chat tool, students in the dyads were asked to discuss on what gift(s) to buy for each family member of four people with whom they would be staying in the U.S. When students clicked on the house image marked with an arrow, a picture for each family member and their hobbies were displayed in the middle main content area. Students were then asked to discuss and decide on the amount of money to spend for each gift and what to buy for each family member based on his/her hobbies. In the "Garage Sale" task (see Figure 5), students in the dyads were asked to imagine that they were dormitory roommates. Dyads are presented with their room and items in the room (see Figure 5). When students click on the items in the room, the items are zoomed in and detailed information is given in the middle main content area. Students are asked to discuss and donate four items in their dorm room to be sold at a garage sale in order to help their class raise money for a trip to Niagara Falls after talking about usefulness, value, condition, and transportation of the items, and discussing how they would convince people to buy them using the chat tool.

a Subtitled Similar Task Videos: Subtitled similar task videos are provided in the online TBLL environment. Each subtitled similar task video presents a short dialog between two native speakers engaged in a task similar to – but not the same as – the one students are about to complete. The videos were recorded in real-life settings, and subtitles were provided below the videos. Language spoken by the native speakers in the videos were not prescribed and prepared prior to the recordings. Native speakers were asked to complete tasks using language as if they were in real-life situations. The primary function of the subtitled similar task videos were not to demonstrate the workings of language, nor to teach linguistic structure, but rather, as the authentic language use defined by Breen (1985), 'communicative,' 'to share experiences' (p.62) of native speakers in similar task situations with the ones the students were expected to complete. Students were provided with control buttons to be able to rewind, fast forward, play, stop, pause, or re-play each video at their will, and study the subtitles as long as they wished. See Table 1 for a brief description of the subtitled similar task videos.

Table 1 Description of subtitled similar task videos

Assigned task	Quantity	Topics of the subtitled similar task videos
Compare the Maps	6	These focus on demonstrating and modeling an activity that is currently happening. These activities include playing a guitar, studying for an exam, making an omelet, getting ready to go home on a bike, and asking directions.
Gifts for a Family	2	Two native speakers play a couple who are deciding on gifts for their relatives, whom they are planning to visit.
Christmas Break Trip	3	Two native speakers play a couple who are making travel plans for a Thanksgiving trip.
Garage Sale	6	Speakers discuss items in their house in order to decide which to sell at a yard sale to raise money to save an endangered animal species. They talk about the value of each item, the condition of each item, the use of each item, and reasons customers might buy them.

Treatment Conditions

Students at the intermediate-level proficiency were assigned to the intermediate-level group (ILG), and students at the advanced-level proficiency experimental were assigned to the advanced-level group (ALG). Because the intact groups were utilized to form the ILG even though students in the ALG were recruited randomly, this study should be characterized as a quasi-experimental rather than a strict experiment. As explained above, participants in the ILG and ALG were drawn from the intermediate and advanced level classes, respectively, at the English Language Institute,

but as a safeguard against outliers or unbalanced groups, the director of the institute reviewed group membership and determined students belonged to their respective groups in terms of their language proficiencies. After the formation of the groups, students in each group were randomly paired to form dyads. There were 12 dyads in the study, six in each of the two groups. Both groups were provided with the online TBLL environment, and dyads in both groups were asked to complete the same four tasks. Both groups had access to subtitled similar task videos within the environment that they could watch before task completion.

Procedures

All dyads met twice, each of which lasted about two hours. While the dyads in the ILG met during regularly scheduled class meetings, the dyads in the ALG met over a weekend. Two computer labs were used for the study. To ensure that none of the dyads worked face-to-face, one member of each dyad was assigned to work in each computer lab. Dyads completed two tasks in each session. Before beginning the experiment, all students were given 10 minutes of instruction for each task, which added up to 40 minutes of instruction for all tasks, on how to use the online TBLL environment and WebCT Vista. After the training, each student was sent to the computer lab to which he or she was randomly assigned. Students were given 50 minutes to complete each task for a total of 200 minutes for the four tasks.

Data Source and Coding

The chat tool that students used to complete the assigned tasks created a transcript of their written interaction. Because dyads had no other means of communication, this transcript captured all of the language they produced in the course of their written interaction. The transcripts of each of the 12 dyads were analyzed for comparison between the two groups. The language production was measured in terms of fluency, lexical complexity, syntactic complexity, and accuracy. The complexity was measured through the use of two dependent variables, syntactic and lexical complexity, in order to obtain a more complete and detailed description of language complexity.

a Fluency: The fluency was measured by the number of words per minute (WPM) (Kellogg, 1996; Tong-Fredericks, 1984). The total number of words produced by each dyad in both groups was tallied and divided by 200, the total number of minutes spent to complete the four tasks, in order to find out the number of words produced per minute.

c Syntactic Complexity: Syntactic complexity was measured by the number of subordinate clauses per 'C-unit' (Robinson, 2001). The total number of communication units (C-units) and the total number of subordinate clauses were calculated in order to find out the mean number of subordinate clauses per C-unit.

d Lexical Complexity: Lexical complexity was measured by mean segmental type token ratio (MSTTR), 'an index that appears to have been originally recommended by Johnson' (Malvern & Richards, 2002, p. 88), and has been used in many other research studies including the one by Ellis and Yuan (2004). To find out the mean segmental type token ratio (MSTTR), the students' written language products were divided into segments of 200 words, the type-token ratio of each segment was calculated, and the average of the type-token ratios for the segments of written language produced by the students were taken. In this study, the MSTTRs were calculated by the WordSmith tool (Scott, 2008).

e Accuracy: Accuracy was measured by the ratio of 'error-free T-units' to total 'T-units' (Bygate, 2001; Pica & Doughty, 1985). Accuracy was calculated by the ratio of error-free T-units to total T-units. A 'T-unit (terminable unit)' defined as an independent clause and subordinate clauses 'attached to or embedded in it' (Hunt, 1970, p.4; Kern, 1995; Long, 1991).

RESULTS AND DISCUSSIONS

Language Production

By looking at the Table 2, we are able to determine the relative amount of language that was produced while students were engaged in task-completion activities. First, in terms of fluency, students in ALG produced almost 1.42 times more words than students in ILG during the same time span. Table 3 shows that students in ILG were not significantly different than students in ALG in terms of their computer proficiencies, which suggest that difference in fluency could not be attributed to students' computer proficiencies. Second, in terms of lexical complexity, students in the ALG produced almost 1.41 times more unique words, and 1.04 times more lexically complex language than students in the ILG. Third, in terms of syntactic complexity, surprisingly, students in the ILG produced about 1.22 times more subordinate clauses per C-unit than students in the ALG. Fourth, in terms of accuracy, students in the ALG produced about 1.59 times more error-free T-units than students in the ILG.

Table 2 Total number of words, unique words, c-units, subordinates, and total and error-free t-units produced across groups

Groups	Total words	Unique words	C-units	Subordinates	T-Units		SPC	MSTTR	WPM	EFT
					Total	Error-free				
ILG	11800	4312	2193	329	1477	644	0.61	51.96	33.71	0.41
ALG	16764	6119	2920	359	2138	1401	0.50	54.44	47.9	0.65

Note: SPC= Subordinate clause per communication unit; MSTTR= Mean segmental type token ratio; WPM= Word per minute; EFT= Ratio of error-free T-units to total T-units

In an attempt to analyze the effect of

Table 3 Comparison of mean computer proficiency scores across groups

Groups	n (Students)	M	SD	T	df	Sig. (2 tailed)
ALG	12	26.4	2.07	-.52	18	.61
ILG	12	25.6	2.7			

p = .05

language proficiency on language production, this study required an analysis of multi variance (MANOVA) because the experiment affects all four dependent variables (fluency, syntactic complexity, lexical complexity, and accuracy) separately and in combination with each other. MANOVA output shows a significant multivariate main effect for Group at .05 significance level, Hotelling's T = 5.22, F = 11.75, p=.001 (see Table 4). This result suggests that students in the ALG based on the composite of the four dependent variables significantly differ from students in the ILG. In addition, a large proportion of the variance (.84) is explained by the between groups SSCP matrix, or in other words by the experiment.

Table 4 Comparison of mean number of WPM, SPC, MSTTR, and EFT across groups

Groups	Value	F	P	Observed power	Partial eta squared
Hotelling's T	5.22	11.75	.001*	.993	.84

Note: WPM = Word per minute, SPC = Subordinate clause per minute, MSTTR = Mean segmental type token ratio, EFT = Ratio of error-free T-units to total T-units

* $p < .05$

Examination of the coefficients for the linear combinations distinguishing the two groups indicated that the ratio of error-free T-units to total T-units (F(1,12) = 9.93, Partial eta-squared = .45, p = .008), word per minute (F(1,12) = 5.33, Partial eta-squared = .3, p = .04), and mean segmental type token ratio (F(1,12) = 6.2, Partial eta-squared = .34, p = .028) contributed significantly in differentiating the groups. However, subordinate clause per communication unit (F(1,12) = 1.56, Partial eta-squared = .115, p = .23) and did not contribute significantly to distinguish the groups. By partial eta-squared, the ratio of error-free T-units to total T-units effect appears stronger than the mean segmental type token ratio effect, which appears stronger than the word per minute effect, which appears stronger than subordinates per C-units effect.

Univariate ANOVAs indicated that ratio of error-free T-units to total T-units (F(1, 12) = 11.218, p = .006), word per minute (F(1, 12) = 5.33, p = .04), and mean segmental type-token ratio (F(1, 12) = 6.24, p = .028) were significantly higher for students in ALG than students in ILG. But, subordinate clause per communication unit (F(1, 12) = 1.56, p = .23) was not significantly higher for students in ILG than students in ALG. The results suggest that students in advance-level proficiency (ALG) produced significantly more correct, fluent, and lexically complex language than students in intermediate-level proficiency (ILG). However, although lexical complexity of language produced by students in ILG was more complex than students in ALG, it was not statistically significant. It is therefore appropriate to report that online task-based second language learning is more beneficial to students in advanced-level course than students in intermediate –level course in terms of fluency, accuracy, and lexical complexity of language produced.

CONCLUSION

Results of the experiment described above provide the evidence necessary to maintain that students in ALG produce better language than students in ILG in an OTBLLE in terms of accuracy as measured by the ratio of error-free T-units to total T-units, lexical complexity as measured by mean segmental type token ratio (MSTTR), and fluency as measured by the mean number of words per minute (WPM).

The results related to accuracy is contradictory to the results reported by Porter (1986), who found that the accuracy of language produced by advanced level student dyads is the same as the accuracy of the language produced by intermediate level student dyads. The results in relation to fluency are not supported by previous research studies conducted by Porter (1986) and Iwashita (2001). Porter reported no significant difference between the fluency of language produced by the advanced and intermediate level student dyads although Porter reported that advance level students produce more total words than intermediate level students, which is congruent with the results of this study. Iwashita reported no significant difference in the amount of language produced by high-high proficiency dyads and low-low proficiency dyads. As a result of the study, Porter reported that advanced and intermediate level students bring comparable language skills to the interaction in a task-based language learning environment, which cannot be confirmed based on the results of this study. One explanation for the difference could be attributed to the means of communication, which was online in this study, but face-to-face in the study conducted by Porter.

To the best of the author's knowledge, there has not been a previous research study investigating the effect of language proficiency on the complexity of language produced by non-native speakers in an OTLLE. Therefore, the results about the complexity of language including lexical and syntactic complexity need to be explored in future research studies as well in order to confirm the results reported in this study.

FIGURES

Figure 1. Main framework of the online TBLL environment and subtitled similar task videos for the compare the maps task.

Figure 2. Compare the maps task.

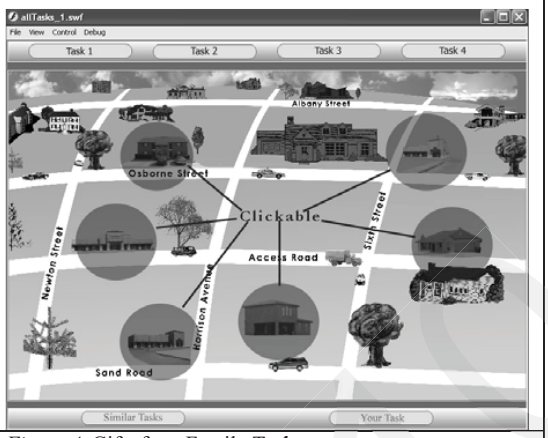

Figure 3. Christmas break trip task.

Figure 4. Gifts for a Family Task.

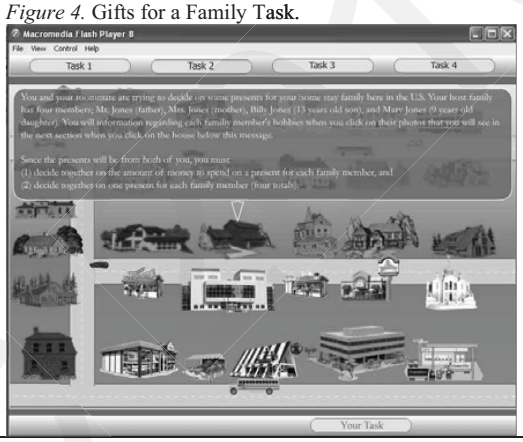

Figure 5. Garage Sale Task.

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EĞİTİM FAKÜLTESİ ÖĞRENCİLERİNİN DİJİTAL VATANDAŞLIK DAVRANIŞ NORMLARININ İNCELENMESİ

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Özet

Bu çalışmanın amacı, eğitim fakültesi öğrencilerinin dijital vatandaşlık davranış normlarına sahip olma durumunu incelemektir. Araştırmanın evrenini 2009-2010 akademik yılı içerisinde gaziantep üniversitesi gaziantep eğitim fakültesi'nde öğrenimleri sürdüren öğrenciler oluşturmaktadır. Araştırmaya ilişkin verilerin elde edilmesinde nitel yöntem kullanılmıştır. Araştırmaya ilişkin veriler görüşme yöntemiyle elde edilmiştir. Elde edilen bulgular, araştırmaya katılan eğitim fakültesi öğrencilerinin çoğunluğunun dijital iletişim ve dijital okuryazarlık temalarına ilişkin davranış normlarını sergilediklerini göstermektedir. Dijital erişim, dijital etiket, dijital ticaret, dijital haklar ve sorumluluklar, dijital hukuk, dijital sağlık ve dijital güvenlik temalarına ilişkin davranış normlarını ise az sayıda katılımcının sergilediği belirlenmiştir. Elde edilen bulgulara dayalı olarak, eğitim fakültesi öğrencilerinin dijital vatandaşlık temalarına ilişkin davranışları tam olarak sergileyemedikleri, özellikle dijital erişim, dijital sağlık, dijital güvenlik, dijital etiket, dijital hukuk, dijital haklar ve sorumluluklar boyutlarına ilişkin davranış normlarında eksiklikler olduğu söylenebilir. Bu sonuçlara göre, türkiye'de öğretmen yetiştirme süreci içerisinde dijital vatandaşlık kavramına ilişkin bir modelin tasarlanması ve öğretmen yetiştirme sürecine kaynaştırılması önerilmektedir.

Anahtar Kelimeler: Dijital Vatandaşlık

Abstract

The purpose of this study is to examine digital citizenship behavior norms of the students of faculties of education.participants of the study comprised of students at the faculty of education, university of gaziantep, in 2009-2010 academic year. A qualitative-research methodology was used to obtain data. The qualitative data were obtained via interviews. Findings obtained show that most of faculty of education students who participated in the study reflect behavioral norms concerning the themes of digital citizenship and digital literacy. On the other hand, it was identified that behavioral norms related to the themes such as digital access, digital etiquette, digital trade, digital rights and responsibilities, digital law, digital health and digital security were reflected by few participants. It can be said that participant students do not fully reflect digital citizenship behavior norms particularly concerning digital access, digital health, digital safety, digital etiquette, digital law, digital rights and responsibilities and that there are shortcomings. Based on these results, it is recommended that a model should be developed for digital citizenship behavior norms and integrated into the process of teacher training in turkey.

Keywords: digital citizenship

1. Problem Durumu

Teknolojinin toplumsal yaşamı değiştirdiği düşünüldüğünde, toplumun aynası olarak kabul edilebilecek okulların da dijital teknolojilerden etkilendiği söylenebilir. Günümüzde okulların yönetiminde dijital teknolojiler kolaylaştırıcı etki sağlamakta, öğretmenler derslerinde dijital teknolojileri kullanmakta, veliler çocuklarının notlarını ve devamsızlıklarını internet üzerinden takip edebilmekte, öğrenciler ise devam edemedikleri derslerin notlarına internet üzerinden ulaşabilmektedirler. Buna karşın öğrencilerin birbirlerine karşı kötü ifadelerde bulunmaları, hatta birbirlerini tehdit etmeleri, yasadışı yollardan video, müzik, kitap vb. dosyaları indirmeleri ya da internet ortamına yüklemeleri, sınıf içinde cep telefonlarını kullanmaları ya da taşınabilir cihazlarla oyun oynamaları dijital teknolojilerin kullanımına ilişkin olumsuz örnekler arasında gösterilebilir. Verilen örneklerin hepsinde dikkat edilecek nokta, dijital teknolojilerin olumlu ya da olumsuz kullanımına ilişkin temel düzeyde bazı özelliklere sahip olmak gerektiğidir. Ancak, bu teknolojilerin doğru bir biçimde, bir başka ifadeyle usulüne uygun bir biçimde kullanımı da önem arz etmekte ve bu çalışmanın kapsamını oluşturmaktadır.

Toplumsal yaşamda letişim dijital cihazların kullanılmaya başlamasıyla birlikte farklı bir boyut kazanmış ve yeni bir toplum kavramının ortaya çıkmasına yol açmıştır. Bu kavram ağ toplumu (Castells, 2000:5) ve bu toplumun temelini oluşturan bireyler ise dijital vatandaşlar olarak tanımlanmıştır (Mossberger, 2008).

Dijital vatandaşlık kavramının oluşmasına temel olan süreçler değişik bakış açıları ile dönüşüm, değişim ya da bölünme gibi kavramlarla ifade edilse de, bu bakış açılarının üzerinde uzlaştığı en önemli nokta artık dünyanın geri dönüşü olmayan bir dijital süreç içerisinde hızla yol aldığıdır. Bilgi teknolojilerine ilişkin yeni üretilen bir teknoloji çok kısa bir sürede güncelliğini yitirmekte, bilgisayar tarihi dikkate alındığında birkaç yıl gibi bir ifade oldukça eski sayılabilmektedir. Özellikle görsel işletim sistemlerinin kullanılmaya başlamasından günümüze kadar geçen zaman dilimine bakıldığında, dünyada dijital teknolojilerinin giderek daha yaygın hale geldiği açıkça görülmektedir (Greenhow, 2009). Dijital teknolojilerinin yaşamın her alanında daha fazla kullanılmaya başlanması ya da dünyanın daha dijital hale gelmesine ilişkin olumlu ve olumsuz görüşler olsa da, bu konu üzerinde yapılan araştırmaların odağında (Shelly, 2004; Yu, 2006; Hand, 2008; Shariff, 2009) insanın yer alması önemli bir nokta olarak düşünülebilir.

Her yıl yayımlanan OECD (Ekonomik İşbirliği ve Kalkınma Örgütü) raporları, dijital alt yapısı güçlü olan ülkelerin ekonomilerinin de güçlü olduğunu ve burada yaşayan bireylerin bilgi teknolojilerine daha fazla eriştiklerini göstermektedir. Gelişmekte olan bir ülke olarak Türkiye, son yıllarda bireylerin internet erişimine yönelik çok büyük atılımlar yapsa da 2009 yılı verileri dikkate alındığında OECD üye ülkeleri içerisinde geniş bant internet abonelik sayısında sondan ikinci sırada yer almaktadır. Türkiye'de geniş bant abone sayısı, her ne kadar OECD verilerine göre gerilerde yer alsa da 2005 yılının ikinci çeyreği ile 2009 yılının ikinci çeyreği arasında kalan beş yıllık süreçte toplam abone sayısındaki 7,27 kat artışla OECD sıralamasında üçüncü ülke olarak yerini almıştır (OECD, 2009). Geniş bant abone sayısındaki bu artış Türkiye'de internet kullanımında dolayısıyla dijital cihazların kullanımında ciddi bir potansiyelin varlığına vurgu yapmaktadır. Bu bağlamda Türkiye Cumhuriyeti Vatandaşlarının birer dijital vatandaş olma yolunda hızla ilerledikleri açıkça söylenebilir.

Dijital vatandaşlık, temel olarak bilgi teknolojilerinin kullanımıyla ilgili davranış normları ve bunların geliştirilmesi olarak tanımlanmaktadır. Burada dikkat edilmesi gereken nokta, dijital vatandaşlık kavramının izlenmesi gereken bir yazılı kurallar bütünü olmadığıdır. Bunun aksine dijital vatandaşlık bireylere, bilgi teknolojilerinin kullanımı sırasında karşılaştıkları sorunları tanımlamalarına ve onlara ilişkin çözüm üretmede bir çerçeve sağlamaktadır. Dijital vatandaş olarak tanımlanan bireylerden bilgi teknolojililerinin kullanımına ilişkin yeterliklere sahip olmanın yanında bu teknolojilerin kullanımına ilişkin bazı davranış normlarına sahip olmaları da beklenmektedir. Bu davranış normlarını planlı süreçlerle eğitim yoluyla kazandırılmasını öne süren Ribble (2007:13) öğrenciler için dijital vatandaşlık davranış normlarını dokuz başlık altında ele almıştır (Tablo 1).

Tablo 1: Dijital Vatandaşlık Davranış Normları

Dijital Vatandaşlık Davranış Normları	Açıklamalar
1.Dijital Erişim (Digital Access)	Toplumda yer alan her birey dijital teknolojilere eşit olarak erişebilmelidir.
2.Dijital İletişim (Digital Communication)	Cep telefonuyla görüşme, anlık mesaj gönderme (kısa mesaj), sohbet (chat) etme, e-posta kullanımı gibi uygulamalar bireyler tarafından gerçekleştirebilmelidir.
3.Dijital Okuryazarlık (Digital Literacy)	Bireyler dijital teknolojilerin kullanımına ilişkin temel bilgilere sahip olmalı ve bu teknolojileri öğrenme süreçlerinde kullanılabilmelidirler.
4.Dijital Etik (Digital Etiquette)	Dijital teknolojilerin kullanımına ilişkin davranışlar bireyleri birer rol-model haline getirmektedir. Dijital teknolojilerin belirli görgü kuralları (adab-ı muaşeret) çerçevesinde kullanılması dijital etik bağlamında değerlendirilmektedir.
5.Dijital Ticaret (Digital Commerce)	Bireyler ürünleri satın almadan önce elektronik ortamda inceleyebilmeli ve alışveriş yapılmasına ilişkin süreçleri gerçekleştirebilmelidirler.
6.Dijital Hukuk (Digital Law)	Bireyler mülkiyet haklarına saygı göstermeli, özellikle telif haklarını ihlal edecek uygulamalardan kaçınmalıdırlar.
7.Dijital Haklar ve Sorumluluklar (Digital Rights and Responsibilities)	Her bireyin dijital teknolojileri kullanabilme hakkı vardır. Bireyler bu haklarını gözetebilmeli ve diğer insanların da bu konuyla ilgili haklarını savunabilmelidirler.
8.Dijital Sağlık (Digital Health and Wellness)	Bireyler dijital teknolojilerin kullanımıyla ortaya çıkabilecek sağlık problemlerini tanıyabilmeli, özellikle problemlerin başlangıç aşamalarının farkına vararak gerekli tedbirleri almalıdırlar.
9.Dijital Güvenlik (Digital Security)	Dijital teknolojileri kullanan her birey, özellikle kişisel cihazlarının güvenlik tedbirlerini almalı, gerek kişisel cihazlarını gerekse ortak erişime açık cihazlarda kişisel bilgilileri (kimlik numarası, kullanıcı adı, şifre vb.) kullanırken güvenlik yazılımlarını kullanmaya dikkat etmelidirler.

2. AMAÇ

Bu araştırmanın amacı eğitim fakültesi öğrencilerinin dijital vatandaşlık davranış normlarını derinlemesine incelemek ve mevcut durumu ortaya koymaktır.

3. YÖNTEM

Bu araştırma 2009-2010 akademik yılında Gaziantep Üniversitesi Gaziantep Eğitim Fakültesi'nde öğrenimlerini sürdüren 17 öğrenci ile gerçekleştirilmiştir. Araştırmada nitel yaklaşım kullanılmış ve bulgular yarı yapılandırılmış görüşmeler yoluyla elde edilmiştir. Yarı yapılandırılmış görüşmeler 30-60 dakikalık sürelerde gerçekleştirilmiştir. Görüşmelerde sesli kayıt sistemi kullanılmış, öğrencilere açık uçlu sorular yöneltilmiş ve verilen cevaplara göre sonda sorularla da derinlemesine bilgi elde edilmeye çalışmıştır. Kayıt altına alınan görüşmeler daha sonra metin haline getirilmiştir. Araştırmacı tarafından metin haline getirilen görüşme kayıtları dikkatle incelenerek araştırma çerçevesini oluşturan kategoriler ve kodlar belirlenmiş ve işlevsel tanımları yapılmıştır. Tanımlanan kodlar bağlamında öğrencilerle gerçekleştirilen görüşmeler yeniden incelenmiş ve hangi kodun hangi sıklıkla kullanıldığı belirlenmiştir. Belirlenen kategoriler alanyazınla uyumluluk göstermektedir (Ribble, 2007). Ancak ulaşılabilen kaynaklar incelendiğinde belirlenen kodlara alanyazında rastlanmamıştır. Bu bağlamda dijital vatandaşlık davranış normlarına ilişkin bu çalışma kapsamında belirlenen ve tanımlanan kodların özgünlük içerdiği söylenebilir.

Tablo 2: Kategoriler (Temalar), Kodlar, Tanımlar ve Örnek İfadeler

Kategoriler (Temalar)	Kodlar	Tanımlar	Örnek İfadeler
Dijital Erişim	Erişim	İhtiyaç duyulduğunda dijital cihazlara erişebilme	▪ İhtiyaç duyduğumda dijital cihazlara rahatlıkla erişebilirim.
			▪ Gerektiğinde cep telefonumdan internete bağlanırım.
	Etkinlik	Dijital teknolojilerin ihtiyaç duyulan alanda etkin bir şekilde kullanılabilmesi	▪ Derslerde tam olarak kavrayamadığım konulara ilişkin kaynaklara, internet üzerinden ulaşırım.
			▪ Hazırladığım çeşitli dosyaları (proje, ödev, film,

			vb.) internet ortamına yüklerim (upload).
			▪ Bir konuyu araştırmam gerektiğinde arama motorlarını (Google, Yahoo vb.) kullanırım.
	Araştırma	Dijital teknolojilerin üretimine ve kullanıma ilişkin yeniliklerin takip edilmesi, araştırılması	▪ Cep telefonu, bilgisayar vb. cihazlara ilişkin yenilikleri takip ederim.
			▪ Okulla ilgili etkinliklerde işlerimi kolaylaştıracak yeni yazılımları araştırırım.
	Motivasyon	Dijital teknolojilerin kullanımına ilişkin bireyin çevresini ve kendisini güdülemesi	▪ Çevremde yer alan insanları dijital cihazları kullanmaları konusunda cesaretlendiririm.
			▪ Arkadaşlarımı daha fazla internet erişimine sahip olmaları konusunda teşvik ederim.
Dijital Okuryazarlık	Cihaz Kullanımı	Dijital teknolojilerin kullanımına ilişkin yeterliklere sahip olunması	▪ Günlük işlerimde dijital cihazlarımı (Bilgisayar, cep telefonu vb.) yardım almadan kullanırım.
	İnternet Kullanımı	İnternette kolaylıkla araştırma yapılması, ihtiyaç duyulan programların kullanılabilmesi	▪ İnternette yer alan web sitelerini zorlanmadan ziyaret ederim.
			▪ İnternetten ihtiyaç duyduğum programları bilgisayarıma indiririm.
	Program Kullanımı	Metin oluşturma, hesap yapma ya da sunu oluşturma gibi işler için tasarlanan paket programları kullanabilme	▪ Ödev ya da projelerime ilişkin dokümanları bilgisayarda kendi başıma hazırlarım.
Dijital İletişim	Paylaşma	Gerek dijital cihazların gerekse bireylerin kendilerine ait olan program vb. dosyaları çevreleriyle paylaşabilmeleri	▪ Arkadaşlarımın dijital cihazlarımı kullanmalarına izin veririm.
			▪ Arkadaşlarımın ihtiyaç duydukları programları onlarla paylaşırım.
			▪ Arkadaşlarımla elektronik formattaki ödev, proje ya da bir derse ilişkin dosyalarımı paylaşırım.
	Dilin Doğu Kullanımı	İnternet üzerinden iletişim kurarken Türkçenin doğru kullanımına dikkat edilmesi	▪ İnternet üzerinden sohbet ederken ya da e-posta gönderirken Türkçeyi doğru kullanmaya özen gösteririm.
	Sosyalleşme	İnsanlarla tanışma, arkadaşlıklar kurma, bir gruba dâhil olma gibi beklentilere dijital ortamda cevap aranması	▪ Yeni arkadaşlıklar kurmak için sosyal paylaşım sitelerini (facebook, twitter, hi5 vb.) ziyaret ederim.
	Rahatlık	Dijital teknolojiler yardımıyla daha rahat iletişim kurulabilmesi	▪ Kızgın olduğum durumlarda, muhatabıma duygularımı anlatmada dijital teknolojileri kullanırım (anlık mesaj-SMS, e-posta, sohbet programları vb.).
			▪ Yüz yüze görüşmelerde ifade etmekte zorlandığım ya da utandığım konularda dijital teknolojiler yardımıyla iletişim kurarım (anlık mesaj-SMS, e-posta, sohbet programları vb.).
Dijital Etiket	Adab-ı Muaşeret (Görgü)	Dijital teknolojilerin görgü kurallarına uygun bir şekilde kullanılması	▪ Yüz yüze görüşmelerimde cep telefonuma çağrı geldiğinde cevap vermem.
			▪ Kütüphane, tiyatro, konser, sinema, seminer, ders vb. esnasında cep, telefonu, bilgisayar ya da bilgisayar özelliği olan dijital cihazlarımla meşgul olmamaya özen gösteririm.
			▪ Toplu taşıma araçlarında cep telefonumla görüşme yapmamaya özen gösteririm.
			▪ Cep telefonumda insanları rahatsız etmeyecek ses düzeyinde melodiler kullanmayı tercih ederim.
	Duyarlılık	Dijital cihazları herhangi bir kimseyi zor durumda bırakmak amacıyla kullanılmaması yönünde hassas davranılması	▪ Bir bilgisayarı başka insanlara zarar vermek için kullanmam.
			▪ Ortak kullanıma açık bilgisayarlarda başkalarına ait dosyalara zarar vermekten kaçınırım.
			▪ Arkadaşlarımın ve yakın çevremin cep telefonu, bilgisayar vb. cihazlarında yer alan bilgileri izin alarak incelerim.
Dijital Ticaret	İnceleme	Bir ürünün satın alınmadan önce dijital cihazlar yardımıyla özelliklerinin araştırılması, benzer ürünlerin özelliklerinin karşılaştırılması ve daha önce satın alan kişilerin ürüne ilişkin yorumlarının incelenmesi	▪ Bir ürünü satın almadan önce internetten özelliklerini incelerim.
	Para Aktarımı	Kişisel faturaların ödenmesi ya da bir başka kişiye para gönderilmesi için dijital teknolojilerin kullanılması	▪ İnternet üzerinden bankacılık işlemlerimi gerçekleştiririm (fatura ödeme, para transferi vb)..
	Alış-Veriş	İnternetten bir ürünün satın alınması ya da satışa çıkarılması	▪ İhtiyaç duyduğumda internetten alış veriş yaparım.
			▪ İnternetten alışverişi yüz yüze alış verişe tercih ederim.
Dijital Hak ve Sorumluluklar	Model Olma	Dijital teknolojilerin kullanımına ilişkin bireyin çevresine bir rol-model olması ve uygun davranışları sergilemesi	▪ İnternette karşılaştığım olumsuz durumlara karşı çevremdeki bireyleri uyarırım.
			▪ Bilgi teknolojilerin nasıl kullanılacağı konusunda

			diğer insanlara örnek olmam gerektiğini düşünür ve buna göre davranırım.
			▪ İnternette uygunsuz şekilde davranan kişileri uyarırım.
	Özgürlük	İnternette gezinti yapma, iletişim kurma, yeni arkadaşlıkları edinme vb. etkinliklerin kısıtlama olmaksızın bireyin hür iradesine dayalı olarak gerçekleştirilmesi	▪ Benim için internet özgürlük demektir.
			▪ İnternette iletişim kurarken gerçek adımı kullanırım.
Dijital Hukuk	Telif Hakları	Bireylerin mülkiyet haklarına saygı gösterilmesi ve bu konuda hassas davranılması	▪ Ödev ya da projelerimi yaparken internette bulduğum başkalarına ait olan çalışmaları yazarından ya da yayımcısından izin alarak kullanmayı tercih ederim.
			▪ Bilgisayarımda kopya yazılım bulundurmam.
	Yasalara Uyma	Dijital teknolojilerin kullanımında devlet tarafından belirlenen kanunlara uyma	▪ İnternetten yasal olmayan şekilde yayımlanan film ve müzik dosyalarını indirmemeye özen gösteririm (download).
Dijital Sağlık	Farkındalık	Dijital teknolojilerin kullanımında bireyin kendi sağlığını ve çevresindeki bireylerin sağlığını koruma hususunda hassas davranması	▪ Cep telefonumla görüşme yaparken çocuklardan uzak dururum.
			▪ Cep telefonumla uzun süreli konuşmalar yapmamaya özen gösteririm.
			▪ İnternette şiddet içerikli web sitelerine girmemeye özen gösteririm.
	Tedbir	Dijital cihazların kullanımında olası sağlık sorunlarına karşı bireyin tedbirli davranması	▪ Cep telefonumla konuşurken kulaklık kullanırım.
			▪ Bilgisayar kullanırken doğru bir oturma pozisyonu belirlerim.
			▪ Bilgisayar kullanırken gözlerimi dinlendirmek için ara veririm.
	Zindelik	Dijital cihazların kullanımında yorgunluk, uykusuzluk, dikkat dağınıklığı gibi rahatsız edici durumların oluşmaması için bireyin kendini zinde tutacak etkinlikler yapması	▪ Dijital cihazları uzu süre kullandığımda dinlenmek için ara veririm.
			▪ Dijital cihazları uzun süre kullandığımda ara verir ve kısa süreli egzersiz yaparım.
	Kontrol	Dijital cihazların kullanımından dolayı oluştuğu düşünülen rahatsızlıklara ilişkin doktor kontrolüne başvurulması	▪ Dijital cihazları kullanmadan kaynaklı olduğunu düşündüğüm sağlık problemleri (omuz, sırt, göz ağrısı vb.) için hastaneye giderim.
Dijital Güvenlik	Kişisel Bilgi	Dijital cihazların kullanımında kişisel bilgilerin (TC Kimlik Numarası, e-posta şifresi, web erişim şifresi vb.) kullanılmaması	▪ E-posta, web erişimi gibi hizmetlere ait şifrelerimi kimseyle paylaşmam.
			▪ Ortak erişime açık bilgisayarlarda herhangi bir şifre gerektiren işlem yapmamaya özen gösteririm.
			▪ Facebook, twitter vb. sosyal paylaşım sitelerinde açık adresimi, telefon numaramı, doğum tarihimi vb. bulundurmamaya özen gösteririm.
	Cihaz Güvenliği	Dijital cihazların virüs programlarıyla korunması ve bilinmeyen kişi ya da adreslerden gelen iletilerin okunmayarak herhangi bir güvenlik açığı oluşmasına karşı dikkatli davranılması	▪ Tanımadığım kişilerden gelen e-posta iletilerini okumamaya özen gösteririm.
			▪ Bilgisayarımda virüs programı kullanırım.

4. BULGULAR

4.1. Dijital Erişim

Tablo 3: Dijital Erişim Temasına İlişkin Bulgular

Tema	Kodlar	Frekans
Dijital Erişim	Erişim	3
	Etkinlik	11
	Araştırma	5
	Motivasyon	8

Dijital erişim temasına ilişkin elde edilen bulgulara göre, **erişim** koduna ilişkin davranışları 3 katılımcı, **etkinlik** koduna ilişkin davranışları 11 katılımcı, **araştırma** koduna ilişkin davranışları 5 katılımcı ve **motivasyon** koduna ilişkin davranışları ise 8 katılımcının sergilediği belirlenmiştir. Bu bağlamda katılımcıların çoğunluğunun **erişim**, **araştırma** ve **motivasyon** kodlarına ilişkin davranışları sergilemedikleri, sadece **etkinlik** koduna ilişkin davranışları sergiledikleri söylenebilir.

4.2. Dijital Okuryazarlık

Tablo 4: Dijital Okuryazarlık Temasına İlişkin Bulgular

Tema	Kodlar	Frekans
Dijital Okuryazarlık	Cihaz Kullanımı	17
	İnternet Kullanımı	14

	Program Kullanımı	13

Dijital okuryazarlık temasına ilişkin elde edilen bulgulara göre, **cihaz kullanımı** koduna ilişkin davranışları 17 katılımcı, **internet kullanımı** koduna ilişkin davranışları 14 katılımcı, **araştırma** koduna ilişkin davranışları 13 katılımcının sergilediği belirlenmiştir. Bu bağlamda katılımcıların çoğunluğunun, dijital okuryazarlık temasına ilişkin davranışları sergiledikleri söylenebilir.

4.3. Dijital İletişim

Tablo 5: Dijital İletişim Temasına İlişkin Bulgular

Tema	Kodlar	Frekans
Dijital İletişim	Paylaşma	11
	Dilin Doğru Kullanımı	5
	Sosyalleşme	15
	Rahatlık	12

Dijital iletişim temasına ilişkin elde edilen bulgulara göre, **paylaşma** koduna ilişkin davranışları 11 katılımcı, **dilin doğru kullanımı** koduna ilişkin davranışları 5 katılımcı, **sosyalleşme** koduna ilişkin davranışları 13 katılımcının ve **rahatlık** koduna ilişkin davranışları ise 12 katılımcının sergilediği belirlenmiştir. Bu bağlamda katılımcıların çoğunluğunun, **paylaşma**, **sosyalleşme** ve **rahatlık** kodlarına ilişkin davranışları sergiledikleri, dilin doğru kullanımı koduna ilişkin davranışları ise sergilemedikleri söylenebilir.

4.4. Dijital Etiket

Tablo 6: Dijital Etiket Temasına İlişkin Bulgular

Tema	Kodlar	Frekans
Dijital Etiket	Adab-ı Muaşeret (Görgü)	3
	Duyarlılık	7

Dijital Etiket temasına ilişkin elde edilen bulgulara göre, **Adab-ı Muaşeret** koduna ilişkin davranışları 3 katılımcı ve Duyarlılık koduna ilişkin davranışları ise 7 katılımcının sergilediği belirlenmiştir. Bu bağlamda katılımcıların çoğunluğunun dijital etiket temasına ilişkin davranışları sergilemedikleri söylenebilir.

4.5. Dijital Ticaret

Tablo 7: Dijital Ticaret Temasına İlişkin Bulgular

Tema	Kodlar	Frekans
Dijital Ticaret	İnceleme	9
	Para Aktarımı	2
	Alış-Veriş	2

Dijital ticaret temasına ilişkin elde edilen bulgulara göre, **inceleme** koduna ilişkin davranışları 9 katılımcı, **para aktarımı** koduna ilişkin davranışları 2 katılımcı ve **alış-veriş** koduna ilişkin davranışları ise yine 2 katılımcının sergilediği belirlenmiştir. Bu bağlamda katılımcıların çoğunluğunun dijital ticaret temasına ilişkin davranışları sergilemedikleri söylenebilir.

4.6. Dijital Haklar ve Sorumluluklar

Tablo 8: Dijital Haklar ve Sorumluluklar Temasına İlişkin Bulgular

Tema	Kodlar	Frekans
Dijital Haklar ve Sorunluluklar	Model Olma	5
	Özgürlük	4

Dijital haklar ve sorumluluklar temasına ilişkin elde edilen bulgulara göre, **model olma** koduna ilişkin davranışları 5 katılımcı, **özgürlük** koduna ilişkin davranışları ise 4 katılımcının sergilediği belirlenmiştir. Bu bağlamda katılımcıların çoğunluğunun dijital haklar ve sorumluluklar temasına ilişkin davranışları sergilemedikleri söylenebilir.

4.7. Dijital Hukuk

Tablo 9: Dijital Hukuk Temasına İlişkin Bulgular

Tema	Kodlar	Frekans
Dijital Hukuk	Telif Hakları	3
	Yasalara Uyma	3

Dijital hukuk temasına ilişkin elde edilen bulgulara göre, **telif hakları** koduna ilişkin davranışları 3 katılımcı, **yasalara uyma** koduna ilişkin davranışları ise yine 3 katılımcının sergilediği belirlenmiştir. Bu bağlamda katılımcıların çoğunluğunun dijital hukuk temasına ilişkin davranışları sergilemedikleri söylenebilir.

4.8. Dijital Sağlık

Tablo 01: Dijital Sağlık Temasına İlişkin Bulgular

Tema	Kodlar	Frekans
Dijital Sağlık	Farkındalık	7
	Tedbir	9
	Zindelik	4
	Kontrol	2

Dijital sağlık temasına ilişkin elde edilen bulgulara göre, **farkındalık** koduna ilişkin davranışları 7 katılımcı, **tedbir** koduna ilişkin davranışları 9 katılımcı, **zindelik** koduna ilişkin davranışları 4 katılımcı ve **kontrol** koduna ilişkin davranışları ise 2 katılımcının sergilediği belirlenmiştir. Bu bağlamda katılımcıların yarısının **tedbir koduna ilişkin davranışları sergilediği**, çoğunluğunun ise **farkındalık**, **zindelik** ve **kontrol** kodlarına ilişkin davranışları sergilemedikleri söylenebilir.

4.9. Dijital Güvenlik

Tablo 11: Dijital Güvenlik Temasına İlişkin Bulgular

Tema	Kodlar	Frekans
Dijital Güvenlik	Kişisel Bilgi	5
	Cihaz Güvenliği	3

Dijital güvenlik temasına ilişkin elde edilen bulgulara göre, **kişisel bilgi** koduna ilişkin davranışları 5 katılımcı, **cihaz güvenliği** koduna ilişkin davranışları ise 3 katılımcının sergilediği belirlenmiştir. Bu bağlamda katılımcıların çoğunluğunun dijital güvenlik temasına ilişkin davranışları sergilemedikleri söylenebilir.

5. Sonuç

Elde edilen bulgular, araştırmaya katılan eğitim fakültesi öğrencilerinin çoğunluğunun dijital iletişim ve dijital okuryazarlık temalarına ilişkin davranış normlarını sergilediklerini göstermektedir. Dijital erişim, dijital etiket, dijital ticaret, dijital haklar ve sorumluluklar, dijital hukuk, dijital sağlık ve dijital güvenlik temalarına ilişkin davranış normlarını ise az sayıda katılımcının sergilediği belirlenmiştir. Bu bağlamda katılımcıların çoğunluğunun dijital vatandaşlık davranış normlarına sahip olmadıkları söylenebilir.

Araştırma sonuçları katılımcı profilini oluşturan eğitim fakültesi öğrencilerinin dijital teknolojilerin kullanımına ilişkin yeterliklerinin yanında bu teknolojilerin nasıl kullanılacağını içeren davranış normlarına da sahip olmaları gerektiğini işaret etmektedir. Bu durum geleceğin dijital vatandaşlarını yetiştirilmesinde ciddi bir görev üstlenecek öğretmenlik mesleği için de önem arz etmektedir.

Elde edilen bulgulara dayalı olarak, eğitim fakültesi öğrencilerinin dijital vatandaşlık temalarına ilişkin davranışları tam olarak sergileyemedikleri, özellikle dijital erişim, dijital sağlık, dijital güvenlik, dijital etiket, dijital hukuk, dijital haklar ve sorumluluklar boyutlarına ilişkin davranış normlarında eksikler olduğu belirlenmiştir. Bu sonuçlara göre, Türkiye'de öğretmen yetiştirme süreci içerisinde dijital vatandaşlık kavramına ilişkin bir modelin tasarlanması ve bir önce öğretmen yetiştirme sürecine kaynaştırılması önerilmektedir.

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EĞİTİM İLE İSTİHDAM ARASINDAKİ İLİŞKİ VE TÜRKİYE ÖZELİNDE BU DURUMUN İNCELENMESİ

THE RELATION OF EDUCATION TO EMPLOYMENT AND THE ANALYSIS OF THIS RELATION IN TURKEY

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Özet

Günümüzde bireyin değişim ve gelişim arzusu ile ileri teknolojinin üretime uyarlanması istihdamda önemli gelişmelere neden olmuştur. Ülkelerin çağdaşlaşma yarışında ihtiyaç duydukları nitelikli işgücünün oluşturulmasının temel şartı bireylerin örgün ve yaygın eğitim kurumlarında ***hayat boyu*** eğitim almalarıdır.

Eğitimli bireyler gelişmekte olan ülkelerin kalkınmasında oldukça önemli bir yer almakta, gelişmiş ülkelerde ise eğitimli bireylerin çalıştıkları kurumlarda aldıkları ilave hizmet içi eğitimler onların etkinliğine değer kazandırmaktadır.

Gelişmekte olan bir ülke olarak türkiye'de henüz vatandaşlarımızın eğitim ihtiyaçları ile ilgili yatırımlar ve eğitimin çağdaşlaşma çabaları gelişmiş ülkelerle kıyaslanmayacak derecede kötüdür. Ülkemizde istihdam edilen bireylerin büyük bölümü emek yoğun alanlarda çalışmakta olup, teknoloji yoğunluklu sektörler henüz ülkemizde yaygınlaşmamıştır.

Ülkemizin gelişmiş bir ülke olabilmesi için hem örgün hem de yaygın eğitim kurumlarında hayat boyu eğitim faaliyetlerinin içinde yer alan bireylerle küresel rekabete ayak uyduran iş alanlarında faaliyet göstermesi gerekmektedir.

Anahtar sözcükler:eğitim, istihdam, verimlilik, kalkınma, gelir.

Abstract

Today, the individual's ambition to change and develope and the adaptation of technology to production have led to significant improvements in employment. The *sine qua non* in the creation of the work force which the countries need in the race of modernization is to provide a ***life-long*** education in formal and public educational institutions.

Well-educated individuals in developing countries play an essential role in the growth of the state, whereas in developed countries educated individuals add value to their effiency through the additional in-service training they get from their employers.

As a developing country, investments in educational needs and the effort to modernize education have been insufficient in turkey when compared to developed countries. The majority of employees in our country are working in labour-intensive areas , whereas technology-intensive areas have not been extended yet.

In order to grow into a developed country, turkey has to operate in work areas which can keep pace with global competition through individuals who have been involved in life-long training activities in both formal and public educational institutions.

Keywords: Education, Employment, Productivity, Growth, İncome.

GİRİŞ

"Eğitim ve İstihdam" arasındaki ilişkinin ***Eğitim Ekonomisi*** bakış açısından değerlendirilmesinde ülkelerin gelişmişlik düzeyi, halkın kültürel dokusu, gelişen sanayinin bağımlı olduğu kaynakların çeşitliliği gibi ülkeden ülkeye değişen konular ile gelecekte hangi sektörlerin ön plana çıkacağına ilişkin belirsizlikler etkili olmaktadır.

Tanım olarak ***"çalışma ve gelir sağlama"*** kararında olan bireylerin, hizmetlerinden yararlanmak üzere gönüllü çalıştırılmalarına ***istihdam*** denilmektedir. Günümüzde bireyin değişim ve gelişim arzusu ile ileri teknolojinin üretime uyarlanması istihdamda önemli gelişmelere neden olmuştur. Geçmişte olduğu gibi bugün de işin gerektirdiği niteliklerin neler olduğu, bu niteliklerin kültürel ve ekonomik anlamda nasıl oluşturulabileceği ve eğitim niteliklerin bireyin işgücü piyasasındaki statüsünü ne ölçüde belirlediği konuları ***eğitim ile ekonomi*** arasındaki ilişkinin ***istihdam*** boyutunu oluşturmaktadır (Kivinen ve Rinne, 1993; Akt.Ünal,1996).

Eğitim ve istihdam arasındaki ilişkinin ortaya konularak Türkiye özelinde durumun incelenmeye çalışılacağı bu bildiride; öncelikle, bireyin istihdam edilmesi ile ülkelerin iktisadi kalkınmasında eğitimin rolü irdelenecek, devamında Türkiye özelinde durum tartışılacaktır.

EĞİTİM İLE İSTİHDAM ARASINDAKİ İLİŞKİ

a.Eğitimin Bireyin İstihdam Edilmesinde Etkisi

Belli işlerin belli öğretim tür ve düzeylerini tamamlamış kişilerce yapılabilmesi işe göre çalışan tercihini gerekli kılmış, bu kişilerin işe alınması işteki verimliliği yükselterek kişisel kazançlarda artışa yol açmıştır (Kural,2002). Günümüzde eğitim ve istihdam ilişkilerinde ulusal ekonomik gereksinimleri aşan, küreselleşmenin gerektirdiği insan gücü nitelikleri etkili olmakta, eğitim etkinliği istihdamı, istihdam etme nitelik ve kıstasları da eğitimi etkilemektedir (Atik, 2008).

Bilgi toplumuna geçişin önemli aşamalarından birisi olan nitelikli işgücünün oluşturulmasının temel şartı bireye örgün ve yaygın eğitim kurumlarında ***hayat boyu*** öğrenmeyi esas alan bir yaklaşımla, uluslar arası piyasalardaki rekabet ortamında uyum sağlayabileceği bir eğitimin verilmesidir (Türkmen, 2002).

Bu husus; ***gelişmiş ülkelerde,*** kamu ve özel eğitim kurumlarında eğitim alan işgücünün istihdam edildiği sektörlerde sürekli iş imkanı bulabilmesi için mesleki bilgisini geliştireceği hizmet içi eğitim imkanları ile desteklenecek şekilde iki boyutlu sürdürülmektedir. Dolayısı ile ***bireyin eğitim seviyesi*** kadar mesleğine yönelik ***hizmet içi eğitim*** de istihdamı etkilemektedir.

Gelişmekte olan ülkelerde ise bu husus henüz tek yönlü olarak işlemekte; istihdam edilen işgücünün örgün eğitim almış olması arzu edilmekte, iş alanları yüksek teknoloji gerektiren sermaye yoğun ortamlardan çok emek yoğun ortamlar olduğu için hizmet içi eğitim faaliyetleri yapılamamaktadır. Bu yüzdende küresel ekonomik dalgalanmalar gelişmekte olan ülkelerde daha çok insanın işsiz kalmasına sebep olmakta, gelişmiş ülkelerde hizmet içi eğitimle niteliğini oldukça artıran işgücü bu durumdan en az kayıpla çıkmayı başarabilmektedir.

Günümüzde ülkeler başta nitelikli işgücü olmak üzere kullandıkları nitelikli üretim girdileri sayesinde ***verimliliği ve istihdamı*** artırabilmektedirler. Bu nedenle de ekonomik gelişme çabası içinde bulunan her ülke, toprak, emek ve sermayeden oluşan üretim faktörlerini

ele alırken, bunlar arasında istenilen amaçlara ulaşabilmek için doğal kaynakların en değerlisi olan ***insan kaynağını*** nitelikli bir duruma getirmek için çaba ve kaynak harcamaktadır (Yılmaz,2009).

Ekonominin her alanında faaliyet gösteren kurumlar; nitelikli insanların sayısı arttıkça ve bu insanların sahip olduğu bilgi, beceri ve yeteneklerinden yararlandıkça başarılı olmakta ve rekabet üstünlüğünü elde edebilmektedir. Eğitilmiş insan gücü ülkelerin fiziki yatırımlarında da artış sağlamakta, yeni teknolojilerin adaptasyonu ve geliştirilmesi konusunda daha başarı göstererek ekonomik büyümeyi hızlandırmaktadır (Demirel, 1999).

Bu konuda çalışmalar yapan iktisatçılar; ***eğitim ve yetiştirmenin*** bilgi ve beceriler biçiminde değer yaratarak insan gücünün üretim kapasitesini arttırdığını, bireylerin kazanç kapasitesini belirlemeye yardım ettiklerini, yaşam boyu gelirlerini arttırmalarını sağladığını ortaya koymuşlardır (Özbey, 1997). Böylece küresel rekabetin yaşandığı dünyamızda; ***Kar*** hangi kurumların var olacağını, ***Teknolojik üstünlük*** hangi kurumların rekabet avantajını sağlayabileceğini, ***Kalite*** hangi kurumların büyüyebileceğini gösterirken; ***İnsan kaynakları*** da bunların hepsini gerçekleştirecek temel bir kıstas olarak bir kurumun var oluşunu sürdürmesinde, büyüyüp gelişmesinde, başarılı olmasında ve rekabet üstünlüğünü sağlamasında önemli etken olarak değer bulmaktadır.

b.Eğitimin İstihdam Çerçevesinde Kalkınma, Ücret Artışı ve Verimliliğe Yönelik Etkileri

Kalkınma sorununun çözümlenmesi büyük ölçüde emek faktörünün üretim sürecinde daha etkin kullanımını sağlayan eğitime verilecek önem ve izlenecek eğitim politikalarına bağlı bulunmaktadır.

Bu husus; ***Sekizinci Beş Yıllık Kalkınma Planı'nda*** "Eğitim sistemimizin geliştirilmesi; genç nüfusa sahip ülkemizin ekonomik gelişmesinin gerektirdiği nitelikli işgücü ihtiyacının karşılanmasına ve rekabet gücü kazanmasına olanak sağlayacaktır" şekilde ifade edilmiştir.

Eğitim istihdamı olumlu yönde etkileyerek işgücünün niteliklerini geliştirmiş, böylece sosyal, kültürel ve kurumsal yapıyı geliştirerek millî geliri ve dolayısıyla kalkınma düzeyini de yükseltmiştir (Unay, 1982). İstihdam üzerinde eğitimin bu etkisini ölçmek üzere ondokuzuncu yüzyılın başlarında itibaren çalışmalar yapılmış ve çoğunda eğitimin bireysel getirilerini ortaya koyabilmek için eğitim-gelir ilişkisi kurulmaya çalışılmıştır (Ünal, 1996). Benzer şekilde eğitimli bireyin ekonomik büyümeye katkısı da Adam Smith'in çalışmalarına kadar dayandırılsa da 1960'larda Schultz ve Denison'un yaptığı çalışmalar işgücünün beceri ve üretim kapasitesinde artış temin edilmesi suretiyle eğitimin milli gelir artışına doğrudan katkı yaptığını göstermiştir (Türkmen,2002).

Özellikle 1990'lı yıllardan sonra bu konuda yapılan çalışmalar artmış ve birbiri ile çelişen sonuçlar elde edilmiştir. Krueger ve Lindahl (1999)'da belirtildiği gibi, çalışma kapsamının makroekonomik veya mikroekonomik seviyede olmasına bağlı olarak farklı sonuçlar vermiştir. Mikroekonometrik çalışmalar genel olarak eğitimin gelirin en önemli açıklayıcı faktörlerinden biri olduğu tezini destekleyen sonuçlar verirken, azımsanamayacak sayıdaki makroekonometrik araştırmalarda bu tezin aksini destekleyen sonuçlar elde edilmiştir (Sarı, 2004). Gerçekte Eğitim, ekonomik büyümenin ve gelir dağılımının önemli bir açıklayıcısıdır (Mankıw/Romer/Weil, 1992; Rehme, 2000; Akt: Sarı, 2003). Bu özelliğinden ötürü eğitim, yoksullukla mücadele ve gelir dağılımının iyileştirilmesi çabasının en önemli unsurlarından biri olarak gündemdeki yerini almıştır (Ünal, 1992; Sarı, 2004).

Eğitimin istihdam üzerindeki etkisine yönelik yapılan çoğu çalışmanın sonuçları, daha fazla eğitim ile daha yüksek kazanç arasında bir ilişkinin var olduğunu göstermektedir. Diğer taraftan çok sayıdaki ampirik çalışma insana yapılan yatırımın mesleklere göre farklı şekilde karşılık bulduğunu göstermektedir (Naderi ve Mace, 2003).

İnsan sermayesi kuramı eğitimsel katılım ile kazançlar ve yatırımlar arasında olumlu bir ilişki tahmin etmektedir (Rubb, 2006). Kurama göre, ücret geliri açısından bakıldığında, bireylerin insan sermayelerini artırmak için yaptıkları yatırım, onların işteki verimliliklerini doğrudan doğruya etkilediği için ücretlerinde de farklılaşma yaratır. Eğitim harcamaları da bu nedenle doğrudan doğruya kişinin ücret gelirini belirler (Ünal, 1992).

Ekonomik yapı ve buna uygun eğitim düzeyi arasındaki ilişkiyi inceleyen araştırmalara göre, birey başına düşen gelir düzeyi ile eğitim düzeyleri arasındaki sıkı bir bağın bulunduğu, yükseköğretim ile gelir düzeyi ilişkisinin oldukça güçlü olduğu, nüfusun eğitim düzeyi yükseldikçe işsizlik oranlarının düştüğü, işgücüne katılma oranlarının ise yükselme eğiliminde olduğu, eğitim düzeyinin işsizlik riski konusunda özel bir önem taşıdığı vurgulanmaktadır.

Bu konuda yapılan bilimsel çalışmalar incelendiğinde;

Wheeler tarafından geliştirilerek seksen sekiz gelişmekte olan ülkeye uygulanan ***"insan kaynaklarının geliştirilmesi ile büyüme arasındaki ilişkiyi inceleyen modelde"*** okuma yazma oranındaki yüzde 20'den yüzde 30 oranına bir artış Gayri Safi Yurt İçi Hasıla (GSYİH)'da yüzde 8'den yüzde 16'ya kadar bir artışa yol açtığı tespit edilerek gelişmekte olan ülkelerde örgün eğitimin yaygınlaştırılmasının ekonomik kalkınmaya çok önemli katkı sağlayacağı ortaya konulmuştur (Türkmen, 2002).

Psacharopoulos tarafından gelişmiş ve gelişmekte olan ülkelerde ***"fiziki sermaye ile insana yapılan yatırımların getirilerini inceleyen çalışmada"*** gelişmekte olan ülkelerde hem fiziki sermayeye yapılan yatırımların hem de bireye yapılan yatırımların getirilerinin yüksek olduğu, gelişmekte olan ülkelerde eğitimli bireyin kalkınmaya etkisinin gelişmiş ülkelere göre daha yüksek olduğu tespit edilmiştir (Özbey,1997).

Ekonominin genel yapısı, eğitimle gelir dağılımı arasındaki ilişkiyi etkilemektedir. Eğitime ayrılan pay artığında gelir dağılımı adaleti ve milli gelir artışı yükselmektedir. Eğitim kademelerini gösteren piramit ne kadar düzgün olursa eğitimin gelir dağılımını ve millî gelir artışını etkilemesi de o derecede yüksek olmaktadır (Kasliwal, 1995; Akt: Ereş, 2005).

Eğitimde harcanan sürenin uzunluğu ile mesleki eğitim de bireyin gelir seviyesini artırıcı özeliğe sahiptir. İlkokul mezunları ile mesleki eğitimden yoksun bırakılan kişilerin oransal olarak fazla olması gelir dağılımını bozucu etki yaratmaktadır. Gelir dağılımını iyileştirmeye yönelik eğitim politikasının en önemli değişkeni bu nedenle mesleki eğitim olmalıdır. Dünya Bankası (2000; Akt: Sarı, 2004) araştırmasında yoksullukla mücadelenin en önemli stratejilerinden birisi olarak yoksul fertlerin eğitim fırsatlarından faydalanma olanaklarının artırılması olduğu ileri sürülmüştür.

Gelişmiş ülkelerde eğitim hizmetlerinin bütün öğrencilere aynı kalitede verilmesine özen gösterilmekte ve bu suretle fırsat eşitliği sağlanarak gelir dağılımı önemli ölçüde iyileştirilmektedir. Böylece, çalışkan ve yetenekli vatandaşların içinde bulundukları bir sosyal sınıftan daha üst bir sınıfa atlamaları kendiliğinden sağlanmaktadır. Bu doğrultuda Türkmen (2002), eğitim, bireylerin gelecekte elde edecekleri ücretlerin tek belirleyicisi olmamakla birlikte, eğitim düzeyi ile ücretler arasında sistematik bir ilişki olduğunu savunmaktadır (Türkmen, 2002). OECD (2006) tarafından yapılan analizlere göre, eğitimin verimlilik üzerinde doğrudan etkisi vardır. Bir yıllık ek eğitimin ekonomik çıktılar üzerindeki uzun vâdede tahmini etkisi genel olarak %3 ile %6 arasındadır.

Eğitim ile bireylerin istihdam edilmeleri arasında güçlü bir bağın olduğu, eğitimli bireylerin daha yüksek gelire sahip olduğu ve özellikle gelişmekte olan ülkelerin temel sorunları arasında yer alan gelir dağılımındaki bozukluğun bireylere sağlanacak eğitim imkanları ile giderilebileceğini ifade ettikten sonra eğitim ile istihdam arasındaki ilişkinin ülkemiz özelindeki durumunu inceleyeceğiz.

EĞİTİM İLE İSTİHDAM ARASINDAKİ İLİŞKİNİN TÜRKİYE ÖZELİNDE İNCELENMESİ

Ülkemiz açısından kıt olan kamu kaynaklarının daha etkin ve rasyonel bir biçimde kullanılabilmesi, sürdürülebilir bir ekonomik ve sosyal kalkınmanın sağlanması için eğitimin istihdama etkisinin anlaşılması büyük önem taşımaktadır. Bu bakımdan ortaya çıkacak sonuçlar,

eğitime ayrılan kaynakların verimliliğinin ve etkin kullanılıp kullanılmadığının ölçülmesi ve kalkınma planlarında öngörülen hedeflere ne kadar ulaşıldığının tespiti konularını ortaya koyacaktır .

Ülke insanının sahip olduğu eğitim düzeyi ve ekonomideki nitelikli insan gücü sayısı kalkınmanın başlıca gereklerinden birisi olarak kişisel kazanç farklılıkları ve uluslararası gelişmişlik farklılıklarının açıklanmasında önemli bir göstergedir. Bu nedenle vatandaşlarımızın eğitimi için GSMH'dan ayrılan pay eğitim ihtiyacının karşılanabilmesi adına oldukça önemlidir. Ancak, Türkiye'de 1980'lı yıllarda GSMH'dan eğitime ayrılan pay yaklaşık %10 oranında iken, tüm eğitim kademesi için yıllar itibariyle bu oran azalma göstermiştir (Koç, 2007).

Türkiye'nin GSYİH'dan eğitim yatırımlarına ayırdığı payın oranı kadar miktarı da dikkate değer bir karşılaştırma aracıdır. Ülkemizin eğitim seviyeleri için harcadığı ortalama rakamlar birçok gelişmiş ülkenin oldukça gerisindedir. Oysa hem eğitime ihtiyaç duyan genç nüfusun yüksek miktarda olması hem de ayrılan kaynağın az olması ülkemizin eğitim alanında gelişmesini de, eğitimdeki gelişmelerin ticaret ve sanayi alanına yansıyarak verimliliğin artmasını da olumsuz yönde etkileyebileceği değerlendirilmektedir.

Kalkınma planları; örgün ve yaygın mesleki ve teknik eğitimin dünya standartlarına yükseltilmesini, meslek standartları ve sertifikasyon (belgelendirme) sisteminin tamamlanarak yürürlüğe konulmasını, okul ve iş hayatı ilişkilerinin geliştirilmesini öngörmüş, Yedinci Beş Yıllık Kalkınma Planında ***"İnsan Kaynaklarının Geliştirilmesi Projesi başlığı altında, ekonomik ve sosyal kalkınmanın sağlanması, toplumsal ve bireysel refah düzeyinin artması, doğa ve insan kaynaklarının etkili şekilde geliştirilmesi ve değerlendirilmesine bağlıdır"*** şeklinde ifade edilmiş ancak ülkemizin mevcut işgücü dağılımının ortaya koyduğu gerçek; işgücünün teknolojik gelişme ile henüz doğru orantılı olarak çok kalifiye işlere yönelmediğini göstermiştir.

2006 yılı verilerine göre ülkemizde istihdam edilenlerin %47.3'ü Hizmetler sektöründe, %25,4'ü Sanayi sektöründe ve %27,3'ü Tarım sektöründe iş bulmaktadır. Erkekler işgücünün %74'ünü, kadınlar ise %26'sını oluşturmaktadır.Erkek ve Kadınların bu üç sektör içinde dağılımları ise; İstihdam edilen erkeklerin %51,1'i Hizmetler sektöründe, %29.1'i Sanayi sektöründe, %19.8'i Tarım sektöründedir. İstihdam edilen kadınların %36.5'i Hizmetler sektöründe, %15.0'ı Sanayi sektöründe, %48.5'i Tarım sektöründedir.

Çizelge 1'de Türkiye'de istihdam edilmiş iş gücünün toplam gelirden aldığı pay gösterilmiştir. Çizelge incelendiğinde, eğitim düzeyi yükseldikçe bireyin toplam gelirden aldığı pay da yükselmektedir. Çizelgede dikkati çeken bir husus ise eğitim seviyesi ilköğretim ve altında olanların ülke gelirinin en çoğunu almalarıdır. Bu durum, sayıca fazla olmasından kaynaklanmaktadır. Diğer bir konu ise Türkiye'de meslek lisesi mezunları ile lise mezunlarının gelir seviyesindeki farklılıktır. Bir meslek eğitimi alarak iş yaşamına başlayanların hiç meslek eğitim almamış lise mezunlarına oranla daha az gelir elde etmesi oldukça düşündürücüdür (Ereş, 2005).

Çizelge 1 Türkiye'de 2005 Yılı İçin 15 Yaş ve Üzeri Hane Halkı Çalışanlarının Eğitim Durumlarına Göre Gelirden Aldıkları Pay

EĞİTİM SEVİYELERİ	Çalışan Nüfus İçindeki Payı (%)	Toplam Gelirden Aldığı Pay (%)
Eğitim Seviyesi İlköğretim ve Altında Olanlar	65.1	48.5
Ortaöğretim ve Dengi Mesleki Eğitimli Olanlar	8.6	10.3
Lise eğitimli Olanlar	13.2	15.6
Lise Dengi Mesleki Eğitimli Olanlar	4.6	6.5
Yüksek Öğretim Kurumlarından Mezun Olanlar	8.5	19.0

KAYNAK: Türkiye İstatistik Kurumu (TÜİK) www.tuik.gov.tr. internet erişim adresinde bulunan istatistiklerinden düzenlenmiştir.

Ülkemiz istihdam profili içinde tarımın oldukça yüksek bir paya sahip olması, kadınların işgücüne katılımının hem düşük olması, hem de büyük oranda tarım içinde faaliyet göstermeleri ülkemizde işgücünün niteliği hakkında da ipuçları vermektedir. Buradan hareketle ülkemizin gelişmekte olan bir ülke olarak nüfusunun önemli bir bölümüne iş imkanı oluşturamadığı, çalışanlarını teknik donanım gerektiren işler yerine emek yoğun işlerde istihdam ettiğini ifade edebiliriz. Erkek ve kadın çalışanların sektörel dağılımı yanında düşük eğitim seviyesine sahip olmaları özellikle ekonomik kriz yaşanan dönemlerde kolay iş kayıplarına da neden olmaktadır.

Çizelge 2'de bu durum ortaya konulmuş olup, ülkemizde kayıtlı işsizler farklı eğitim düzeylerinde çarpıcı değişiklikler göstermektedir. Kadın lise mezunları daha yüksek işsizlik riski ile karşı karşıya iken, bu risk üniversite mezunu kadınlarda azalmaktadır. Erkek eğitim seviyesi ilköğretim ve altında olanlar; işsiz erkeklerin ve aynı zamanda erkek işgücünün hemen hemen yarısını oluşturmakta, eğitim seviyesi arttıkça işsizlik içindeki yüzde de azalmaktadır.

Çizelge 2: Ülkemizde 2006 Yılı İçin 15 Yaş ve Üzeri Kayıtlı İşsizlerin Eğitim Düzeyine Göre Dağılımı (x1000 Kişi)

Cinsiyet	Eğitim Seviyesi İlköğretim ve Altında Olanlar	Ortaöğretim ve Dengi Mesleki Eğitimli Olanlar	Lise ve Dengi Mesleki Eğitimli Olanlar	Yüksekokul ve Fakülte Eğitimli Olanlar	TOPLAM
ERKEK	945	244	431	156	1776
KADIN	221	55	257	137	670

KAYNAK: Türkiye İstatistik Kurumu (TÜİK) www.tuik.gov.tr. internet erişim adresinde bulunan istatistiklerinden düzenlenmiştir.

Eğitim almış kişilerin istihdamının çok daha kolay olması bu kişilerin istihdam maliyetlerini de daha düşük tutmaktadır. İlave eğitim almış kişiye, sahip olduğu bilgi birikimi sebebiyle duyulan ihtiyaç, ekonomik kriz zamanlarındaki istihdamdaki daralmadan bu kesimin en az kötü sonuçla etkilenmesi sonucunu doğuracaktır. Eğitim düzeyi yükseldikçe çalışanların hem gelir düzeyi hızla artmakta hem de işsiz kalma riski azalmaktadır (Ereş, 2005).

Ayrıca sanayileşme ve teknolojik ilerlemenin sağlanması, gelişmiş ve diğer ülkelerin sanayi ürünleriyle rekabet edebilme ve Avrupa Birliği gibi entegrasyonlara üye olabilme açısından mesleki ve teknik eğitim oldukça önemlidir. Türk Millî Eğitim sistemi mesleki ve teknik eğitim açısından değerlendirildiğinde, Türk işgücü piyasasının en önemli sorunlarından birisinin nitelikli işgücü eksikliği olduğu ortaya çıkmaktadır.

Türk işgücü piyasasında bir yandan niteliksiz işgücü fazlalığı diğer yandan nitelikli işgücü açığı olmak üzere iki yönlü bir dengesizlik gözlenmektedir. Eğitim planlaması ve sanayideki gelişmenin yeterli ölçüde koordine olmaması nitelikli işgücü açığını ortaya çıkarmaktadır. Bu durumda mesleki teknik eğitim politikalarının ekonomik talebi karşılayacak şekilde geliştirilmesi ve eksikliklerin giderilmesi gerekmektedir.

SONUÇLAR

Eğitimin istihdam ile ilişkisi açısından aşağıda yer alan sonuçları çıkarabiliriz;

a.***Gelişmiş ülkelerde,*** kamu ve özel eğitim kurumlarında eğitim alan işgücünün istihdam edildiği sektörlerde sürekli iş imkanı bulabilmesi için mesleki bilgisini geliştireceği hizmet içi eğitim imkanları ile desteklenmesi sağlanmakta dolayısı ile ***bireyin eğitim seviyesi*** kadar mesleğine yönelik ***hizmet içi eğitim*** de istihdamı etkilemektedir.

b.***Gelişmekte olan ülkelerde*** ise istihdam edilen işgücünün örgün eğitim almış olması arzu edilmekte, iş alanları yüksek teknoloji gerektiren sermaye yoğun ortamlardan çok emek yoğun ortamlar olduğu için hizmet içi eğitim faaliyetleri yapılamamaktadır.

c.Küresel ekonomik dalgalanmalar gelişmekte olan ülkelerde daha çok insanın işsiz kalmasına sebep olmakta, gelişmiş ülkelerde hizmet içi eğitimle niteliğini oldukça artıran işgücü bu durumdan en az kayıpla çıkmayı başarabilmektedir.

ç.Eğitim istihdamı olumlu yönde etkileyerek işgücünün niteliklerini geliştirmiş, böylece sosyal, kültürel ve kurumsal yapıyı geliştirerek millî geliri ve dolayısıyla kalkınma düzeyini de yükseltmiştir.

d.Ekonomik yapı ve buna uygun eğitim düzeyi arasındaki ilişki dikkate alındığında, birey başına düşen gelir düzeyi ile eğitim düzeyleri arasındaki sıkı bir bağ bulunmaktadır.

e.Nüfusun eğitim düzeyi yükseldikçe işsizlik oranları düşmekte, işgücüne katılma oranları yükselme eğiliminde olmaktadır.

ÖNERİLER

Yukarıdaki sonuçlar bağlamında bu konudaki öneriler şunlardır:

a.Türk işgücü piyasasında bir yandan niteliksiz işgücü fazlalığı diğer yandan nitelikli işgücü açığı bulunmaktadır. Eğitim planlaması ve sanayideki gelişmenin yeterli ölçüde koordine olmaması nitelikli işgücü açığını ortaya çıkarmaktadır. Bu durumda mesleki teknik eğitim politikalarının ekonomik talebi karşılayacak şekilde geliştirilmesi ve eksikliklerin giderilmesi gerekmektedir.

b.Dünyada ve ülkemizde eğitime ayrılan pay artığında gelir dağılımı adaleti ve milli gelir artışı yükselmektedir. Bu nedenle ülkemizde eğitimin her seviyesi için ihtiyaç duyulan kaynak milli bütçeden önceliklendirilerek ayrılmalı ve yıllara sari bir bakış açısı ile gelişmiş ülke standartlarına ulaşılması hedeflenmelidir.

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EĞİTİM ÖĞRETİM FAALİYETLERİNDE TEKNOLOJİ KULLANIMI
USE OF TECHNOLOGY ON TEACHING AND LEARNING ACTIVITY

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Özet

Çağımızda bilgi teknolojilerininin yoğun olarak kullanılmasının yarattığı değişiklikler, bireylerin ve toplumların, hayatın tüm alanlarında teknoloji ile bütünleşmelerini gerekli kılmıştır. Bu araştırma, eğitim öğretim faaliyetlerinde teknoloji kullanımı konusunda öğretim elemanları ile üniversite öğrencilerinin düşüncelerini öğrenmeyi amaçlamaktadır. Araştırmanın evrenini kıbrıs'taki üniversitelerde görevli olan ve eğitim fakültesinde derse giren öğretim elemanları ile bu üniversitelerin eğitim fakültelerinde öğrenim gören öğrenciler oluşturmuştur. Araştırma örneklemini, uluslararası kıbrıs üniversitesi'nden amaçsal ve seçkisiz örnekleme yöntemi ile belirlenen 41 öğretim elemanı ile 168 öğrenci oluşmuştur.

Araştırmada veri toplama aracı olarak, araştırmacı tarafından geliştirilen kişisel bilgi formu ile çil (2008) tarafından geliştirilen ve cronbach alpha güvenilirlik katsayısı .70 olarak belirlenen "teknolojinin eğitim-öğretim faaliyetlerindeki rolü" ölçeği kullanılmıştır. Verilerin analizinde, frekanslar ve yüzde değerler hesaplanmış, ortalamalar arasındaki farkın test edilmesinde t testi ve anova analizi kullanılmıştır. Önem düzeyi .05 olarak alınmıştır. Araştırma sonucunda, eğitim öğretim faaliyetlerinde teknoloji kullanımı konusunda öğretim elemanları ile üniversite öğrencilerinin düşüncelerinin farklılıklar gösterdiği saptanmıştır.

Anahtar Kelimeler: Teknoloji Kullanımı, Eğitim Öğretim Faaliyeti, Öğretim Elemanı, Öğretmen Adayı.

Abstract

The density of using information technologies in our time, cause some differences such as, to force individuals and comminities to use technology in their entire life. The aim of this research is to investigate the ideas, of lecturers and university students of using technology in education activities. Survey population is the lecturers and faculty of educatin students in cyprus. The sample consists of 41 lecturers and 168 students at cyprus international university selected according to purposeful sampling and random sampling.

Data collection instruments are personel information form and "roles of technology on teaching and learning practices" scale developed by çil (2008) with the reliability of .70. In the analysis of data, frequency and percentage values (%) had been calculated and to test the difference t test and anova are used. The significance level is .05. As a result of research, its observed that lecturers and students have different ideas about of using technology in teaching and learning activities.

Keywords: Use Of Technology, Teaching And Learning Activity, Lecturer, Teacher Candidates.

GİRİŞ

Bilme, düşünme ve yapma kavramlarının bütünlüğünü içeren teknoloji (Satıcı, Akkuş ve Alp, 2009) ve uygulamaları, insanın doğayı kontrol altına alma ve yönlendirme çabasıyla birlikte varolmuştur. Yunanca kelime anlamı hüner vaya sanat olarak bilinen teknoloji kavramı, insanların üretim faaliyetlerinde bulunurken kullandığı yol ve yöntemler olarak tanımlanabilir. Bir başka deyişle teknoloji, insan ihtiyaçlarını karşılamak amacıyla bilginin, ürün ve süreçlere uygulanmasıdır (Cardullo, 1996; Tekin, Güleş ve Burgess, 2000).

19. ve 20. yüzyılda meydana gelen hızlı değişim ve gelişmeler iletişim ve bilgi teknolojilerini de önemli ölçüde etkilemiştir. Teknolojik gelişmeler aynı zamanda eğitim sürecinin de yapısını değiştirmiş, eğitim anlayışına farklı bir bakış açısı getirmiştir (Keser, 1991). Bilginin artık geleneksel öğretim yöntemleri ile aktarılması ve ezberlenmesinin tercih edilmediği çağdaş eğitim yaklaşımlarında. öğretmenin rolü de öğrenciden beklenenler de değişmiştir. Düşünen, üreten, yaratan, paylaşan, kendine güvenli, etkileşime yatkın, bilgi ve iletişim teknolojilerini kullanabilecek bilgi ve becerilere sahip, dünyaya ve gelişmeler duyarlı, donanımlı bireyler olarak ifade edilebilecek beklentileri karşılamanın yollarından biri de teknolojiyi bilmek ve onu etkin olarak kullanabilmektir. Bu yönüyle üniversitelere ve bilime yön veren akademisyenlere önemli görevler düşmektedir. Eğitim araştırmalarının da vurguladığı gibi, teknolojiye karşı olumlu tutum geliştiren öğretim elemanları, teknolojiyi eğitime entegre etmede, olumsuz tutum geliştiren öğretim elemanlarından daha başarılı olmuşlardır (Satıcı, Akkus ve Alp, 2009). Üniversitelerde yaygın olarak kullanılan bilgi teknolojileri arasında, basılı materyaller, radyo, gazete, tv, cd, video, film, tepagöz, asetat, slayt, bilgisayar, multimedya, web siteleri ve uzaktan eğitim söylenebilir. Tor ve Erden (2004) eğitimde bilgi teknolojilerinden yararlanma üzerine yaptıkları çalışmada, öğretmenlerin sınıfta en çok tepegöz , kara tahta, bilgisayar, televizyon, slayt makinası ve VCD gibi eğitsel öğrenme araçlarını kullandıklarını belirlemiştir

Üniversiteler bilgiyi üreten, koruyan, yaygınlaştıran ve bu bilgiden uygulama boyutunda faydalanan kurumlar olarak toplumda çok önemli rol üstlenmektedir. Bu anlamda Yükseköğretim Kurumları'nın yaşanan bu hızlı değişmelerden haberdar olması da, eğitim-öğretim kalitesinin yükselmesi açısından gerekli olmuştur. Üniversitelerin eğitim öğretim faaliyetlerinde teknolojiyi kullanma ve geliştirmede örnek olmaları, toplumların yeni teknolojilere uyumu ve bilgi çağı toplumunun oluşturulması için önemlidir. Çağdaş toplumlarda bilgi teknolojilerindeki araçları ustalıkla kullanabilen, veri toplama, yorumlama ve bu verileri kullanabilmede bilgi sahibi olan, uygun bilgi teknolojileri kaynaklarını kullanarak çalışma yapabilen bireyler yetiştirmek önemli hedefler olmuştur. Teknolojileri uygulamaya geçirecek olan öğretmenlerin sadece teknolojiyle tanıştırılmaları değil, teknolojinin ve yeni öğretim tekniklerinin kullanılarak öğrenme etkinlikleri düzenleme becerilerinin de kazandırılması gerekmektedir Bu nedenle öncelikle öğretmen yetiştiren kurumların, genelde eğitim teknolojisi ve özelde yeni bilgi teknolojilerinin kullanımına ilişkin planları olmak zorundadır (Akt; Akpınar, 2003).

Bu araştırmadan elde edilecek bilgiler ile eğitim öğretim faaliyetlerinde teknolojiyi kullanma ve geliştirmede örnek olmaları beklenen öğretim elemanları ile onların yetiştirdikleri eğitim fakültesi öğrencilerinin teknoloji kullanımı konusunda düşünceleri öğrenilmeye çalışılacaktır. Ayrıca, araştırmadan elde edilecek verilerin, bu konuda çalışan öğretim elemanları ile program geliştirme uzmanlarına, yöneticilere fikir vererek, ışık tutacağı ve öğretmen adaylarına da yol göstereceği düşünülmektedir.

Araştırmanın Amacı

Bu araştırma, eğitim fakültesinde görevli öğretim elemanları ile eğitim fakültesi öğrencilerinin eğitim öğretim faaliyetlerinde teknoloji kullanımı konusunda düşüncelerini öğrenmeyi amaçlamaktadır.

Problem Cümlesi

Bu temel problem doğrultusunda aşağıdaki sorulara cevap aranmıştır;

1. Öğretim elemanlarının düşünceleri, cinsiyete, mesleki deneyime ve teknoloji kullanımına ilişkin kendilerini nasıl algıladıklarına göre farklılık göstermekte midir?
2. Eğitim fakültesi öğrencilerinin düşünceleri, cinsiyete, bölüme ve teknoloji kullanımına ilişkin kendilerini nasıl algıladıklarına göre farklılık göstermekte midir?
3. Öğretim elemanlarının ve öğrencilerin düşünceleri, genel olarak nasıldır?

ARAŞTIRMA YÖNTEMİ

Araştırma Deseni

Araştırma, betimsel yöntemlerden tarama modelli bir çalışmadır. Betimleyici yaklaşım, ilgilenilen durumu tanımlamayı amaçlamaktadır. Tarama modelleri ise var olan durumu, var olduğu şekliyle betimlemeyi amaçlayan araştırma yaklaşımıdır (Karasar, 2009).

Evren ve Örneklem

Araştırmanın genel evrenini Kıbrıs'taki üniversitelerde görevli olan ve eğitim fakültesinde derse giren öğretim elemanları ile bu üniversitelerin Eğitim Fakültelerinde öğrenim gören öğrenciler oluşturmuştur. Çalışma evrenini ise Uluslararası Kıbrıs Üniversitesi'nde görevli olan ve eğitim fakültesinde derse giren öğretim elemanları ile bu üniversitede öğrenim gören eğitim fakültesi öğrencileri oluşturmuştur. Araştırma örneklemini, Uluslararası Kıbrıs Üniversitesi'nden amaçsal örnekleme yöntemi ile belirlenen 41 öğretim elemanı ile seçkisiz örnekleme yöntemi ile belirlenen 168 öğrenci oluşturmuştur.

Veri Toplama Aracı

Araştırmada veri toplama aracı olarak, Kişisel Bilgi Formu ile "Teknolojinin Eğitim-Öğretim Faaliyetlerindeki Rolü" ölçeği kullanılmıştır.

Verilerin Analizi ve Yorumlanması

Verilerin analizinde, frekanslar ve yüzde değerler hesaplanmış, ortalamalar arasındaki farkın test edilmesinde t testi ve ANOVA analizi kullanılmıştır. Önem düzeyi .05 olarak alınmıştır.

Kişisel Bilgi Formu:

Kişisel Bilgi Formu olarak, öğretim elemanlarının ve öğrencilerin, cinsiyet, bölüm ve teknoloji kullanımı konusunda kendilerini nasıl değerlendirdikleri ile ilgili konular hakkında bilgi almaya yarayan bir form hazırlanmıştır.

Teknolojinin Eğitim-Öğretim Faaliyetlerindeki Rolü Ölçeği

CDW-G tarafından sunulan ve Teachers Talk Tech 2006, raporunda kullanılan anketten referans alınarak oluşturulan ölçek, Amerika'da ülke genelinde binin üzerindeki öğretmene uygulanmış ve öğretmenlerin teknolojinin, eğitimi ne şekilde şekillendirdiğine dair görüşlerini öğrenmeyi amaçlamıştır. Ölçek Çil (2008) tarafından Türkçe'ye uyarlanmıştır. Türkiye'deki eğitim öğretim faaliyetleri göz önünde bulundurularak ilişkili maddeler eklenmiş ve iki ana bölüm ve toplam on yedi sorudan oluşan ölçek son halini almıştır. Ölçeğin birinci bölümünde, teknolojinin eğitim öğretim faaliyetlerindeki rolüne ilişkin sorularla, farklı beceri ve uygulamaları öğretmede teknolojinin ne kadar etkili bulunduğu irdelenmiştir. Ölçeğin ikinci bölümlünde, teknolojik araçların sınıf içinde ne kadar önemli olduğuna dair düşünceleri öğrenmeyi amaçlayan sorular yer almıştır. Bu maddelere ait görüşler likert tipinde oluşturulan ve (1) Hiç Katılmıyorum, (2) Katılmıyorum, (3) Kararsızım, (4) Katılıyorum, (5) Tamamen Katılıyorum şeklinde düzenlenen seçeneklerle alınmıştır. Ölçeğin Cronbach Alpha güvenilirlik katsayısı .70 olarak bulunmustur.

BULGULAR

Araştırma grubunda yer alan öğretim elemanlarına ve öğrencilere ait bilgiler.

Tablo1. Öğretim elemanlarının cinsiyete, mesleki deneyime ve teknolojik araçları kullanma konusunda kendini değerlendirmelerine göre dağılımları

Özellik	X	n	ss	%	t/F	P
Cinsiyet (n= 41)	Kadın	25	61,00	68,72	6,53	0,414	0,681
	Erkek	16	39,00	69,75	9,44		
Mesleki Deneyim	1-5 yıl	12	29,20	69,25	4,86	0,187	0,944
	6-10 yıl	10	24,40	68,20	7,87		
	11-15 yıl	7	17,10	71,29	8,58		
	16-20 yıl	5	12,20	69,00	8,94		
	21 yıl ve üzeri	7	17,10	68,14	11,13		
	Toplam	41	100,00	69,12	7,70		
Teknolojik Araçları Kullanma Konusunda Kendini Değerlendirme	Yetersiz	1	2,41	72,00	-	1,524	0,224
	Orta Düzeyde	14	34,10	65,86	9,16		
	Yeterli	23	56,10	71,17	6,58		
	Mükemmel	3	7,30	67,67	5,69		
	Toplam	41	100,00	69,12	7,70		

*P < .05

Araştırma grubuna katılan 41 öğretim elemanının 25'i kadın (%61), 16'sı erkektir (%39). Mesleki deneyim açısından bakıldığında genel olarak 1 ile 10 yıl arası deneyime sahip öğretim elemanları çoğunluktadır (n=22, %53,70). Bunu 11-15 yıl (n=7, %17,10) ile 21 yıl

üzeri (n=7, %17,10) deneyime sahip olan öğretim elemanları takip etmektedir. Öğretim elemanlarının eğitimde teknolojik araç-gereçleri kullanma konusunda kendilerini daha çok "yeterli" olarak (n=23, %56,10) değerlendirdikleri, bunu "orta düzey" (n=14, %34,10) değerlendirmenin izlediği görülmektedir.

Teknolojinin Eğitim-Öğretim Faaliyetlerindeki Rolü Ölçeği toplam 17 maddeden oluşmaktadır. 5'li likert tipinde hazırlanan ölçekten alınabilecek en düşük puan 17, en yüksek puan ise 85'dir. Ölçekten alınan puan yükseldikçe, eğitimde teknoloji kullanımını destekleyen düşünceler artmaktadır. Öğretim elemanlarının, eğitimde teknoloji kullanımına yönelik düşüncelerinin ortalamalarına bakıldığında, X=69,12 olduğu görülmektedir. Bu ortalamanın, eğitimde teknoloji kullanımına yönelik düşünceler açısından yüksek düzeyde ve olumlu olduğu görülmektedir. Erkek öğretim elemanlarının eğitimde teknoloji kullanımına yönelik düşüncelerinin (%69,75), kadın öğretim elemanlarına göre (%68,72), az bir farklılıkla, daha olumlu olduğu görülmektedir. Mesleki deneyim açısından bakıldığında, 11-15 yıl arası deneyime sahip olanların (%71,29) düşüncelerinin daha olumlu olduğu, onu 1-5 yıl arası deneyime sahip olanlarla (%69,25), 16-20 yıl arası deneyime sahip olanların (%69,00) izlediği görülmektedir. Öğretim elemanlarının teknoloji kullanımı konusunda kendilerini nasıl değerlendirdikleri ile ilgili ortalamalarına bakıldığında ise, kendini "yeterli" olarak değerlendiren öğretim elemanları (%71,17) daha olumlu görüş bildirmişlerdir. Bunu sırasıyla kendini "mükemmel" olarak değerlendirenler (%67,67) ile "orta düzey" (%65,86) olarak değerlendirenler oluşturmuştur. Ölçek maddeleri bazında verilen cevapların ortalamaları incelendiğinde, "Teknolojik araçlar, derslerin hazırlanmasında araştırma yapmak için önemlidir." İfadesi en yüksek ortalamayı (X=4,76), "Teknoloji matematik alıştırmalarının yapılmasında etkilidir." İfadesi de en düşük ortalamayı (X=3,61) almıştır.

Öğretim elemanlarının eğitimde teknoloji kullanımına yönelik düşüncelerinin cinsiyetlerine göre farklılaşıp farklılaşmadığını belirlemek amacıyla yapılan t testi analizi sonucuna göre; t (39)= .414 P>.05, anlamlı bir farklılığa rastlanmamıştır. Öğretim elemanlarının eğitimde teknoloji kullanımına yönelik düşüncelerinin mesleki deneyimlerine göre farklılaşıp farklılaşmadığını belirlemek amacıyla yapılan ANOVA analizi sonucunda; F(4, 36)= .187 P>.05, anlamlı bir farklılığa rastlanmamıştır. Aynı şekilde, öğretim elemanlarının düşüncelerinin, eğitimde teknolojik araçları kullanma konusunda kendini değerlendirme durumlarına göre farklılaşıp farklılaşmadığını belirlemek amacıyla yapılan ANOVA analizi sonucunda da F(3, 37)= 1,524 P>.05, anlamlı bir farklılığa rastlanmamıştır.

Tablo2. Öğrencilerin cinsiyete, bölüme ve teknolojik araçları kullanma konusunda kendini değerlendirmelerine göre dağılımları

Özellik		n	X	ss	%	t/F	P
Cinsiyet (n= 168)	Kız	100	59,50	63,36	12,30	0,834	0,405
	Erkek	68	40,50	64,94	11,70		
Bölüm	TÖB	30	17,90	61,40	10,63	1,292	0,275
	PDR	38	22,60	67,34	10,16		
	PSE	37	22,00	64,14	10,74		
	ZEÖ	30	17,90	62,03	14,05		
	ELT	33	19,60	64,15	14,27		
	Toplam	168	100,00	64,00	12,05		
Teknolojik Araçları Kullanma Konusunda Kendini Değerlendirme	Yetersiz	11	6,50	64,27	19,46	2,122	0,099
	Orta Düzeyde	62	36,90	61,03	13,30		
	Yeterli	74	44,00	65,70	9,49		
	Mükemmel	21	12,50	66,62	10,45		
	Toplam	168	100,00	64,00	12,05		

*P < .05

Araştırma grubuna katılan 168 öğrencinin 100'ü kız (%59,50), 68'i erkek öğrencidir (%40,50). Uluslararası Kıbrıs Üniversitesi Eğitim Fakültesi, Türkçe Öğretmenliği, Psikolojik Danışma ve Rehberlik, Okul Öncesi Öğretmenliği, Zihin Engelliler Öğretmenliği ve İngilizce Öğretmenliği olmak üzere toplam beş bölümden oluşmaktadır. Bölümlere göre düşüncelere bakıldığında, Psikolojik Danışma ve Rehberlik Bölümü öğrencilerinin en yüksek ortalamaya sahip oldukları görülmektedir (%67,34). Öğrencilerin, eğitimde teknolojik araç-gereçleri kullanma konusunda kendilerini daha çok "yeterli" olarak (n=, %44,00) değerlendirdikleri, bunu "orta düzey (n=62, %36,90) değerlendirmenin izlediği görülmektedir. Kendini "mükemmel" olarak değerlendirenlerle (n=21, %12,50), "yetersiz" olarak (n=11, %6,50) değerlendirenlerin ise daha az oldukları görülmektedir.

Öğrencilerin, eğitimde teknoloji kullanımına yönelik düşüncelerinin ortalamalarına bakıldığında, X=64,00 olduğu görülmektedir. Bu ortalamanın, eğitimde teknoloji kullanımına yönelik düşünceler açısından olumlu olduğu görülmektedir. Erkek öğrencilerin eğitimde teknoloji kullanımına yönelik düşüncelerinin (%64,94), kız öğrencilere göre (%63,36) az bir farklılıkla daha olumlu olduğu görülmektedir. Bölümler açısından bakıldığında, Psikolojik Danışma ve Rehberlik Bölümü öğrencilerinin (%67,34) düşüncelerinin daha olumlu olduğu görülmektedir. En az puan ortalamasına sahip olan bölüm ise Türkçe Öğretmenliğidir. Öğrencilerin teknoloji kullanımı konusunda kendilerini nasıl değerlendirdikleri ile ilgili ortalamalarına bakıldığında ise, kendini "mükemmel" olarak değerlendiren öğrenciler (%66,62) daha olumlu görüş bildirmişlerdir. En düşük ortalamaya ise kendisini "orta düzey" olarak değerlendirenler oluşturmuştur (%61,03). Ölçek maddeleri bazında verilen cevapların ortalamaları incelendiğinde, "Teknolojik araçlar, derslerin hazırlanmasında araştırma yapmak için önemlidir." ifadesi en yüksek ortalamayı (X=4,33), "Teknoloji yazma becerilerini öğretmede etkilidir." İfadesi de en düşük ortalamayı (X=3,36) almıştır.

Öğrencilerin eğitimde teknoloji kullanımına yönelik düşüncelerinin cinsiyetlerine göre farklılaşıp farklılaşmadığını belirlemek amacıyla yapılan t testi analizi sonucuna göre t (166)= .834 P>.05, anlamlı bir farklılığa rastlanmamıştır. Öğrencilerin eğitimde teknoloji kullanımına yönelik düşüncelerinin öğrenim gördükleri bölümlere göre farklılaşıp farklılaşmadığını belirlemek amacıyla yapılan ANOVA analizi sonucunda F(4, 163)= 1,292 P>.05, anlamlı bir farklılığa rastlanmamıştır. Aynı şekilde, öğrencilerin düşüncelerinin, eğitimde teknolojik araçları kullanma konusunda kendilerini değerlendirme durumlarına göre farklılaşıp farklılaşmadığını belirlemek amacıyla yapılan ANOVA analizi sonucunda da F(3, 164)= 2,122 P>.05 anlamlı bir farklılığa rastlanmamıştır.

SONUÇ VE ÖNERİLER

Sonuç

Araştırmada, eğitim fakültesinde görevli öğretim elemanları ile eğitim fakültesi öğrencilerinin eğitim öğretim faaliyetlerinde teknoloji kullanımı konusunda düşünceleri öğrenilmiştir. Öğretim elamanlarına ve öğrencilere uygulanan "Teknolojinin Eğitim-Öğretim Faaliyetlerindeki Rolü Ölçeği" verilerine göre, genel olarak hem öğretim elamanlarının hem öğrencilerin, teknoloji kullanımına karşı yüksek düzeyde olumlu düşüncelere sahip oldukları görülmüştür. Erkek öğretim elemanlarının, kadın öğretim elemanlarına göre az bir farklılıkla daha olumlu görüş bildirdikleri, mesleki deneyim açısından bakıldığında, 11-15 yıl arası deneyime sahip olanların düşüncelerinin daha olumlu olduğu, teknoloji kullanımı konusunda kendilerini nasıl değerlendirdikleri ile ilgili ortalamalarına bakıldığında da, kendini "yeterli" olarak değerlendiren öğretim elemanlarının daha olumlu görüş bildirdikleri görülmüştür. Erkek öğrencilerin düşüncelerinin, kız öğrencilere göre az bir farklılıkla daha olumlu olduğu görülmüştür. Bölümler açısından bakıldığında, Psikolojik Danışma ve Rehberlik Bölümü öğrencilerinin düşüncelerinin daha olumlu olduğu, teknoloji kullanımı konusunda kendilerini nasıl değerlendirdikleri ile ilgili ortalamalarına bakıldığında ise, kendini "mükemmel" olarak değerlendiren öğrencilerin daha olumlu görüş bildirdikleri görülmüştür. Ölçek maddeleri bazında verilen cevapların ortalamaları incelendiğinde, hem öğretim elemanları hem de öğrenciler "Teknolojik araçlar, derslerin hazırlanmasında araştırma yapmak için önemlidir." İfadesini en yüksek ortalamayla desteklemişlerdir. Öğretim elemanları "Teknoloji matematik alıştırmalarının yapılmasında etkilidir." İfadesini, öğrenciler de "Teknoloji yazma becerilerini öğretmede etkilidir." İfadesini en düşük düzeyde desteklemişlerdir. Bir başka deyişle, öğretim elemalarının matematik alıştırmalarının yapılmasında, öğrencilerin de okuma yazma becerilerinin öğretilmesinde teknoloji kullanımının etkisinin daha az olacağını düşündükleri söylenebilir.

Öğretim elemanlarının düşünceleri, cinsiyet, mesleki deneyim ve teknoloji kullanımı konusunda kendilerini nasıl değerlendirdikleri ile ilgili değişkenler açısından değerlendirildiğinde, anlamlı bir farklılığa rastlanmamıştır. Aynı şekilde, öğrencilerin düşünceleri, cinsiyet, bölüm ve teknoloji kullanımı konusunda kendilerini nasıl değerlendirdikleri ile ilgili değişkenler açısından değerlendirildiğinde, anlamlı bir farklılığa rastlanmamıştır.

Tartışma

Alanyazında yapılan çalışmalar da sonuçları destekler görünmektedir. Eğitimde teknoloji kullanımında gerek öğretim elemanlarının gerekse öğrencilerin yüksek düzeyde olumlu tutumlara sahip oldukları ve eğitim-öğretim faaliyetlerinde teknolojik yapılanmayı destekleyecek çalışmalara yer vermeye vurgu yaptıkları görülmektedir.

Akpınar (2003), öğretmenlerin yeni bilgi teknolojilerini kullanmada bilgi teknolojilerinin etkisini araştırdığı çalışmasında, öğretmenlerin sınıfta bilgi teknolojilerini kullanma konusunda, yükseköğrenimini metropollerde yapanlar lehine olumlu tutumlar gösterdiklerini, Eğitim Enstitüsü, Edebiyat Fakültesi, eğitim fakültesi öğrencilerinin teknoloji kullanıma ilişkin tutumlarının, diğer fakültelerde öğrenim görenlere göre daha olumlu olduğunu belirlemiştir. Gürol (2008), teknik öğretmen adaylarının bilgi ve iletişim teknolojilerine ilişkin niyetlerini belirlemek amacıyla teknoloji kabul modelini uyguladığı çalışmasında, teknik öğretmen adaylarının bilgi ve iletişim teknolojilerini benimseme durumlarına ilişkin görüşleri, teknoloji kabul modelini genel olarak destekler nitelikte olmuştur. Turan ve Çolakoğlu (2008), yüksek öğrenimde öğretim elemanlarının teknoloji kabulü ve kullanımı konusunda Adnan Menderes Üniversitesinde yaptığı ampirik değerlendirmede, Teknoloji Kabul Modelini (TAM) büyük oranda destekleyen sonuçlar almış ve kabulün teknolojilerin kullanılma şansını ve iş verimliliğini arttıracağını öngörmüştür. Yavuz ve Coşkun (2008), sınıf öğretmenliği öğrencilerinin öğretimde teknolojik araç gereç kullanımına karşı tutum ve sahip oldukları fikirleri belirlemek amacıyla yaptığı çalışmasında, öğrencilerin öğretimde teknolojik araç gereçleri kullanmalarının, tutumlarını olumlu yönde etkilediğini tespit etmiştir. Ayrıca yapılan görüşmeler sonucunda öğrencilerin teknoloji kullanımı hakkındaki olumlu fikirleri olduğunu da belirlemiştir. Çil (2008), öğretmen adaylarının teknolojinin eğitim-öğretim faaliyetlerindeki rolüne ait görüşlerini incelemek amacıyla yaptığı çalışmada, öğretmen adaylarının genel olarak olumlu görüşlere sahip olduğunu belirlemiştir. Ayrıca, sözkonusu araştırmadan ve yapılan diğer araştırmalardan farklı olarak, kız öğretmen adaylarının görüşlerinin erkek öğretmen adaylarına göre daha olumlu olduğu da görülmüstür. Demir'in (2001), öğretim elemanları ve öğrencilerin internetin öğretim amaçlı kullanımına ilişkin görüşlerini ve tutumlarını incelediği çalışmasında, öğretim elemanlarının derse hazırlıkta internet kaynaklarını kullanmada, görev yaptıkları bölümlerin etkili olduğunu belirlemiştir. Eğitim Bilimleri bölümünde görevli öğretim elemanlarının %75'inin derslerinde interneti kullanmadıkları belirlenirken, bunun nedeni olarak internet uygulamaları konusunda yeterli seminer ve kursa katılmamalarını göstermişlerdir. Öğrenciler de benzer şekilde düşünceler belirtmişlerdir. Araştırmada ayrıca, öğretim elemanları ile öğrencilerin %85,4'ü, bölümlerin internet tabanlı eğitim yapmaya hazır olmadığını da belirtmişlerdir. 2001 yılında yapılan bu çalışmanın sonuçları ile söz konusu çalışmanın sonuçları dikkate alındığında, günümüz itibari ile hem öğretim elemanlarının hem de öğrencilerin, derslerde internet kaynaklı teknolojileri kullanmada kendilerini daha yeterli ve hazır gördükleri düşünülebilir.

Öneriler

Araştırma bulguları sonucunda aşağıdaki önerilerde bulunulmuştur.

Eğitim alanında kullanılan teknolojilerin kolay öğrenilir ve kullanılır olmasının öğrenme-öğretme sürecinde verimliliği arttıracağı bir gerçektir.Öğrenme-öğretme ortamında teknolojiyi kullanma konusunda olumlu fikirlerin yaygınlaşması, söz konusu eğitim teknolojilerinin kullanılması, motivasyonun artmasına da yardımcı olacaktır. Bu anlamda Eğitim Fakültelerinin Bilgisayar Teknolojileri Eğitimi Bölümü öğretim elemanları ile işbirliği yapılarak, teknolojik gelişmeler ve araç gereçlerin etkin kullanımı konularında öğretim elemanlarına ve öğrencilere eğitim programları düzenlenmeli ve bu çalışmalar yaygınlaştırılmalıdır. Öğretim elemanlarına teknik destek ve teknolojik araç-gereç temini saglanmalıdır. Öğretim elemanları eğitim teknolojilerini tanıma ve etkin kullanma konusunda öğrencilerine örnek olabilmeli ve bu görevin sorumluluğunu taşıyabilmek için gereken hazırlıkları yapmış olmalıdırlar. Öğretmen adayı öğrencilerin eğitim öğretim faaliyetlerinde teknoloji kullanımı konusunda olumlu düşüncelerinin geliştirilebilmesi için, gerek öğretim elemanları gerekse üniversite yönetimi özendirici çalışmalar yapmalıdır. Eğitim teknolojileri ile ilgili konfreans, seminer, hizmet içi eğitim çalışmaları ile ulusal veya uluslararası düzeyde organize edilmiş kongrelerle gibi organizasyonlarla ilgili duyurular planlanmalıdır. Üniversitelerde kampüsün tamamına hitap edecek bilgisayar teknolojisi merkezlerinin kurulması sağlanmalı, teknolojinin kullanım alanları yaygınlaştırılmalıdır. Araştırma, Uluslararası Kıbrıs Üniversitesi'ndeki eğitim fakültesi ile sınırlı olduğundan, farklı bölümlerde ders veren öğretim elemanları ve öğrenim gören üniversite öğrencileriyle de yapılarak, araştırma konusuna ilişkin farklı sonuçlar toplanmalı ve konuya ilişkin tespit ve değerlendirmeler arttırılmalıdır.

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EĞİTİM ÖRGÜTLERİNDE PERFORMANS DEĞERLENDİRME ARACI OLARAK E PORTFOLYONUN KULLANILMASI

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Özet

Örgütsel etkililik ve verimliliğin sağlanmasında etkin bir performans değerlendirme sisteminin varlığı büyük önem taşımaktadır. Ülkemizde uzun bir geçmişe sahip olan eğitimin denetimi; denetim birimleri arasında eşgüdüm bulunmaması, denetim etkinliklerinin kontrol yönelimli olması, denetim kriterlerinin performans ölçümünü sağlayacak nitelikte olmaması gibi sorunlar nedeniyle istenilen başarıya ulaşamamıştır. Çağdaş gelişmeler performans değerlendirmede çoklu veri kaynaklarını, bilgisayar ve internet teknolojisinden yararlanmayı zorunluluk haline getirmiştir. Bu bağlamda eğitim denetiminde portfolyo anlayışının kullanılması ve elektronik ortamın da işe koşularak e-portfolyo ile performans değerlendirme önem kazanmaktadır. Bu araştırma, eğitim örgütlerinde işgören performansının e-portfolyo aracılığı ile değerlendirilmesi konusunda ilköğretim okulu yönetici ve öğretmenlerinin görüşlerini belirlemeyi amaçlamıştır. Bu amaçla hazırlanan ölçme aracının geçerlik ve güvenirlik çalışmaları yapılmıştır. Katılımcılar performanslarının e-portfolyo ile değerlendirme düşüncesine " tamamen katılıyorum" düzeyinde görüş bildirmişlerdir. Katılımcı görüşleri arasında cinsiyet ve branş değişkenleri açısından anlamlı bir farklılık bulunmazken, görev değişkeni açısından öğretmen ve yöneticiler arasında, kıdem değişkeni açısından 26 yıl ve daha fazla kıdeme sahip olanlarla, diğer gruplar arasında anlamlı görüş farklılığı tespit edilmiştir.

Anahtar Kelimeler: Eğitim İşgörenleri, Performans Değerlendirme, E-Portfolyo, Denetim, Yönetici, Öğretmen.

THE USE OF E- PORTFOLIO AS A TOOL OF PERFORMANCE ASSESSMENT IN EDUCATIONAL ORGANIZATIONS

Abstract

An effective performance assessment method has an important role in order to create organizational effectiveness and productivity. The supervision of education, which has a long past, has not yielded a desired success because of some reasons such as; the lack of coordination between the supervision oriented activities, controling tendency of supervision activities, unqualified criterions of supervision in measuring the performance in our country. Contemporary developments have made necessary to usage of multiple data sources, computer and internet in performance assessment. In this sense, the e portfolio assesment is to come into question. The main aim of the study is to determine the opinions of elementary school teachers and administrators related to evalution of employee performance through e-portfolio in educational organizations. Results of the study showed that the participants have strongly agreed the idea of assessment through e portfolio . A meaningful difference between participants' opinions has not been found in terms of gender and branches. However, a meaningful difference has been found in term of task variable. A meaningful difference between the 26 years and more seniority and the others groups has been found in term of professional seniority variable as well.

Keywords: Training Employees, Performance Evaluation, E Portfolio, Supervision, Principal, Teacher.

GİRİŞ

Eğitim alanında, portfolyo terimi, öğrencilerin öğrenme ve değerlendirme süreçlerine yenilikçi bir bakış açısı olarak kavramlaştırılmıştır. Bu bakımdan öğrenenlerin niteliksel zenginliği hedef alınarak öğretim sürecinin kalitesinin arttırılmasına çalışılmaktadır. Kaliteyi arttırma çabaları, yeni eğitim anlayışlarının yaygınlaştırılmasından yeni bilgi teknolojilerinin kullanımına kadar birçok önemli unsuru kapsamaktadır. İç içe girmiş bir ilişkiler düzenine sahip tüm bu unsurların bireyin öğrenmesine yönelik işe koşulmasıyla farklı öğretim süreçlerinin oluşturulduğu görülmektedir.

Günümüz eğitim dünyası, köklü ve hızlı biçimde bir paradigma dönüşümü yaşamaktadır. Bu dönüşümün bir yansıması olarak öğrenmeye ve öğretmeye yönelik yeni yaklaşımlar ortaya atılmaktadır. Özellikle son zamanlarda, yaratıcı ve kritik düşünme, problem çözme, bilgi teknolojilerini etkin kullanabilme öğrendiklerini yeni durumlara ve uygulamaya uyarlayabilme bireylerden beklenen temel beceriler olarak benimsenmiş bulunmaktadır. Bunlarla birlikte, öğrenme ve öğretme sürecinde farklı eğitim gereksinimi içinde olan bireylerin özellikleri de dikkate alınarak gerçek yaşam durumları ile sıkı bağlar kuran ve öğrenilenleri anlamlı kılan ortamların oluşturulması önemsenmektedir. Aynı zamanda mevcut yetersizlikleri ortadan kaldıracak bireysel ve bağımsız öğrenme sağlayacak ortamlar gerçekleştirilmelidir. Böylelikle bireylere yeni değerlerin ortaya çıkardığı nitelikleri kazandırmak mümkün olabilecektir.

Tüm bunların bir yansıması olarak öğretim süreçlerinden artık salt bir bilgi ediniminden öte beklentilerin oluştuğu görülmektedir. Bu beklentilerden öne çıkanlar genel olarak ele alındığında; öğrenmeye yönelik hedeflerin yüksek düzeyde belirlenmesi ve gerçekleştirilmesi, öğrenmedeki bireysel farklılıkların dikkate alınması ve farklı anlamlandırmaların oluşabileceğinin bilinmesi, öğretimin bir süreç olduğunun farkındalığıyla birlikte esnek bir yapı içerisinde sürekli gelişime ve gelişimin sürekliliğine önem verilmesi, öğretim ortamlarının teknoloji destekli, zengin ve etkileşimli biçimde oluşturulması, öğrenmenin teknolojiyle gerçekleşmesinin sağlanması, öğrenmeye yönelik değerlendirme sürecinin öğretimden ayrı bir etkinlik olarak görülmeyip öğretimi tamamlar biçimde yürütülmesi, değerlendirmelerde niteliğin öne çıkarılarak; çok yönlü ve farklı tarafların (öğretmen, akran, ebeveyn gibi) katılımlarıyla gerçekleştirilmesi olarak ifade edilebilirler (Demirli, 2007).

Portfolyo sözcüğünün, etimolojik olarak, Latince kökenli "portare" (taşımak) ve "folium" (kağıt, sayfa) kelimelerinin İtalyancada "portafoglio" olarak bir araya gelmesinden ve oradan İngilizceye "portfolio" olarak geçmesinden oluştuğu görülmektedir (OED, 2007). Türkçede ise sözlük anlamı bakımından "evrak çantası" olarak karşılık bulmuş olsa da, farklı disiplinlerde farklı anlamlar taşıması nedeniyle birden fazla kavram ve tanımla karşılaşılmaktadır. Nitekim ülkemiz eğitim alanında da bu kavramın Türkçe karşılığına yönelik henüz tam bir mutabakat sağlanamamıştır. Kavram, Milli Eğitim Bakanlığı tarafından "öğrenci ürün dosyası" olarak karşılık bulurken, bilim çevrelerinin bir kısmı tarafından "gelişim dosyası" ve "ürün dosyası" diğer yandan da "öğrenci seçki dosyası" olarak ifade edildiği görülmektedir (Demirli, 2007).

Günlük yaşamda kullanımı yeni olmayan portfolyolara, özellikle müşterilerine finansal destek sağlayanların sıklıkla başvurduğu ve portfolyoların güzel sanatlardan pazarlamaya, mimariden eğitime kadar birçok alanda kullanıldığı görülmektedir. Eğitim alanında ise 1970'li yıllardan itibaren yeni anlayışların etkisiyle birlikte öğretimsel bir araç olarak kullanılmaya başlanmış (Reckase, 1995; Danielson ve Abrutyn, 1997; Underwood ve Murphy, 1998; Callahan, 1999; Lawrenz, Huffman ve Welch, 2000; Briscoe ve Wells, 2002), zamanla yaygınlaşarak öğretim süreçlerine farklı biçimlerde dâhil edilmiştir.

Portfolyo kullanımının özelliklerinin yanısıra; bilgisayar ortamında hazırlanacak olan veri tabanı ortamları oldukça elverişli ve etkin bir kullanım alanı yaratmaktadır (Baron, 1996). Elektronik portfolio ile, portfolyoyu hazırlayan öğrencinin yapmış olduğu çalışmaya istenildiği zaman ulaşılabilmesi; bunlar üzerinde istenildiği ölçüde değiştirme yapılabilmesi; öğrencilerin kendi gelişim süreçlerini görebilmesi ve yine istedikleri kişilerle paylaşabilmesi sağlanabilmektedir (Hetterscheidt, Pott, Russell, & Tchang, 1992). Bununla beraber, elektronik portfolyoların, öğrenciler ile beraber günlük sınıf etkinlikleri düzenleyen öğretmenlere teknoloji ile sorun çözme sürecinde model olduğu gözlenmiştir (Blake, 1996).

Araştırmalar bireysel gelişim dosyaları ile değerlendirmenin geleneksel ölçme araçlarıyla yapılan değerlendirmelere göre karşılaştırıldığında öğretmene, öğrenciye ve veliye öğrenci hakkında birinci elden güvenilir ve dinamik veriler sağlamasından dolayı eğitim alanında kullanılması gerektiği birçok araştırmacı tarafından önerilmektedir (De Fina, 1992; Mumme, 1990).

Portfolyo değerlendirme anlayışının kökenini, yönetim alanının önemli konularından biri olan performans değerlendirme oluşturmaktadır. Performans değerlendirme ile geleneksel değerlendirme arasında; değerlendirme amaçlarından ölçütlerine, sürecin işletilmesinden sonuçlandırılmasına kadar birçok farkın olduğu görülmektedir. Bu her iki yaklaşımın; bilgiye bakış açıları, öğrenmenin nasıl gerçekleştiğine dair görüşleri, öğretim süreci ile ürün arasında ne gibi bir bağ kurdukları, değerlendirmedeki odakları, amaçları ve kontrol mekanizmaları gibi unsurları farkların belirgin hale geldiği yerler olarak ifade edilebilir.

Son yıllarda, okullardaki öğretim ve yönetim süreçlerinin değerlendirilmesi ve denetiminde sanal ortamın kullanımına ilişkin bir yönelimin olduğu görülmektedir. Bu araştırma, elektronik portfolyo sürecinin okullardaki öğretim ve yönetim süreçlerinin değerlendirilmesi ve denetiminde kullanılmasına ilişkin öğretmen görüşlerini içeren bir giriş niteliğindedir.

Araştırmanın Amacı

Bu araştırmanın amacı; ilköğretim okullarında görev yapan yönetici ve öğretmenlerin, performans değerlendirmede elektronik portfolyo anlayışının kullanımına ilişkin görülerini belirlemektir. Bu genel amaç çerçevesinde aşağıdaki sorulara cevap aranacaktır;

1. E-portfolyo ile performans değerlendirme konusunda öğretmen ve yöneticilerin görüşleri nedir?
2. Öğretmen ve yöneticilerin görüşleri arasında cinsiyet, branş, görev, mesleki kıdem değişkenleri açısından anlamlı farklılık var mıdır?

YÖNTEM

Araştırma tarama modelindedir. Araştırmanın çalışma evrenini Elazığ il ve ilçe merkezlerindeki ilköğretim okulları oluşturmaktadır. Bu amaçla random örnekleme yolu ile ilköğretim okulları seçilmiştir. Elazığ İl merkezinde 5, iki ilçe merkezinde 5 ilköğretim okulu olmak üzere toplam 10 ilköğretim okulunda 150 yönetici ve öğretmene ulaşılmıştır. Bu okullardan toplam 142 form geri dönmüş, 6 form hatalı doldurulduğundan işleme alınmamış, toplam 136 form değerlendirilmiştir.

Veri Toplama Aracının geliştirilmesi

Veri toplama aracı, araştırmacılar tarafından geliştirilmiştir. Araç, Fırat Üniversitesi Eğitim Bilimleri Bölümü Eğitim Yönetimi Teftişi Planlaması ve Ekonomisi Anabilim Dalı'nda görev yapan üç öğretim üyesi tarafından görünüş ve kapsam geçerliliği açısından incelenmiş, getirilen öneriler doğrultusunda bazı değişiklikler yapılmıştır. Ölçme aracında yer alan maddelerin anlaşılırlığı için de beş ilköğretim okulu öğretmeninin görüşüne başvurulmuştur. Öneriler doğrultusunda geliştirilen araç, ilköğretim okulu yönetici ve öğretmenlerine uygulanmıştır. 150 adet dağıtılan ölçme aracından, 136 tanesi işleme alınabilmiştir. Ölçeğin yapı geçerliliği faktör analizi ile test edilmiştir. Yapılan faktör analizinde 4,5,18,19. maddelerin faktöriyel yüklerinin .30'un altında olduğu görülmüş, bu maddeler ölçme aracından çıkarılmıştır. Ölçme aracında yer alan maddelerin tek boyut altında ele alınabileceği, tek boyutun toplam varyansın % 37,248'ini açıkladığı görülmüştür. Maddelerin faktoriyel yükleri ,353 ile ,766 arasında değişmektedir. Kaiser-Meyer-Olkin Measure of Sampling Adequacy katsayısı, ,855, Bartlett's Test değeri: 736,059, sig.: ,000, iç tutarlık katsayısı Cronbach alfa: ,866 olarak tespit edilmiştir.

BULGULAR

Katılımcıların % 56,50'si erkek, % 42.00'ı kadın, görev değişkeni açısından % 9.40'ı yönetici, % 89.10'u öğretmen, branş değişkeni açısından % 58.70'i sınıf, % 39,90'ı branş öğretmeni, kıdem değişkeni açısından; 1-5 yıl kıdeme sahip olanlar % 8.70, 6-10 yıl kıdeme sahip olanlar 13.80, 11-15 yıl kıdeme sahip olanlar % 37.00, 16-20 yıl kıdeme sahip olanlar 12.30, 21-25 yıl kıdeme sahip olanlar %10.10, 26 yıl ve kıdeme sahip olanlar % 18.10'unu oluşturmaktadır.

Araştırmanın amacı doğrultusunda saptanan bulgular maddeler halinde aşağıda sunulmuştur.

1. İlköğretim Okulu yönetici ve öğretmenleri e portfolyo aracılığı ile performans değerlendirme konusundaki görüşleri nedir?

Katılımcılar, eğitici personelin performanslarının e portfolyo aracılığı ile değerlendirilmesine genel olarak (X= 4.39 ve SS= 0,72) ile " Tamamen katılıyorum" düzeyinde görüş bildirmişlerdir. Bu durumda yönetici ve öğretmenlerin e portfolyo ile değerlendirilmeyi yüksek düzeyde benimsemedikleri söylenebilir. Yönetici ve öğretmenler; "Okulda ve sınıfta yaptığımız çalışmaları resimler, videolar, dökümanlar yoluyla internet ortamında sergilemek isterim" maddesine (X= 3,95, SS=0.95) "katılıyorum" düzeyinde, diğer maddelere "Tamamen katılıyorum" düzeyinde görüş belirtmektedir. Katılımcılar bu maddeye de yüksek düzeyde katılırlarken, bazı katılımcılar kendilerine ait kişisel durumların başkaları tarafından görülebileceği yönünde yanlış bir algı içerisine girmiş olabilirler veya personel çalışmalarının kıyaslanarak değerlendirilmesinden rahatsızlık duymuş olabilirler.

2. E portfolyo ile değerlendirilme konusunda katılımcıların görüşleri; cinsiyet, görev, branş ve kıdem değişkenleri açısından anlamlı bir farklılık oluşturmakta mıdır?

2.1. E portfolyo ile değerlendirme konusunda katılımcıların cinsiyetleri açısından anlamlı görüş farklılığı var mıdır?

Katılımcılardan elde edilen verilerin aritmetik ortalamaları arasında anlamlı farklılık olup/olmadığı t testi ile analiz edilmiş, sonuçlar Tablo 1'de gösterilmiştir.

Tablo 1. Katılımcı görüşlerinin "cinsiyet" değişkeni açısından karşılaştırılması

Maddeler	cinsiyet	N	Mean	SS	t	p
1	Erkek	**78**	4,28	,91	-,178	,859
	Kadın	**58**	4,31	,92		

2	Erkek	**78**	4,62	,60	,229	,819
	Kadın	**58**	4,60	,64		
3	Erkek	**78**	4,61	,70	-,328	,743
	Kadın	**58**	4,65	,68		
4	Erkek	**78**	4,23	,71	-,221	,826
	Kadın	**58**	4,25	,73		
5	Erkek	**78**	4,51	,57	,447	,656
	Kadın	**58**	4,46	,65		
6	Erkek	**78**	4,37	,89	-,796	,428
	Kadın	**58**	4,48	,65		
7	Erkek	**78**	4,55	,61	,156	,876
	Kadın	**58**	4,53	,62		
8	Erkek	**78**	4,32	,84	-1,086	,279
	Kadın	**58**	4,46	,65		
9	Erkek	**78**	4,28	,85	-1,126	,262
	Kadın	**58**	4,43	,62		
10	Erkek	**78**	4,55	,61	-,004	,997
	Kadın	**58**	4,55	,62		
11	Erkek	**78**	4,41	,65	-1,249	,214
	Kadın	**58**	4,55	,65		
12	Erkek	**78**	4,46	,67	-1,563	,120
	Kadın	**58**	4,63	,61		
13	Erkek	**78**	4,38	,68	-1,304	,195
	Kadın	**58**	4,53	,62		
14	Erkek	**78**	4,08	,94	-,179	,858
	Kadın	**58**	4,12	1,06		
15	Erkek	**78**	3,88	,953	-,899	,370
	Kadın	**58**	4,03	,972		

*p <.05

Tablo 1'de görüldüğü gibi cinsiyet değişkeni açısından katılımcı görüşleri arasında anlamlı görüş farklılığı bulunmamaktadır.

2.2. E portfolyo ile değerlendirme konusunda katılımcıların görevleri açısından anlamlı görüş farklılığı var mıdır?

Katılımcıların görev değişkeni; yönetici ve öğretmen olarak belirlenmiştir. Bu amaçla yapılan t-testi sonuçları Tablo.2'de gösterilmiştir.

Tablo 2. Katılımcı görüşlerinin "görev" değişkeni açısından karşılaştırılması

Maddeler	Görev	N	Mean	SS	t	p
1	Yönetici	13	4,0769	1,11516	-,902	,368
	Öğretmen	123	4,3171	,88999		
2	Yönetici	13	4,6154	,76795	-,014	,989
	Öğretmen	123	4,6179	,60761		
3	Yönetici	13	4,9231	,27735	1,590	,114
	Öğretmen	123	4,6016	,72134		
4	Yönetici	13	4,2308	,72501	-,062	,951
	Öğretmen	123	4,2439	,72814		
5	Yönetici	13	4,1538	,68874	-2,139	,034
	Öğretmen	123	4,5285	,59126		
6	Yönetici	13	4,0000	1,22474	-2,000	,048
	Öğretmen	123	4,4634	,73877		
7	Yönetici	13	4,4615	,51887	-,504	,615
	Öğretmen	123	4,5528	,62990		
8	Yönetici	13	4,0000	1,15470	-1,900	,060
	Öğretmen	123	4,4228	,71297		
9	Yönetici	13	4,3077	,63043	-,187	,852
	Öğretmen	123	4,3496	,77865		
10	Yönetici	13	4,6923	,48038	,863	,390
	Öğretmen	123	4,5366	,63106		
11	Yönetici	13	4,3846	,50637	-,496	,620
	Öğretmen	123	4,4797	,66959		
12	Yönetici	13	4,3077	,63043	-1,331	,185
	Öğretm	123	4,5610	,65470	-1,372	

	en					
13	Yönetici	13	4,2308	,59914	-1,245	,215
	Öğretmen	123	4,4715	,66929		
14	Yönetici	13	3,8462	,68874	-,982	,328
	Öğretmen	123	4,1301	1,01593		
15	Yönetici	13	3,6154	1,04391	-1,318	,190
	Öğretmen	123	3,9837	,94941		

*p <.05

Tablo 2'de görüldüğü gibi görev değişkeni açısından katılımcı görüşleri arasında anlamlı görüş farklılığı bulunmamaktadır.

2.3. E portfolyo ile değerlendirme konusunda katılımcıların branşları açısından anlamlı görüş farklılığı var mıdır?

Katılımcıların branş değişkeni; sınıf öğretmeni ve branş öğretmeni olarak belirlenmiştir. Bu amaçla yapılan t testi sonuçları Tablo.3'te gösterilmiştir.

Tablo 3. Katılımcı görüşlerinin "branş" değişkeni açısından karşılaştırılması

Maddeler	Görev	N	Ortalama	SS	t	p
1	Sınıf Öğretmeni	81	4,3210	,86353	,416	,678
	Branş Öğretmeni	55	4,2545	,98542		
2	Sınıf Öğretmeni	81	4,5926	,68516	-,569	,570
	Branş Öğretmeni	55	4,6545	,51705		
3	Sınıf Öğretmeni	81	4,6420	,76336	,195	,846
	Branş Öğretmeni	55	4,6182	,59289		
4	Sınıf Öğretmeni	81	4,1852	,70907	-1,123	,264
	Branş Öğretmeni	55	4,3273	,74671		
5	Sınıf Öğretmeni	81	4,4691	,63416	-,545	,586
	Branş Öğretmeni	55	4,5273	,57267		
6	Sınıf Öğretmeni	81	4,4198	,86406	,011	,991
	Branş Öğretmeni	55	4,4182	,71209		
7	Sınıf Öğretmeni	81	4,4938	,67312	-1,151	,252
	Branş Öğretmeni	55	4,6182	,52673		
8	Sınıf Öğretmeni	81	4,4444	,68920	1,142	,256
	Branş Öğretmeni	55	4,2909	,87502		
9	Sınıf Öğretmeni	81	4,4198	,72222	1,379	,170
	Branş Öğretmeni	55	4,2364	,81567		
10	Sınıf Öğretmeni	81	4,5556	,63246	,093	,926
	Branş Öğretmeni	55	4,5455	,60302		
11	Sınıf Öğretmeni	81	4,4691	,69077	-,031	,975
	Branş Öğretmeni	55	4,4727	,60414		
12	Sınıf Öğretmeni	81	4,4815	,74349	-1,197	,233
	Branş	55	4,6182	,49031		

	Öğretmeni					
13	Sınıf Öğretmeni	81	4,5185	,59395	1,497	,137
	Branş Öğretmeni	55	4,3455	,75076		
14	Sınıf Öğretmeni	81	4,0741	1,05804	-,411	,682
	Branş Öğretmeni	55	4,1455	,89065		
15	Sınıf Öğretmeni	81	3,9506	,90693	,031	,976
	Branş Öğretmeni	55	3,9455	1,04382		

*p <.05

Tablo 3'te görüldüğü gibi, katılımcı görüşleri branşları itibarı ile anlamlı farklılık oluşturmamaktadır.

2.3. E portfolyo ile değerlendirme konusunda katılımcıların kıdemleri açısından anlamlı görüş farklılığı var mıdır?

Katılımcıların kıdemleri altı grupla ifade edildiğinden, görüşler arasında anlamlı farklılığın olup/olmadığı tek yönlü varyans analizi ile test edilmiştir. Yapılan analiz sonucu 1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14 ve 15. Maddelerde katılımcıların mesleki kıdemleri açısından anlamlı farklılığın olmadığı görülmüştür (m1= [$F_{5\text{-}132}$= .615, p>.05]; m2= [$F_{5\text{-}132}$= .808, p>.05]; m3= [$F_{5\text{-}132}$= 1.193, p>.05]; m4= [$F_{5\text{-}132}$= 1.891, p>.05]; m5= [$F_{5\text{-}132}$= 2.068, p>.05]; m6= [$F_{5\text{-}132}$= ,736, p>.05]; m7= [$F_{5\text{-}132}$= ,702, p>.05]; m8= [$F_{5\text{-}132}$= ,855, p>.05]; m11= [$F_{5\text{-}132}$= 1,734, p>.05]; m12= [$F_{5\text{-}132}$= 1,662, p>.05]; m13= [$F_{5\text{-}132}$= ,126, p>.05]; m14= [$F_{5\text{-}132}$= ,763, p>.05]; m15=[$F_{5\text{-}132}$= 1,621, p>.05]). Ancak "Performans değerlendirme sürecinde işbirliği ve katılım (Müfettiş-okul yönetimi-öğretmen-veli-öğrenci, diğer meslektaşlar) desteklenmelidir" maddesinde (m9= [$F_{5\text{-}132}$=2,631, p<.05]) katılımcı görüşleri arasında anlamlı farklılık olduğu ve farklılığın 1,2,3,4,5. gruplar (lehinde) ile 6. Grup (25 yıl ve üzeri kıdem kıdeme sahip olanlar) arasında bulunduğu ve "Performans değerlendirme süreci, çalışanların mesleki güçlendirilmesini amaçlamalıdır." maddesinde (m10 = [$F_{5\text{-}132}$= 2,602, p>.05]) katılımcı görüşleri arasında anlamlı farklılık olduğu ve farklılığın 2,3,4,5. gruplar (lehinde) ile 6. Grup (25 yıl ve üzeri kıdeme sahip olanlar) arasında bulunduğu ortaya çıkmaktadır. Bu noktadan hareketle, performans değerlendirmede işbirliği ve katılımın desteklenmesine ve performans değerlendirmede çalışanların mesleki güçlendirilmesine mesleki kıdemi daha az olan öğretmenler daha yüksek düzeyde katılım göstermişlerdir.

TARTIŞMA VE SONUÇ

Türk eğitim sisteminin denetim örgütlerinin tarihi 1846'lara kadar dayanır (Binbaşıoğlu, 2005; Karagözoğlu, 1974; Taymaz, 1997). Denetim sisteminin etkili ve verimli bir şekilde görevini yerine getirebilmesi örgütsel amaçlara göre faaliyet gösterebilmesine bağlıdır. 1900'lü yılların başında kontrol yönelimli denetimsel davranış, bilimsel yönetimin özüne ve ilkelerine uygun düşmekteydi. Ancak sonraları gelişen yönetim yaklaşımları insanı ve performansını etkileyen sosyal ve psikolojik faktörlerin dikkate alınmasını sağladı. Bu nedenle günümüzde personelin değerlendirmesinde salt örgütsel çıktıları değil, çalışanın etkin olduğu katılımlı ve çoklu değerlendirme araçlarına gereksinim duyulmaktadır. MEB EARGED tarafından bu amaçla "Öğretmenlerin Performans Değerlendirme Modeli ve Sicil Raporları (2000)" adlı bir araştırma yapılmıştır. Bu araştırmada; Türkiye genelinde 2036 sınıf öğretmeninin, 1138 branş öğretmeninin, 487 ilköğretim okulu yöneticisinin, 344 ilköğretim müfettişinin, 129 ilçe millî eğitim müdürünün, 138 il millî eğitim müdür ve yardımcılarının olmak üzere toplam 4272 kişinin görüşleri alınmıştır. Elde edilen bulgulara göre; öğretmenlerin performans değerlendirme sürecinde okul yöneticisi, müfettiş, zümre öğretmenleri, öğretmenin kendisi, veli ve öğrencinin de yer alması istendiği ortaya çıkmıştır. Ersoy (2006) "Öğretmen adaylarının gelişim dosyasına dayalı değerlendirmeye ilişkin görüşleri "konulu çalışmasında, öğretmen adaylarının gelişim dosyası ile yapılan değerlendirmeyi nesnel ve performansa yönelik bir değerlendirme aracı olarak görmüşlerdir. Yapılan birçok araştırma; eğitici personelin tekli veri kaynakları yoluyla değil, çoklu veri kaynakları ile değerlendirilmek istediklerini göstermektedir (Erken, 1990; Çelik, 2006; Can, 2004; Alay, 2006; Eskici, 2005; Akşit, 2006; Uçar, 2002) bu bulguyu destekleyici niteliktedir. Yine bu araştırmada, öğretmen performansının değerlendirilmesinde kullanılması gerektiği düşünülerek hazırlanan ölçütler araştırmaya katılan gruplar tarafından "tamamen düzeyinde" kabul görmüştür. Bu araştırma yaptığımız araştırma ile birebir örtüşmektedir.

MEB Teftiş Kurulu Başkanlığı 2005 yılında İlköğretimde Denetim ve Performans Değerlendirme Esasları" başlıklı bir kitap hazırlamıştır (MEB, 2005). Ancak bir türlü performans değerlendirme sistemine geçilememiştir. Her çalışan için çok fazla evrak doldurulması, bu nedenle kırtasiyeciliğin arttığı varsayımı, iletişim teknolojisinin etkililik ve verimliliğinin arttığı bugün için savunulacak bir durum olmaktan çıkmıştır. E portfolyunun katılımlı, çalışan destekli yaklaşımı birey ve örgüt için çok sayıda yararlar sunmaktadır. Bu nedenle e portfolyo uygulamalarına geçilmemesi şaşırtıcı bir durum olarak görülebilir.

Araştırma sonuçları; portfolyo ile değerlendirmenin öğretmene, öğrenciye ve veliye yönelik bir çok faydasının olduğunu ortaya koymuştur (Bahar, Nartgün, Bekiroğlu, 2004:118; Durmuş ve Bıçak, 2006:80; Tan, 2006: 477; Borton ve Collins, 1997; Aschbacher, 1995; Akt: Baki ve Birgin, 2002).

Öğretmen görüşlerinin cinsiyet değişkeni açısından anlamlı farklılık göstermemesi, Ersoy (2006) çalışması ile koşutluk göstermektedir. Çalışmamızda cinsiyet, Aslında yönetici ve öğretmenlerin e-portfolyo ile değerlendirmeye çok yüksek düzeyde katılmaları, bazı değişkenlerin önemsiz duruma gelmesine neden olabilir.

Performans değerlendirme sürecinde işbirliği ve katılım (Müfettiş-okul yönetimi-öğretmen-veli-öğrenci, diğer meslektaşlar) desteklenmelidir" ve "Performans değerlendirme süreci, çalışanların mesleki güçlendirilmesini amaçlamalıdır."

Baki ve Birgin (2004) yapmış oldukları çalışmada, öğretmen, öğrenci ve velilerin teknik açıdan yetersizleri sorunu, eğitim çalışanlarının değerlendirilmelerinde de bir sorun olarak karşımıza çıkabilir. Ancak günümüzde bilişim teknolojisinin her yaş ve kesim

tarafından kullanılma sıklığı artmaktadır. MEB tarafından düzenlenecek eğitimlerle bu sorunun üstesinden gelinebilir. Araştırma sonucunda aşağıdaki öneriler getirilebilir;

1. Okulların web sayfaları geliştirilmeli, personel bölümünden URL bağlantısı ile veya doğrudan personelin kendisine ait sayfaya yönlendirme yapılmalıdır. Bu sayfa içerisinde personele ait bilgiler yer almalı ve öğretmen tarafından geliştirilmelidir.
2. Okulun stratejik amaçları ile bireysel amaç, hedef ve performans göstergeleri arasında bağ oluşturulmalıdır.
3. Personelin değerlendirilmesinde ilgili olan paydaşlara alt kullanıcı olarak şifre verilmeli, süreç değerlendirme esaslı olarak periyodik değerlendirmeler yapılmalıdır.
4. Kişisel web sayfalarının oluşturulmasında okul bilgisayar formatörlerinden yararlanılabilir.
5. Değerlendirme sürecinde yer alacak personel eğitilmelidir.
6. Performans değerlendirme sürecinde elektronik portfolyonun kullanılması için gerekli altyapı çalışmaları yapılmalı ve pilot uygulamalar gerçekleştirilmelidir.

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EĞİTİM TEKNOLOJİLERİNDE GÜNCEL EĞİLİMLER: TÜRKİYE KÖKENLİ ARAŞTIRMALAR

RECENT TRENDS IN EDUCATIONAL TECHNOLOGIES: RESEARCHES FROM TURKEY

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Özet:
Bu çalışmanın amacı; son beş yılda sscı kapsamında bulunan yabancı dergilerdeki türkiye kökenli eğitim teknolojileri araştırmalarının; yöntemsel boyutlarını belirlemek ve bu araştırmaların genel eğilimlerini ortaya çıkarmaktır. Bu çalışmada içerik analizi yöntemi kullanılmıştır. Çalışma kapsamında 2005-2009 yılları arasında sscı kapsamındaki 25 yabancı dergide yayınlanmış, eğitim teknolojileri konulu türkiye kökenli 102 makale incelenmiştir. Araştırmada veri toplama aracı olarak eğitim teknolojileri yayın sınıflama formu kullanılmıştır. Toplanan veriler betimsel istatistikî yöntemlerle analiz edilmiştir. Elde edilen önemli sonuçlara göre makalelerde en çok araştırılan konu öğretim ortamları ve teknoloji, kullanılan yöntem nicel yöntem, veri toplama aracı anket, araştırma deseni betimsel, veri analiz yöntemi betimsel analiz ve örneklem seçim şekli de kolay ulaşılabilir olarak karşımıza çıkmıştır. Bu sonuçlar ışığında gelecekte yapılabilecek çalışmalara yönelik önerilerde bulunulmuştur.

Anahtar Kelimeler: Eğitim Teknolojisi, Öğretim Teknolojisi, Eğilim

Abstract:
The aim of this research is to determine procedural dimensions of the researches on educational technologies made abroad in the scope of sscı within the years 2005-2009 and to reveal general trends of these researches. In this study, 102 articles in 25 magazines were examined, using content analysis method. A form prepared for classification of educational technologies presentation is used to collect data. In the study, the data obtained were analyzed, using descriptive statistics methods. According to the results gained, it is found out that in published articles the most common issue investigated is school media and technology; the method used is quantitative method; the tool for collecting data is questionnaire; the research design and data analysis method is descriptive and the type of choosing the sample is convenience sampling. With the help of these results some suggestions were made aiming at future studies to be carried out.
Keywords: Educational Technology, İnstructional Technology, Trend

1. GİRİŞ

Günümüzde teknoloji etkisini birçok alanda olduğu gibi eğitim alanında da göstermektedir. Teknoloji ve eğitim arasında oluşan sıkı ilişki karşımıza eğitim teknolojisi kavramını çıkarmaktadır. Eğitim teknolojisin birçok tanımı mevcuttur. Association for Educational Communications and Technology (AECT) (2004) tarafından yapılan tanıma göre eğitim teknolojileri; uygun teknoloji süreçlerini ve kaynaklarını oluşturarak, kullanarak ve yöneterek öğrenimin kolaylaştırılması ve performansın geliştirilmesi için etik uygulama ve çalışmalardır. Öğrenme konusunda eğitim teknolojisinden önemli yardımlar alındığı düşünüldüğünde konu ile ilgili ortaya koyulan her yenilik öğrenme süreçlerini yakından etkilemektedir. Eğitim teknolojilerinin uygulama ve kullanım alanı oldukça geniştir. Bu kadar geniş kullanım ve uygulama alanı bulan eğitim teknolojileri, araştırmacıların da ilgisini çekmektedir. Eğitim teknolojileri alanındaki literatüre bakıldığında zaman içerisinde eğitim teknolojileri araştırmalarında yurtdışında ve yurtiçinde eğilimlerin belirlendiği birçok çalışma yapıldığı görülmektedir.

Eğitim teknolojilerindeki araştırmaların incelendiği çalışmalar arasında özellikle Caffarella'nın (1999) çalışması dikkat çekmektedir. Caffarella, 1977 yılından itibaren ABD'de tamamlanan doktora tezlerindeki bazı eğilimleri incelemiştir. Araştırmasında eğitim teknolojileri ile ilgili yayınlanan tezlerde en çok bilgisayara dayalı ve bilgisayar destekli eğitim konularının ele alındığını ve son dönemlerde deneysel çalışmaların azalarak, nitel araştırmaların ağırlık kazandığını vurgulamıştır.

Yan Ma (2000) da Caffarella (1999) gibi eğitim teknolojileri alanında yapılan tezlere yönelmiştir. Bu amaçla Wisconson Üniversitesi Eğitim Teknolojileri Bölümü'nde 1977-1999 yılları arasında yönetilen tezleri içerik analizi ve atıf analizi yaparak incelemiştir. İncelemeleri sonucunda eğitimsel bilgisayarlar ve interaktif video konularının, deneysel çalışma, görüşme, tarama ve durum çalışmalarının yoğun olarak seçildiğini ortaya koymuştur.

Masood (2004) da Educational Technology Research & Development (ETR&D) dergisinde eğitim teknolojisi alanında yayınlanan 200 makaleyi içerik analizi yöntemi ile incelediği çalışmasında en çok araştırılan konuların başında medya araştırmaları ve öğretim tasarımı araştırmaları olduğunu, nitel araştırmanın popüleritesinin arttığını ve nitel olarak yapılan araştırmaların sayısının nicel araştırmaların sayısını geçtiğini ifade etmiştir.

Hew, Kale ve Kim (2007) ise yaptıkları doküman analizi niteliğindeki çalışmalarında ETR&D dergisinde 2000–2004 yılları arasında yayımlanan 340 deneysel araştırma makalesini inceledikleri konu, kullandıkları araştırma yöntemi, veri toplama yöntemleri ve araştırma çevreleri açısından incelemişlerdir. Elde ettikleri bulgulara göre medya araştırmaları en çok araştırılan konu, betimsel araştırma yöntemleri en çok tercih edilen araştırma yöntemi, yüksek öğretim ve ilköğretim en çok seçilen örneklem grubu ve anket de en çok kullanılan veri toplama aracı olarak karşımıza çıkmaktadır.

Ülkemizde de eğitim teknolojileri alanında yapılan çalışmaları inceleyen araştırmalar mevcuttur. Şimşek vd. (2008) son on yıl içerisinde ülkemizde eğitim teknolojisi alanında yayınlanmış olan doktora tezlerinin genel bir değerlendirmesini yaptıkları çalışmalarında 64 adet doktora tezini incelemişlerdir. Araştırmacılara göre eğitim teknolojisi alanında yapılan doktora tezleri konu olarak bilgisayarlı sistemlerde öğrenme, öğretim tasarımı değişkenleri ve öğrenme yaklaşımları üzerinde yoğunlaşmıştır. Aynı zamanda Türkiye'de hala nicel paradigmanın

nitel paradigmaya oranla daha fazla tercih edildiğini ve sık kullanılan veri toplama araçlarının arasında başarı testleri, tutum ölçekleri, anketler ve görüşme formlarının dikkat çektiğini de vurgulamışlardır.

Alper ve Gülbahar (2009) TOJET dergisinde 2003-2007 yılları arasında yayınlanmış olan makaleleri inceledikleri araştırmalarında Şimşek vd.'nin (2008) ortaya koyduğu duruma yakın bir sonuç bulmuşlardır. Farklı olarak diğer bir popüler konunun da online sistemlerin eğitimde kullanılması olduğu üzerinde durmuşlardır. Onlar da nicel ve nitel yöntemlerin farklı ağırlıkları olduğunu ve son dönemlerde nitel yöntemin daha fazla tercih edildiği sonucunu ortaya koymuşlardır.

Ülkemizde yapılan ve eğitim teknolojilerindeki eğilimleri belirleyen önemli çalışmalardan birisi de Erdoğmuş ve Çağıltay'ın (2009) çalışmalarının bir bölümünü sundukları bildirileri olmuştur. Çalışmalarında Türkiye'de alanda yapılan tezleri incelemişlerdir. Yaptıkları çalışmada tezlerde ele alınan en popüler üç konunun medya, medya karşılaştırmaları ve öğrenci değişkenleri olduğu sonucunu bulmuşlardır. Buldukları sonuçlar diğer araştırmacıların buldukları sonuçlar ile büyük ölçüde örtüşmektedir.

Literatür çalışması sonucunda ülkemizde yapılan içerik çözümlemeleri çalışmaları arasında uluslararası platformda sunulan Türk kökenli yayınlar üzerine kapsamlı çalışmaların olmadığı dikkat çekmektedir. Oysaki eğitim teknolojisi araştırmalarında ülkemizdeki güncel eğilimlerin belirlenmesinde SSCI kapsamında bulunan dergilerde yayınlanmış makalelerin şekil ve içerik yönünden çözümlemelerinin yapılmasının alana önemli bir katkı sağlayacağı düşünülmektedir. Türkiye'deki eğitim teknolojisi alanındaki eğilimler SSCI kapsamında bulunan yabancı dergiler aracılığıyla uluslar arası bir platforma taşınmaktadır ve bu sayede Türkiye 'de eğitim teknolojileri alanında yapılan çalışmalar, bu çalışmalar sonucunda elde edilen bulgular tüm dünyaya aktarılmaktadır.

Eğitim teknolojileri alanında uluslararası platformda yapılmış bireysel çalışmaların bir araya getirilip sentezlenmesiyle oluşmuş büyük bir resmi gösteren ve bilimsel genellemeler yapılabilmesini sağlayan bir çalışmanın yapılmasının alanda bulunulan yeri ve alandaki araştırma eğilimlerini belirlememizde önemli bilgiler sağlayacağı ve ne tür yeni araştırmalara gereksinim duyulduğunu belirlemede yol gösterici olacağı düşünülmektedir.

Bu çalışmanın amacı; son beş yılda SSCI kapsamında bulunan yabancı dergilerdeki Türkiye kökenli eğitim teknolojileri araştırmalarının yöntemsel boyutlarını ve bu araştırmaların genel eğilimlerini ortaya çıkarmaktır.

Araştırma kapsamında aşağıda belirtilen araştırma sorularına cevap aranmıştır:

1) Son beş yılda eğitim teknolojileri alanında hangi araştırma konuları yaygın olarak incelenmiştir?
2) Son beş yılda eğitim teknolojileri alanında yapılan araştırmalarda hangi araştırma yöntemleri yaygın olarak kullanılmıştır?
3) Son beş yılda eğitim teknolojileri araştırmalarında kullanılan yöntemlerin yıllara göre dağılımı nasıldır?
4) Son beş yılda eğitim teknolojileri alanında yapılan araştırmalarda hangi araştırma desenleri yaygın olarak kullanılmıştır?
  a) Nicel araştırma yönteminin kullanıldığı makalelerde hangi desenler yaygındır?
  b) Nitel araştırma yönteminin kullanıldığı makalelerde hangi desenler yaygındır?
  c) Karma araştırma yönteminin kullanıldığı makalelerde hangi desenler yaygındır?
  d) Alan yazın araştırma yönteminin kullanıldığı makalelerde hangi desenler yaygındır?
5) Son beş yılda eğitim teknolojileri alanında yapılan araştırmalarda hangi veri toplama araçları yaygın olarak kullanılmıştır?
6) Son beş yılda eğitim teknolojileri alanında yapılan araştırmalarda hangi örneklem seçim şekilleri yaygın olarak kullanılmıştır?
7) Son beş yılda eğitim teknolojileri alanında yapılan araştırmalarda yaygın olarak seçilen örneklem düzeyleri nelerdir?

2. YÖNTEM

Bu araştırma temelde bir içerik analizi çalışmasıdır. İçerik analizinde birbirine benzeyen veriler belirli kavramlar ve temalar çerçevesinde bir araya getirilerek okuyucunun anlayacağı biçime dönüştürülür (Yıldırım ve Şimşek, 2005). İçerik analizi çalışmaları birçok alanda yapılmaktadır ve alanda belirli bir süre içerisinde meydana gelen araştırma ve yönelimleri belirleyebilmek için kullanılan uygun bir araştırma yöntemidir.

2.1. Örneklem

Araştırma kapsamında SSCI kapsamında yayınlanan yabancı dergilerdeki Türkiye kökenli eğitim teknolojileri konulu makaleler incelenmiştir. Araştırmacılar tarafından makalelerin Türk kökenli sayılması için yazarlarından en az birisinin Türk olması kriteri belirlenmiştir. Toplamda SSCI kapsamında eğitim teknolojileri alanında yayın yapan 25 dergide yayınlanmış olan 102 Türk kökenli makale incelenmiştir.

2.2. Veri Toplama Aracı

Araştırmada veri toplama aracı olarak araştırma sorularından ve Sözbilir ve Kutu (2008) tarafından geliştirilen formdan yararlanılarak oluşturulan eğitim teknolojileri yayın sınıflama formu kullanılmıştır. Yayın sınıflama formunun geçerliliği ve güvenirliliği için, araştırmacılar hazırlanan taslak form üzerinde fikirlerini paylaşmış ve gerekli düzenlemeler yine araştırmacılar tarafından bu paylaşımlar dikkate alınarak yapılmıştır. Form daha sonra Türkçe dil uzmanına kontrol ettirilerek son haline getirilmiştir. Yayın sınıflama formu web sayfası üzerinden yayınlanarak veri girişinin web ortamında yapılabilmesi sağlanmıştır. Çalışmanın iç geçerliliğinin ve tutarlılığının sağlanması amacıyla girilen veriler kontrol edilmiştir.

2.3. Verilerin Analizi

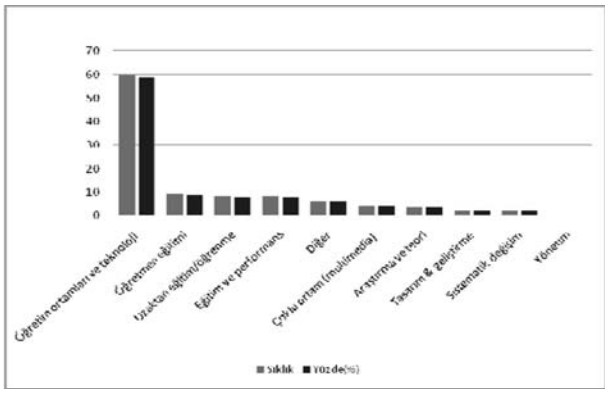
Makalelerin incelenmesi sonucu elde edilen veriler betimsel istatistikî yöntemler (yüzde ve frekans) kullanılarak çözümlenmiştir.

3. BULGULAR

3.1. Eğitim teknolojileri alanında yaygın olarak incelenen araştırma konuları

Eğitim teknolojisi alanında yapılan çalışmaların %58,82 (n=60) oranı ile öğretim ortamları ve teknoloji konusunda yoğunluk kazandığı görülmektedir. Öğretim ortamları ve teknoloji konusunu öğretmen eğitimi (n=9) %8.82, uzaktan eğitim/öğrenme (n=8) %7.84 konuları verilen oranlarıyla izlemiştir.

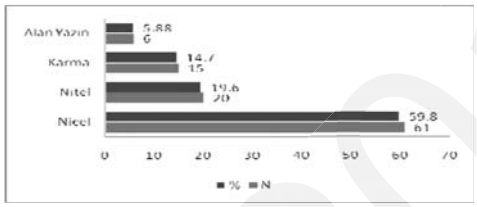
Grafik 1. Araştırma konularının dağılımı



3.2. Eğitim teknolojileri alanında yapılan araştırmalarda yaygın olarak kullanılan araştırma yöntemleri

Araştırma kapsamında incelenen makalelerin yöntemlere göre dağılımlarına bakıldığında nicel yöntemin (n=61) %59.8 ile en çok kullanılan yöntem olduğu ve onu sırayla nitel (n=20) %19.6, karma (n=15) %19.6 ve alan yazın (n=6) %5.88 yöntemlerinin verilen oranlarıyla izlediği görülmüştür.

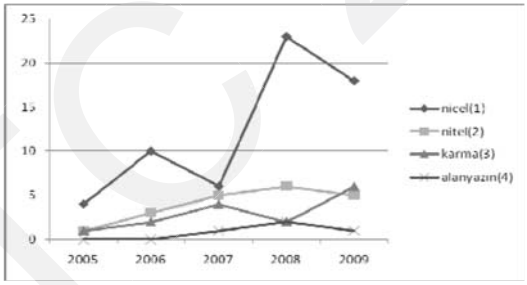
Grafik 2. Araştırma yöntemlerinin dağılımı



3.3. Son beş yılda eğitim teknolojileri araştırmalarında kullanılan yöntemlerin yıllara göre dağılımı

Araştırma kapsamında incelenen makalelerde kullanılan yöntemlerin yıllara göre dağılımı Grafik 3' te verilmiştir. Buna göre nitel araştırmaların sayısında düzenli bir artış varken, nicel araştırmaların sayısında yıllara göre dengesiz bir dağılımın olduğu görülmektedir.

Grafik 3. Son beş yılda eğitim teknolojileri araştırmalarında kullanılan yöntemlerin yıllara göre dağılımı



3.4. Eğitim teknolojileri alanında yapılan araştırmalarda yaygın olarak kullanılan araştırma desenleri

3.4.1. Nicel araştırma yönteminde yaygın olarak kullanılan araştırma desenleri

Nicel araştırma yönteminin kullanıldığı makalelerde araştırma desenlerinin dağılımına bakıldığında deneysel desenin (n=26) %42.61 ve deneysel olmayan desenin de (n=35) % 57.39 oranında kullanıldığı görülmektedir. Deneysel desenler arasında en sık kullanılan (n=15) %24.59 oranı ile yarı deneysel desen, deneysel olmayan desenler arasında ise (n=17) %27.86 oranı ile tarama deseni olmuştur.

Tablo 1. Nicel araştırma yönteminde yaygın olarak kullanılan araştırma desenlerinin dağılımı

Deneysel	**N**	**%**
Tam Deneysel	9	14,75
Yarı Deneysel	15	24,59
Zayıf deneysel	2	3,27
Tek Denekli	0	0
Deneysel Olmayan	**N**	**%**
Betimsel	11	18,03
Karşılaştırmalı	5	8,19
Korelasyonel	2	3,27
Tarama	17	27,86
Ex post facto	0	0
İkincil Veri Analizi	0	0
TOPLAM	**61**	**100**

3.4.2. Nitel araştırma yönteminde yaygın olarak kullanılan araştırma desenleri

Nitel araştırma yönteminin kullanıldığı makalelerde araştırma desenlerinin dağılımı sırası ile örnek olay (n=12) %60, kavram analizi (n=4) %20 ve olgu bilimi (n=3) % 15 oranında dağılmıştır.

3.4.3. Karma araştırma yönteminde yaygın olarak kullanılan araştırma desenleri

Karma araştırma yönteminin kullanıldığı makalelerde araştırma desenlerinin dağılımı çeşitleme (n=8) %53.3, açıklayıcı (n=5) %33.3 ve keşfedici (n=2) %13.3 oranıyla olmuştur.

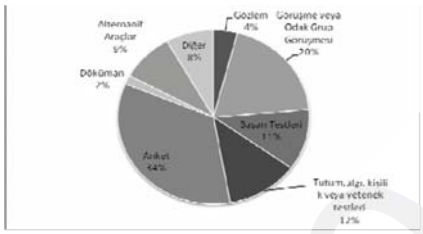
3.4.4. Alan yazın araştırma yönteminde yaygın olarak kullanılan araştırma desenleri

Alan yazın araştırma yönteminin kullanıldığı makalelerde araştırma desenleri sırasıyla alan yazın derleme (n=5) %84.4 ve meta analiz (n=1) %16.6 şeklinde dağılım göstermiştir.

3.5. Eğitim teknolojileri alanında yapılan araştırmalarda yaygın olarak kullanılan veri toplama araçları

Araştırma kapsamında incelenen makalelerde kullanılan veri toplama araçlarına bakıldığında ilk sırada anket (n=42) %34 gelmektedir. Anketi sırasıyla görüşme (n= 24) %20, tutum, algı, kişilik ve yetenek testleri (n=15) %12, başarı testleri (n=14) %11, alternatif araçlar (n=11) %9, diğer (n=10) %8, gözlem (n=5) % 4 ve doküman (n=2) %2 oranında izlemektedir.

Grafik 4. Veri toplama araçlarının dağılımı



3.6. Eğitim teknolojileri alanında yapılan araştırmalarda yaygın olarak kullanılan örneklem seçim şekilleri

Araştırma kapsamında incelenen makalelerde örneklem seçim şekillerinin kullanım sıklıkları kolay ulaşılabilir (n=44) %46, amaca uygun (n=32) %33, rastgele (n=16) %17 ve evrenin tamamı (n=4) % 4 olmak üzere dağılım göstermiştir.

3.7. Eğitim teknolojileri alanında yapılan araştırmalarda yaygın olarak seçilen örneklem düzeyleri

Araştırma kapsamında incelenen makalelerde seçilen örneklemlerin düzeylerine bakıldığında lisans (eğitim fakültesi) düzeyinin (n=26) %23.42 oranıyla en fazla seçilen düzey olduğu görülmektedir.

4. SONUÇ ve TARTIŞMA

1. Araştırılan makalelerin inceledikleri konulara bakıldığında en yoğun olarak öğretim ortamları ve teknoloji konusu üzerinde durulduğu sonucu ortaya çıkmıştır. Yönetim konusun da ise yapılmış herhangi bir çalışma bulunmamaktadır. Literatüre bakıldığında da en fazla bilgisayarların eğitim ortamlarında kullanımı konusunun işlendiği görülmektedir (Alper ve Gülbahar, 2009; Caffarella 1997; Erdoğmuş ve Çağıltay, 2009; Hew, Kale ve Kim, 2007; Masood, 1997; Yan Ma, 2000; Şimşek vd. 2008).

2. Araştırmalarda yoğun olarak kullanılan yöntemin nicel yöntem olduğu sonucu ortaya çıkmıştır. Yurt içinde yapılan çalışmalarda (Alper ve Gülbahar, 2009; Şimşek vd. 2008) nicel yöntemin, yurt dışında yapılan çalışmalarda ise nitel yöntemin yoğun olarak kullanıldığı vurgulamaktadır (Caffarella, 1997; Masood, 1997). Aynı zamanda ülkemizde son zamanlarda karma yöntemin ön plana çıkmaya başladığı sonucu da belirtilmektedir (Şimşek vd., 2008). Bu durum ulusal ve uluslararası platformlarda nicel paradigmanın etkisini kaybetmesi ve nitel paradigmaya olan ilginin artması ile açıklanabilir.

3. Araştırmalarda kullanılan desenler incelendiğinde nicel yöntemde en çok yarı-deneysel ve betimsel, nitel yönteminde örnek olay, karma yöntemde çeşitleme ve alan yazında alan yazın derleme desenlerinin yoğun olarak kullanıldığı sonucu ortaya çıkmıştır. Bu sonuca paralel olarak ülkemizde ve yurt dışında yapılan çalışmalarda deneysel ve betimsel desenlerin sıklıkla kullanıldığı ifade edilmektedir (Alper ve Gülbahar, 2009; Caffarella, 1997; Şimşek vd., 2008; Erdoğmuş & Çağıltay, 2009).

4. İncelenen araştırmalarda en çok kullanılan veri toplama araçları olarak anket, görüşme ve tutum testleri ön plana çıkmıştır. Şimşek vd. (2008) de yaptıkları çalışmalarında en çok tutum ölçekleri, anketler, görüşmeler, değerlendirme formları ve envanterlerin dikkat çektiğini vurgulamışlardır.

5. Araştırmalarda örneklemlerin en çok kolay ulaşılabilir ve amaca uygun şekillerde seçildikleri sonucu ortaya çıkmıştır. Şimşek vd. (2008) hazır örneklem, amaca uygun örneklem ve evrenin tamamının örneklem olarak seçildiği şekillerin yoğun olarak kullanıldığını vurgulamışlardır.

6. Araştırmalarda kullanılan örneklemleri en çok eğitim fakültesi öğrencileri ve öğretmenler oluşturmuştur. Bu durum eğitim teknolojileri alanındaki araştırmaların öğretmen yetiştirme üzerine yoğunlaştığını göstermektedir.

5. ÖNERİLER

Elde edilen sonuçlar ışığında aşağıda verilen önerilerde bulunulmuştur.

- Tasarım ve geliştirme, çoklu ortam, yönetim, araştırma ve teori, sistematik değişim konularında yapılacak çalışmalara ağırlık verilmelidir.
- Nitel ve karma paradigmaya ağırlık verilmelidir.
- Yoğun olarak kullanılmamış olan araştırma desenleri seçilmelidir.
- veri toplama aracı olarak bugüne kadar yoğun olarak kullanılmamış olan (gözlem, doküman analizi, alternatif araçlar) araçlara ağırlık verilmelidir.

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EĞİTİM TEKNOLOJİSİNDE YENİ KAVRAM MOBİL PERFORMANS DESTEK SİSTEMLERİ

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Özet
Son yıllarda eğitim teknolojisi alanında *elektronik* performans destek sistemleri (epds)'nden, *mobil* performans destek sistemleri(mpds)'ne doğru bir dönüşüm yaşanmaktadır. Kullanıcıların daha etkili performans göstermelerine odaklanan mpds, doğru yerde ve doğru zamanda kullanıcılara gereken bilgiyi ve öğrenme desteğini sağlar. Mesleğe yönelik olarak çalışma ortamlarında tasarlanırsa ya da gereksinime yönelik olarak eğitim ortamlarında öğretimi destekleyici olarak geliştirilirse, mpds performans gelişimi için oldukça etkili sistemlerdir. Bu çalışma, mpds'nin kuramsal özelliklerinin incelendiği betimsel bir çalışmadır, bu çalışmanın temel amacı ise mpds'ler hakkında farkındalık yaratmaktır.

Anahtar Kelimeler: Mobil Performans Destek Sistemleri, Mobil Öğrenme, Elektronik Performans Destek Sistemleri

NEW CONCEPT IN EDUCATIONAL TECHNOLOGY MOBİLE PERFORMANCE SUPPORT SYSTEM

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Abstract
Currently, there is a transform from electronic performance support systems (epss) to mobile performance support systems (mpss) in educational technology. Mpss provide tne necessary information and learning support users at the right time and right place. The system focus on improving the better users performance. If mpss are designed for job-aid in workplace or mpss are developed for the users' needs as a supportive to the training in educational environment, mpss could be more effective system for performance improvement. This study is a descriptive study examined the theoritical approaches of mpss, its aim is to create an awareness about mpss.

Keywords: Mobile Performance Support System, Mobile Learning, Electronic Performance Support System

Giriş
Günümüzde, kullanıcıların gereksinim duyduğu bilgiyi anında sunacak, iş ortamında görev performansını artıracak, sürekli yanlarında taşıyabilecekleri mobil teknolojilere olan ilgisi gün geçtikçe artmaktadır. Bunun nedeni, bilgi toplumunda insanların bilgiye gerektiğinde erişebilmesi, bilgiyi işleyerek etkili performansa dönüştürmesi gerekliliğinden kaynaklanmaktadır. Aksi halde insanlar bulundukları çevrede geri kalmışlık duygusu yaşayabilirler, bunun sonucunda işlerini kaybedebilirler veya çevrelerine uyum sağlayamayabilirler. Eğitim teknolojisinde yeni bir kavram olan Mobil Performans Destek Sistemleri (MPDS), mobil teknolojiler aracığıyla erişime izin vererek kullanıcıların performansını geliştirmeye, anında bilgiye erişimi sağlayarak onların bilgilerini sürekli güncel tutmasını amaçlar. Bilgi çağında, MPDS eğitim ortamlarında öğrenmeyi destekleyici olarak, iş ortamlarında ise mesleğe yönelik performansı geliştirmeye yönelik olarak tasarlanan ve kullanımında bireysel kontrolü izin veren teknoloji olarak ön plana çıkmaktadır.

MPDS'nin Tarihçesi
MPDS, temel dayanağı performans destek sistemleridir. Performans Destek Sistemleri (PDS), herhangi bir yerde ve herhangi bir zamanda kullanıcın gereksinim duyduğu bilgi ve anında destek sağlayarak kullanıcının görev tanımlı performansını artırmak için tasarlanmaktadır. Bu sistem kullanıcı performansını arttırmak için gerekli bilgi, danışmanlık ve destek hizmeti sağlar. Rossenberg (2001), PDS'yi şöyle tanımlamaktadır:

> Doğrudan öğrenmene gerek kalmadan, bir görevi ya da bir işi daha hızlı, daha iyi ve az maliyetli gerçekleştirmek ister misin? İşini daha iyi yapmak için sana yardım edecek sistem veya araçları kullanmak ister misin? Sana yol gösteren bir sistemi kullanarak daha önce yapamadığın şeyleri yapabilmeyi ister misin? Bu performans desteği arkasındaki anlayıştır (s.72).

PDS, karmaşık görevlerin başarılması için elektronik teknolojileriyle birleşmesinden sonra, Elektronik Performans Destek Sistemi (EPDS) olarak bilinmektedir. EPDS, çalışanlara çalışma ortamında gereksinim duyulan öz bilgiyi sunarak çalışanların performansını geliştirmek için ortaya çıkmıştır. Gery (1991), EPDS'yi gereksinim duyulan bilgiye erişim, danışma, öğrenme deneyimi ve diğer insanlardan en az destekle yüksek seviyedeki mesleki performansını gerçekleştirmeyi sağlayacak araçları birleştiren elektronik sistem olarak tanımlamaktadır. EPDS'nin önde gelen diğer bir ismi Raybould (1990)'a göre ise, EPDS, bir uzman sistemin, bir veritabanının, öğrenme desteğinin, çevrimiçi başvuru kaynaklarının, üretime yönelik yazılımların, hiper ortam ve hipermetin öğelerinin bulunduğu bilgisayar temelli sistemlerdir. EPDS tasarımı, insan performans teknolojisi, bilgisayar destekli işbirlikli çalışma, uygulamalı iletişim, elektronik yayıncılık, öğretim tasarımı ve yetiştirme alanları ile ilgili olup çokludisiplinli bir yaklaşıma dayanır (Hannafin ve diğerleri, 2000; Çağıltay; 2002).

EPDS, çalışanların gereksinim duyduğu bilgiye erişim zamanı ve öğrenme için harcanan maliyeti azaltırken; üretim ve mesleki performansı artırır. AT&T, EPDS kullanılarak yetiştirdiği her 400 çalışanında bir milyon dolardan fazla para harcamaktan kurtulduğunu belirtmektedir

(AT&T, 1997). Bu nedenle bir çok şirket tarafından EPDS kullanılmaktadır (Çağıltay, 2002; Banerji ve Scales, 2005). Aşağıda Ariel firması tarafından üretilen EPDS'yi kullanan *Fisher Prise, Metlife, Payless ShoeSource* gibi şirket yöneticilerin, elektronik performans destek sistem hakkındaki görüşlerine yer verilmiştir (Ariel, 2009):

> *"Son 6 yıldır, 50 tasarımcının, gelişen Bilgisayar Destekli Endüstriyel Tasarım [BDET] okur yazarlığından sorumlu kişiyim. BDET'den dolayı 50-60 haftalık zaman çizelgesinin 8 haftaya kısaldığını gördük ve daha önce satışları 3milyon$ taşıdık. Ariel'in bizim için geliştirdiği Oyuncak Tasarımda Performans Merkezli Sistemin yeni ürün geliştirme verimliliğimizi arttırmada daha büyük etkiye sahip olacaktır."*
>
> *Robert "Bud" Kolic, Tasarım Servisi Müdürü/Fisher-Price*

> *"Eski sistemimiz, esneklikten yoksundu ve tasarımı çok doğrusaldı. Bugünkü sistemimiz büyük bir esneklik sağlıyor. Bilgiye anında erişim sağlanması ve öğrenme için harcanan zamanın önemli ölçüde azalması ile yeni sistemde çalışanların verimliliği artmaktadır."*
>
> *Kevin Lawrence, Yönetici/Başkent Emlak ve Kaza Sigorta Şirketi/ Metlife*

> *"Ariel, kullanıcılarımız ve bizim iş hedeflerimiz arasında bir köprü yarattı. Onlar performans için gerekli bilgi ve araçları kullanıcılara verdikten sonra işe sistematik bir bakış açısı getirdiler."*
>
> *Tamara Jarrow, Parakente Yöneticisi/Payless ShoeSource*

Yukarıda ki görüşlerde EPDS'nin çalışanların performansını geliştirmeye yönelik olarak tasarlanan, maliyet ve zamandan tasarruf sağlayarak çalışanların verimliliği arttıran, esnek sistemler olduğunu desteklemektedir. EPDS'nin öncelikli amacının "bir görevi gerçekleştirmenin gerekli olduğu zamanda gereken bilgiyi çalışanlara sağlayarak, insanların daha etkili performans gerçekleştirmesine yardımcı olmaktır" denilebilir (Laffey, 1995). EPDS gerekli performansı hızlandırmak ve görev üzerinde harcanan zamanı azaltmak için doğru kalitede ve detaylı bilgiyi doğru zamanda kullanıcılara sağlar (Gery, 1991; Raybould, 1995; Rosenberg, 1995). EPDS'nin ikinci amacı ise daha acemi çalışanların daha deneyimli çalışanlar olabilmesi için performans desteği sağlamaktır (William, 2004). EPDS kullanan acemi çalışanlar, bilgiye erişebilir ve daha uzman çalışanlar gibi görevlerini gerçekleştirebilirler. Bunun gerçekleşmesi için mesleki performansa yönelik en iyi uygulamaları içeren bir rehber ve iş stratejileri, EPDS'ye entegre edilmelidir.

EPDS, öğretim sistemlerinden farklıdır. Öğretim sistemleri, öğretimin planlandığı, öğretim unsurlarının organize edildiği ve öğretim uygulamacılarına yol gösteren bir sistem, öğretim ise, önceden belirlenmiş amaçlara ulaşmak ve bireyin davranışlarında kalıcı değişim sağlamak için gerçekleştiren planlı etkinlikler bütünüdür (William, 2004). EPDS'de kullanım süresince öğrenme gerçekleşirken, EPDS'nin öncelikli amacı performansın gerçekleştirilmesini hızlandırmaktır, ikinci amacı ise öğrenmenin sağlanmasıdır. Öğretimsel sistemler ile EPDS arasındaki ikinci farklılık EPDS'nin görev öncesi değil, görev esnasında kullanılmasıdır. Üçüncü farklılık ise öğretimsel sistemleri iyi tanımlanmış, durağan ve kurallara dayalıdır ama EPDS ise dinamik çevrelerde göreve duyarlı bağlamsal bilgi sağlanırsa etkili olur (Laffey, 1995).

Son yıllarda, mobil araçlarının kapasitelerinin artması ve her bütçeye uygun fiyat seçenekleri ile kullanıcılar tarafından kullanımının yaygınlaşması, kablosuz ağların ve 3G teknolojisinde yaşanan gelişmeler, video, animasyon gibi çoklu ortam özelliklerinin ve SMS, podcast, e-mail, chat gibi uygulamaların mobil teknolojiler aracılığıyla öğrenme ve performans gelişimi için kullanılması sonucu EPSS mobil teknolojiler ile birleşerek, Mobil Performans Destek Sistemlerine dönüşmüş, ve böylece günümüzde eğitim teknolojisi alanında ilgi gören bir teknoloji haline gelmiştir.

MPDS'nin Özellikleri

MPDS, mobil cihazlar üzerinden, kullanıcıların doğru zamanda ve doğru yerde bir görevi gerçekleştirirken performansını arttırmaya odaklanır (Ahmad, 2009). MPDS, farklı kullanıcı özelliklerini önemseyerek, video, ses, resim gibi zengin ortamların kullanımına izin verir. Kullanıcılar, bir görevi yaparken karşılaştıkları sorunları çözmek, daha iyi bir görevi nasıl gerçekleştireceklerine ilişkin rehberlik almak, görevin gerçekleşmesine yönelik yeni bir öğrenme deneyimi kazanmak amacıyla MPDS'leri kullanılabilir.

Öğrenme gereksinimleri için düzenlenen yüz yüze eğitimler, çevrimiçi öğrenme ortamları, çalıştaylar, seminerler tam olarak bütün kullanıcıların öğrenme gereksinimlerini karşılamaz. Örneğin; bir konu ile ilgili kaynakça listesine, bazen karar vermek için bir kılavuza, bazen bir örneğe, bazen de görevimizle ilgili kısa ve somut bilgiye gereksinim duyarız. MPDS'ler bütün bu gereksinimlerin her birini karşılamak için tasarlanabilir.

MPDS'ler sadece kullanıcı performasını geliştirmez, bunun yanında mobil öğrenmeyi de destekler. Mobil öğrenme, belirli bir yere bağlı olmadan e-öğrenme içeriğine erişebilmeyi, dinamik olarak üretilen hizmetlerden yararlanmayı ve başkalarıyla iletişimde bulunmayı sağlayan bir öğrenme biçimidir (Hulme ve Traxler, 2007). Mobil öğrenme ile masaüstü bilgisayarların durağan yapısı, mobil araçlar ile dinamik hale gelmiştir. Singh'e (2003) göre, mobil öğrenme bir paradigma değişimidir ve öğrenmede var olan durumları değiştirir:

- **Masaüstü bilgisayardan cep telefonuna:** Mobil kullanıcı arayüzü, hazır ve standart Web tarayıcısından daha kişisel ve bağlama duyarlı yaşantıya geçmektedir. Tam zamanında (just-in-time) gerçek zamana değişim söz konusudur. "Tam zamanında" gerektiği zamanda gerekli bilgiye erişmek anlamında gelir.
- **Eğitim yazılımından performans-yazılımına:** Bağımsız öğrenme içerik modelleri, bağlamsal, göreve duyarlı, performans destek modeline dönüşmektedir. Örneğin; yardımcı klavuzlar, mesleğe yönelik destek hizmetleri, referans yazılımlarını içerir
- **Kurs yönetiminden iş akış şemasına:** İş akış şeması ve işlemleri mobil öğrenme ve performans destek sistemine yönelik iletim ortamında olur.
- **Öğretim tasarımından performans-tabanlı tasarıma:** İçerik ve kursların derlemesi, meslek, görev, etkinlik, iş uygulamalarına yönelik bağlam analizine dönüşmektedir.
- **Fare ve tıklamadan, kalem ve ses arayüzüne:** Mobil teknolojilerle, küçük ve varolan yada olmayan klavye arayüzünü içeren yeni etkileşimli forma geçildi. Gelecekte kalem tabanlı el yazısı tanıma ve ses tanıma araçları bilgiyi yakalamak ve erişmek için kullanılacak.

- **Merkezileştirilmiş sunucudan eşler arası (peer to peer-noktadan noktaya) ağa:** Geleneksel istemci-sunucu ağ modelini eşler arası ağla karşılaştırırsak; eşler arası ağ, iletişimi, işbirliğini ve internetteki kaynak paylaşımını kolaylaştırmaktadır.

Performans desteği ile birlikte düşünüldüğünde mobil öğrenme belirli bir yere bağlı olmadan eğitim içeriğine erişebilmeyi, dinamik olarak üretilen hizmetlerden yararlanmayı ve başkalarıyla iletişimde bulunmayı sağlayan, kullanıcının bireysel olarak gereksinimine anında cevap vererek üretkenliğini ve iş performans verimliliğini arttıran, mobil teknolojiler aracılığıyla gerçekleşen bir eğitim yöntemidir (Özdamar-Keskin, 2010). MPDS, öğretim ile birlikte kullanıldığında, mobil öğrenme etkili bir şekilde sağlanabilir. Nguyen (2007)'un araştırmasına göre, farklı şirketlerde çalışan katılımcılara, vergi hazırlama süreci, bir EPDS, bir web tabanlı eğitim, bir de her ikisini kullanarak verildi. Web tabanlı eğitimi ve EPDS'yi birlikte kullanan kullanıcılar ile sadece performans destek sistemini kullanan kullanıcılar göre daha başarılı, sadece EPDS kullanan kullanıcılar, sadece web tabanlı eğitim alan kullanıcılara göre daha başarılı çıkmıştır. Bu sonuca göre mobil öğrenmeyi destekleyici özelliği ile MPDS, eğitim kurumlarında öğrencilerin öğrenme yaşantılarını desteklemek için tasarlanabilir.

MPDS'nin Bileşenleri

MPDS'nin bileşenleri EPDS ile benzerlik göstermektedir. Tek fark EPDS'nin bilgisayar tabanlı olması ve elektronik teknolojilerle birleşmesi, MPDS'nin ise mobil araçlar tabanlı olması ve mobil teknolojilerle birleşmesidir. Bu nedenle MPDS'in bileşenlerini, EPDS'nin bileşenlere göre düşünmek, sadece bu farklılığı göze alarak MPDS'nin bileşenlerine karar vermek gerekmektedir.

McKAy ve Wager (2007) EPDS bileşenlerini; **bilgi tabanı** *(information base)*, **öğrenme deneyimi** (learning experiences), **koçluk ve yardım araçları** (embedded coaching and help tools), **uzman danışman** (an expert advisor) ve **uyarlanmış araçlar** (customized tools) olmak üzere beşe ayırmaktadır. *Bilgi tabanı*, hiperlinklerle ve aranabilirlik özelliğiyle çalışanların görev başındayken kolaylıkla erişebildiği düzenlenmiş başvuru bilgileri içerir. Çevrimiçi başvuru bilgileri, bilgi veritabanı, çevrimiçi belgeler ve durum-tarih veritabanını içermektedir. Bilgi, kullanıcıların öğrenme stillerine ve varolan görevlere uygun olarak kavramayı arttırmak için metin, grafik, video, resim ve ses gibi ortamlarda sunulabilir. *Öğrenme deneyimleri,* kullanıcının gerçekleştirmesi beklenilen özel göreve ilişkin etkileşimli bilgisayar tabanlı öğretim, öğretici yazılım ve benzetimin öz parçalarıdır. Çalışanlar gerektiği zaman öğretime erişebilir, görevlerini yaparak öğrendikleri şeyleri uygulayabilirler. *Koçluk ve yardım araçları*, görevlerin gerçekleşmesine yardım ettiği kadar, çalışanların sistemi kullanmasına da yardımcı olur. Kullanıcı girdisine dayalı bir gereksinimi fark ettiğinde, koçluk ve yardım araçları kullanıcı ya da sistem tarafından etkinleştirilir. Bir EPDS'de u*zman danışman* rolü ise, zor ve sıradan olmayan görevler için karar alma desteği sağlamaktır. Danışman olay tabanlı sorunlar kullanarak kullanıcının mesleğe yönelik sorunları çözmeye yardımcı olur. Elektronik danışman sıklıkla problem hakkında bir dizi soru sorar ve kullanıcıların cevaplarına dayalı olarak sistem, hareket tarzı (prosedür) önerir. *Uyarlanmış araçlar* iş uygulamaları ve kelime işlemci, veri tabanı, iş akış şeması, hesap programları gibi üretim programları ile uyarlanış şablonlar ve mesleğe ilişkin özel şekilleri içerir.

Gary (1991) ve Raybould (1990)'göre geliştirilen bir EPDS'de danışman sistemi, veri tabanı, öğretimsel destek sistemi, çevrimiçi yardım, verimliliği destekleyici yazılımlar ve son kullanıcı arayüzü bileşenleri olması gerekmektedir. *Danışman sistem*, özel görevler ile ilgili kullanıcılara önerilerde bulunan bir çevrimiçi rehber, kullanıcıyı sonuca ulaştırmak için yol gösteren bir uzman rolündedir. *Veritabanı,* sistem tarafından performans desteği sağlanırken ihtiyaç duyulan bilginin tutulduğu bölümdür. Rehber kitap dışında, sıkça sorulan sorular ve ilgili kaynaklar da veritabanı bölümünde tutulabilmektedir. *Öğretimsel destek sistemi,* öğrenme ortamlarında kullanılan bilgisayar destekli öğrenme yazılımlarına benzetilebilir. Bu bölümde, bireyin uygulamaya yönelik uzman sistemi ya da diğer bileşenleri kullanmaya başlamadan önce ihtiyaç duyabileceği, konu ile ilgili temel bilgiler, çoklu ortam desteği ile verilir. Öğretimsel destek sistemi içerisine diğer bileşenlere geçişi kolaylaştırmak amacıyla bağlantılar yerleştirilir. Öğretim sisteminde hareketli videolarla bir süreç gösterilebilir veya içeriğinde kullanıcının uygulamasına izin verecek görev simülasyonlarını barındırabilir. *Çevrimiçi yardım,* EPDS kullanım sürecinde, bireyin sistem içerisinde bulamadığı ancak ihtiyaç duyabileceği bilgilere erişimin sağlanabilmesi amacıyla çevrimiçi kaynaklara bağlantıların bulunduğu bölümdür. *Verimliliği destekleyici yazılımlar*, uygulamadaki verimliliğin arttırılmasına yönelik katkıda bulunabilecek, hesap makinesi, çizim araçları, elektronik not kitabı, istatistiksel analiz paketleri, sözlük gibi yardımcı yazılım eklentileri olarak düşünülebilir. *Son kullanıcı arayüzü*, kullanıcının sistem üzerindeki tüm bölümlere kolay bir şekilde erişebilmesini ve sistem içerisinde gezinebilmesini sağlayan bölümdür (Chang, 2004).

Gustafson (2000) ise EPDS'nin bileşenlerinin çoklu bilgi kaynakları, uzman sistemleri veya yapay zeka, bağlamsal çokluortamlı öğretim ve özelleştirilmiş araçlar olduğunu ifade ederek EPDS kapsamını genişletmektedir. Farklı araştırmacılar tarafından ortaya konulan EPDS bilişenleri incelendiğinde bir EPDS'de olmazsa olmaz bileşenler, bilgi veritabanı, uzman sistemi, öğretimsel sistem, özelleştirilmiş araçlardır. Sonuç olarak ilgili alanyazına göre MPDS'nin bileşenleri danışman sistem, bilgi veritabanı, çevrimiçi yardım, öğretimsel destek sistemi, özelleştirilmiş araçlar olarak ifade etmek mümkündür. Bu bağlamda bir MPDS'nin özellikleri aşağıda ki ifade edilebilir:

- Mobil teknoloji destekli olması ve mobil araçlar aracığıyla erişilebilmesi
- Görevin gerçekleştirildiği anda erişilebilmesi
- Çalışma ortamında bulunması
- Çalışan tarafından kontrol edilebilmesi
- Çalışanları önceden yetiştirme gereksinimi azaltması
- Kolay güncellenmesi
- Bilgiye hızlı erişilebilmesi
- Gereksiz bilgiye yer verilmemesi
- Farklı düzeylerde bilginin sunulması
- Farklı öğrenme biçimlerini dikkate alması
- Tümleştirilmiş bilgi, danışmanlık ve öğrenme deneyimleri sunması
- Yapay zekanın kullanımı
- Çokluortamlı öğretimi desteklemesi

MPDS'ye Yönelik Yapılan Çalışmalar

MPDS, alanyazında henüz daha çok yenidir. MPDS ile ilgili yapılan projelerden biri, Avrupa Projesi olarak 1 Ekim 2008 yılında başlayan ve 1 Ekim 2010 yılında bitecek olan "MPSS: Mesleki Eğitim ve Yetiştirmeye Yönelik Mobil Performans Destek Sistemi" projesidir. Bu projede bir mobil öğrenme yönetim sisteminde performans merkezli yaklaşım uygulanmaktadır. Bir dizi öğrenme kaynağının, uyarlamalı senaryoların olduğu, performans merkezli değerlendirme yöntemlerinin ve değerlendirme kriterlerinin yer aldığı ve uzman görüşlerini içeren modül ve kurslar bulunmaktadır. Bu proje ile birlikte, kullanıcıların çalıştığı yerde performans destek sistemine erişebilmesi, gerektiği zamanda bilgiyi bulabilmesi, yeni bilgi ve becerileri hemen uygulayabilmesi ve çoklu ortam araçlarının kullanımı sağlanmaktadır. Bu projede, mesleki eğitim kurumlarına kayıtlı, iş ve eğitim çalışmalarında teknolojiyi kullanabilen öğrenciler hedeflenmektedir.

MPDS ile ilgili yapılan bir diğer çalışma ise İngiliz ordusunda Barış Destek Operasyonu bağlamında acil durumlar için kullanılması gereken araçların hareketleri ve kullanıcı etkileri için tasarlanan ve COTS (Commercial Off-The-Shelf) mobil cihazlar üzerinden erişilebilen MPDS'ye yöneliktir (Jarvis ve Swift, 2006). Yapılan araştırmaya göre m-öğrenme aracı olan COTS'un herhangi yerde ve herhangi zamanda askerlerin gereksinim duyduğu teknik ve teknik olmayan bilgiye erişiminde kullanabilir olduğu sonucuna varılmıştır. Ayrıca MPDS'nin işlevsel ve ekonomik olduğu sonucuna varılmıştır.

Bir diğer proje ise Satış ve Pazarlamayı desteklemek için, Windows Mobile platformunda tasarımlanan Microsoft Mobil Öğrenme Projesidir (Metcalf, 2006). Bu projede, kullanıcı performansını geliştirmeye yönelik modüler yapıda kurslar ve sesli materyaller kullanılmaktadır. Microsoft ile Tell me (http://www.tellme.com) teknolojilerinin birleşiminden sonra, Windows Mobile tabanlı herhangi bir telefondan gerçek zamanlı ses paylaşımı (podcast) gerçekleşebilmektedir. Böylece kullanıcı tell me teknolojisi ile sesini kullanarak hızlı arama, bilgiye anında erişme ve sesli mesaj yollama gibi özellikleri gereksinim duyduğunda kullanarak, iş performans sürecini hızlandırabilir.

Sonuç

Eğitim teknolojilerinde yeni bir çalışma alanı olan MPDS, m-öğrenme ve EPDS'nin tüm özelliklerini barından bir sistemdir. Mobil öğrenmenin e-öğrenmeye sağladığı üstünlükler burada da geçerlidir. Doğru zamanda ve doğru yerde bilgiye erişmek mobil cihazlarla mümkün olabilmektedir. Buna ek olarak elektronik performans destek sistemlerinin bilgisayar tabanlı durağan yapısını MPDS dinamik hale getirmiştir. Bununla birlikte MPDS, mobil öğrenmenin içerik bağlamındaki durağan yapısını da, bağlama dayalı, performans merkezli, gerçek sorunlara çözüm getirme, gereksinimi karşılama gibi özellikleriyle dinamikleştirir. MPDS, zaman ve yerden esnektir, uzun süreli düşünüldüğünde maliyeti az sistemlerdir.

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EĞİTİM VE TEKNOLOJİ ALANINDAKİ GELİŞMELER ÇERÇEVESİNDE TEKNOLOJİ STANDARTLARI VE PERFORMANS GÖSTERGELERİNDEKİ DEĞİŞİM

AMENDMENTS IN TECHNOLOGY STANDARDS AND PERFORMANCE INDICATORS WITHIN THE FRAMEWORK OF ADVANCEMENTS IN THE FIELD OF EDUCATION AND TECHNOLOGY

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Özet
Eğitim ortamında teknolojinin kullanımı, sağladığı yaralar bakımından büyük önem taşımaktadır. Bu amaçla eğitimde teknoloji kullanımını arttırmak için pek çok ülkenin meb (milli eğitim bakanlıkları) tarafından yürütülen programlar uygulamaya başlamıştır. Ancak öğretmenlerin farklı oranlarda teknolojiyi kullanması bir birliktelik sağlama ihtiyacını ortaya çıkarmıştır. Bu yüzden eğitim teknolojisi standartları oluşturularak öğretmenlerin sahip olması gereken yeterlilik düzeyleri belirlenmiştir. Iste (uluslar arası eğitim teknolojileri topluluğu) isimli kuruluş tarafından oluşturulan nets (ulusal eğitim teknolojisi standartları) 3 gruba göre oluşturulmuştur. Nets*s; öğrencilerin sahip olması gereken standartları, nets*a; yöneticilerin sahip olması gereken standartları ve nets*t; öğretmenlerin sahip olması gereken teknoloji standartları şeklinde sınıflandırılmıştır. Nets*t (öğretmenler için ulusal eğitim teknolojisi standartları) ilk olarak 1993 yılında 13 adet performans göstergesi ile ortaya çıkmış öğrenme kuramlarında ve teknolojideki değişme ve gelişmelere bağlı olarak 1997 yılında 3 başlık ve 18 performans göstergesi olarak, 2000 yılında 6 başlık ve 23 performans göstergesi olarak ve 2008 yılında 5 başlık 20 performans göstergesi olarak düzenlenmiştir. Ortaya çıkan bu standartlar hem ulusal düzeyde hem de uluslar arası düzeyde kabul görmüş, kimi ülkeler bu standartları direkt kullanarak, kimi ülkelerde kendilerine uygun şekillerde uyarlayarak bu standartlardan yararlanılmıştır. Iste kuruluşunun öğretmenlerin teknolojiyi kullanımı ile ilgili olarak belirlemiş olduğu standartlar olan nets*t ile ilgili olarak türkiye'de öğretmen adaylarının teknoloji kullanımı ile ilgili sahip oldukları yeterlikleri ve öğretmen adaylarına göre eğitim fakültelerinde eğitim teknolojisi standartları ve performans göstergelerinin uygulanma durumu gibi araştırmalar yapılmıştır. Standartlardaki gelişimin teknoloji alanlarında meydana gelen gelişimlerle orantılı olduğu, bunun yanında eğitim ve öğrenme alanıyla ilgili yeni yaklaşımlardan da etkilendiği söylenebilir. Bu etkileşimin ne düzeyde gerçekleştiği türkiye için standartların oluşturulmasında yol gösterici olacaktır. Buna bağlı olarak gerçekleştirilmesi planlanan çalışmanın amacı; nets* t (ulusal eğitim teknolojileri standartlarının) yıllara göre nasıl bir değişim gösterdiği, özellikle son teknoloji standartlarının hangi özellikleri temel aldığı ve bu yeni standartların eğitim ve öğrenme alanındaki eğitim ve öğrenme alanındaki yeni yönelimlerle ilişkisinin belirlenmesidir. Çalışma, doküman analizi yöntemi ile yürütülecektir. Nets*t 'ler yıllara göre analize tabi tutulacak, en son geliştirilen standartların eğitimde yeni yönelimleri ne ölçüde içerdiği ve standartların belirlenmesindeki rolü ile ilgili analiz yapılacaktır. Analizlerde içerik analizi yöntemi kullanılacaktır.
ANAHTAR SÖZCÜKLER: EĞİTİM Teknolojisi, Teknoloji Standartları

Abstract
The use of technology in educational environment is of great prominence because of the benefits it provides. Therefore, many programs are now being carried out by the ministries of national education of many countries. However, differences among teachers in terms of using technology made it necessary to achieve a level of conformity. Therefore, standards for educational technology were determined and thus competency levels that teachers are to have were determined. Nets (national education technology standards) which were defined by ıste (ınternational society for educational technology) were classified into 3 groups as nets*s- the standards students are to have-, nets*a -the standards that administrators are to have- and nets*t-the standards that teachers are to have. Nets*t (national educational technology standards for teachers) were first introduced in 1993 with 13 performance indicators and as a result of developments and changes in learning theories and technology they were refreshed in 1997 to include 3 headings and 18 performance indicators, and in 2000 to include 6 headings and 23 performance indicators and in 2008 to include 5 headings and 20 performance indicators. These standards introduced gained admission both at national and at international level. While some countries used them without making any change, some others adapted these standards to their specific contexts. Many studies have been carried out in turkey with regard to nets*t -which are the standards defined by the ıste on the use of technology by teachers- on the competencies of teachers in using technology, teacher trainees' views about educational technology standards at faculties of education and the application of performance indicators. It can be argued that the improvements in standards are proportional to the advancements in technology and these improvements are also influenced by new approaches in the field of education and learning. The extent of this interaction will guide the establishment of standards for turkey. Accordingly, the aim of the projected study is to determine how nets*t (national education technology standards) have changed with years, and particularly to determine which features are taken as basis for the latest technology standards and the relation of these new standards to new trends in education and learning. The study will be carried out with document analysis method. Nets*t will be analyzed according to years, to what extent the latest standards include new trends in education and their role in the determination of standards will be analyzed. In the analyses, content analysis method will be used.
KEYWORDS: Educational Technology, Technology Standards

GİRİŞ

Eğitim, yaşantı ve öğrenme yoluyla bireyde istendik yönde (olumlu) davranış değişikliği meydana getirme sürecidir. Yani eğitim bireyin davranışlarının toplum istek ve beklentilerine uygun doğrultuda değiştirilmesi temeline dayanır (Arslan, 2006). Eğitim amaçlarından biri de toplumun gereksinimleri doğrultusunda bireyler yetiştirmek olduğuna göre; bilgi çağına uygun, bilgi toplumlarının özelliği göz önüne alınarak öğrenci yetiştirmek zorunluluğu ortaya çıkmıştır (Şimşek,2002). Toplumdan topluma öğretmenlik mesleğinin tanımı değişse de güdülen amaç değişmemekte ve öğretmenlik mesleği model olma vasfını korumaktadır. Toplumların kendisine örnek aldığı öğretmenler ne kadar kaliteli ve üstün niteliklere sahip olursa yetiştireceği bireylerde o derece üstün niteliklere sahip olarak yetişeceklerdir. Bu bağlamda öğretmen niteliklerinin önemli bir kavram olduğu ortaya çıkmaktadır ancak tüm toplumlar için öğretmen niteliklerini ifade eden ortak bir kavramlaştırma yoktur (Şişman, 2009). Öğretmen nitelikleri gelişmiş ülkelerde hazırlanmış bazı çalışmalardan uyarlanarak ülkemizde Öğretmen Yetiştirme Ve Eğitimi Genel Müdürlüğü tarafından (1995) şu şekilde açıklanmıştır. Öğretmenler; dinamik ve aktif kişilikli olmalı, programların ve planların geliştirilmesine katılmalı, öğrenmeyi kolaylaştırmalı, çocukların davranış tarzını değiştirmeye öncelik vermeli, sorun çözebilen ve hızlı değişimlere uyum sağlayabilen bireyler yetiştirmeli, konusunda bilgilerini güncellemeli, konusunun içeriğini öğrencilerine uydurabilmeli, öğretim stratejilerinde yaratıcı olmalı, öğretmede yeniliklere açık olmalı, yetenekli öğrencileri ortaya çıkarmada ve eğitimde etkin olmalıdır. İçinde bulunduğumuz ve adına bilgi çağı dediğimiz 21, yüzyılda bilgideki hızlı artış ve öğrenci sayısındaki

artışlar birtakım sorunları da beraberinde getirmiştir. Gürol; (1990) farklı yeteneklerdeki öğrencilerin bir arada eğitim görmek zorunda kalması yeni yöntem ve teknolojilerin eğitim kurumlarına girmesi için uygun ortamının oluştuğunu ifade etmiştir. Eğitim teknolojisini Hızal; (1990) Çağdaş anlamda daha verimli bir öğrenme-öğretme sağlamak amacıyla insan gücü ve insan gücü kaynakların tümünden yararlanarak öğretme-öğrenme sürecini sistematik bir biçimde tasarlama, uygulama, değerlendirme ve geliştirmeyi esas alan eğitim bilimi olarak tanımlamıştır. Ergin (2003), eğitim teknolojisi ile ilgili olarak sorunların analizi ve çözümünde insanları, yöntemleri, düşünceleri, araç-gereçleri ve organizasyonu içeren karmaşık ve tümleşik bir süreçtir şeklinde ifade etmektedir. Teknolojinin sürekli gelişen ve değişen dinamik bir yapıya sahip olduğu düşünülüğünde teknoloji gibi dinamik bir yapıya sahip olan eğitim sistemi içerisinde görevli olan öğretmenlerin de bu değişimin içerisinde kendilerini sürekli olarak yenilemeleri ve hızla değişen Dünya'daki gelişmeleri takip etmeleri gerekmektedir. Bu bağlamda birçok ülkede eğitimin kalitesini arttırmak ve eğitim sisteminde ortaya çıkabilecek başıboşluğu engellemek için öğretmenlerle ilgili, onların yeteneklerini ölçmeye yönelik standartlar belirlenmiştir (Şişman, 2009). Öğrencilerin bireysel farklılıklarını dikkate alarak öğrenmelerini olumlu yönde etkileyen eğitim teknolojilerinin öğrenme- öğretme süreçlerinde öğretmenler tarafından etkili bir şekilde kullanılması gerekmektedir.

Öğretmenlerin eğitim teknolojilerini etkili kullanımını desteklemek amacıyla eğitim teknolojisi standartları geliştirilmiştir. Eğitim teknolojisi standartları, Temelinde teknoloji kullanımı bulunan ve öğretim sürecinde öğrencilerin öğrenmelerini artırmak amacıyla öğretmen, öğrenci ve yöneticilerde bulunması gereken eğitim teknolojisi kullanım yeterlikleri ve nitelikleridir (NETS, 2008). Yeterlilik; bir iş veya görevi etkili bir şekilde yerine getirmek için sahip olunması gereken nitelikleri tanımlar. Öğretmenlik mesleği için yeterlilik öğretmenlerin bilgi, beceri, tutum, değer, davranış gibi yönlerden sahip olmaları öngörülen özellikler yada nitelikler bütününü ifade eder. Öğretmen yeterlilikleri öğretmenin bireysel olarak performansına ve bunun ölçülmesine vurgu yapar. Diğer yandan öğretmen standartları, aynı zamanda eğitim ve öğrencilerle ilgili standartların da belirlenmesiyle birlikte gündeme gelmektedir (Connel, 2009; Şişman, 2009). Eğitim teknolojisi standartları adı altında birçok ülke çalışma yapmış ve kendi standartlarını belirlemiştir. Bu ülkelerden ABD'de ISTE (International Society for Educational Technology) isimli bir kuruluş tarafından NETS (National Education Technology Standards) adı altında eğitim teknolojisi standartları geliştirilmiştir. Geliştirilen bu standartlar ABD'nin eyalet sistemi olması nedeniyle farklı eğitim sistemleri ve geniş kitlelere göre düzenlenmiş olup bu bağlamda uluslararası kabul gören standartlar haline dönüşmüştür. Ayrıca bu standartların diğer ülkelerin hazırlmış olduğu standartlardan bir farkı da tavsiye niteliğinde olmayıp uygulanmakta olan ve başarısı izlenen standartlardır. Uluslar arası anlamda kabul görmüş eğitim teknolojileri standartları teknolojik gelişmelere paralel olarak güncellenerek belirli dönemlerde yayımlanmaktadır. Bu yenileşme çalışmalarının bilimsel gelişmeler, teknolojideki gelişmeler ve eğitim alanındaki gelimlere göre gerçekleştiği söylenebilir. Özellikle standartlardaki son yenilemenin eğitim bilim alanındaki gelişmelerle sıkı bir ilişkisi olduğu gözlenmektedir. Bu ilişkinin ne düzeyde olduğunun belirlenmesi öğretmen yetiştirme programlarının düzenlenmesinde büyük önem taşımaktadır.

AMAÇ

Gerçekleştirilmesi planlanan çalışmanın amacı; NETS* T (Ulusal Eğitim Teknolojileri Standartlarının) yıllara göre nasıl bir değişim gösterdiği, özellikle son teknoloji standartlarının hangi özellikleri temel aldığı ve bu yeni standartların eğitim ve öğrenme alanındaki yeni yönelimlerle ilişkisinin belirlenmesidir.

YÖNTEM

Bu çalışma, doküman analizi yöntemi ile yürütülecektir. 2000, 2006 ve 2008 yıllarında yayınlanan NETS*T 'ler yıllara göre değişen ve değişmeyen özellikler bakımından ele alınacaktır. NETS*T 'ler in performans göstergelerinde meydana gelen değişim; Teknolojinin değişimine bağlı olarak değişen özellikler ve eğitimde yeni yönelimlere bağlı olarak değişen özellikler şeklinde ikiye ayrılarak incelenecektir. Ayrıca en son geliştirilen teknoloji standartlarının hangi özellikleri temel alarak geliştirilmiş olduğu ve bu standartların eğitim ve öğrenme alanındaki yeni yönelimleri ne ölçüde içerdiği ile ilgili analiz yapılacaktır. Analizlerde içerik analizi yöntemi kullanılacaktır. İçerik analizi; beyanların içeriksel ve biçimsel özelliklerini sistematik ve nesnel tasvir eden ampirik bir yöntemdir. (Früh;2001:25) Analizlerde kullanılacak olan 2000 ve 2008 yıllarında yayınlanan NETS*T 'lere http://cnets.iste.org/ adreslerinden ulaşılmış olup 2006 yılında yayınlanan NETS*T'ye 'Öğretmen Adaylarının Eğitim Teknolojisi Standartları İle İlgili Özyeterliklerinin Belirlenmesi' (Çoklar,A. 2008) isimli doktora tezinden ulaşılmıştır.

BULGULAR VE YORUMLAR

NETS*T (Öğretmenler için ulusal eğitim teknolojisi standartları) ilk olarak 1993 yılında 13 adet performans göstergesi ile ortaya çıkmıştır. Öğrenme kuramlarında ve teknolojideki değişme ve gelişmelere bağlı olarak 1997 yılında 3 başlık ve 18 performans göstergesi olarak, 2000 ve 2006 yıllarında 6 başlık ve 23 performans göstergesi olarak ve 2008 yılında 5 başlık 20 performans göstergesi şeklinde yeniden düzenlenmiştir. Ortaya çıkan bu standartlar hem ulusal düzeyde hem de uluslar arası düzeyde kabul görmüş standartlar olup, kimi ülkeler bu standartları direkt kullanarak, kimi ülkelerde kendilerine uygun şekillerde uyarlayarak bu standartlardan yararlanılmıştır.

2000 ve 2006 yıllarında yayınlanan NETS*T'lerdeki performans göstergelerinde değişiklik olmadığı dikkat çekerken daha çok 2008 yılında yayınlanan NETS*T'de değişiklik olduğu gözlemlenmektedir. NETS*T'lerin yıllara bağlı analizinde performans göstergelerinde **değişmeyen özellikler;**

- Öğrencilerin farklı gereksinimlerini karşılayabilmek için öğrenme aktivitesi tasarlarken dijital araç ve kaynakları kullanma.
- Öğrencilerin yüksek düzeyde düşünme becerileri ile yaratıcılıklarını geliştirmek için teknolojik kaynaklardan faydalanma.
- Öğrenci öğrenmelerini arttırmak için öğrencilerin arkadaşları, aileleri ve diğer toplum üyeleri ile iletişim kurma ve bu kişilerle işbirliği sağlamak için teknolojik kaynakları kullanma.
- Teknoloji kullanımı ile ilgili olarak yasal ve etik uygulamaların kullanımı hakkında bilgi sahibi olma ve teknoloji kaynaklarının yasal, etik, güvenli kullanımını modelleme ve öğretme.
- Teknolojik kaynakların güvenli ve sağlıklı kullanımını destekleme.
- Öğretmenler devam eden mesleki gelişimleri ve yaşam boyu öğrenme süreçlerini geliştirmek için teknoloji kaynaklarını kullanabilme.

2000 ve 2006 yıllarında yayınlanan NETS*T'ler genel olarak aynı özellikleri taşıdıkları için aşağıda düzenlenen tabloda 2000-2006 NETS*T performans göstergeleri ile eğitim alanındaki yeni yönelimlere bağlı olarak değişen ve bu değişiklikler sonucu oluşturularak 2008 yıllında yayınlanan NETS*T karşılaştırılmıştır ve değişen özellikler maddeler halinde sıralanmıştır.

2000 ve 2006 yıllarında yayınlanan NETS*T'lerde değişime uğrayan performans göstergeleri	**Eğitim Alanındaki Yeni Yönelimlere Bağlı Olarak NETS*T'de Meydana Gelen Değişiklikler**
• 2000 ve 2006 yıllarında yayınlanan standartlarda öğrencilerin özgün problemler, gerçek dünya sorunları ve bunların çözümünden bahsedilmemektedir.	• En son geliştirilen standartlarda (2008) öğrencilerin gerçek dünya sorunlarını açıklaması ve bu sorunlara çözüm getirebilmesi için öğretmenlerin dijital araç ve kaynakları kullanımından bahsetmektedir.

• 2000 ve 2006 yıllarında yayınlanan standartlarda öğrencilerin üst düzey düşünme becerilerinin geliştirilmesinden bahsedilmekte fakat bu kavram net olarak açıklanmamaktadır. • 2000 ve 2006 yıllarında yayınlanan standartlarda öğrencilerin öğrenme amaçları ve öğrenme aktivitelerinin yönetimi ve bu aktivitelerin ölçülmesi öğretmen tarafından yapılması gereken bir performans göstergesidir. • 2000 ve 2006 yıllarında yayınlanan standartlarda öğrencilerin öğrenmelerinin ölçülmesi sadece öğretmenlere atfedilen bir görevdir. • 2000 ve 2006 yıllarında yayınlanan standartlarda öğretmenlerin teknolojik kaynakların yönetimini planlama ve yönetimiyle ilgili sorumluğundan bahsetmektedir. • 2000 ve 2006 yıllarında yayınlanan standartlarda öğrenen merkezli stratejilerden bahsetmemiş olup sadece dijital araç ve kaynaklar kullanarak öğrenciye yetki verme ve öğrencilerin farklı ihtiyaçlarına hitap etme durumundan bahsedilmektedir. • 2000 ve 2006 yıllarında yayınlanan standartlarda öğretmenlerin teknolojik gelişmelerle ilgili olarak kendilerini sürekli geliştirmesi gerekliliğinden bahsedilmiştir • 2000 ve 2006 yıllarında yayınlanan standartlarda yaratıcı ve yenilikçi düşünme modelinden bahsedilmemektedir. • 2000 ve 2006 yıllarında yayınlanan standartlarda öğretmenlerin yaşam boyu öğrenme süreçlerini geliştirmek için teknoloji kaynakları kullanmasından bahsedilmektedir.	• En son geliştirilen standartlarda (2008) üst düzey becerilerin geliştirilmesinin yanı sıra öğrencilerin kavramsal anlayış, düşünme, planlama ve yaratıcı süreçlerini açıklaması, ortaya çıkarması için işbirlikli araç kullanarak yansıtma yapmasına öğrenciyi öğretmenin teşvik etmesinden bahsedilmektedir. • En son geliştirilen standartlarda (2008) öğretmenler öğrencilerin; kendi öğrenmesini yönetebilmesi, kendi sürecini değerlendirmesi ve kendi eğitim amaçlarını belirleyerek aktif katılımcı haline gelebilmesi için teknoloji ile zenginleştirilmiş ortamı sağlayan rehber konumundadır. • En son geliştirilen standartlarda (2008) öğrencilerin öğrenmelerinin değerlendirilmesi farklı formatif ve summatif değerlendirmelerle öğretmen ve öğrenciler birlikte yapmaktadır. • En son geliştirilen standartlarda (2008) öğretmenler teknolojik kaynakların kullanımı ve öğrencilerin bu kaynaklara adil erişimi için fırsatlar sunan rehberdir. • En son geliştirilen standartlarda (2008) öğrenen merkezli stratejilerden bahsetmekte olup öğretmenlerin öğrencilerin farklı ihtiyaçlarına hitap etmesi için dijital araç ve kaynaklara adil erişimi sağlamasından bahsedilmektedir. • En son geliştirilen standartlarda (2008) öğretmenlerin, öğrencilerin öğrenmesini destekleyen mevcut ve gelişmekte olan dijital araç ve kaynakların kullanımını etkili kılmak için profesyonel uygulama ve güncel araştırma üzerinde yansıtma yapmasından söz edilmektedir. • En son geliştirilen standartlarda (2008) yaratıcı ve yenilikçi düşünme modelinin destelenmesinden bahsedilmektedir. • En son geliştirilen standartlarda (2008) Öğretmenlerin; öğretmenlik mesleğinde, okul ve toplulukların kendini yenilemesinde, etkilik ve canlılık kazanması için katkı sağlama.

2000, 2006 ve 2008 yıllarındaki NETS*T'lerde değişen özelliklerden eğitim alanına bağlı olarak değişen özellikler incelendiğinde yaratıcı düşünme, yansıtıcı düşünme, yapılandırmacı yaklaşım gibi yeni yaklaşımların yer aldığı görülmektedir. Önceki standartlarda yer alan performans göstergeleri öğrenci öğrenmeleri değerlendirmelerinde, öğrenmeyi etkileyecek aktivitelerin tasarlanmasında öğretmene görev yüklüyorken en son geliştirilen NETS*T'de yer alan performans göstergelerinde öğretmenler öğrencilerin kendi algılarını değerlendirmeleri için öğrencilerin yansıtıcı düşünme yapmalarına rehberlik etme görevindedir. Ayrıca son geliştirilen standartlara baktığımızda teknolojinin gelişimine bağlı olarak telif hakkı, dijital görgü gibi kavramların üzerinde durulmakta ve küresel farkındalık, kültürel anlayış kavramlarının ortaya çıktığı görülmektedir.

2008 yılında NETS*T'lerde öne çıkan kavramlar.

1. Yaratıcılık 2. Yenilikçi düşünme 3. Gerçek dünya sorunları 4. Özgün problemler çözme 5. İşbirlikli araç kullanma 6. Yansıtma yapma 7. Dijital etik	8. Bilgiyi yapılandırma 9. Aktif katılımcı 10. Kendi öğrenmesini kontrol eden öğrenci 11. Bireysel merakın izlenmesi 12. Öğrenme stilleri 13. Öğrenme stratejileri 14. Bireysel farklılıklar (yetenekler)	15. Bireyselleştirilmiş öğretim 16. Çoklu değerlendirme 17. Güncelleme 18. Teknolojik sistemde akıcılık 19. Üst düzey düşünme becerileri 20. Bireyin ihtiyaç ve beklentileri	21. Sosyal etkileşim 22. Sosyal sorumluluk 23. Çok kültürlülük-kültürler arası etkileşim 24. Yerel ve küresel öğrenme toplulukları 25. Teknoloji yayılması için liderlik 26. Araştırmalara dayalı yansıtmalarla gelişim

Teknolojideki hızlı değişime paralel olarak NETS*T'lerde meydana gelen değişiklikler ise şu şekilde sınıflandırılabilir.

2000 ve 2006 yıllarında yayınlanan NETS*T'lerde değişime uğrayan performans göstergeleri	**Teknolojideki Hızlı Değişimlere Bağlı Olarak NETS*T'de Meydana Gelen Değişiklikler**
• Öğretmenlerin sosyal etkileşimlerle ilişkili sorumluluk ve dijital görgü kavramlarını modellemesinden bahsedilmemektedir. • Öğretmenlerin öğrenci öğrenmesini ilerletmek ve teknolojinin yaratıcı uygulamaları için yerel ve küresel öğrenme topluluklarına katılmasından bahsedilmez. • Teknoloji yayılması görüşünden bahsedilmemektedir.	• Öğretmenler teknoloji ve bilginin kullanımı için sosyal etkileşimlerle ilişkili sorumluluk ve dijital görgüyü modeller ve destekler. • Öğretmenler, öğrenci öğrenmesini ilerletmek ve teknolojinin yaratıcı uygulamaları için yerel ve küresel öğrenme topluluklarına katılır. • Öğretmenler, diğerlerinin teknoloji becerileri ve liderliğini geliştirerek, topluluk oluşturarak ve ortak karar vermeye katılarak teknoloji yayılması görüşünü gösterecek liderlik sergilemelidir.

• Kaynakların belgelenmesi sırasında telif hakkı kavramına saygıyı içeren bir performans göstergesi içermez. • Küresel anlayış ve küresel farkındalık kavramlarından söz edilmemektedir. • Güncel bilginin transferinden bahsedilmemektedir ayrıca teknoloji hakkında temel becerileri sergileme durumdan söz edilmektedir.	• Öğretmenler, kaynakların uygun belgelenmesi ve entelektüel özelliklerin telif hakkı için saygı içiren dijital bilgi ve teknolojinin güvenli, yasal ve etik kullanımını modeller, savunur ve öğretirler. • Öğretmenler, dijital çağ iletişim ve işbirlikli araçlar kullanarak diğer kültürlerin iş arkadaşları ve öğrenciler ile birlikte çekici kılınmasıyla küresel farkındalık ve kültürel anlayışı modeller ve geliştirirler. • Öğretmenler, yeni teknoloji ve durumlar için güncel bilginin transferi yapabilir ve teknolojik sistemlerde akıcılık gösterirler.

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EĞİTİM YÖNETİCİLERİNİN OKULLARDA BİLGİ VE İLETİŞİM TEKNOLOJİLERİNİ KULLANMA STANDARTLARI

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Özet

Bu çalışmada uşak ilinde görev yapan eğitim yöneticilerinin, dünyadaki bilgi ve iletişim teknolojilerinin entegrasyon standartlarını belirleyen nets tarafından geliştirilen, nets-a (national educational technology standarts for administartors), ulusal eğitim teknolojisi yönetici **standartlarına erişim durumlarını** incelemektir. Ayrıca erişilerini engelleyen faktörler de belirlenerek, süreçte ortaya çıkan problemlerin nedenleri de belirlenmeye çalışılmıştır. Betimsel tarama modeli kullanılan çalışmanın evrenini uşak il merkezindeki ilköğretim okullarında görev yapan okul yöneticileri, örneklemini ise tabakalama örnekleme yolu ile seçilenler oluşturmaktadır. Veriler, uzmanlar tarafından geliştiren standart erişim ve etken faktörler anketleri aracılığı ile toplanmış, spss paket programı ile analizlenmiştir.

PROBLEM DURUMU

Yirmi birinci yüzyılının eşiğinde her yönden hızlı değişim gösteren toplumsal yapı, artık bilgi toplumu olarak algılanmaktadır. Bu kavram her ne kadar değişik çevre ve bilim adamları tarafından zaman zaman tartışılsa da genel çerçeve olarak kabul görmüştür. Bilgi toplumunun oluşumunda temel rolü olan yeni teknolojiler bilgisayar, haberleşme ve iletişim teknolojileri ise hızlı bir şekilde birbirleri ile bütünleşerek tümleşik yapılar oluşturarak, teknolojinin ayrım noktalarının belirlenmesini güçleştirmeye başlamıştır (Demirel, Erden, Akkoyunlu, 1994, s.57). Bu kategorileştirme içerisinde yeni teknolojik sistemlere bakıldığında, bu sistemlerin televizyondan uyduya ve bilgisayara kadar çok çeşitli boyutlarda insan yaşamına girdiği görülür. Bu sistemler içerisinde bilgisayar teknolojisi, günümüzde diğer sistemlerin yanında bilginin iletimindeki hızı ve çok yönlü işlevselliği nedeniyle günümüzün vazgeçilmez teknolojisi olmuştur. Temelde bilgisayarların yapısına entegre edilerek oluşturulan yeni ve farklı işlevsel boyutları olan bilgi teknolojileri (Videodisk gösterici, Modem, Kamera ve daha sayılabilecek birçok ek donanımlar ile çok yönlü kullanıma olanak sağlaması yanında, ağ sistemlerine bağlanabilmesi) dünya ülkelerini biri birlerine yakınlaştırmıştır (Gökdaş, 1996, s.5). Bilgi teknolojilerinin belirtilen ve benzeri fonksiyonları dikkate alındığında, söz konusu teknolojilerin bulunduğu noktanın ve buna verilen önemin haklılığı ortaya konulmuş olur.

Bilgi ve iletişim teknolojilerinin kullanımının ve öneminin günlük hayatta artmasının etkileri, eğitim alanında da görülmektedir. Literatür, verimli teknoloji kullanımının öğrencileri etkin, bireysel ve öz-güdümlü öğrenmeye teşvik ettiğini göstermektedir (Hadley ve Sheingold, 1993). Bu teknolojilerinin eğitime entegrasyonu ile birlikte birçok problem de gündeme gelmiştir. Farklı dinamikleri içinde barındıran ve çok boyutlu olarak incelenmesi gereken entegrasyon sürecinde özellikle eğitim yöneticileri ve öğretmen faktörünün önemi vurgulanmaktadır. Günümüz eğitim sisteminde, eğitim - öğretim etkinlikleri sürecinde kullanılacak bir araca tek başına karar verilmesi söz konusu değildir. Eğitim, öğretim ortamlarındaki uygulamaları düzenleme ve karar verme mekanizması eğitim yöneticileridir. Bu bilgiler ışığında entegrasyon sürecinde eğitim yöneticilerinin konuya karşı olan tutumları ve öz yeterlilikleri önemlidir. Eğitimsel yeniliklerin yayılımı ve uygulanması da büyük ölçüde eğitim yöneticilerinin yeniliklere verdiği kişisel ve bireysel anlamlara; kısaca eğitim yöneticileri tarafından yeniliklerin benimsenmesine bağlıdır. (Fullan, 1991). Ayrıca eğitim yöneticilerinin okullarda BİT'in kullanımı konusunda kendi ilke, fikir ve yargılarını oluşturdukları ve tüm bunların uygulamalarını etkilediği araştırmalarla da ortaya konulmuştur (Wilson & Peterseon, 1995). Bu nedenle BİT'in öğrenme öğretme süreçlerine etkili entegrasyonu için merkezi bir konumda olan eğitim yöneticileriyle ilgili araştırmalar yapılması gereksiniminden yola çıkılarak, bu araştırmada BİT'in öğrenme öğretme sürecine entegrasyonunda eğitim yöneticilerinin bu sürece erişim durumları belirlenmeye çalışılmıştır.

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Bu çalışmanın amacı Uşak ilinde görev yapan eğitim yöneticilerinin, dünyadaki bilgi ve iletişim teknolojilerinin entegrasyon standartlarını belirleyen NETS tarafından geliştirilen, NETS-A (National Educational Technology Standarts for Administartors), Ulusal Eğitim Teknolojisi Yönetici **Standartlarına erişim durumlarını** incelemektir. Ayrıca erişileri engelleyen faktörler de belirlenerek, süreçte ortaya çıkan problemlerin nedenleri de belirlenmeye çalışılmıştır.

YÖNTEM

Araştırma Modeli

Bu çalışmanın araştırma modeli betimsel nitelikteki tarama modelidir. Tarama modelleri, geçmişte ya da su anda var olan bir durumu var olduğu şekliyle betimlemeyi amaçlayan araştırma yaklaşımlarıdır (Karasar, 1994).

Evren ve Örneklem

Çalışmanın evrenini Uşak il merkezinde bulunan ilköğretim okullarının müdürleri oluşturmaktadır. Çalışmanın örneklemini ise bu okullarda görev yapan yöneticilerden rastgele seçilen 50 tanesi oluşturmaktadır. Basit seçkisiz örnekleme yolu ile seçilen müdürlere genel tarama modeli uygulanması amaçlanmaktadır.

Veri Toplama Araçları

Veriler NETS-A yönetici teknoloji standartlarından yola çıkarak geliştirilen "*Teknoloji Liderleri Standartları Ölçeği"* aracılığı ile toplanmıştır.

BULGULAR

Çalışma analiz aşamasındadır.

SONUÇ VE ÖNERİLER

Çalışma analiz aşamasındadır.

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EĞİTİMDE AKILLI ÖĞRETİM SİSTEMLERİNİN ÖĞRENCİ VE PEDAGOJİK MODÜLÜ

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Özet

BİLGİSAYARLAR 40 YILI AŞKIN BİR ZAMANDIR EĞİTİM ALANINDA KULLANILMAKTADIR. BİLGİSAYAR DESTEKLİ eğitim ve bilgisayar temelli eğitim, bilgisayarları kullanan öğretim girişimlerinin, ilk uygulanan sistemleridir. Bu tür eğitimlerde öğrencinin kişisel yetenekleri göz önünde bulundurulmazdı. Hem bilgisayar destekli eğitim hem de bilgisayar temelli eğitimin öğrenciye etkili bir biçimde yardımcı olduğu ancak öğrencinin bir insan aklından alacağı kadar yararın sağlanmadığı görülmüştür. Bilgisayar temelli eğitim sistemi öğrencinin ilgi alanında olmalı ve dikkatini sağlamalıdır. Bu tür nedenler akıllı öğretim sistemleri (aös) alanındaki çalışmaları harekete geçirmiştir. Aös öğrencilerin bireysel ihtiyaçlarına büyük ölçüde cevap vermekte ve materyal sunumunda önemli esneklikler sağlamaktadır.

Akıllı öğretim sistemlerinin, öğrencilerin performanslarında ve motivasyonlarında önemli artışlara sebep olduğu görülmektedir. Derslerinde akıllı öğretim sistemlerini kullanan öğrenciler, geleneksel sistemlere eşdeğer performans ortaya koymaktadırlar ancak materyallerin hazırlanması için önemli ölçüde zaman gerekmektedir. Bu çalışmada akıllı öğretim sistemlerinin unsurlarına genel bir bakış yapılarak, bu sistemlerin farklı türlerinin kısa bir özeti yapılacaktır. Ayrıca bu sistemlerin öğrenci modülü ve pedagojik modülünün detaylarından ve bu alanının geleceğinden bahsedilecektir.

ANAHTAR KELİMELER: Akıllı Öğretim Sistemleri, Öğrenci, Pedagojik Modül, Bilgisayar Destekli Eğitim, Yapay Zekâ

STUDENT AND PEDAGOGIC MODULES OF INTELLIGENT TUTORING SYSTEMS IN THE EDUCATION

Abstract

Computers have been used in the field of education for over 40 years. Computer aided instruction and computer based education are the first systems applied out of education attempts using computers. In such educations, personal skills of students were not taken into consideration. It has been observed that both computer aided instruction and computer based education help student effectively but the student is not able to benefit from them as much as the human intelligence. System of computer based education should be in interest area of the student and attract his/her attention. Such reasons have triggered studies on the field of intelligent tutoring systems (itss). Itss are able to meet personal needs of students to a great extent and ensure significant flexibilities in material presentation.

It is observed that intelligent tutoring systems have caused important increases in performance and motivation of students. Students using intelligent tutoring systems in their lessons exhibit a performance equivalent to that delivered with conventional systems however, it takes a long time to prepare the materials. In this study, by overviewing elements of intelligent tutoring systems a short summary on different types of these systems is present. Details of student module and pedagogic module of these systems and future of this field are also discussed.

Keywords: intelligent tutoring systems, sudent, pedagogic module, computer aided instruction, artificial intelligence

1. GİRİŞ

Günümüzde hızla gelişen bilgisayar teknolojisi, kullanım alanlar her geçen gün yaygınlaşan bir sektör haline gelmiştir. Bu durumdan etkilenen eğitim bilimleri alanı da bilgisayar teknolojisini etkin ve farklı şekillerde kullanmaktadır. Bilgisayar teknolojisinin kullanımı, eğitim alanında 1960 yıllarda önem kazanmaya başlamış ve hala geçerliliğini koruyan uygulamaların başında da gelmektedir. Ders ve sınav programlarının hazırlanması, sınavların yapılması ve sonuçlarının değerlendirilmesi, karne ve diplomaların düzenlenmesi vs. gibi öğrenci işleri uygulaması verilebilecek örneklerden birkaçıdır.

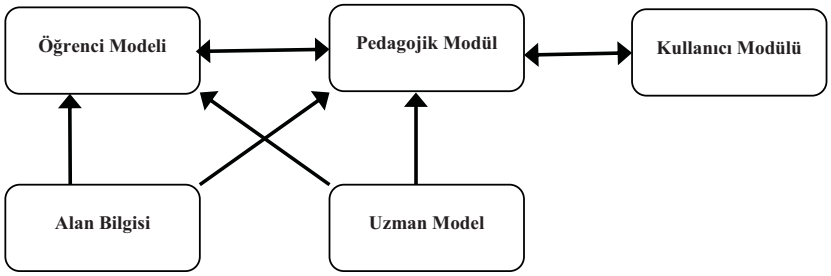
Internet, multimedya ve HTML'nin hızlı gelişimi ve hâkimiyetiyle, www tabanlı uzaktan eğitim sistemleri giderek çok daha popüler hale gelmiş ve heterojen kullanıcı grupları tarafından kullanılmaya başlanmıştır. Akıllı öğretim sistemleri (ITS) ve web tabanlı teknolojilerin birleştirilmesi eğitim amaçlarının gerçekleştirilmesi için çok yararlı olacaktır[12].

Akıllı öğretim sistemleri, öğrenme ve öğretme işleminde öğretmenin görevini yerine getiren bilgisayar destekli öğretim (Computer Aided Instruction-CAI) sistemlerinin jenerasyonudur. Akıllı öğretim sistemlerinin (ITS) temel hedefi her öğrencinin birebir eğitim görmesine benzer bir çalışma deneyimi yaşamalarını sağlamaktır. Birçok uzman çalışması öğrencilerin öğrenmeleri için en etkili yolun uzman bir öğretici ile yapılan bireysel çalışma olduğunu göstermiştir. Dikkate değer şekilde akıllı öğretim sistemleri yapay zekâ teknikleri üzerine kurulmuştur ve bu nedenle öğretilecek konu bu sistemlerde daha esnek bir şekilde sunulur ve öğrencilerin iyi bir eğitim ve dönüt alınması sağlanır[13].

Bununla beraber akıllı öğretim sistemleri, çalışma ortamları ve sınıflar gibi gerçek eğitim ortamlarında halen kapsamlı olarak kullanılmamaktadır. Bu kısıtlı kullanımın temel nedeni muhtemelen akıllı öğretim sistemleri tasarımının kompleks, zaman alıcı olması ayrıca programcı, yönetici ve alanında uzman kişiler gibi geniş bir insan grubunu içermesidir. Bu çalışmada ilk olarak tipik bir akıllı öğretim sisteminin yapısı ve temel bileşenlerine giriş yapılarak öğrenci ve pedagojik modülün detaylarından bahsedilecektir.

2. AKILLI ÖĞRETİM SİSTEMLERİNİN BİLEŞENLERİ

Akıllı öğretim sistemleri dışarıdan monolitik (tek) sistemler olarak görülebilir, ancak kavramsal ve tasarım özellikleri ele alındığında bunların birbirine bağlı bir kısım bileşenlerin oluşumundan meydana geldiğini düşünmek daha anlaşılırdır. Bir akıllı öğretim sistemi, öğrenciye daha önce öğretilen bilginin yanında, neyin öğretileceğini ve nasıl öğretileceğini dikkate almaktadır. Akıllı öğretim sistemleri, çok bilgi içeren ve karmaşık konuların öğretilmesinde bir insan öğreticiyi taklit edebilen ve her bir öğrenci için birebir öğretim olanağı sunan yazılım sistemleridir. Akıllı öğretim sistemlerinin bileşenleri ve bunlar arasındaki ilişki Şekil-1'de görülmektedir[17].



Şekil-1. Akıllı Öğretim Sistemlerinin Bileşenleri ve Etkileşimi

2.1. Öğrenci Modeli

Öğrencinin bilgi düzeyini ölçmek ve bilişsel bilgi düzeyini tahmin etmeye çalışmak için bir öğrenci modeli ve öğrencinin o anki bilgi düzeyine erişmek için farklı metotlar kullanılmaktadır. Bunun için bilgisayar tabanlı uzman davranışı ile öğrenci performansının kıyaslanması gerekir. Akıllı öğretim sistemlerinin akıllı davranışlar gösterebilmesi için sistemin öğrencileri tanıması, gerekliliklerden birisidir. Öğrencileri tanımak ise, o anda akıllı öğretim sistemini kullanan öğrenci için bir öğrenci modeli oluşturmayı gerektirir. Bu dinamik sunum, sistemin teşhis kapasitesi kullanılarak güncellenir. Böylece sunulan bilgi ile öğrenci bilgisi karşılaştırılabilir[6,7,8,12].

2.2. Pedagojik Modül

Pedagojik modül, öğrenme süreçlerinin bir modelidir. Örnek olarak; bilgilerin ne zaman ve ne kadar sürede sunulacağı, yeni bir konuya ne zaman geçileceği, hangi konuların sunulacağı ve hata mesajlarının uyarlanabilir sunumu bu modül tarafından kontrol edilir. Öğrenci modülü tarafından sağlanan veriler bu modül için girdi olarak kullanılır. Böylece, her bir öğrencinin birbirinden farklı olan ihtiyaçları verilecek pedagojik kararları etkiler[7]. Pedagojik modül, metot, sunu zamanlaması ve sistemin içerisinde barındırması gereken öğretim materyallerinin bir kümesinden oluşmaktadır[15].

2.3.Alan Bilgisi

Bu bileşen öğretimde kullanılacak bilgiyi içerir ve en önemlisi ise bu bileşen olmadan öğrenciye hiçbir şey öğretilemeyeceğidir. Genellikle bu bileşende, eğitimde bir bilgi alanının temsil edilmesi ve eğitimin diğer bölümlerinin de bilgiye ulaşabilmesi için geniş bir bilgi mühendisliğine ihtiyaç duyulmaktadır. Çünkü bu konu ile ilgili bir araştırma konusu, bilginin daha geniş bilgi alanları ile uyumlu olarak nasıl sunulacağı ile birlikte, alan bilgisinin zihinsel model işlemlerinden nasıl ayırt edilerek sunulacağıdır.

2.4. Kullanıcı Modülü

Öğrenci ile akıllı öğretim sistemi arasındaki iletişim ve etkileşimi sağlayan, diyalogları ve ekran planlarını kontrol eden modüldür. Öğrencinin uygulaması gerekenleri kontrol altında tutmak, uzman bilgi modülünün ve akıllı öğretim sistemini oluşturan diğer modüllerin harici gösterimi için bir iletişim ortamı sağlamaktadır. Burada öncelikle üzerinde durulması gereken, materyalin en etkili biçimde öğrenciye nasıl sunulacağıdır. Akıllı öğretim sisteminin öğrenci ile etkileşimde bulunduğu modül olduğundan dolayı öğrencinin sistemi kabul etmesi için kullanım kolaylığı sağlamalı, olabildiğince basitleştirilmiş ve motive edici özelliğe sahip olmalıdır. Aksi takdirde, öğretim sitemi aracılığıyla öğrenme sürecinde öğrencinin sistemi öğrenme çabası bir engel oluşturabilir. Eğer öğrenci sistemi kullanma arzusunu yitirirse, sistemin hiçbir etkinliğinin olmayacağı açıktır.

2.5. Uzman Model

Akıllı öğretim sistemlerinde öğrenciye sunulacak alan bilgisinin saklandığı ve kontrol edildiği modüldür. Bu modül, bilgi tabanında bulunan uzmana ait problem çözümlerini kullanır. Öğrenciye kazandırılacak bilgi ve becerilerin gerçek modeli bu modülde oluşturulur. Nitelikli bir uzman bilgi modülü, uzmanın problem çözümüne ilişkin yeterli uzman bilgisini içermelidir. Bu bilgiler, kural tabanlı (rule-based), semantik ağlar (semantic networks), çerçeveler (frames) ve benzeri yöntemlerle sunulabilir. Bu modül tarafından gerçekleştirilen iki temel işlev vardır[8,10,15].

1. Soru, cevap, ipucu ve açıklamalar geliştirerek bir kaynak gibi davranış gösterebilme,
2. Bilişsel düzeyi saptamak için standartları belirlemek açısından kullanıcı performansı değerlendirebilme.

3. ÖĞRENCİ MODELİ VE BİLGİNİN MODELLENMESİ

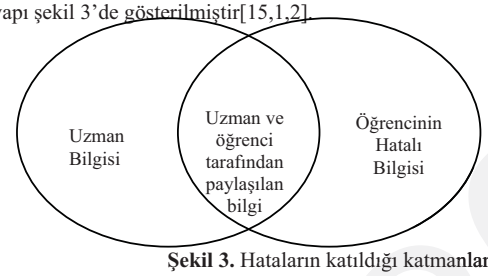
Öğrenci modellerinde, öğrenci bilgileri genellikle 'Uzun Dönemli' ve 'Kısa Dönemli' olmak üzere iki farklı şekilde tutulmaktadır. Uzun dönemli öğrenci modelinde, öğrencinin hemen değişmeyen, uzun süre geçerliliğini koruyan bilgileri tutulur. Bunlara örnek olarak, öğrencinin bilgi düzeyi, amacı, öğrenme metodu gibi bilgiler gösterilebilir. Kısa dönemli öğrenci modelinde ise, öğrencinin sadece bir oturum süresince geçerli olan bilgileri tutulur. Bunlar, öğrencinin sürekli takip edilen davranışlarına ilişkin bilgilerdir. Örneğin bir problem çözümü sırasında seçtiği yöntem, hata yaptıysa bu hataya sebep olabilecek bilgi eksikliğinin ya da hatalı algılamanın ne olduğu, bir konuya harcadığı zaman gibi bilgiler, kısa dönemli öğrenci modelinde yer alır[9,11].

Bir öğrenci modeli, akıllı öğretim sisteminin öğrenciler hakkında yaptığı gözlemlerden yararlanılarak kurulur. Öğrenci gözlemleri sırasında elde edilen bilgiler; sorulara verilen cevaplar, zorluklar karşısındaki tutum, izlediği adımlar şeklindeki ham bilgilerdir. Öğrenci modeli tüm bu bilgilerin düzenlenmiş bir özeti olarak düşünülebilir. Çünkü bu bilgilerin bazıları birleştirilir, bazıları atılır, elde edilen sonuçlar sistemin

kullanacağı şekilde özetlenir ve öğrenci hakkında bir dizi yargılar şeklinde saklanır[8]. Öğrenci bilgisinin modellenmesi için farklı yöntemler kullanılmaktadır[6,8,10].

Şekil-2 Katmanlama (Overlay) Modeli

Bu yöntemlerden biri olan katmanlama (overlay) modelinde, öğrencinin bilgi düzeyi, uzman bilgisinin bir altkümesiyle temsil edilir. Bu model örtülü birleştirme modeli olarak da ifade edilmektedir. Öğrenci bilgisi, altkümeninkiyle kıyaslanarak ustalık derecesinin ölçülmesi için kullanılmaktadır. Öğrencinin davranışı, sistemin basit olarak bilgi tabanı içerisinde var olan doğru ya da yanlış bilgi kalıpları ile tanımlanmaktadır. Buna göre akıllı öğretim sistemi öğrenciye, bilgisinin tam olarak uzmanın bilgisine uyuşacak şekilde materyal sunar. Bu tip öğrenci modelinde betimlenebilecek bilgi çeşitleri, uzmanlık alanı bilgisinin öğelerine uyan konuları ve üretim kurallarını içerir. Bu model, şekil 2'de gösterilmiştir. Bu yaklaşımın bir dezavantajı, öğrencilerin uzmanın bilgi temelinin bir parçası olmayan bilgilere sahip olabileceğini kabul etmemesidir. Örneğin, öğrenciler bir uzmanlık alanını sık sık yanlış anlayabilirler. Bu yüzden, bu kapsama alanının genişletilmesiyle öğrencinin sahip olabileceği yanlış bilgi temsil edilebilir. Bir öğrencinin doğru olmayan bir şeye inandığı gerçeği pedagojik olarak önemli olduğu için bu genişletme ile öğrencilerin yanlışlarının iyileştirilmesine olanak tanınır. Öğrencinin hatalı bilgisinin de sistem içerisinde temsiline ilişkin yapı şekil 3'de gösterilmiştir[15,1,2].



Şekil 3. Hataların katıldığı katmanlama modeli

Bir diğer yöntem ise, öğrencinin yeteneği anlama ve muhakeme işlemi hakkında sonuç çıkartmak için öğrencinin tepki geçmişine örüntü tanımlaması uygulaması ile dönütlerin elde edilmesi için kullanılır. Bu aşama aynı zamanda tanımlama olarak da adlandırılır ve istatistiksel analiz gibi metotlar da kullanılabilmektedir[5].

Öğrenci hakkındaki bilginin modellenmesi için kullanılan Bayesian ağları yaklaşımı ise son zamanlarda sıkça kullanılmaya başlanmış en etkili yöntemlerden biridir. Daha önce de ifade edildiği gibi bir akıllı öğretim sistemi, öğrenci modelini öğrenci gözlemleri sonucunda oluşturur. Tam güvenilir olmayan veriler ve zayıf sonuç çıkarma kuralları belirsizlik doğurur. İdeal olmayan eğitsel aktivite seçimi kuralları belirsizliği arttırır. Öğrenci, sistem davranışlarına verdiği karşılıklarla yeni veriler üretir. Bayesian ağları, öğrenci modeli oluşturmada ve pedagojik aktivite seçimi konusunda kullanılan yapay zekâ tekniklerinden biridir. Diğer bir deyişle, belirsizlik yönetimi için kullanılan bir olasılık kuramıdır. Bayesian olasılık kuramından doğup gelişmişlerdir. Bu kuram, belirsizlik taşıyan herhangi bir durumun modelinin oluşturularak, bu durumla ilgili evrensel doğrular ve gerçekçi gözlemler ışığında belli sonuçlar üretilmesini sağlar[3,9,11].

Öğrenci modeli modülüne genel olarak bakıldığında modülde her bir öğrenci hakkında spesifik bilgilerin kaydedildiği bir yapı bulunmaktadır. Asgari seviyede bir öğrenci modeli modülü, öğretilen bilgi için bir öğrencinin ne kadar performans gösterdiğini takip etmelidir. Ayrıca, öğrencinin yanlış anlamalarını da kaydedebilir. Öğrenci modülünün amacı, akıllı öğretim sisteminin pedagojik modülü için veri sağlamak olduğu için öğrenciye ait toplanan bilgiler öğretici tarafından kullanılabilir olmalıdır[15]
İdeal koşullarda öğrenci modeli öğrencinin performans ve öğrenimini etkileyebilecek tüm davranış ve bilgilerini kapsamalıdır. Ancak, öğrencinin akıllı öğretim sistemi ile olan iletişiminde klavye ve fareyi kullandığı göz önüne alınırsa böyle bir modelin oluşturulmasının oldukça sınırlı olanaklar içinde yapıldığı anlaşılmaktadır. Diğer algı ve iletişim kanallarının da teknolojik yenilikler elverdiği ölçüde bu amaca yönelik işe koşulabileceği düşünüldüğünde, tam bir öğrenci modeline ulaşmanın olası olacağı söylenebilir. Özellikle son yıllarda geliştirilen sanal gerçeklik sistemleriyle ve simülasyonlarla kullanıcıdan gelen tepkiler doğrultusunda öğretime yön vermek mümkündür[1,15].

4. PEDAGOJİK MODÜL VE YAKLAŞIM TÜRLERİ

Pedagojik modül, öğrenme süreçlerinin bir modelidir. Örnek olarak; bilgilerin ne zaman ve ne kadar sürede sunulacağı, yeni bir konuya ne zaman geçileceği, hangi konuların sunulacağı ve hata mesajlarının uyarlanabilir sunumu bu modül tarafından kontrol edilir. Öğrenci modülü tarafından sağlanan veriler bu modül için girdi olarak kullanılır. Böylece, her bir öğrencinin birbirinden farklı olan ihtiyaçları verilecek pedagojik kararları etkiler[7]. Pedagojik modül, metot, sunu zamanlaması ve sistemin içerisinde barındırması gereken öğretim materyallerinin bir kümesinden oluşmaktadır[15]. Öğrencinin yeni konuları seçmesi, öğrenciye sunulacak açıklama, destek ve tavsiyelerin sağlanması, öğrenciyi problemin doğru çözümüne ulaştıracak ipuçlarının ne zaman verileceği gibi öğretim yöntemlerinin icrası ve öğrenci modelinin bu unsurlar dikkate alınarak güncellenmesi pedagojik modül formları ile gerçekleştirilebilir. Akıllı öğretim sistemlerinde pedagojik modülün gerçekleştirilebilmesi için iki yaklaşım bulunmaktadır.

Sokratik yaklaşımda, akıllı öğretim sistemleri bir dizi soru ile öğrenciye verilecek öğretime ait içeriğin sunulma sırasına ve şekline rehberlik eder. Eğer öğrenci bir hata yaparsa program herhangi bir anlaşmazlığı önleyerek öğrenciye yardım etmek için soruların sıralamasını değiştirir. Bu yaklaşım, öğrencinin kendi yanlış anlamalarını giderme işlemi için öğrenciye yöneltilen bir soru setini devreye sokar[5,14].

Coaching yaklaşımında ise, öğrencinin çeşitli problem çözme yollarını keşfetmesine izin verir. Problemler öğrenciye sunulduğunda bir akıllı öğretici cevapları analiz eder ve neden bu metotların seçildiğini ve alternatif metotları öğrenciye önerir. Bu yaklaşım, öğrenci için bilgisayar oyunları gibi eğlenceli bir ortam yaratarak problem çözme alışkanlıklarını öğretmektedir[14,16]. Bir akıllı öğretim sistemi, kendi öğretim modeline bağlı olarak öğretimi nasıl gerçekleştireceğini bilir. Pedagojik modül, hedef alanda ve insan öğrenimi konusunda genel uzman bilgisi doğrultusunda öğretim yöntemi için gerekli tekniklerin ve özgün uzman metotlarının yönergesel bir sunumudur. Özet olarak pedagojik

modül, öğretim eylemini idare eder, öğrenci hatalarını teşhis eder, seçim yapar, uyarlar ya da öğrencinin anlık bilgi ve beceri düzeyine bağlı olarak pedagojik müdahaleler oluşturur. Böylece öğrenme sürecinde öğrenciye çalıştırıcılık sağlar[15].

Aslında pedagojik modülün gerçekleştirilmesi eğitim bilimleri uzmanının işi gibi görünmektedir. Ancak herhangi bir alanla ilgili konu ve kavramların öğretilmesinde aynı zamanda alan uzmanının bilgi ve deneyimlerinden faydalanılması kesinlikle kaçınılmazdır. Burada, uzman eğitimcilerin rolü oldukça fazladır. Fakat aynı anda her iki konu alanında da uzmanlaşmış bireye oldukça nadir olarak rastlanmaktadır. Bu modül hazırlanırken konu alanı uzmanı ve eğitim bilimleri uzmanı birlikte çalışmalıdır.

5. SONUÇ

Akıllı öğretim sistemlerinin, öğrencinin bireysel olarak motivasyonun ve öğrenmesinin artmasında etkili olduğu görülmektedir. Bu tür sistemlerin tasarlanmasında, onların beş bileşenden oluşuyormuş gibi incelenmesi faydalı olacaktır. Bu beş bileşen; öğrenci modeli, pedagojik modül, alanı bilgisi, kullanıcı modülü ve uzman modelidir. Bu bileşenler üzerindeki devam eden çalışmalara ek olarak, önemli bir araştırma konusu da bu sistemleri geliştirmesine yönelik zaman ve maliyetlerin azaltılmasıdır. Bunu yapmak için mevcut olan stratejiler modüler biçimde yetkilendirme araçları ve oluşturma sistemlerinin geliştirilmesini kapsamaktadır. Bu sorunun çözülmesi de akıllı öğretim sistemi araştırmasında büyük bir dönüm noktası olacaktır zira daha fazla sistem oluşturulabilir ve böylece bilgisayar temelli öğretimin etkinliği üzerine daha fazla araştırma yapılabilir.

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EĞİTSEL BİLGİSAYAR YAZİLİMLARİNİN ILETİŞİM TASARİMİ AÇİSİNDAN INCELENMESİ

HATİCE ÖZ

Özet:
Ülkemizde bilgisayar ve internet kullaniminin artmasiyla birlikte eğitim amaçli bilgisayar yazilimlarinin kullanimi da artmaktadir. Eğitim amaçli bilgisayar yazilimlarina "egitsel yazilim" denilmektedir. Eğitsel yazilimlarda bir ögretici eslik etmez, ögrenci okul ve ögretmen kavramlarindan bagimsiz olarak çalisip uygulama yapabilmektedir. Egitsel yazilimlar, alistirma-uygulama yazilimlari, bire-bir ögretim yazilimlari, benzetisim yazilimlari, ögretici oyunlar, problem çözme yazilimlari olarak siniflandirilabilir.
Eğitsel yazilimlarin içeriği öğrencilerin özelliklerine ve beklentilerine göre uyarlanabilir, ve etkileşimi yüksektir. Eğitsel yazilimlarda yazi, grafik, ses ve hareketli görüntü gibi farkli ortamlar bir arada kullanabilir. Gelişen eğitim teknolojileri öğrenme içeriğinin tasarimlanmasi ve sunulmasinda öğrenci özelliklerini dikkate alarak, öğrenciye daha fazla denetim olanaği tanimaktadir.
Eğitsel yazilim tasarimi pek çok uzmanlik alani ile ilgili bilgilerin kullanimini gerektiren karmaşik bir görevler bütünüdür. Bu görevler takimi kendi içinde bir bütün olmakla beraber; yazilimin grafik, programlama, içerik uzmanliği, öğretim, ergonomi gibi ayri uzmanlik alanlariniilgilendiren tasarim elemanlari ve gerekleri vardir.
Öğrenmenin gerçekleşmesi için iletişimin olmasi gerektiği dikkate alindiğinda, içerik ve öğrenenin buluşup iletişime geçeceği ortamlarin hazirlanmasi önem kazanmaktadir. Hangi tür olursa olsun öğrenme ortami tasarimi, oldukça çok değişkeni içinde barindiran karmaşik bir bütündür.
Başarili bir öğretim yazilimi tasariminda içerik tasarimi, yazilim tasarimi, sanat tasarimi gibi birden fazla uzmanlik alaninin dengeli işbirliğine ihtiyaç duyulur. Bde yazilimlarinin tasariminda tasarimcilarin uğraş alanlari 90'li yillarin başinda yayginlaşan çoklu ortam teknolojisi tarafindan önemli ölçüde belirlenmektedir.tasarim hem pedagojik hem teknolojik olmak üzere birçok konuyla ilişkilidir.
Uygulamanin gerçekten eğitsel olabilmesi için yukarida siralanan başliklari uygun pedagojik ağirlikta içermesi gerekir. Bu durum, yazilimin kullanici dostu ve etkileyici bir ara yüze sahip olmasi anlamina gelir. Eğitsel yazilimlarin tasarlanmasi aşamasinda kullanilan ekran tasarimi standartlari metin düzeni, yerleştirme, görünüm ve grafik başliklari altinda gruplandirilmiştir.
Yapilan araştirmada ilköğretim 5. Sinif sosyal bilgiler dersi içeriğinin işlendiği 5 farkli eğitsel yazilim incelenip ve aşağidaki tasarim unsurlarina göre değerlendirilecektir:
-eğitsel tasarim –içerik -ara yüz tasarimi -gezinme (navigation) -etkileşim ve geri bildirim -kullanici kontrolü -sosyal görünüş -teknik problemler -müfredat programi değişiklikleri

Anahtar Kelimeler: Eğitsel Yazilim, Bilgisayar Destekli Eğitim, Iletişim Tasarimi, Arayüz Tasarimi, Interaktif Eğitim

EĞİTSEL İÇERİKLİ WEB SİTELERİNİN METİN TASARIM UNSURLARI AÇISINDAN İNCELENMESİ

EXAMINATION OF THE EDUCATIONAL WEB SITES IN TERMS OF TEXT DESIGN

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Özet

Web ortamındaki kullanıcı sayısı gün geçtikçe artmaktadır. Buna paralel olarak yayına giren web sitelerine her gün bir yenisi eklenmektedir. Kullanıcılara hizmet veren web siteleri arasında eğitsel içerikli web siteleri de yer almaktadır. Bu sitelere geliş amacı bilgi edinmek olan kullanıcıya, bilgiyi en sade ve etkili şekilde sunmak kullanıcı memnuniyetini arttıracaktır. Özellikle ilköğretim ve ortaöğretim çağındaki kullanıcılara hitap eden eğitsel içerikli web sitelerinde kullanılan metinlerin gerek tasarım, gerekse içerik açısından iyi seçilmiş olması gerekmektedir. Eğitsel içerikli web sitelerinde metinler aracılığıyla aktarılan bilgilerin iyi tasarlanmış olması bu araştırmanın konusunu oluşturmaktadır.

Araştırma kapsamında eğitsel içerikli web sitelerinde bulunan metinler, okumaya etki eden fiziksel özellikleri açısından değerlendirilmiştir. Değerlendirme aracı olarak araştırmacılardan biri tarafından geliştirilen web siteleri metin tasarım unsurları değerlendirme ölçeği kullanılmıştır.

Değerlendirme sonucuna göre eğitsel içerikli web sitelerinden %20'sinin metin tasarımı açısından kolay okunur nitelikte, %50'si orta okunur nitelikte ve %30'unun ise zor okunur nitelikte olduğu sonucuna ulaşılmıştır.

ANAHTAR SÖZCÜKLER: Metin Tasarımı, Eğitsel İçerikli Web Siteleri, Okunabilirlik

ABSTRACT

The number of the internet users is increasing. Correspondingly everyday many new web-sites are founded to serve. Among these educational web-sites are also established. Therefore, presenting the information directly in a way that avoids unnecessary details, animations, and etc. Can increase the contentment of the users and effectiveness of the web-site. Especially the texts are used in the educational web-sites which serve primary and high school students should choose conveniently in terms of both design and content. The aim of this study is well designing knowledge transferred through texts in educational web-sites.

In this study texts of educational web-sites are evaluated in terms of physical properties which are affecting readability. Web sites text design evaluation scale is developed and used as an evaluation tool. According to evaluation results, it is concluded that 20% of the educational web-sites are easy, 50% are mediocre, and 30% of them are difficult in terms of readability.

Keywords: text design, educational web site, readability

GİRİŞ

Bilgisayar teknolojilerindeki gelişmeler insan hayatını birçok yönden etkilemekte ve geliştirmektedir. İnsanlar çoğu ihtiyacını bilgisayar ve internet aracılığıyla istediği yerden, zaman ve mekân kaygısı olmadan karşılayabilmektedir. Bu amaçla çok farklı alanlarda her gün yayına giren milyonlarca web sitesi bulunmaktadır.

Faklı alanlarda yayına giren web siteleri kullanıcıları etkilemek adına farklı teknikler denemektedir. Web sitelerinde kullanıcıları etkilemek, iyi bir iletişim ortamı sağlayarak siteye olan ilgilerini artırmak için site tasarımcıları resim, canlandırma, ses ve çeşitli tasarım unsurları üzerine fazlasıyla eğilmektedir. Bu web siteleri arasında, kullanıcıların bilgi edinme ihtiyaçlarını karşılama amaçlı kurulan eğitsel içerikli siteleri de yer almaktadır.

Eğitsel içerikli web sitelerinde, kullanıcıyı etkilemede sözü edilen yöntemlerden çok, bilginin sunumu önem taşımaktadır. Siteye aradığı bilgiyi almaya gelen kullanıcı, baktığı kelimeyi değil, aradığı kelimeyi görür. Bu bağlamda böyle bir kullanıcı için sitede bulunan resimlerin veya canlandırmaların çok güzel olması kullanıcıyı ilgilendirmemektedir. Kullanıcıyı etkilemek adına sayfaya yerleştirilen bu elemanların sayısının artması ve tasarım bilgisine sahip olmayan kişilerce yapılması, bu tür sitelere asıl geliş amaçları bilgi edinmek olan kullanıcıların işini zorlaştırmaktadır.

Kişinin aradığı bilgiyi, ziyaret etmekte olduğu sitede bulabileceği izlenimini vermenin yolu bilgilerin kolay göz atmaya elverişli olmasıdır. Böyle bir site tasarlamak için ise, sayfadaki metin tasarımına özen göstermek gerekmektedir. Nielsen'in (1997) de belirttiği gibi, web kullanıcısı öncelikli olarak sitedeki metinleri tek tek okumamakta, siteye göz atmaktadır. İnsanların web sitelerini nasıl okudukları ile ilgili olarak Nielsen'in (1997) yaptığı araştırmada, araştırmaya dâhil olan kullanıcılardan %79'unun herhangi yeni bir sayfaya rastladıklarında sayfayı taradıklarını yani göz atmayı tercih ettiklerini, sadece %16'sının sayfadakileri kelime kelime okuduğunu görmüştür. Bu çalışma sonunda Nielsen (1997), web sayfalarının metin tasarımında öncelikle dikkat edilmesi gereken konunun; kolay taranabilir metinler oluşturmak olduğu sonucuna varmıştır. Dolayısıyla, web içeriği geleneksel yazıdan, kitaplardan, gazetelerden farklı olmalıdır (Doğan, 2006). Kullanıcının siteden bilgi alması, sitede kullanılan yazıtipi, rengi gibi özellikler tarafından ayırt edilmesiyle ilişkilidir. Bununla birlikte, sitede bulunan metinlerin zorluk derecesi de hedef kullanıcıya uygun olmalıdır. Bu şekilde, kullanıcı, siteye aradığı bilgiyi almak amacıyla geldiğinde, onun isteğine cevap verebilecek ve onu memnun ederek, sitede kalmasını sağlayacaktır.

Her tasarımda olduğu gibi, bilgi tasarımında da iyi bir planlama temel koşuludur. Amaca uygun olarak derlenmiş bir bilgi, doğru düzenlenir, iyi sınıflandırılır ve etkili şekilde sunulursa alıcısı tarafından kolayca algılanır. Düzensiz yerleştirilen yazı ve görüntü öğeleri algılamayı, iletişimi güçleştirir ve yanlış anlaşılmalara neden olur (Pektaş, 2001). Doğan (2006), webde iletişimin ağırlıklı olarak kelimelerle sağlandığını belirtmiştir. Web iletişiminde kelimeler yani içerik bu kadar önemli iken, tasarımcıların odağında olması gereken soru da "Bilgiyi en etkili ve hızlı bir şekilde kullanıcıya nasıl iletirim?" olmalıdır. Web sitelerine gelen ziyaretçilerin büyük çoğunluğunun bir hedefi vardır. Kimi bir ürün hakkında bilgi almak, kimi bir konu hakkında bilmediklerini öğrenmek için siteyi ziyaret edebilir. Hedefler faklı olsa da özünde ziyaretçi çoğu zaman siteye sunulan bilgiyi almak için gelir (Doğan, 2006).

Nielsen'in yaptığı çalışmadan da anlaşılacağı gibi web ortamında, aktarılacak mesajın alıcıya iletilmesi için, öncelikle sitenin kolay tarama yapmaya elverişli olması gerekmektedir. Kolay taranabilir bir site tasarımı için, yazı ve görüntüler arası görsel denge iyi kurulmalıdır. Renkler, biçimler ve bunların yerleşimi dengeli olmalı, ilgi çekmelidir. Göz, bilgi akışına göre zorlanmadan sayfadaki hareketi takip edebilmelidir. Yazı, iletişimsel anlamını kaybettiği an amacından da uzaklaşmış olur (Pektaş, 2001). Bu bağlamda web tasarımcılarının web sitelerinde yayınlanan metinsel bilgilerin içeriğinin yanında fiziksel özelliklerine de dikkat etmeleri gerekmektedir.

Eğitsel içerikli web sitelerinde bulunan metinlerin fiziksel özellikleri, tasarım açısından ne durumda oldukları bu araştırmanın problemini oluşturmaktadır. Araştırma kapsamında birçok web sitesi incelenmiş özellikle eğitim alanında hizmet veren web sitelerinin metin

tasarım unsurlarını ne kadar dikkate aldıkları araştırma dâhilinde hazırlanan "Metin Tasarım Unsurları Değerlendirme Ölçeği" ile değerlendirilmiştir. Araştırma sonucunda eğitsel içerikli web sitelerinde metin tasarım unsurlarına ne ölçüde dikkat edildiği belirlenmiş ve bu amaç doğrultusunda aşağıdaki sorulara cevap aranmıştır:

1. Eğitsel içerikli web sitelerinin Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeğinde yer alan her bir maddeden aldığı puan nedir?
2. Eğitsel içerikli web sitelerinin Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeğine göre en çok dikkate alınan özellikler nelerdir?
3. Eğitsel içerikli web sitelerinin Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeğine göre en az dikkate alınan özellikler nelerdir?
4. Eğitsel içerikli web sitelerinde yer alan metinlerin, Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeğine göre zorluk düzeyleri nedir?

YÖNTEM

Eğitsel içerikli web sitelerini metin tasarım unsurları açısından incelemeyi amaçlayan bu çalışma tarama modelindedir.

Evren ve örneklem

Araştırmanın çalışma evrenini 2008-2009 Eğitim Öğretim yılında internet üzerinde Türkçe olarak yayınlanan, ilköğretim öğrencilerine yönelik eğitsel içerikli web siteleri oluşturmaktadır. Eğitsel içerikli web sitelerine ulaşmak için, arama sonuçlarının sıralanmasında PageRank (Brin ve Page, 1998) adı verilen bir algoritmayı kullanarak, uyguladığı ileri teknikler sayesinde kısa sürede en iyi arama motoru olma başarısını yakalayan Google arama motorundan (Gürdağ ve Özturan, 2002)yararlanılmıştır. Google arama motorunda "eğitsel içerikli web siteleri, eğitim siteleri, ders anlatımı, online ders, ders siteleri, uzaktan eğitim, öğretmen siteleri, online öğrenme, çocuk siteleri" ve benzeri anahtar kelimeleri girilerek yapılan aramalar sonucunda farklı sitelere erişilmiş, arama motorunda bulunan sitelerde verilen ilgili bağlantılar ile de arama dallanarak geniş bir evrene ulaşılmaya çalışılmıştır. Erişilen siteler arasından bir ders içeriğini veya bir konuyu site aracılığıyla kullanıcılara aktaran 10 site araştırmaya dâhil edilmiş ve araştırmanın örneklemini oluşturmuştur. Arama motorunda anahtar kelimelerle yapılan arama sonucunda erişilen siteler arasından eğitimle ilgili olmasına rağmen herhangi bir ders içeriği ve konu anlatımı sunmayan ya da ilköğretim ve ortaöğretimde okutulan derslere uygun olmayan siteler araştırmanın dışında tutulmuştur.

Verilerin Toplanması

Araştırmada, web sitelerindeki metinlerin tasarım özelliklerinin okuma üzerine etkisi olduğu düşünülmektedir. Bu fikirden yola çıkılarak araştırmaya ilişkin verileri toplamak amacıyla 55 maddeden oluşan "Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeği" geliştirilmiştir.

Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeği

Ölçek geliştirme sürecinde öncelikle web sitelerindeki metinlerin sayfa içinde hangi formlarda bulunduğu belirlenmiştir. Metinlerin web sayfalarında başlıklar, listeler, bağlantılar ve içerik olarak yer aldığı belirlenerek metinler bu 5 başlık altında gruplandırılmıştır. Oluşturulan bu gruplara ait olması gereken özellikler ilgili başlıklar altındaki maddelerde ele alınmıştır. Ölçek maddeleri belirlenirken, başlıklar, listeler, bağlantılar ve içeriğe ait tipografik öğeler, tasarım ilkeleri gibi metnin fiziksel özellikleri dikkate alınmış, bu zamana kadar yapılan çalışmalardan ve birçok kaynaktan faydalanılmıştır. Bu bağlamda faydalanılan çalışmalardan biri olan Gülgün Alpan'ın (2004) "Ders kitaplarındaki metin tasarımı" adlı çalışmasında geliştirdiği ölçek, araştırma dâhilinde geliştirilen "Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeği" büyük ölçüde yol gösterici olmuştur. Alpan'ın (2004) çalışmasından bu araştırmaya kaynak teşkil edecek ölçek maddeleri, metnin tipografik özellikleri ile ilgili olan maddeleridir. Web sitelerindeki metin tasarım unsurlarını değerlendirmeye yönelik ölçek maddeleri; A.Genel Metin Tasarımı, B.Başlıklar, C.Listeler, D.Bağlantılar, E.İçerik başlıkları altında değerlendirilmiştir.

Web sitelerindeki metin tasarımına yönelik ilkelerin belirlenmesi için hazırlanan 74 maddelik metin tasarım unsurları taslağı, üçlü derecelendirme ölçekli veri toplama formuna dönüştürülerek, her bir maddenin geçerliğine ve uygunluğuna ilişkin uzman (8) değerlendirmesine sunulmuştur. Konu alanı ile ilgilenen 5'i öğretim teknolojisi ve 3'ü Türkçe Eğitimi alanında 8 uzman tarafından, ölçek incelemeye tabi tutulmuş, uzmanların her bir madde için verdiği puanların ortalaması alınarak madde ile ilgili, çıkarılması, düzeltilmesi ya da herhangi bir değişikliğe uğramaması gerektiği konusunda karara varılmıştır.

Uzmanlardan gelen geribildirimler doğrultusunda elde edilen verilerden ortalaması 2 ve daha yüksek olan 55 madde ile tanımlanan ilkeler, web sitelerinin metin tasarımı için temel alınmıştır. 74 maddeden oluşan metin tasarım unsurları taslağı uzman görüşü sonucu elde edilen verilere göre düzenlenerek 55 maddelik son haline getirilmiştir.

Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeği 5'li derecelendirme ölçeği şeklinde hazırlanmıştır. Ölçekteki maddeler, (5)Tamamen uygun, (4)Uygun, (3)Kararsızım , (2)Uygun değil, (1)Hiç uygun değil şeklinde puanlanmıştır.

BULGULAR VE YORUM

Araştırmanın ilk alt amacı;

"Eğitsel içerikli web sitelerinin Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeğinde yer alan her bir maddeden aldığı puan nedir?**"**

Araştırmada değerlendirilen web sitelerinin metin tasarım unsurlarına göre her bir maddenin gözlemci değerlendirmesinden aldığı ortalama puanlar Tablo1'deki gibidir. Tabloda:

$\overline{\mathbf{X}}_{n:}$ Her bir site için madde ortalama puanı.

$\overline{\overline{X}}$ **:** Maddelerin sitelerden aldığı ortalama puanların ortalamasını göstermektedir.

Tablo 1. Ölçek Maddelerinin Gözlemcilerden Aldığı Puan Ortalamaları

Ölçek	$\bar{x}_1$	$\bar{x}_2$	$\bar{x}_3$	$\bar{x}_4$	$\bar{x}_5$	$\bar{x}_6$	$\bar{x}_7$	$\bar{x}_8$	$\bar{x}_9$	$\bar{x}_{10}$	$\overline{\bar{X}}$
1	4.0	2.0	1.0	2.0	2.0	2.5	4.0	3.5	3.5	3.5	2.80
2	5.0	5.0	5.0	2.0	1.0	4.0	4.5	2.0	3.5	2.5	3.45
3	5.0	1.0	5.0	4.0	3.0	5.0	3.5	3.5	3.5	3.5	3.70
4	5.0	5.0	2.0	2.0	2.5	4.0	4.0	5.0	2.5	2.0	3.40
5	5.0	2.0	5.0	5.0	2.5	4.0	4.5	4.5	3.0	4.0	3.95
6	5.0	4.0	5.0	5.0	3.5	5.0	4.5	4.5	5.0	4.0	**4.55**
7	5.0	5.0	4.0	5.0	2.0	4.0	4.5	5.0	2.5	4.0	**4.10**
8	-	4.0	4.0	2.5	1.0	5.0	-	1.0	5.0	2.5	3.12
9	4.0	5.0	5.0	5.0	4.0	4.0	4.5	4.0	3.5	3.5	**4.25**
10	5.0	5.0	1.5	5.0	2.0	2.0	5.0	4.0	4.5	4.0	3.80
11	5.0	5.0	5.0	5.0	4.5	5.0	4.5	4.5	4.0	4.5	**4.70**
12	5.0	5.0	5.0	4.5	4.0	4.0	5.0	4.0	4.5	5.0	**4.60**
13	-	5.0	5.0	4.0	5.0	5.0	3.0	1.5	4.5	2.0	3.88
14	1.0	5.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	*1.50*
15	-	4.0	-	-	-	-	1.0	-	-	-	*2.50*
16	1.0	1.0	1.0	1.0	1.0	1.0	2.5	1.0	1.0	1.0	*1.15*
17	1.5	1.0	1.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0	*1.25*
18	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	2.0	2.5	**4.15**
19	5.0	5.0	4.0	5.0	4.0	5.0	5.0	5.0	3.0	3.5	**4.45**
20	5.0	2.0	4.0	2.5	4.5	5.0	3.5	3.5	1.5	1.0	3.25
21	5.0	4.0	5.0	4.5	3.5	5.0	5.0	5.0	5.0	4.0	**4.60**
22	2.0	1.5	4.0	1.5	2.0	5.0	4.0	2.5	3.5	4.5	3.05
23	4.0	4.0	4.0	-	4.5	5.0	5.0	4.5	2.5	4.5	**4.22**
24	-	-	5.0	-	1.0	5.0	-	-	-	-	3.66
25	5.0	2.0	5.0	4.0	4.5	5.0	5.0	5.0	4.5	4.0	**4.40**
26	2.0	2.0	5.0	4.0	4.0	5.0	5.0	4.5	1.0	1.0	3.35
27	5.0	2.0	5.0	1.0	3.5	5.0	4.0	5.0	1.5	2.5	3.45
28	4.5	2.0	5.0	1.0	5.0	5.0	4.5	5.0	2.0	1.0	3.50
29	5.0	4.0	5.0	1.0	3.5	5.0	5.0	5.0	4.5	5.0	**4.30**
30	5.0	4.0	5.0	5.0	5.0	2.5	5.0	5.0	4.0	5.0	**4.55**
31	4.0	1.0	2.0	5.0	3.5	1.5	4.0	1.0	2.0	1.0	*2.50*
32	4.5	1.0	2.0	3.0	2.0	3.5	4.0	4.5	4.5	3.5	3.25
33	5.0	5.0	4.0	4.5	4.5	5.0	5.0	4.5	5.0	4.0	**4.65**
34	1.0	1.0	1.0	1.0	1.0	1.0	5.0	2.5	1.0	1.0	*1.55*
35	4.0	5.0	5.0	5.0	3.5	5.0	5.0	5.0	5.0	4.0	**4.65**
36	2.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	5.0	**4.65**
37	1.5	1.0	1.0	4.0	1.0	5.0	5.0	2.5	2.5	1.5	*2.50*
38	-	-	5.0	-	-	1.0	1.0	-	-	-	*2.33*
39	1.0	4.0	5.0	1.0	4.5	1.0	5.0	5.0	4.5	1.0	3.20
40	4.5	5.0	1.0	5.0	2.0	5.0	5.0	4.0	2.0	1.5	3.50
41	5.0	5.0	5.0	3.5	4.5	5.0	5.0	4.5	1.0	1.5	**4.00**
42	5.0	5.0	1.0	5.0	2.0	5.0	5.0	5.0	1.0	4.0	3.80
43	5.0	5.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	*1.90*
44	2.0	5.0	-	-	1.0	-	5.0	4.5	1.0	-	3.08
45	4.0	2.0	5.0	5.0	5.0	4.0	5.0	4.0	5.0	4.5	**4.35**
46	5.0	4.0	5.0	4.5	4.0	5.0	5.0	5.0	5.0	4.0	**4.65**
47	5.0	1.0	5.0	2.0	3.5	4.5	5.0	4.0	5.0	3.5	3.85
48	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	*1.10*
49	5.0	4.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	**4.80**
50	5.0	2.0	4.0	2.0	1.5	3.5	5.0	4.0	4.0	4.5	3.55
51	5.0	5.0	5.0	4.0	4.0	4.0	5.0	2.5	1.5	4.0	**4.00**
52	4.5	2.0	4.0	4.0	3.5	2.5	5.0	4.5	4.0	5.0	3.90
53	4.5	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	1.0	**4.25**
54	1.0	1.0	1.0	1.0	1.0	5.0	5.0	1.0	1.0	1.0	*1.80*
55	5.0	2.0	2.0	1.0	1.0	1.0	4.0	4.0	1.0	1.0	*2.20*

Araştırmanın ikinci alt amacı;

"Eğitsel içerikli web sitelerinin Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeğine göre en çok dikkate alınan özellikler nelerdir?"

Tablo 1'e göre değerlendirmeye tabi tutulan web sitelerinde ölçek maddelerinden 6, 11, 12, 18, 19, 21, 23, 25, 29, 30, 33, 35, 36, 41, 45, 46, 49, 51 ve 53. maddeler 4,0 puanın üzerinde puan almıştır (Tabloda 4'ün üzerinde puan alan maddeler kalın olarak belirtilmiştir). 49. maddenin uzman değerlendirmesi sonucu ölçekten aldığı ortalama puan 4,80'dir. Bu durum hakkında, incelenen web sitelerinde 49. maddede sözü geçen "Her paragrafta bir konu ya da fikirden bahsedilmiş" ölçütüne tüm web sitelerinde çoğunlukla uyulduğu yorumu yapılabilir.

Araştırmanın üçüncü alt amacı;

"Eğitsel içerikli web sitelerinin Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeğine göre en az dikkate alınan özellikler nelerdir"

Tablo 1'e göre değerlendirmeye tabi tutulan web sitelerinde ölçek maddelerinden 14, 15, 16, 17, 31, 34, 37, 38, 43, 48, 54 ve 55. maddeler 2,5 puanın altında puan almıştır (Tabloda 2,5 puanın altında puan alan maddeler italik yazılmıştır). İncelenen web sitelerinde, bu maddelerdeki metin tasarım unsurlarının en az dikkate alınan özellikler olduğu söylenebilir. Tabloya göre en düşük puan alan madde 48. maddedir. Değerlendirilen web sitelerinde 48. maddede sözü geçen "Sonucun başlangıca konulması (Ters Piramit)" ölçütünün sitelerde göz ardı edilen bir ölçüt olduğu sonucuna ulaşılabilir.

Araştırmanın dördüncü alt amacı;

"Eğitsel içerikli web sitelerinde yer alan metinlerin, Web Sitesi Metin Tasarım Unsurları Değerlendirme Ölçeğine göre zorluk düzeyleri nedir?"

Web sitelerinin metin tasarım unsurları değerlendirme ölçeğinden aldıkları puanlar ve gözlemci puanları arasındaki korelasyon tablolaştırılarak, karşılaştırmalı bir şekilde değerlendirilmiş ve yorumlanmıştır. Her siteye ait değerlendirmeye katılan madde sayıları da Tablo 2'de yer almaktadır.

Tablo 2. Metin Tasarım Ölçeği Sonucunda Web Sitelerinin Metin Tasarımına İlişkin Alınan Veriler

	Gözlemci 1 $\bar{x}$	*Gözlemci 2* $\bar{x}$	*r*	*p*	*Madde Sayısı*	*Aldığı Puan*	*Ölçek Düzeyi*
1. Site	3,92	3,98	,969	,00	50	79,00	Kolay
2. Site	3,34	3,36	,997	,00	53	66,98	Orta
3. Site	3,75	3,77	,997	,00	52	75,19	Orta
4. Site	3,18	3,30	,957	,00	50	66,00	Orta
5. Site	3,00	3,02	,905	,00	53	60,18	Zor
6.site	3,87	3,85	,973	,00	53	77,16	Orta
7.site	4,25	4,28	,855	,00	53	85,28	Kolay
8.site	3,77	3,69	,882	,00	52	73,20	Orta
9.site	3,02	3,15	,916	,00	52	61,73	Zor
10. Site	2,96	2,92	,924	,00	51	58,82	Zor

Sitelerin gözlemciler tarafından, hazırlanan ölçeğe göre yaptıkları değerlendirme sonuçları arasındaki korelasyonun ve güvenilirliğin yüksek olduğu gözlenmiştir. Gözlemcilerin siteler için verdikleri puanlar arasındaki korelasyon katsayısının, mutlak değer olarak, 0.70–1.00 arasında olması yüksek düzeyde bir ilişki olduğunu göstermektedir(Büyüköztürk, 2007).

Tablo2'de web sitelerinin ölçekten aldıkları puan ve bu puana karşılık gelen düzeylerin belirlenmesinde araştırmacı, siteleri değerlendirirken; sitelerden yüksek, orta ve alt düzeyde puan alan maddeleri işaretleyerek bu maddelerin yüzdesini almıştır. Bazı maddelere her sitede ortak olarak uyulmakta ve bu maddeler sayesinde web siteleri ölçekten yüksek puanlar almaktadır. Ölçek düzeyinin puan aralıklarına bölünebilmesi için; her bir maddenin aldığı puanlar toplamı alınarak ölçekteki madde sayısına (55) bölünmüş ve bir maddenin ortalama değeri 3,48 olarak bulunmuştur. Ölçekten alınan puanların kolay yorumlanabilmesi amacıyla bir maddenin alabileceği ortalama değer 100 üzerinden hesaplanmış ve sonuç 1,81 olarak bulunmuştur. Ölçekte başlıklar altında verilen maddelerden, her başlık için yüksek ve düşük puan alan maddeler belirlenmiştir. 2,5 ve altında puan alan maddeler düşük, 4 ve üzerinde puan alan maddeler ise yüksek puan alan maddeler olarak kabul edilmiştir. 2,5 ve üstünde puan alan 43 madde ortalama madde puanı (1,81) ile çarpılarak "Orta güçlük" düzeyinin üst sınırı belirlenmiştir. Yapılan bu işlemler sonucunda "Orta güçlük" düzeyinin üst sınırı 78,18 olarak bulunmuştur. Aynı şekilde 4 ve üzerinde puan alan madde sayısı belirlenip ortalama madde puanı ile çarpılarak "Orta güçlük" düzeyinin alt sınırı 62 olarak belirlenmiştir. Buna göre metin tasarım unsurları açısından 0–61 puan aralığında olan siteler "Zor", 62–78 puan aralığında olan siteler "Orta güçlükte" ve 79'dan yüksek puana sahip olan siteler "Kolay" okunabilir olarak kabul edilmiştir.

İncelenen web sitelerinde 6, 11, 12, 18, 19, 21, 23, 25, 29, 30, 33, 35, 36, 41, 45, 46, 49, 51 ve 53. maddelerdeki metin tasarım unsurlarının dikkate alındığı söylenebilir. 49. maddenin uzman değerlendirmesi sonucu ölçekten aldığı ortalama puan 4,80'dir. Bu durum hakkında, incelenen web sitelerinde 49. maddede sözü geçen "Her paragrafta bir konu ya da fikirden bahsedilmiş" ölçütüne tüm web sitelerinde çoğunlukla uyulduğu yorumu yapılabilir. Tablo 1'e göre değerlendirmeye tabi tutulan web sitelerinde ölçek maddelerinden 14, 15, 16, 17, 31, 34, 37, 38, 43, 48, 54 ve 55. maddeler 2,5 puanın altında puan almıştır. İncelenen web sitelerinde, bu maddelerdeki metin tasarım unsurlarının en az dikkate alınan özellikler olduğu söylenebilir. Tabloya göre en düşük puan alan madde 48. maddedir. Değerlendirilen web sitelerinde 48. maddede sözü geçen "Sonucun başlangıca konulması (Ters Piramit)" ölçütünün sitelerde göz ardı edilen bir ölçüt olduğu sonucuna ulaşılabilir.

SONUÇLAR ve ÖNERİLER

Eğitsel içerikli web siteleri metin tasarım unsurları açısından değerlendirildiğinde Türkiye'de yayınlanan web sitelerinin metin tasarımı açısından düzeyleri hakkında yorum yapılabilir. Araştırmanın bulgularına göre çıkan sonuçlar ve sonuçlara geliştirilen öneriler özetle şu şekildedir:

1. Değerlendirmeye tabi tutulan 10 siteden düzeyleri kolay olarak nitelendirilebilecek site sayısı %20 (n=2), orta düzey olarak nitelendirilebilecek site sayısı %50 (n=5), okunabilirliği zor olarak nitelendirilebilecek site %30'dur (n=3). Bu frekanslara ve araştırma sonunda elde edilen verilere göre Türkiye'de yayınlanan web sitelerinden %20'si okunabilirlik açısından kolay, %50'si orta güçlükte, %30'u ise zor olarak nitelendirilebilir.
2. Eğitsel içerikli sitelerde bilginin kolay anlaşılabilecek şekilde tasarım açısından en sade şekliyle sunulması önem taşımaktayken, bu durumun göz ardı edildiği; sayfadaki bilginin çeşitli resimler, canlandırmalar ve metin efektleri yüzünden arka planda kaldığı görülmektedir. Karmaşık sayfa tasarımları dikkati bilgiden çok, farklı yerlere çekmektedir.
3. İncelenen sitelerde metnin önemli noktaları vurgulanmak istenirken metin tasarım unsurlarından birden fazlasının bir arada kullanıldığı gözlenmektedir. Bu durumun metnin okunurluğu açısından sıkıntı yaratabileceği düşünülmektedir.
4. Ayrıca araştırmada kullanılan veri toplama aracındaki maddeler ve madde puanlarına bakılarak üzerinde çalışılan sitelerde metin tasarım unsurları açısından hedef kitlenin öğrenim düzeyinin dikkate alınmadığı söylenebilir. Eğitsel içerikli web siteleri hazırlanırken tasarım süreci içinde web tasarımcısı hedef kitlenin öğrenim düzeyine göre metin tasarım unsurlarını göz önüne almalı, metinleri kullanıcının vakit kaybetmeden algılayabileceği şekilde tasarlamalıdır. Bu şekilde hazırlanmış siteleri ziyaret eden kullanıcılar, vakit kaybetmeden aradığı bilgiye ulaşabilir ve kullanıcı memnuniyeti artabilir.

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EĞİTSEL YAZILIMLARIN NİTELİKLERİNİ NASIL ÖLÇEBİLİRİZ?: BİR ÖLÇEK ÖNERİSİ

HOW CAN WE EVALUATE THE QUALİTY OF EDUCATİONAL SOFTWARE?: A SCALE PROPOSAL

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Özet

Eğitimde bilgisayar ve öğretim teknolojilerinin etkili kullanımı sıklıkla dile getirildiği halde, var olan eğitsel yazılımların öğrenme-öğretme gereksinimlerini ne ölçüde karşıladığının belirsiz olması ve eğitsel yazılımların değerlendirilmesine yönelik geçerliği ve güvenirliği saptanmış araçların eksikliği, ülkemiz açısından üzerinde durulması gereken önemli konulardandır. Bu doğrultuda yapılan bu çalışmada, üretilen eğitsel yazılımların değerlendirilmesine yönelik alanyazın incelenerek geliştirilmiş olan bir "*eğitsel yazılım değerlendirme ölçeği"* sunulmaktadır. Ölçeğin, kapsam geçerlik oranı 0,89; puanlayıcılar arası güvenirliği ise 0,81 olarak hesaplanmıştır. Son hali 50 maddeden oluşan bu ölçek, eğitsel özellikler, görsel tasarım özellikleri, çoklu ortam özellikleri, içerik, yönlendirme ve yardım, kurulum ve kullanım özellikleri şeklinde altı boyuttan oluşmaktadır. Ölçeğin özellikle derslerinde bilişim teknolojilerinden yararlanmayı planlayan öğretmenlere ve akademisyenlere kullanacakları eğitsel yazılımları seçme, karşılaştırma ve değerlendirme olanakları sağlayacağı; eğitsel yazılım geliştirmeyle ilgilenenlere ise yol gösterici bir ölçüt seti olacağı düşünülmektedir.

ANAHTAR SÖZCÜKLER: Eğitsel Yazılım, Eğitim Yazılımı, Eğitsel Yazılım Değerlendirme

ABSTRACT

Although effective use of computer and instructional technology in education is frequently mentioned, uncertainty of capabilities of current educational software in fulfilling teaching and learning needs and the lack of valid and reliable measurement tools are worth for studying in turkey. Accordingly, this paper aims to present an "*educational software evaluation scale" (eses)* which used findings of previously developed educational software evaluation tools. The construct validity ratio of the scale is 0.89. While inter-rater reliability is 0.81. Final version of the eses including 50 items is of six dimensions as educational elements, visual design-interface, multi-media, content, navigation and help, installation and usability. Eses is considered to be a useful tool for teachers and academicians who intend to make use of educational software in selecting, comparing and evaluating educational software and it can also guide educational software developers as a criteria set.

KEYWORDS: Educational Software, Courseware, Educational Software Evaluation.

Giriş

Eğitimde bilgisayar ve öğretim teknolojilerinin etkili kullanımı sıklıkla dile getirildiği halde, var olan eğitsel yazılımların öğrenme-öğretme gereksinimlerini ne ölçüde karşıladığı belirsizdir ayrıca eğitsel yazılımların değerlendirilmesine yönelik açıkça belirlenmiş yöntemler geliştirilememiştir (Williams, Boone ve Kingsley, 2004; Sim ve diğ., 2006). Bu nedenle, bu çalışmada eğitsel yazılımları değerlendirmek üzere geçerli ve güvenilir bir ölçek geliştirilmesi amaçlanmıştır.

Eğitsel yazılım geliştirme ve değerlendirme

Mutlu ve Özkul (2003), eğitsel yazılım geliştirme sürecinde temel aşamaları, "çözümleme", "tasarım", "geliştirme", "uygulama" ve "değerlendirme" olarak belirtmiştir. Bu süreçte, eğitsel yazılımın üretimi aşamasında yazarlık sistemlerinin kullanımı, uygulamasında ise öğrenim yönetim sistemlerinin kullanımı öngörülmektedir. Ayrıca yazılım geliştirme boyutu teknik işlemler olarak tanımlanarak eğitim yazılımları geliştirme sürecinin görüş açısının dışında bırakılmaktadır. Değerlendirme, bir ürünün özelliklerinin belirlenmiş ölçütlerle karşılaştırılması ve buradan bir karara varılması işlemidir. Erişen ve Çeliköz'e (2007) göre, yazılım değerlendirmede, ilk olarak yazılımın belirli niteliklere sahip olma düzeyi belirlenir, ardından bu düzey öngörülen düzeyle karşılaştırılır. Yazılım kullanıcılarının, üretilen yazılımların kendi beklentilerine uygunluğunu gözetme hakları bulunmaktadır. Kelly (2008) ise eğitsel yazılım değerlendirmeyi, yazılımların sunduğu öğrenme deneyimlerinin ne ölçüde etkili olduğunun incelenmesi olarak ifade etmiştir. Buna göre, eğitsel yazılımların hedef kitlenin öğrenme gereksinimine, beklentisine uygun olarak eğitim programlarının hedefleriyle tutarlı öğrenme yaşantıları sunabilmesi ve bunu etkili olarak gerçekleştirmesinin önemli olduğu düşünülmektedir.

Eğitsel yazılımların ya da ders yazılımlarının niteliklerinin değerlendirilmesinde çeşitli yaklaşımlar ve değerlendirme formları kullanılmaktadır. Değerlendirme; (a) geliştirmeye/ biçimlendirmeye yönelik, (b) seçmeye/ düzey belirlemeye yönelik gerçekleştirilebilir (Akpınar, 1999; Williams et al.,2004; Erişen ve Çeliköz, 2007; Bishop, Amankwatia ve Cates, 2008). Alternatif değerlendirme yöntemleri de kullanılabilmektedir. Örneğin, Kelly (2008), Avustralya Queensland Üniversitesi'nde geliştirilen çevrimiçi işbirlikli yazılımlarını (OCS), öğrenci-öğretmen ve öğrenci-öğrenci işbirliğiyle değerlendirmiştir. Kullanıcı değerlendirme araçları arasında odak grup görüşmeleri, kullanıcı gözlemleri, elektronik ve kağıt üzerindeki anketler ve yazılıma duyulan güven dereceleri yer alabilir. Shiratuddin ve Landoni'ye (2002) göre, eğitsel yazılımlar genellikle 5 nedenle değerlendirilir. Bunlar; (a) yeni geliştirilen programların değerlendirilmesi, (b) alternatif programlar arasından seçim yapmak, (c) bir programı uygulamaya koymak, (d) bir programa devam etme konusunda karar vermek, (e) var olan programları düzeltmek, düzenlemek. Sayılanlardan (a) ve (e) maddeleri geliştirmeye/ biçimlendirmeye yöneliktir, diğer maddeler ise seçmeye/ düzey belirlemeye yöneliktir. Eğitsel yazılımlarda uygunluk, işlerlik, etkililik ve verimlilik birer kalite göstergesi olarak görülebilir (Erişen ve Çeliköz, 2007). Seferoğlu'na (2006) göre, bilgisayar yazılımlarını değerlendirmede şu ölçütlere bakılabilir: (1) Programla (hedeflerle) uyumu, (2) Doğruluğu, (3) Dilin açık, öz ve anlaşılırlığı, (4) Güdüleyici olması/ dikkati canlı tutması, (5) Katılımı teşvik etme özelliği, (6) Teknik kalitesi, (7) Etkililik derecesi (ör. Alan testi sonuçları bir kanıt olabilir), (8) Önyargılardan arındırılmış olması, (9) Kullanıcı kılavuzu, (10) Yönergelerin açıklığı, (11) Yaratıcılığı teşvik etme özelliği. Kaya (2005) tarafından önerilen yazılım değerlendirme kontrol listesindeki temel ölçütler ise şu şekilde özetlenebilir: (1) Kurulum ve işletim, (2) İçerik, (3) Sorgulama teknikleri, (4) İlgi ve sürekliliğin sağlanması, (5) Yaratıcılık, (6) Kullanıcı kontrolü, (7) Dönüt, (8) Değerlendirme ve kayıt tutma, (9) Teknik kalite, (10)

Dokümantasyon ve destek. Görüldüğü gibi araştırmacılar, eğitsel yazılımları değerlendirmede farklı ölçütleri ele alabilmektedir. Eğitim ortamlarında kullanılacak olan eğitsel yazılımları seçmek üzere kullanılabilecek geçerli ve güvenilir bir yazılım değerlendirme aracı önemli bir gereksinim olarak karşımıza çıkmaktadır.

Aday ölçek geliştirilirken kapsam geçerlik oranlarına başvurulmuştur. Ölçek geliştirme çalışmalarında deneysel uygulamaların olanaklı olmadığı durumlarda *kapsam geçerlik oranlarına* başvurulur. Kapsam geçerlilik oranları, uzman görüşlerine dayalı nitel çalışmaları istatistiksel nicel çalışmalara dönüştürmek için kullanılan bir yöntemdir (Yurdugül, 2005). Lawshe tekniği olarak bilinen kapsam geçerlilik oranlarının hesaplanmasında 6 basamaktan oluşan bir yol izlenerek en az 5 en fazla ise 40 uzmanın görüşlerine başvurulur. İzlenen basamaklar şu şekildedir:

a) Alan uzmanları grubunun oluşturulması
b) Aday ölçek formlarının hazırlanması
c) Uzman görüşlerinin elde edilmesi
d) Maddelere ilişkin kapsam geçerlik oranlarının elde edilmesi
e) Ölçeğe ilişkin kapsam geçerlik indekslerinin elde edilmesi
f) Kapsam geçerlik oranları/indeksi ölçütlerine göre nihai formun oluşturulması

Araştırmaya konu olan "Eğitsel yazılım değerlendirme formu"nun geliştirilmesinde ilk olarak BÖTE alanı uzmanlarının e-posta adresleri İnternet aracılığıyla elde edilmiştir. İlgili alanyazının ve önceden hazırlanmış yazılım değerlendirme formlarının incelenmesinin ardından 63 maddeden oluşan aday ölçek formu hazırlanmıştır. Türkiye'deki BÖTE bölümleri öğretim elemanlarına iletilen aday ölçek formuna 10 uzman tarafından görüş bildirilmiştir. Aday ölçek formundaki her bir maddenin Kapsam Geçerlik Oranı'nın (KGO) hesaplanmasında aşağıdaki formül kullanılmaktadır:

$$KGO = \left(N_G \div \frac{N}{2}\right) - 1$$

N_G: Maddeye gerekli diyen uzmanların sayısı

N: Maddeye görüş belirten toplam uzman sayısı

α=0,05 anlamlılık düzeyinde KGO'ların minimum değerleri (kapsam geçerlik ölçütleri) Veneziano ve Hooper (akt. Yurdugül, 2005) tarafından tabloya dönüştürülmüştür. Buna göre, araştırmada ilk olarak 10 uzmanın görüşlerine başvurulduğu için α=0,05 anlamlılık düzeyinde KGO'lar için aranacak minimum değerin, Kapsam Geçerlik Ölçütü (KGÖ) 0,62'dir. Aday ölçek maddelerinin kapsam geçerlik oranlarının hesaplanmasının ardından, tüm KGO'ların ortalaması alınarak ölçeğin tamamına ait *Kapsam Geçerlik İndeksi (KGİ)* **0.89** olarak hesaplanmıştır. Ölçeğin KGİ> KGÖ (0,62) olduğundan ölçeğin kapsam geçerliğinin istatistiksel olarak anlamlı olduğu söylenebilmektedir.

Ölçeğin Güvenirlik Çalışması

Eğitsel yazılım değerlendirme ölçeğinin güvenirliğini sınamak üzere BÖTE alanında çalışmakta olan 5 uzmandan, aynı eğitsel yazılımı, geliştirilen ölçeği kullanarak incelemeleri istenmiştir. Ölçek maddelerinin uzunlukları, yeterince açık ve anlaşılır olma durumları konusunda da ilgili uzmanların görüşü alınmıştır. Bu değerlendirmeler doğrultusunda Eğitsel Yazılım Değerlendirme Formu son haline getirilmiştir *(EK-1)*. Uzmanların değerlendirmeleri alındıktan sonra, puanlayıcı güvenirliği (inter-rater reliability) hesaplanmıştır. Buna göre, ölçeğin güvenirliği **0,81** olarak hesaplanmıştır. Yapılan geçerlik ve güvenirlik çalışmaları sonunda geliştirilen ölçeğin nihai hali 50 maddeden oluşmaktadır. Bu maddeler; eğitsel özellikler (11), görsel tasarım özellikleri (5), çokluortam özellikleri (7), içerik (7), yardım (5), kurulum ve kullanım özellikleri (15) şeklinde gruplandırılmıştır. Ölçek maddeleri 0 ile 4 (0: 0 puan/Gözlenmedi, 1: 1 puan/Zayıf, 2: 2 puan/Orta, 3: 3 puan/İyi, 4: 4 puan/Çok iyi) arasında puanlanmaktadır. Ölçekten alınabilecek en düşük puan 0, en yüksek puan ise 200'dür.

TARTIŞMA VE SONUÇ

Bu çalışmada, eğitsel yazılımların değerlendirilmesinde kullanılabilecek geçerli ve güvenilir bir ölçme aracı geliştirme sürecinin paylaşılmasının yanı sıra Türkiye'de eğitsel yazılım geliştirme alanındaki bu gereksinime dikkat çekebilmek amaçlanmıştır. Türkiye'de eğitsel yazılımların ya da ders yazılımlarının niteliklerinin değerlendirilmesinde farklı araştırmacılar tarafından önerilen çeşitli yaklaşımlar ve değerlendirme formları önerilmektedir (Kaya, 2005; Seferoğlu, 2006; Erişen ve Çeliköz, 2007). Var olan değerlendirme formlarının eksik ve sınırlı yönlerine rastlanması ve bu araçların geçerliği ve güvenirliğine ilişkin bulgulara rastlanmaması bu amaca yönelik bir ölçek geliştirilmesini gerektirmiştir. Yurdugül'e göre (2005), son zamanlarda eğitim alanında süreç ya da ürün değerlendirmeye yönelik olarak gözlemleyici merkezli ölçme araçlarına ilişkin uygulamaların arttığı görülmektedir. Gözlemleyici merkezli yaklaşımlarda ölç(ül)meye konu olan özelliklerin daha özel alanlarda yer almasından ve bu alanda geniş örneklemelere ulaşmanın zorlukları düşünüldüğünde kapsam geçerlik çözümlemelerinin uygulanabileceği görülmüştür. Buna göre geliştirilen eğitsel yazılım değerlendirme formunun geçerliğinin belirlenmesi için uzman görüşleri doğrultusunda, maddelerin kapsam geçerlik oranları saptanmış, gerekli düzenlemelerin sonucunda ölçeğin kapsam geçerliği 0,89 olarak hesaplanmıştır. Ölçeğin güvenirlik çalışması için 5 uzmanın aynı eğitim yazılımını, geliştirilen formu kullanarak değerlendirmeleri istenmiştir. Hesaplanan puanlayıcılar arası güvenirlik analizinde alfa 0,81 olarak belirlenmiştir. Rubio ve diğerlerine (2003) göre, bir ölçeğin geliştirilmesi asla bitmeyen bir süreçtir. Ancak, puanlayıcı ya da gözlemci merkezli bir ölçek geliştirme noktasında gerekli bilimsel işlem basamaklarının izlendiği bu çalışmanın, eğitim araştırmalarında yararlı bir örnek olması, kullanışlı bir değerlendirme aracı olarak kullanılması ve eğitsel yazılım ya da ürün geliştirme ve değerlendirme araştırmalarına yararlı olabilmesi arzu edilmektedir.

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EK-1. EĞİTSEL YAZILIM DEĞERLENDİRME FORMU (NİHAİ FORM)

Değerlendiren kişinin adı:…….. …….
Değerlendirdiği yazılımın adı: ……
Yazılımı üreticisi (üreticileri):…… Üretim tarihi:……

Bu form aracılığıyla, incelemiş olduğunuz eğitsel yazılımının aşağıdaki özelliklerini 0 ile 4 **(0: 0 puan/Gözlenmedi, 1: 1 puan/Zayıf, 2: 2 puan/Orta, 3: 3 puan/İyi, 4: 4 puan/Çok iyi)** arasında puan vererek değerlendirebilirsiniz. Lütfen ilgili kutucuğa (X) işareti koyarak değerlendirmelerinizi yapınız.

Öğr.Gör. Alev ATEŞ - Ege BÖTE

	EĞİTSEL YAZILIMIN ÖZELLİKLERİ	0	1	2	3	4
	1. Eğitsel Özellikleri					
1	Hedef kitlenin öğrenme gereksinimlerine uygunluk					
2	Hedefleri uygun biçimde belirtmesi					
3	Öğrenen kitlesi açısından tümcelerin açık ve anlaşılır olması					
4	Konuya dikkat çekebilmesi					
5	Öğrencilerin ön bilgilerini sınaması					
6	Yönergelerin açık ve anlaşılır olması					
7	Sayfa başlıklarının konuyu yansıtması					
8	İstenmeyen unsurlardan (ırk, din, dil, şiddet, saldırganlık, korku, cinsiyet ayrımı vb.) arınık olması					
9	Gereken her durumda öğrenciye geribildirim vermesi					
10	Yeterli miktarda alıştırma ve uygulama yapma olanağı sunması					
11	Ders konularının öğrenilmesini desteklemesi					
	2. Görsel Tasarım Özellikleri					
12	Metinlerin gereğinden az veya fazla olması					
13	Menülerin uygun tasarlanması					
14	Düğmelerin (buton) uygun tasarlanması					
15	Sayfa başlıklarının yerleşim açısından uygunluğu					
16	Görsel tasarım ilkelerine uygunluğu					
	3. Çoklu ortam Özellikleri					
17	Kullanılan çoklu ortam öğelerinin (ses, video, metin, animasyon, simülasyon, resim, vb.) amaca uygunluğu					
18	Tüm işitsel unsurların (ses, müzik, konuşma vb.) olması					
19	Yeterince görsel unsurun (resim, video, grafik) olması					
20	Yeterince canlandırmanın (animasyon) olması					
21	Çoklu ortam öğeleri ile ilgili açıklama ve göndermelerin uygunluğu					
22	Video gibi görsel unsurlar için durdurma, ileri, geri, yeniden oynatma özellikl**erinin** etkin çalışması					
23	Ses, müzik gibi işitsel unsurlar için durdurma, ileri, geri, yeniden oynatma **özelliklerinin** etkin çalışması					
	4. İçerik					
24	İçerikte doğru bilgilere yer verilmesi					
25	İçerikte güncel bilgilere yer verilmesi					
26	Konunun diğer derslerle ilişkilendirilmesi					
27	Konunun gerçek yaşamla ilişkilendirilmesi					
28	İçeriğin basitten karmaşığa/somuttan soyuta doğru düzenlen**mesi**					
29	Yazılım içeriğine ait bir "Kaynakça" bölümünün **olması**					
30	Dilin, doğru ve etkili kullanılması					
	5. Yönlendirme ve yardım					
31	Sayfalar arası bağlantıların (ileri, geri, **ana** sayfa**) yeterli olması**					
32	Öğrenciye gerekli durumda ipuçları su**nulması**					
33	Yazılımda, işlevsel bir yardım men**üsünün olması**					
34	Etkileşimli bir yazılım haritasının **olması**					
35	Yazılımın kullanımı ile ilgili gerekli **yönlendirmelerin** yazılım**da** olması					
	6. Kurulum ve Kullanım Özellikleri					
36	Yazılımın, kullanım **kılavuzuna bakılmadan kolaylıkla k**ullanılabilmesi					
37	Yazılımın otomatik **olarak kurulması**					
38	Yazılımın ekran **boyutunun kullanıcının isteğ**ine göre değiştirilebilmesi					
39	Kullanıcının, **istediği yerden yazılıma başlayab**ilmesi					
40	Kullanıcının**, kaldığı** yerden **sonradan kolaylık**la devam edebilmesi					
41	Kullanıcı adı **ve şifresi gibi kullanıcı bilgi**lerinin kaydının tutulması					
42	İst**ediğinde** yazılımın **ayarlarını (**arka plan, fon müziği..vb.) değiştirebilmesi					
43	Yazılı**mın kull**anıcı **komutlarına** kısa sürede yanıt verebilmesi					
44	Yazılım **ekranında**ki tüm **öğe**lerin işlevlerinin açık ve anlaşılır olması					
45	Kullanım k**ılavuzund**a yazılımın yüklenmesi ve çalıştırılması ile ilgili yönergelerin yeterli olması					
46	Kullanım kılavuzu**nda y**azılımın çalışması için gerekli minimum sistem gereksinimlerinin olması					
47	Kullanım kılavuzunda yazılım üreticileriyle iletişim bilgilerinin olması					
48	Yazılımın hatasız çalışması					
49	Yazılım içeriğinin güncellenebilmesi					
50	Ek bir program kurmayı gerektirmemesi					
	GENEL TOPLAM					

Diğer Görüşleriniz:

E-LEARNING ACTIVITIES INTENDED FOR SOCIAL STUDIES EDUCATION IN TURKEY

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Abstract

E-learning is a new example for use of technology in education field. E-learning media built by utilizing from computer networks, gives students the opportunity of creating a learning environment by themselves without any time and location limitations and also gives them the opportunity of sharing information with other students or teachers by communicating with them synchronously or asynchronously. In addition, enriching of e-learning environment with audio-visual educational tools increases motivation of student towards lessons and interaction with these audio-visual aids provides active participation of student to the lesson.

In this study, goals intended in studies which will be carried out by the ministry of education within the context of e-learning will be mentioned and educational materials and learning media intended for social studies education will be analyzed in detail.

KEY WORDS: E-Learning, Advantage Of E-Learning, E-Learning Using The Social Studies, E-Learning In Turkish Education System, Turkish E-Learning Projects.

Introduction

Many qualitative and quantitative improvements in education as well as economy, social life and many other areas have taken place in the 21st century, which we can name as communication and information era. Information and sharing the information is gradually gaining importance in every part of our social life. Thus, educational institutes are trying to provide their students with every device necessary for them to reach the information easier and faster.

Not only the content of the information but also the process to reach it is important. Therefore, education systems are aiming at both having the students gain the new information and assuring that the process is as fast as possible. This requires the use of new technological devices and systems during the transfer of the information. For this aim, they are investing more in education systems to realize technology and technology based applications. Among these investments, e-learning has a significant place as an application supported by many countries these days.

What Is E-Learning

E-learning is an approach to teaching and learning that utilised Internet technologies to communicate and collaborate in an educational context. This includes technology that supplements tradition classroom training with web-based components and learning environments where the educational process is experienced online (Cotechuang, A. 2005). E-learning, which includes much more different approaches and policies than traditional education activities, brings about quite essential and structural changes in learning-teaching processes in terms of theory and practice (Kurubacak, 2009). E-learning environments can be used in the form of systems that are based on the transfer of educational content either directly or as course supportive materials. Educational content enables the text, picture, sound and image files designed and produced in accordance with web technology to be distributed interacting with the students in these environments (Yılmaz & Gümüş, 2005).

E-learning environments differ from classical learning environments in terms of both environment and time. Teachers and students' sharing a specific physical environment within a planned time limit and the use of teacher or published materials as the source of information are a necessity of classical learning environments. The duty of the students in these environments is not something more than attending the activities as a passive recipient and memorizing the content offered. However, the student who reaches the information through various means in e-learning environments and who use and share the achieved information actively is totally independent in terms of placed and partly independent in terms of time. The diversification of e-learning environments in time dimension has brought about synchronous and asynchronous learning environments. Individuals, who are independent of place in synchronous learning environments, come together in virtual environment concurrently. Means such as video conference and IRC are suitable to this learning environment. On the other hand, in asynchronous learning environment, students are taught in different settings in terms of both place and time.

Use of ICT and E-Learning in Turkey

E-learning is quite a new approach for Turkey. However, Turkish education system is obliged to make use of the opportunities offered by information and information technologies to a maximum extent in order to realize the requirements of 21st century and train the experienced and qualified people. Although some projects and attempts have been started for this purpose as from 1984, ICT took place in education policies with e-Turkey studies and "E-Dönüşüm Türkiye Projesi (E-Transformation Turkey Project)", which were introduced in 2003. Some concrete policies and targets towards ICT have been realized since that date. Education Technologies Head Office is carrying on the studies about ICT on behalf of Ministry of National Education and trying to do some projects. The most important of the studies realized in this subject are "Çağı Yakalama 2000 Projesi (Overtaking the Era 2000 Project)", which determined the aims, and ""Milli Eğitimi Geliştirme Projesi (MEGP) (National Education Improvement Project)", which started in 1992 with the support of World Bank and completed in 1997. Many projects have been realized in Ministry of National Education within the aims of "Overtaking the Era 2000 Project". Computer laboratories are set in different schools and necessary studies for the use of computers have started within "National Education Improvement Project" (Bayrakçı, 2005). Furthermore, Ministry of Education aims to make the use of ICT in education common attending the World Links for Development Program, in which 25 countries are included, in 1998. The aim of the World Links for Development Program is to make the teachers and students throughout the world come together on the internet, develop common learning methods and realize learning activities that are based on cooperation, project rooted and student centered.

The following studies towards short, medium and long-term aims determined within the realization of learning environment are done by the Ministry of National Education (Aytaç, 2003).

- Setting up adequate information technology classes in all schools and Education institutes.
- Setting up the education portal and meeting any kind of information requirement of people from every stage of education through the internet.
- Developing education programs aimed at diploma and certificate by using distant education techniques.
- Developing learning centers and making them common.
- Realizing the e-learning approach in the in-service training activities.
- Starting the e-exam application.

While projects about the use of e-learning environment in teaching-learning process intended to achieve these goals are increasing gradually, there are some factors such as the shortages in internet infrastructure, incompetency of the legislation, limited encouragements peculiar to this field, scarcity of Re-De (research and development) investments in these fields, failure in the establishment of a public opinion and inadequate acquaintance of the decision makers with the subject seen as factors limiting full adaptation to e-learning environments. However, the provision of the internet access of 621.000 computers and about 12 million students, including 100% of high school students and 94% of primary school students, is an indication of a high decrease in the internet access problem (MEB, 2009b).

On the other hand; there are some problems about the establishment of e-learning environment in teaching-learning process in schools where there is no internet access due to some reasons such as the geographical conditions of the country, large quantities of schools and institutions, the unsuitability of the schools to the installation of computer technology infrastructure and the heterogeneousness of the school distribution in accordance with regions. However, ADSL infrastructure works are still being carried out by Turkish Telecommunication A.Ş. to overcome these problems. Besides, there is a need to develop software and web-based teaching materials which the students can use and appropriate websites (MEB, 2009b).

Use of E-Learning in Social Studies Education

Social Studies is "an area which consists of the unity of social and humanity sciences to increase the students' citizenship adequacies" (NCSS, 1994: vii). This study area appears as a subject taught in the 1st. and 2nd stages in primary schools in Turkey. This is stated in the Social Studies teaching program as;

"A primary school subject which is set up with collective teaching approach, in which person is examined by its interaction with its social and physical environment within past, present and future, which includes the unification of the learning areas under a unit and theme, and which reflects subjects such as history, geography, economy, sociology, anthropology, psychology, philosophy, political science and citizenship in order to help the individual to realize its social existence" (MEB, 2005).

When the sample activities which take place in Social Studies teaching programs (4^{th}-7^{th} classes) are examined, it is suggested that learning can take place not only in class but also everywhere and every time. In this sense, studies are done to make e-learning environments more functional using new Social Studies views and practices in order to ensure the functionality of learning environments and enrich the content of them. Whereas not much importance is given to the communication devices depending on the use of computer and the internet in old Social Studies teaching programs (1997), the new program (2004) mentions the necessity for students to use computer and the internet.

Different dimensions of Social Studies education matches with the mental skills which e-learning environment will provide. For instance, in e-learning environment, students will be able to comprehend the sustainable development and global citizenship concepts which are among the subjects that Social Studies education primarily supports. Critical thinking, communication, research, problem solving, social participation, empathy and technology skills which the Social Studies aim to have the students acquire will develop more.

Providing students with sustainable progress and global citizenship concept within Social Studies Education is possible with skills and values that can be achieved through international cooperation and studies. Primary subjects to be investigated about the education of these concepts are (Corbett, 2005:2);

- Keeping the environment, reducing the environmental pollution and the management of natural sources with a sustainable method
- Reducing the inequality between the people living on earth and keeping human rights
- Developing peace and harmony between societies and increasing social cooperation.

Within these subjects, students ensure the acquisition of information using information technologies in e-learning environments, and share information and exchange ideas through communication technologies. They share the social, economical and environmental problems they face with in their areas and their problem solving suggestions with other people, and they develop cooperation working in common projects. Their using the internet and intranet technologies in e-learning environment improves their technology using skills. Likewise; sharing information, exchange of ideas and project activities improve their research, communication, decision making, problem solving and social participation skills. However, it is a fact that, despite these advantages that e-learning environments ensure, there are also limitations. Some social, cultural and religious disagreements between communities and the adaptation of e-learning users to a different language can be seen among these limitations. E-learning trainers and instructional designers can strive to achieve consistency while allowing flexibility. In essence, global e-learning personnel need to be (Wentling, et al, 2000):

- Aware of , respect and manage cultural differences
- Work with social constrains and avoid sensitive issues
- Be aware of and learn the native language(s) or find good interpreters
- Take into consideration technological infrastructure, and the cultural aspects and implications of a wide range of technologies.

E-learning Environments That Can Be Used in Social Studies Education in Turkey

Every Time Everywhere Education Project: It is a portal which the Ministry of National Education developed to support the successes of students. In this portal, in addition to other teaching programs, there are also activities, exercises, tests and enjoyable contents together with course and subjects appropriate to the learning areas and achievements which take place in Social Studies Education Program (MEB, 2009c).

Vitamin Project: It is a free access site provided by Turkish Telecommunication Inc. Teachers working in state schools and students studying in 4th, 5th, 6th, 7th and 8th grades of state schools will be able to access this site free. The Social Studies contents in this site are appropriate to the teaching program of the Ministry of National Education and they are prepared with interactive exercises, experiments, three dimensional role-plays, worksheets and class activities (MEB, 2009a).

The Greenbox Project: It is a multi-purpose environment education set which primary school teachers and students can reach with internet access. This set focuses on specific subjects about environmental protection and sustainable development which take place in primary education Social Studies teaching program. Green Box consists of a teacher handbook including course plans and study notes, of a DVD including animation and short films, of an interactive CD including comprehensive information about environmental subjects and of dilemma games. It deals with not only information build up about certain subjects but also setting up new values and developing a new behavior model at school, at home and in the society. In this sense, students are partners with teachers in realizing various activities, having debates, role-playing and decision making (Yeşilkutu Projesi, 2009).

Include Me Project: It is the social knowledge, communication and sharing platform which is also among the aims of Social Studies aims. Educational contents and cooperation devices are used together in this platform. The aim of this project is to make it easy to produce and share educational information and to make education fun and effective. Every student is provided with a computer and every school is provided with limitless e-learning contents through a pedagogical social study sharing portal within the project. The project is maintained with the cooperation of Intel Corporation, the Ministry of National Education, United Nations Development Program, and Youth Association for Habitat and Turkey Informatics Foundation (BeniDahilEt, 2009).

The most important feature of these portals is that they are sites by which students can attain the achievements intended to realize the aims of Social Studies teaching program. Content in these portals are enriched by visual items and activities to increase the students' motivation and attract their attention. Another remarkable feature of these portals is that they are asynchronous learning environments. Asynchronous learning environments are an advantage for the students to use the time in accordance with their learning speed in completing processes such as understanding the content, doing the learning activities and answering the evaluation questions. However, students may move away from these environments and their motivation may decrease when the students are given feedback late on the information they share while using asynchronous communication devices such as e-mail and forum. This may be seen a restriction also for these portals designed for Social Studies Education. In fact, no arrangement about synchronous learning environments exists in these portals.

Another restriction of these portals is that no activity about global issues and global citizenship, which are among the aims of Social Studies Education, exists in them. Portals are prepared in Turkish, the native language of the country. Thus, the students are able to debate on the problems they face with regionally or throughout the country and their suggestions to solve those problems. One problematic side of these portals is that they haven't got an international dimension.

Conclusion

E-learning has made it possible to pass from a teacher centered classical method to a method appropriate to a student centered, interactive and constructivist approach. In this learning environment, learning occurs everywhere and every time but not only in educational institutes. In the light of new technological advances, e-learning has changed the role of teachers as a information store and transmitter and let them serve as a guide providing alternative learning options for their students in classroom.

E-learning environment is among the prior subjects of the Ministry of National Education, which tries to form the education system in accordance with technological advances. Both the Ministry of National Education and other state and civil community associations are trying to realize e-learning projects that will support the improvement of education system. Therefore, completed projects can be seen as a preliminary in the realization of more comprehensive projects.

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E-LEARNING: DYNAMIC GEOMETRY CONSTRUCTION WITH GEOGEBRA

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ABSTRACT

The idea of this paper is to develop a better visualization of the geometric constructions made with compass and straightedge. The pupils in elementary schools draw these geometric constructions in their notebooks, but frequently their final version of the construction is crammed with additional straight and curved lines, so it becomes difficult for them to perceive the main elements of the construction.

the main purpose of this paper is to compose several basic geometric constructions with the help of the freely-available dynamic mathematics software geogebra, and to place them on the pbworks service together with a step by step explanation how to make them, which will provide the opportunity to the pupils to compose the constructions by themselves.

with the software the making of the geometric construction becomes more interesting, and it gives the pupils a clear image how the construction should look like. One of the big advantages of geogebra is the possibility to test the construction, which is more difficult when the construction is made on paper.

KEYWORDS: Construction, Geometry, Geogebra, Straightedge, Compass, Ruler, Caliper, Angle, Triangle, Segment, Copy

INTRODUCTION

Everyday living depends of the development of technology, ask to change our habits and to accept the technology in our lives. The technology is present in every area in our life, even in education. For further advance for us as individuals or as society, the educational process has to be at first place.

The idea of this paper is to get better visualization for the compass and straightedge constructions. These constructions are drawn by the students in their notebooks and often the final work is crammed with additional straight and curved lines, so the students cannot perceive the main elements of the construction. Geometry as a mathematical branch is hard to understand from the majority of the students, especially in lower classes. Therefore there should be new admission for the geometry presentation. We have to pay attention, the new admission to be suitable for the facilities and the needs of the students, their age and at the same time studying and the realization of their creativity to ensure. Because of that, mathematical software that give a closer geometry approach to students and helps them to understand it, have and must have wider usage in the classroom.

The main target for this paper is, with the help of the free open-source mathematical software Geogebra, a new basic compass and straightedge constructions to be done, and the before mentioned to be posted on the PBWorks service, with an explanation how they have been constructed, so that the students have a chance to do the constructions by themselves. The YouTube presentations, represent an additional source of help for the students, while they make the constructions. Thus, students have a complete audio-visual perception for the basic compass and straightedge constructions, so they can easily make their own constructions.

To create the basic geometric constructions using the mathematic software applications is interesting for the students, because they have a clear perception for the final construction. In addition, they can use different colors to present the construction objects and the most important is that they can test their constructions. One great advantage of the mathematic software Geogebra is the possibility to test the constructions, which is more difficult to be done when the constructions are made on a piece of paper.

Geogebra and YouTube presentations are made and intended for Math teaching in the elementary schools in Macedonia (5^{th} and 6^{th} grade). On the PBWorks service, a page with an explanation of the basic Geogebra tools used with the compass and straightedge constructions is set:

- Основи на конструкциите со шестар и линијар со Геогебра

As well as the seven basic compass and straightedge constructions:

Macedonian version	English version
Копирање на отсечка	Copy a line segment
Копирање на триаголник (страна - страна - страна)	Triangle copy
Копирање на агол	Angle Copy
Преполовување на отсечка (средна точка)	Bisect segment
Конструкција на нормала	Construct perpendicular
Преполовување на агол	Bisect angle
Конструкција на паралела	Construct paralell

Table 1. Seven basic compass and straightedge constructions

Each of the seven compass and straightedge constructions is consisted of:

- Defining the basic parameters of the problem: what is given (which are the input parameters) and what is the goal of the problem.
- YouTube Mathcast – Audio-visual explanation of the construction, that presents a video file set on the web page YouTube, where the explanation shows how the construction is made with Geogebra. The video is file with a high resolution made with software Camtasia studio.

- Exploring interactivity – applet made with the software GeoGebra in which the construction is presented, and gives opportunity to watch and explore the steps of construction.
- Geogebra Interactivity – empty Geogebra applet, in which the students can create the previously described construction. This part is intended for the students, and contains directions for interactivity, explaining every step of construction.
- Metadata – Basic data for the construction: in which classroom activity this construction is processed, in which strand of the curriculum, in which grade, how can it be use, which programs are required, etc.

WHAT IS GEOGEBRA?

GeoGebra is a free interactive geometry software for education in schools. Its creator, Markus Hohenwarter, started the project in 2001 at the University of Salzburg, continuing it at Florida Atlantic University (2006-2008), Florida State University (2008-2009), and now at the University of Linz together with the help of open-source developers and translators all over the world. GeoGebra is written in Java and thus available for multiple platforms.
GeoGebra is dynamic geometry software (DMS) for teaching and learning mathematics from elementary school through college level. Constructions can be made with points, vectors, segments, lines, polygons, conic sections, and functions. All of them can be changed dynamically afterwards. Elements can be entered and modified directly on screen, or through the command line. GeoGebra has the ability to use variables for numbers, vectors and points, find derivatives and integrals of functions and has a full complement of commands like Root or Extremum. Teachers can use GeoGebra to make conjectures and prove geometric theorems.
GeoGebra is open source software under the GNU General Public License and freely available at www.geogebra.org. There, you can either download installers for multiple platforms or launch the software directly from the Internet using GeoGebra Web Start.
GeoGebra was created to help students gain a better understanding of mathematics. You can use it for active and problem-oriented teaching, it fosters mathematical experiments and discoveries both in classroom and at home.

GeoGebra Toolbar for Compass and Straightedge Constructions

Click on Tools -> Customize toolbar, to customize the toolbar. The window Customize toolbar opens. To remove all unnecessary tools click on Remove. To insert the necessary tools click on Insert. Click on Apply when the all the twelve tools are insert. Figure 1 shows a geogebra file BasicConstructions.ggb, where the toolbar contains the twelve necessary tools for compass and straightedge constructions. To avoid this customization, you can download the Basic Geogebra file for compass and straightedge constructions from the following web page: http://mathcasts.org/gg/construct/BasicConstruct.ggb

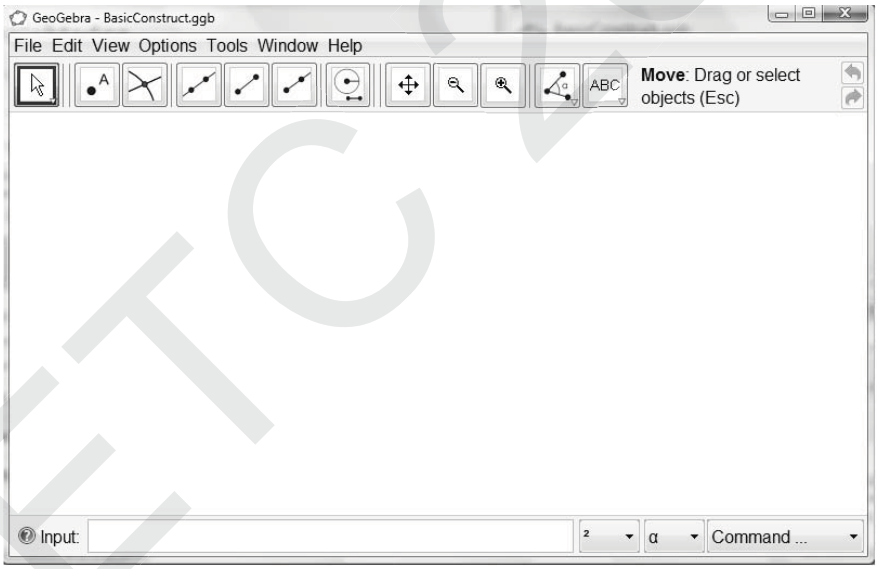

Figure 1. GeoGebra graphical user interface for compass and straightedge constructions

To construct the seven basic compass and straightedge constructions with Geogebra, all available tools from the toolbar are unnecessary. Hence, the toolbar customizes with the following twelve tools:

1. Move
2. New Point
3. Intersect Two Objects
4. Line through Two Points
5. Segment between Two Points
6. Ray through Two Points
7. Compass
8. Move Drawing Pad

9. Zoom Out
10. Zoom In
11. Angle
12. Insert Text

How to Create Construction in GeoGebra

The students, especially those in the lower classes, show enthusiasm when creating the constructions in Geogebra. Geometry, particularly the geometric constructions, are complicated for most of the students. Using Geogebra, geometry becomes interesting and fun, and students easily creates basic and even the complex constructions. Constructing with Geogebra, students experiment and start to think logically about the constructions. Usually they ask themselves: If I do it like this, which is the out-coming result? Thus, they come to very interesting solutions of the geometric problems.
The fact that GeoGebra gives the opportunity to work with different colors, helps students to enhance and visualize what they construct. When the students use paper to construct, at the same time on the construction appear many trivial lines. Thus, the perception is obstruct and it is hard for the students to visualize the final geometric figure. Also, if the students mistake during the process of construction, at the most cases they need to erase the construction and start from the beginning, which certainly causes frustration. It is easily to correct every mistake in Geogebra. By bolding and coloring the main lines of the construction with strong colors, it is easy to notice the out-coming result. The trivial lines of the construction are always thinner and less noticeable.
The main advantage in GeoGebra is the dynamic. The given parameters can be changed in every construction, thus the construction is changeable depending on them. This way, the relations between the elements in the construction is emphasized. For example, after the construction of a triangle given with two sides and apothem, students can analyze, depending of the lengths of segments, when the out-coming result is one triangle, two triangles or when the construction is impossible. It is difficult to do this on paper when the student creates a static construction, and also have to analyze and conclude what will happen if the length of the given segments changes.
In this paper are present the seven basic compass and straightedge constructions. Each construction has its own wiki page, accessible trough the above given links. Each wiki page also contains the final construction in Geogebra, empty Geogebra file and directions for interactivity. According to the directions the student can create the construction by himself, to test and to analyze. In this way, the class is more interesting with a better teacher- student interaction, and the most important - it gives excellent results to understand and learn the curriculum. Figure 2 illustrates a GeoGebra file with a final geometric construction-Construct a perpendicular.

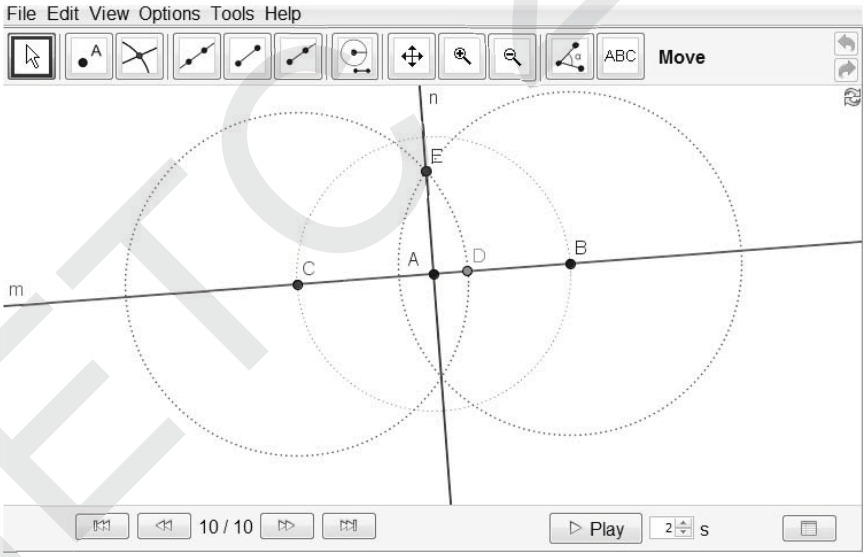

Figure 2. Construction of perpendicular

Figure 3 shows the directions for the construction in GeoGebra accessible though the following link:
http://geogebramk.pbworks.com/Конструкција+на+нормала+-+помош (Macedonian) and
http://geogebrawiki.pbworks.com/Perpendicular-Help (English).
Directions how to construct the other six constructions, can be found on their suitable wiki pages, in the part Directions for Interactivity (opens in new window) (English version) и Упатство за интерактивност (се отвора во нов прозорец) (Macedonian version).

Do the givens.		
	Draw a line by clicking twice in drawing pad.	Point A Point B a=Segment[A,B]
Label: Use right-click to hide/show labels on points and to rename the line m.		
Make A the midpoint of line segment CB		
	Draw circle with radius AB and center A by clicking on points A, B and A.	Circle c=Circle[A, Segment[A, B]
	Draw point C by clicking on left intersection point of circle c and line m. (A is midpoint of CB.)	C=Intersect[c, m, 2].
Decorate: Right-click on circle, choose "Properties" and make it thin and dotted. Click on Close.		
Get ready to draw circles with a radius bigger than 1/2 of CB.		
	Draw a fourth point between A and B. (This makes it bigger than 1/2 of CB.)	Point D D=Point[m]
Draw 2 circles with radius CD - one with center C and other with center B.		
	Draw circle with radius CD and center C by clicking on points C, D and C.	Circle d=Circle[C, Segment[C, D]
	Draw circle with radius CD and center B by clicking on points C, D and B.	Circle e=Circle[B, Segment[C, D]
Decorate: Right-click on either circle, choose "Properties". Make both circles red and dotted so you can find them. Click on Close.		
Draw an intersection points of the circles		
	Draw point E by clicking on top (or bottom) intersection point of red circles d and e.	E=Intersect[c, d, 2].
Draw perpendiular (normal).		
	Draw line through E and A by clicking on points E and A.	a=Line[D,E]
Label: Use right-click to rename this line n. **Decorate:** Right-click on any object, choose "Properties" and go for it! When done, click on Close.		
Check construction.		
	Click and drag point A (and/or point B).	The line n should pass through A and be perpendicular to line m.
Save construction. Command: File -> Save.		

Figure 3. Instructions for constructing perpendicular

FEW WORDS ABOUT PBWORKS SERVICE

PBworks (formerly PBwiki) is a commercial collaboration service created by David Weekly, with Ramit Sethi and Nathan Schmidt joining shortly thereafter as co-founders. Based in San Mateo, California, the company's original name stems from their belief that "making a wiki is as easy as making a peanut butter sandwich". The company operates on a freemium basis, with basic features being offered for free and more advanced features for a fee.
With over 800,000 communities using PBworks to collaborate publicly and privately, PBworks is the largest business and educational wiki host in the world.
PBworks hosts collaborative wikis that can be used by anyone and for anything, featuring a setup that takes less time than making a peanut butter sandwich and easy, point-and-click editing. Users can insert video and photos, chat rooms, voice chat, community calendars and all other sorts of media which can then be rearranged or added to by other users given access privilege.

PBworks in Education

PBworks lets you create a secure online workspace in about 60 seconds. Encourage classroom participation with interactive wiki pages that students can view and edit from any computer.
Share class resources and completed student work with parents. You can even collaborate with fellow educators on courses and curriculum, and manage the work of running your school or district. Each page has a revision history, so you never lose content and you always know who edited the page.You control who can view and edit your workspace. Each student has a unique login and password, so you always know who made what change. Email notifications help you monitor changes on your workspace. And Classroom Accounts let you create accounts for students who don't have email. No matter who edits the page, you're always notified and can reverse the changes at anytime.

YOUTUBE IN THE CLASSROOM

As the users of Internet increases, YouTube and the other video clip sites become more popular, especially among the young population. This fact can be used in educational goals. Audio-visual presentation can be present to the young population, towards to keep their attention. Thus, YouTube presentations show how to construct the basic compass and straightedge constructions, where in few minutes the students will understand how to create a construction. Created YouTube presentations are set on the suitable wiki pages, in the part YouTube Mathcast (English version) and YouTube ABO (Macedonian version).
The YouTube presentation for the Construction of a perpendicular mentioned above is shown on the following link:
http://www.youtube.com/watch?v=wvnSLU-Rn80&feature=player_embedded (Macedonian version) and
http://www.youtube.com/watch?v=unFtGs5nCIo&feature=player_embedded (English version).
Today, a wide range of videos with educational value are available on YouTube. YouTube provides an easy way to use interface, a robust connection, and the largest collection of videos on the Internet. These videos are delivered in a streaming Flash format, which efficiently uses bandwidth as the trade off of image quality.
In Macedonia, certain schools have banned YouTube access because there are unsuitable video clips. According to us, it is pity because the students cannot watch many of the video clips with an educational content. We hope for a solution for this problem in future, perhaps by limiting the access only for the contents that will help in their education.
YouTube alternatives include: TeacherTube, SchoolTube, OurMedia.

CONCLUSION

The studying today, more then ever, is a communicative process, and the new technologies are the media that broadcast the knowledge. The new technologies are the media on which the knowledge is broadcast not only educational tools. Like this the student has more flexible position, as a lifelong student but also as a mentor, who is ready to discuss, authoritative actor in the learning process. From the well known process, of one way transmitting on the information and knowledge, we pass in interactive, network learning process, where every participant redound in constructing the experience and the knowledge. Using the new technology the role of the student is equal, more recognized and more responsible.

Through this paper, we show how to use the new technology for a new and different access in the learning process of the basic geometric constructions. For that purpose, we use mathematic software GeoGebra and YouTube service, and we present new ways how to construct the basic compass and straightedge constructions. As it was mention, the students, especially the younger, have difficulties to understand the geometry. The paper gives an interesting access to one difficult mathematic branch – geometry. In this case, the usage of the technology in the educational process shows incredible results in a relation of motivation and interest of the students during the classes. The students are delighted and accept these classes, click on every visible button and react on different colors that are used in the constructions. They especially show a great interest in the opportunity to test the construction.

Thus, the technology allows to make the classroom dynamic and interesting place for learning, and the students will show a great interest and learn the new material easily.

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E-LEARNING IN HELP TO HIGHER EDUCATION AND HIGH SCHOOL: CASE LITHUANIA

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Abstract
Lithuania, as the country in transition, is undergoing rapid changes in politics, economics and society relating to the changes that replaced the centralised economy with the market economy. This has happened in parallel with the continuous progress of science and technology, which has resulted in permanent changes where labour market needs are concerned. It has consequently affected educational sector and vocational qualifications, which are no longer fully adequate to meet all the new requirements. In lithuania, e-learning services are provided by universities, collages, vocational schools, adult education centres, secondary schools and other relevant institutions. In this paper we offer a brief overview of the e-learning providers in lithuania, providing readers with national examples of current practice before presenting the lithuanian case studies. Finally we summarize the experiences and good practices in higher education, while presented the challenges and the lessons learnt.

INTRODUCTION

Following significant changes in the European labour market, new requirements for teachers and trainers are announced every day, related to methodologies which are applied to guide and support learners in learning process, as well as with new pedagogical trends in preparation of learning content. E-learning techniques inspire for innovative, more flexible and individualised solutions meeting individual learners' needs. Thus teachers and trainers become the target group for education and pedagogy specialists cooperating with learning technologists in application of information and communication technologies (ICT) and creating favourable context for teacher competence development. The development of e-competences among teachers who also deliver e-learning is directly influenced by the development of the context in which they work. New knowledge and definition of competence evaluation process is required, as well as new assessment method of learning groups and learning process. In order to raise qualifications of teachers and trainers, we need to establish proper contextual situation first, where a teacher encounters self-assessment possibilities, learning content, to raise individual competences, and tools for realisation of e-learning ideas. Distance education (DE) brings big challenges to high education and high school professors but this new form of service delivery becomes urgent, as the need for it is detected in various target groups of learners.

Lithuania, as a country in transition, is undergoing "double- time changes" in politics, economics and social life relating to the changes that replaced the centralised economy by the market economy. These changes raise a new set of challenges for the entire Lithuanian higher education system. In Lithuania, the life long learning (LLL) process is realized through secondary schools, universities, colleges, vocational schools, adult education centres and other relevant institutions. Thus a LLL system is in process of establishment at all education levels – vocational, tertiary, etc. There is a widespread consensus in the Government and non-governmental educational sector institutions that DE and training has enormous potential to tackle the new challenges. A national study of the e-learning situation in Lithuania (Tereseviciene et al., 2004) and National report on e-learning in Lithuania (VMU, 2006) have shown that it is necessary to increase the quantity and quality of e-learning providers. It has been found that due to insufficient Web 2.0 knowledge and competences of professors, teachers and trainers, there is still a lack of efficient organisation of distance studies in the country within the given infrastructure. The lack of learning content prepared according to the new didactical and pedagogical paradigms (Tereseviciene et al., 2004, VMU 2006) results in low numbers of motivated e-learners and there is an absence of monitoring systems in the country. Professors themselves need to be motivated to transform their courses and programmes using new computer and Web 2.0 technologies. In this context it is very important to define and realize a methodological, technological and organizational system for the distance education of new professional figures with a high specialization in the field of e- Learning, based on a didactic paradigm focusing on the learner and on original models of action for the training of system figures able to apply this paradigm. Kaunas University of Technology together with Baltic Education Technology Institute were partners in HeLPS Transfer project. The goal of this project is to transfer the results of previous European projects and initiatives in e-Learning field in the framework of high school, university and post-university high training through the specialization of the training pathways developed on the basis of the needs of the two reference sectors, the linguistic localization and structural adaptation of the main products, tools and the training and orientation of school and university operators. In this paper we describe in more details how teacher training in e-Learning field is developing in Lithuania and provide practical examples.

E-LEARNING STAFF DEVELOPMENT IN LITHUANIA

The great demand for training, qualification improvement and re-qualification distance learning courses in Lithuania still exists. Information and communication technologies develop very quickly, because of that it is very important constantly train teachers and trainers, DE administrators and moderators. Teachers and trainers should be introduced with Web 2.0 and other ICT tools and the ways of their application in learning process. Each institution of higher education in Lithuania is responsible for its staff development, and each institution has its internal system that motivates and encourages their employees for professional development. To look at the situation of staff development in Lithuania, we should say that we will focus on distance learning providers and will analyse the participants on this process and their possibilities to improve their competences and skills. Gaining new skills and competences is a continuous process, a part of adult teacher education. Most

educational institutions, where Lithuanian teachers are employed, create the necessary conditions for this. There are three basic categories of purposeful learning activity:

- Formal learning. This type of learning takes place in education and training institutions, leading to recognised diplomas and qualifications.
- Non-formal learning. This type of learning takes place alongside the mainstream systems of education and training and does not typically lead to formalised certificates. Non-formal learning may be provided in the workplace and through the activities of organisations and groups. It can also be provided through organisations or services that have been set up to complement formal systems (such as arts, music and sports classes or private tutoring to prepare for examinations).
- Informal learning is a natural accompaniment to everyday life. Unlike formal and non-formal learning, informal learning is not necessarily intentional learning, and so may well not be recognised even by individuals themselves as contributing to their knowledge and skills.

Forms of formal qualification improvement are: courses in the subject and its teaching methodology, pedagogy, psychology, humanities and social studies, special internships. Non- formal and informal teacher qualification improvement is voluntary teacher self- education, which is encouraged by educational institutions and Government supported to the extent the course content meets school interests. In- service teacher training system in Lithuania is decentralised (Figure 1).

Figure 1. Institutions, responsible for Teacher training in Lithuania.

According to European experience, there are 10-15 people employed in the development and delivery of distance learning courses in an institution: content specialist, supervisors, ICT specialists, designers, managers and administrators, web designers and other specialists. However, it is not common practice in Lithuania to have all these specialists in a distance learning centre, and only those who have these professionals are usually able to develop courses and programme of a required model. The participants of distance learning delivery in Lithuania and their roles should be defined. There are various courses offered in Lithuania for ICT specialists and administrators to develop general skills. There are also formal, non- formal and informal learning possibilities, as well as professional and qualification study programmes on ICT and education delivered in a distance mode in Lithuania, in addition to those delivered by a single University or by several Lithuanian universities.

In recent years most Lithuanian universities have established distance education centres (to give some examples: the e-Learning Technology Centre at Kaunas University of Technology; the Distance Study Centre at Vytautas Magnus University; the Distance Education Centre at Siauliai University etc.). Highly skilled staff within the Centres, along with a modern technical infrastructure, ensures quality services for internal university needs as well as external customers.

The Main activities of Distance Education Centres are similar in all types of institutions. They include:

- Research in the field of Distance Education;
- Development of Distance Education methodology for authors, tutors and administrators of distance education courses;
- Tutor training;
- Preparation and delivery of DE courses;
- Cooperation with industry and business sector, formal and non- formal education institutions;
- Technical and administration issues such as formation and support of virtual learning environments, production of audio- video materials for DE, coordination and managing video conferences etc.

One of the goals of Distance Education Centres is the provision of vocational informal education for teachers.

DEMAND FOR E- LEARNING COURSES IN LITHUANIAN EDUCATION INSTITUTIONS

Distance Education in Lithuania is based on the Lithuanian distance education network, which joins almost all universities and colleges, and vocational schools. The Lithuanian Virtual University (LVU) is a national initiative, which was set up in 2007. The main aim of the LVU initiative is to expand the information infrastructure of Lithuanian science and studies, applying available resources in a drive to develop an effective, coherent and continuous educational system and provide conditions for lifelong learning; to ensure the quality of the educational system while integrating into the common European educational space; to prepare specialists of the highest quality; to carry out research; to ensure possibilities for Lithuanian citizens to obtain knowledge, skills and qualifications that will allow them to adapt to rapidly changing conditions of life and work; and to

expand the programmes for involving disadvantaged groups into the information society through the application of information technologies.

In 2005 and 2007 LVU initiated two empirical studies all around Lithuania on the attitudes of educators towards distance education, their motives for using different kinds of ICT in education, and problems educators meet in providing e-learning courses [3].

The data showed that in 2005 majority of educators indicated that they lacked sufficient knowledge of distance education. After the completion of training courses the situation is slightly different. In 2007 the majority of educators (53%) indicate that they have enough knowledge how to arrange and provide distance education courses. Nevertheless the majority of educators still are open for further training, as 92% of respondents in 2005 and 82% of respondents in 2007 indicated that they are willing to participate in training programs. The majority of respondents (69% in 2005 and 77% in 2007) had received the information about the opportunities to participate in distance education courses. The interesting detail is that 35% of educators in 2005 had not participated in any educational courses in order to obtain the knowledge necessary for delivering distance education courses. In the 2007 survey the number had decreased to 14% as all educators had an opportunity to participate in training programs. Nevertheless 22% of respondents had studied by themselves, although the majority of educators (56% in 2005 and 46% in 2007) had acquired knowledge through participating in distance education courses (Figure 2).

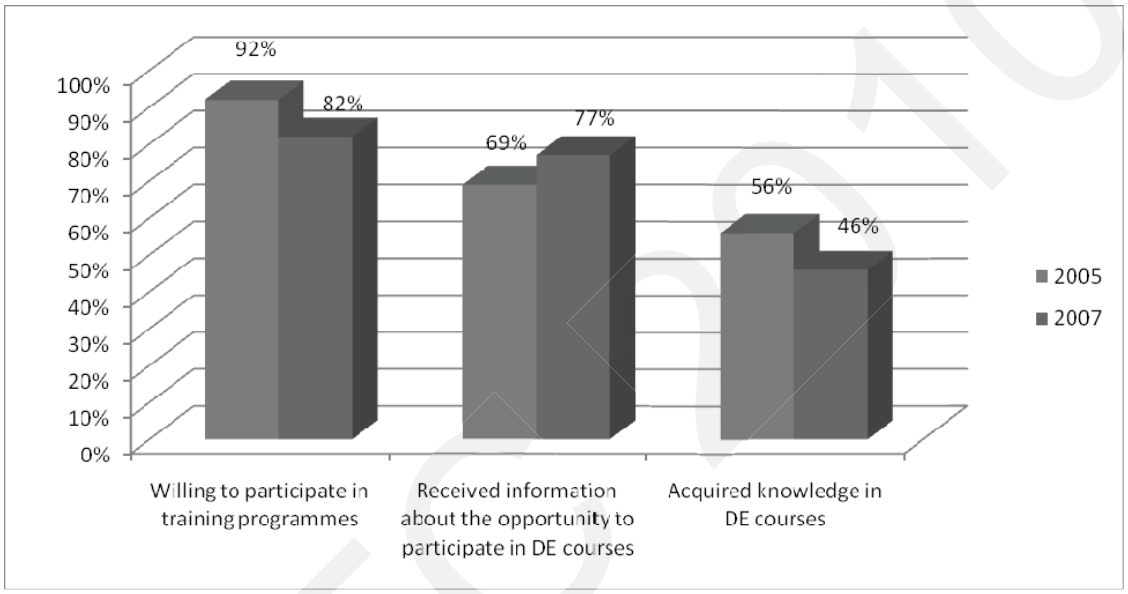

Figure 2. Comparison of results from LVU empirical research year 2005 and 2007, N=157.

The main factor which had influenced educators to start organizing distance education courses was their pursuit for innovations and the sense of a lack of Web 2.0 knowledge and practical skills. This factor was indicated by 75% of respondents in 2005 and by 70% of respondents in 2007. The least significant motive was financial reasons as just 12 % of respondents stated that this was the reason for their undertaking distance education courses. The majority of educators (95%) consider that distance education (and using Web 2.0 in education) has a future in Lithuania, with just 1 % having the opposite opinion.

The main conclusion of these surveys is that the demand for e-learning courses is increasing in the areas of formal, as well as non-formal education. The methods used to provide distance learning services differ from traditional ones, thus new institutions will be needed to provide these services. Teacher mentoring is welcomed, useful and needed in different types of educational institutions. To improve the competence of all distance education actors, the Lithuanian distance education network together with Lithuanian Virtual University organizes competitions for e-learning course developers and provides support for institutions willing to adapt and create new e-learning courses. We will now describe institutions that support teachers in these types of activities.

TEACHER TRAINING TO BECOME E-LEARNING PROVIDERS

The E-Learning technology centre at Kaunas University of Technology is a university centre, which was established at the Kaunas University of Technology in 1996 within the framework of the Phare project “Multi-country Co-Operation in Distance Education”. The mission of the Centre is to promote and develop a higher and further education system supported by advanced Learning Technologies. The aim of the Learning Technologies Centre is to support and develop Learning Technologies in educational processes. This includes e-learning courses and curriculum development, design and delivery of courses and a teacher support system. Additional centre activities are research in the field of distance education and educational consultancy for private and public education organizations, with cooperation at local, regional, national and trans-national levels (Figure 3).

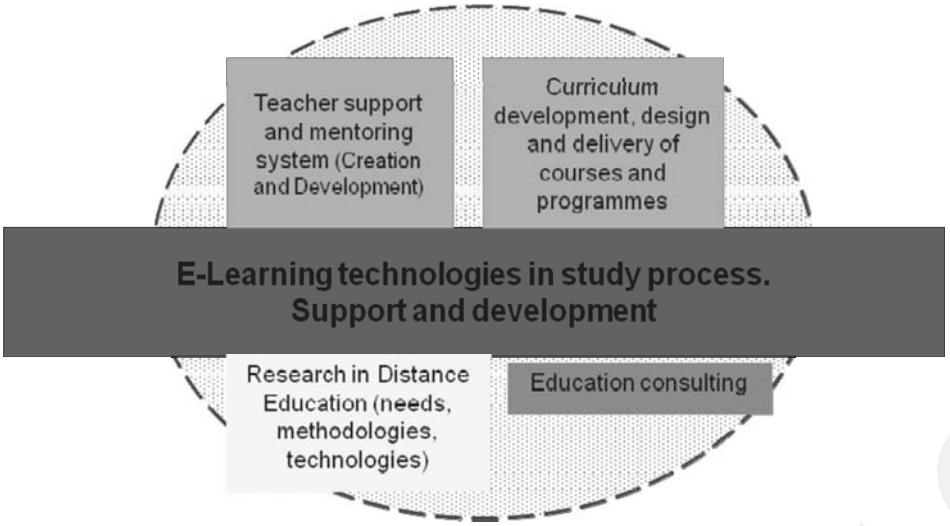

Figure 3. Directions of activities in e-Learning Technology Centre at Kaunas University of Technology.

Teacher support and mentoring included support in e- Studies ICT administration, e-learning courses, modules and programmes quality assurance and individual mentoring activities for university staff; methodological support and practical help for e-learning course creators and teachers who delivers e-learning courses, creation, testing and evaluation of e-learning scenarios, competence development, mentoring to make knowledge and skills assessment, evaluation and verification systems, ICT tools and knowledge assessment instruments; technical and design support: document conversion to HTML format; help in creating e-learning course structure; help in creation questionnaires, forms, e-learning course design, graphics, animations, educational video and audio materials.

This system (Figure 4) was established and tested in Kaunas University of Technology.

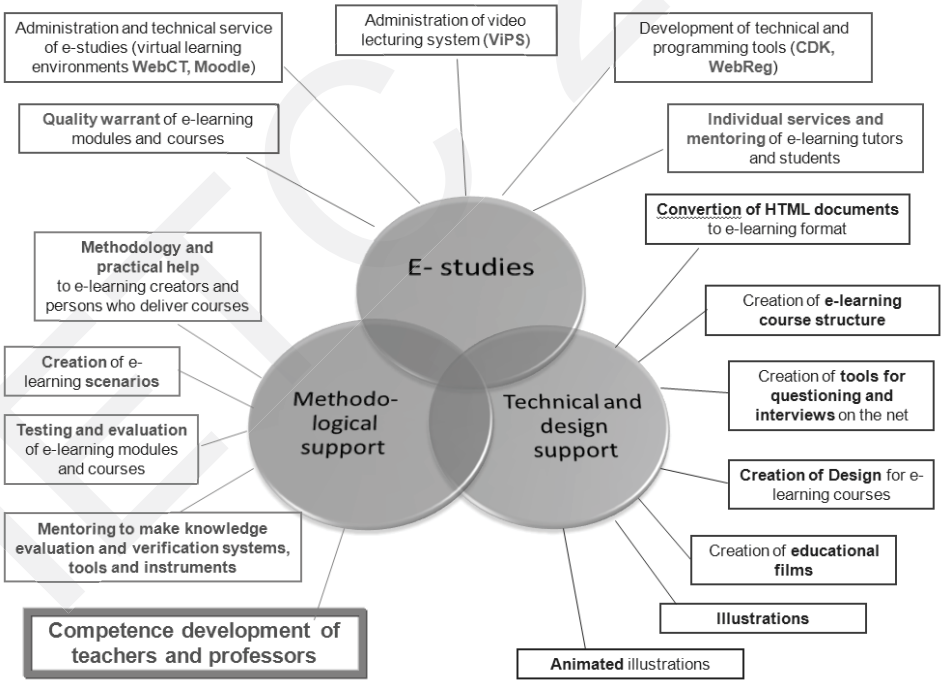

Figure 4. Teachers mentoring and support system (Lithuanian case).

The Learning Technologies Centre delivers technical and methodological support to teachers and professors in creating study modules, administering and developing e-learning systems.
University staff has to opportunity to participate not only in University courses but in courses organized by other institutions or national and international projects and initiatives.

In academic year 2009-2010 Kaunas University of Technology has 4 study programmes delivered using e-learning methodologies, more than 200 lecture records on the net, approximately 70 accredited study modules in virtual learning environments. These study modules have more than 10 000 registered students.

CONCLUSIONS

Today's economic situation, changes in society, ongoing educational changes and reforms, the developments in e- learning provide a starting point for planning future steps. Twenty first century skills professional development prepares all actors in education field to integrate Web 2.0 into their classrooms and schools. It should be a part of a comprehensive emphasis on these skills, including an alignment with standards, curriculum and assessments.

There are many ways in which educators can acquire ICT and Web 2.0 trainings. Young teachers have the opportunity to gain knowledge and skills in formal teacher training system as far as other educators need training and raising qualification. As we have demonstrated in the case studies presented here, programmes and initiatives exist in Lithuania but additional training for teachers is still needed. This training could be provided by special departments and centres where the learner works, or by various national or international projects or initiatives.

Being a partner in international project Helps Transfer – High e-Learning professional skills, Kaunas University of Technology together with 10 other institutions from 5 European countries analyses e-Learning didactics, design and planning methodology and possibly adapt it to the existing procedural, normative, organizational and didactic specific needs of the country; adapts the training pathways to the professional figures in order to make them post- university master pathways to be realised; perform the linguistic localisation of e-learning pedagogical materials.

ACKNOWLEDGEMENTS

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E-LEARNING ..... "CHALLENGES AND PROSPECTS"

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The concept of e-learning

E-learning is a kind of distance learning that makes use of the most modern communicative means. These means are, for instance, computer networks, their various modes like audio machines, and visual pictures, search engines, electronic libraries, and either wide area networks or local area networks as in classrooms. In fact, the ultimate goal of *e-learning* is to effectively facilitate technology to the learner in receiving the information effortlessly and shortly.

The comparison	Traditional education	E-Learning
The center of the learning process	Teacher	Learner
Time	Receiving Specific	Unspecific
Location	Specific	Unspecific.
Learning process	Delivery of information in a single-direction from the teacher to the learner	Multi-directions.
Individual differences	Ignoring individual differences	Take into account individual differences
Contact teacher	Is only during the explanation	Is at any time
Role of the learner	Negative.	Positive.
User's learning style	Traditional technique	The most current electronic techniques.
The interaction	Does not depend on interaction.	Multi-interaction Interaction between the teacher and learner. Interaction between the learner and her/his colleagues
Processes of modernization and development	A difficult process and is not available, and expensive	An easy and accessible, inexpensive and continuous process.

In addition to the previous definition, *e-learning* can be defined as Can be defined as "broadening the process of teaching and learning beyond the limits of traditional classroom walls, and the starting point for multi-source-rich environment, the techniques for interactive distance learning so that the main factor redrafted the work of both teacher and learner." Another definition to the term *e-learning* is"education that uses the methods and means and methods of teaching and learning indirectly, such as the book, study guide, Internet, and satellite television and terrestrial radio, telephone, fax, e-mail and regular, and methods of teaching and learning such as direct classroom education and face to face and semi-direct, such as telephone conferences television and other media and technology education and learning "

The most important aspect of *e-learning* is that it opens the gate of education to all people regardless of the requirements of the traditional education.

The importance of e-learning:

There are several important points regarding the importance of e-learning, and here are some:

• Supporting the most current teaching methods.

• Dealing with remote resources.

• Expanding educational programs.

•Enlightening individuals' knowledge.

Indeed, the importance of e-learning can be presented through some of the educational innovations caused by computer

The aims of e-learning:

- It boosts the society to more educationally refined and to self-training. It, in fact, improves the trainees as well as the learners' skills with least effort and cost.
- It develops the teachers' skills and increases their experience in preparing the educational material.
- It presents the educational material in a software format for both the teacher and the learner.
- It allows the most distinguished professors to be available to a wide range of learners. However, sometimes the shortage of such distinguished human resources may be subject to monopolization.
- It enhances the learners' educational scientific level once the internet becomes an integrated part in the educational process.
- It eases the interaction among educational and governmental institutions as much as with the learners' parents.
- It makes it much easier to contact with the teachers.
- It meets the social, the occupational, and the professional needs to the e-learning users in a more convenient and fashionable way.
- It enforces the teaching material to be more audible and visually convenient and adjustable to the learner.
- It provides the curricula to the learner daily and weekly.
- It presents various and easy techniques of assessing the learner.

Justifications that led to the emergence of e-Learning:

• The explosion of knowledge and the flow information.

• The increase in the learners' number in which public schools and universities cannot accommodate them.

• The convenience of the e-learning for employers who cannot attend direct classrooms.

• The presence of some groups in the society that are socially, financially, politically, or physically disabled.

• The lack of sufficient of faculty members, laboratories, equipment and technology to the extent appropriate to the number of students studying in these universities.

The requirements of e-Learning:

The success of e-learning initially requires a well designed plan in order to benefit from it. And here are some of the major factors:

• Need for decision-making at the political level, accompanied by an integrated plan for the integration of e-learning.

• Analysis of the plans of countries that have pioneered e-learning, to benefit from their experiences in this area.

• Involvement of the private sector in building the foundations of training and e-learning.

• Advance preparation for the selection of the technical means compatible with the educational content.

• Development of the human resource and rehabilitation specialists in the design of educational programs.

• Processing infrastructure of computers and communication networks and software.

• Accuracy of monitoring and evaluation to ensure effective integration of technical means.

The benefits of e-Learning:

• Helps the learner to learn, to be self-reliance and to develop intellectual capacity.

• Provides more opportunities for the education to the old people.

• Raises the interest of the investment by reducing the cost of education.

• Breaks the psychological barriers between the teacher and learner.

• Satisfies the needs and characteristics of the learner.

• Integrates of learning technologies in all activities and educational programs.

• Affords the learner with whatever s/he needs with a computer and internet and all its applications.

• Provides direct and automatic assessment to the learner.

• Surveys information from direct sources.

• Creates a dynamic system affected directly by the outer world.

• Increases the demand of knowledge, which becomes the basis of investment in people and their skills.

Disadvantages of e-Learning:

Despite the advantages of the *e-learning*, there are a few negatives, including:

• Students may feel isolated from the teacher and classmates.

• The difficulty to access some of the course materials because of either the low speed of the internet connection, or the computers are not up-to-dated.

•The complexity of some of the program managers or e-learning programs to the learners especially those with limited computer skills.

• It is easy to imitate the manual or the laboratory work to that in the virtual classroom.

Obstacles of the spread of e-learning:

• *E-learning* still suffers from lack of clarity in the regulations, methods and techniques of the normal education.

• Fear of hackers to access the teachers' personal computers and their exams. This is considered as a computer crime.

• Lack of response from some students for this new style and lack of interaction.

• Lack of teachers who are fluent in "the art of e-learning".

• Lack of awareness among members of the community of this type of education.

• Training should correlate with the rapid technological development. That is, continuous training and development of the learners' as well as the administrators' performance is one of the obstacles that should be overcome.

• The need to achieve high level of global quality accreditation and assurance.

• The difficulty in providing computers to the learners and the users in many institutions because of the high cost of such kind of technology.

•The rapid change in the field of computer technology, and therefore the schools cannot cope with that rapid change for many reasons, and the failure to provide a sufficient budget for that.

• Lack of teacher competence in the use of computers and software, and this is due to the different universities and colleges that do not qualify the teacher enough to use computers in the classroom.

• The pressure upon the teacher when s/he has to apply the e-learning in his/her classroom. Thus, employing this technology in large classrooms with great number of learners might be a nightmare for the teacher.

• Fear of change by using the computer, where a large number of teachers are used to teach in formal and traditional style.

• Arabic educational programs are very rare.

• Health problems and high-temper mood are all symptoms of spending much time on computers and internet.

• Deprivation from social interaction among the learners and their teachers while using the computers only.

Constraints Arabic content in e-learning:

There are several impediments to the Arabic content in e-learning, including:

First: the infrastructure for information technology in the Arab World:

There is a direct correlation among the prevalence , the strength, and means to connect to the Internet and *e-learning* content in general. In Arabic countries, the low speed of technological connection is very notable and inefficient compared to the means and connectivity solutions in many developed Western countries. As a matter of fact, this plays a negative role in the expansion and the increase of the Arabic electronic content and lead to decrease penetration of many applications that increase the size of their custom e-learning content.

Secondly: the weakness of cultural activities:

That cultural activity in the Arab world is relatively small. The average of illiteracy is equivalent to 40% in general . However, more than 50% of women and 27% among men are illiterate. On the other hand, there are a few numbers of readers in the Arabic countries and poor translation of books. All that lead to the weakness and the lack of what is being published electronically by the Arab educational content.

Third: - Arabic language and technical aspects:

Aspects of the Arabic language is divided into two parts: First of all, is the vernacular language and its negative impact on the proper handling of the classical Arabic. Many of the digital Arabic content includes a huge amount of colloquial speech with different dialects. the second aspect is relevant to the Arabic language processing tools dictation accuracy ,grammatical rules, diacritic marks, and

morphological analysis. Since there is no currently strong electronic mechanism for the translation Arabic texts , it is recommendable to work for a strong translation system and to search on this area. And it is also essential to increase the capacity for electronic translation of the scientific content of the foreign into Arabic.

Fourth: - the challenges arising from the economic level and academic:

There are several technical problems that hinder any access to computer networks and consequently any information. For example, the sudden power cut, the deficiency in providing learners in schools with computers and networks, the high cost of technology, and the requirement of being up-to-date with the most advanced technological programs. Moreover, the lack of experience from the users can be a great obstacle in e-learning. Also, teachers as well as learners would face difficulties in adapting such kind of education since they get used to the old-fashion education.

Experience of Saudi Arabia in e-learning:

Schools and universities are perfect starting points towards the development of the younger generation to face the challenges in the future. The Ministry of Education in Saudi Arabia has recently applied e-learning platforms in schools through the implementation of the pilot project chapter-mail (e-classroom) in some areas.

Also universities and colleges in Saudi Arabia also achieved great strides in the use of e-learning.

King Saud University in Riyadh, is one of the first universities that have adopted e-learning tools in its curricula. Also, King Abdul Aziz University in Jeddah is one of the first universities that implements e-learning curricula to serve learners who are distant or students attending classes alike. The University has also the largest electronic library in the Kingdom of Saudi Arabia containing 16,000 e-book.

in addition to that, King Khalid University in Abha, implemented the pilot project of e-learning in 2005-2006 AD. Aramco, that is a gigantic Saudi oil company, has a successful e-learning training system.

With the steady rise in e-learning market in Saudi Arabia various institutions are seeking to take advantage of this technique, and specify a great budget for the education sector and vocational training.

The e-learning initiatives proof the seriousness of the bodies concerned in the Kingdom in the field of technical awareness among the various sectors of society in Saudi Arabia. And many governmental institutions are concerned to be the main force behind many gigantic information and technological projects in Saudi Arabia.

The future vision of e-learning education in Saudi Arabia in general:

It can be made through the above, expect to see the future through the next five years as follows:

- E-learning will become an alternative or parallel to the traditional education in public education, although it is expected to be widely used in high education.
- Some educators, teachers and students will focus on e-learning techniques and will be interested in applying e-learning in education.
- sometimes there will be a group of people who do not work in their specialization, therefore, the need is not available qualified human resources or the desire of some to obtain positions of leadership and functional.
- Many private schools will adopt online learning system, and will encourage the owners of these schools to use it in their promotions..
- Companies and businesses will be established that are specialized in e-learning and will facilitate its applications in public schools, will also work on the training of teachers and students to use e-learning techniques.

Conclusion & Recommendations:

Despite such importance to this type of education, initial results approved its successfulness. However, it is still in its early stages education, where he faces some obstacles and challenges, whether technical, is not to adopt a uniform standard for the formulation of the content or technical The privacy and confidentiality, or educational and is non-participation in the educational making this type of education. Therefore, we recommend the following:

1. To encourage research in the field of Natural Language Processing, especially in Arabic and translation-mail.
2. To apply e-learning in an environment blended with traditional education, so it is not to dispense with the traditional, but to be complementary to each other. In specific, children at an early age so as not to affect other aspects Ktraja level of writing by hand.
3. To work on the rehabilitation of telecommunication networks and Non-wired in the Arab world and to the possible extent by electronic means for schools and educational facilities.
4. To adopt a unified Arab project and to provide electronic copies of textbooks including training programs, theoretical questions, images, videos, and slideshows.
5. Promote action on the university e-learning, especially the graduates and to focus on their graduation projects on this subject.
6. To build a digital system specialized in e-learning for primary first stage in the application. The idea is to substitute with the electronic equivalent of the class material given in the initial stages, and they are fed and supported by examples and further explanations and realistic simulation based on full documentation (video, Vlacat, audio files and examples) of the lessons given in schools to be a permanent reference for the child and parents.

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ELECTRONICS IN MATHEMATICS; IDEA ABOUT A DIFFERENT LESSON IN A DIFFERENT CLASSROOM

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Abstract

"Pure" mathematical problems concerning inequality systems will be modeled in electronic environment with aim to find corresponding solutions in an electronic phase plane. The electronic solution platform is based on the use spice like program. Min and max circuits having background in a fuzzy set theory, *curve generators* and other more or less common circuits are used to get the solution.

1. INTRODUCTION

The aim of this paper is to introduce a different teaching approach in "an old good classroom". This new approach is, of course, based on a PC-technology that our student adore very much and on the idea of multidisciplinary approach in presenting knowledge from different scientific areas.

We are going to explain through two examples how some simple lessons in mathematics can be explained in a pure electronic environment. The SPICE like program (Electronic WorkBench) shall be used as primary explicative tool. EWB shall help us to design mostly self-explanatory circuits (models) that seek (give) the solution(s) for a mathematical problem(s).

Modeling and simulation usually represent one of the basic methodologies in the treatment of interdisciplinary projects and are directly or indirectly included in all modern methods of analysis and design.

Although modeling and simulation approaches have been known for a long time, until relatively recently they were not used to great extend because the simulation tools (analog computers, different simulation languages on large mainframes and first personal computers) were extremely expensive. The great advances in computer technology, especially the appearance of the non-expensive personal computers brought the tools for solving mathematical (and other problems) in our everyday classroom and thus encouraged interest in modeling and simulation.

The aims of using electronics as a solving tool in mathematics are as follows:

- increase student understanding in both areas; electronics and mathematics
- improve student skills in hardware design
- invent (design) new electronic circuits that can have practical use in electronics
- verify models (solutions) obtained in some other way.

As SPICE-based program Electronic Workbench is available in our classrooms, it was a natural way to choose that program as: illustrative tool, problem solving tool, checking tool and modeling tool.

In the first section we shall deal with linear inequality system, electronic model of the system, and testing circuit will be designed and explained. In the second section we shall use again MIN and MAX-circuits to solve a different kind of inequalities, i.e. we will show how to solve an inequality system consisting of a straight line and parabola in an electronic phase plane (EPP).

2. INEQUALITIES: A Graphical solutions for inequality systems

2.1. Problem Solving Circuits

Regardless to the order of an inequality system under consideration, the solution graphic procedure is almost the same. Inequality equations are transformed (if necessary) in a form suitable for presentation in *x-y plane* and plotted. Then one must to hatch the area in which coordinates of points do not satisfy the given inequality. Non-hatched area(s) is solution(s).

In electronic problem solving strategy, for the same problem, we can do almost the same: generate the curves and deduce the solution in an EPP as above or we can design a special circuitry for automated inequality testing. Some kind of visual display indicating the solution for a given test point can be used along with a test circuit.

Curve generators, i.e. electronic models of straight line(s) and conic sections are kind of dedicated hardware are used to model MIN and MAX circuits inequality (relation) symbols ("≥" and "≤"). The testing circuits are based on standard comparators and logic gates. Straight line generators (SLG) exploit transfer characteristics of inverting/non-inverting operational amplifier to model inequality systems [1] and can have a general electronic form (GEF) for modeling conic section is too complicated and unwieldy. Therefore, conic section generators are occasionally designed.

In general, the inequality system consisting of linear and second order equations has a general form that can be expressed as:

$$a'x + b'y + c' \leq (\geq)\ 0 \qquad ax^2 + by^2 + 2fx + 2gy + 2hxy + c \leq (\geq)\ 0$$

Provided its graph does not degenerate into a point or straight lines, second order equation is representative of

- circle if $a = b \neq 0$ and $h = 0$ (electronic model is based on Lissajous test [1] or direct approach)
- an ellipse if $h^2 < ab$ (electronic model is based on Lissajous test [1] or direct approach)
- a parabola if $h^2 = ab$ (implicit solution design or direct approach depending on parabola type [1])
- a hyperbola if $h^2 > ab$ (implicit solution design)

If we take $a = 0$, $b = 0$, $h = 0$, $f = a''/2$ and $g = b''/2$ the second order equation will degenerate into a straight line giving a linear inequality system.

2.1.1. MIN and MAX circuits

The notion of MIN and MAX circuits are related to fuzzy sets and fuzzy logic [2]. In our experiments we used simple transistor versions showed in Figure 1, as these circuits can be easy assembled in a laboratory environment. It is easy to extend the number of MAX (MIN) inputs when a transistor-technology is in question; n-p-n (p-n-p) transistors are added between $\pm$ Vcc line and the base of output n-p-n (p-n-p) transistor (see Fig.1.). More accurate outputs can be achieved if our OP-based MIN/MAX circuits are used [2].

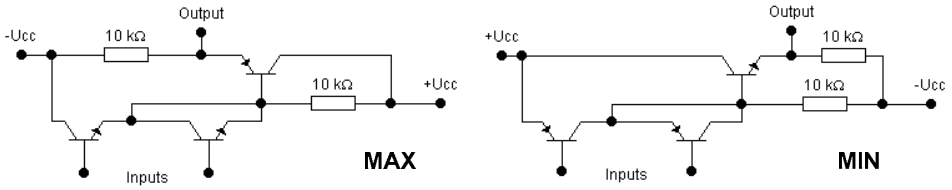

Fig 1. Simple transistor MIN and MAX – circuits

2.1.2. Test circuits

In our testing we are using three different electronic test circuits to check whether the test point P_T is an element of the solution space (a hatched domain of the EPP).

In all cases OP-Ampl. (LM741) is used as a sensing comparator. When the test point lies inside the solution area, both comparators will respond (output voltage) with positive voltage level turning the AND-gate on. Indicator glows. Circuit action algorithms for all three test circuits are shown along corresponding schemata (see Fig. 2, 3, and 4. respectively).

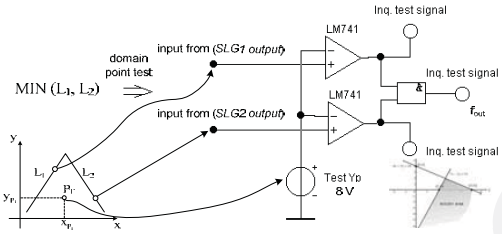

Fig 2. $f_{out} = \begin{cases} 1 & if \;\; P_T \in MIN(L_1, L_2) \\ 0 & else \end{cases}$

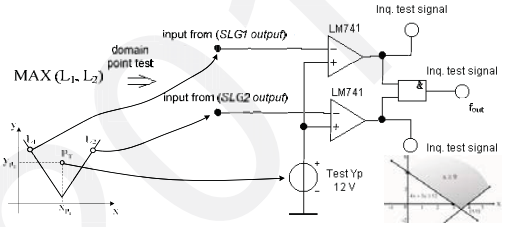

Fig 3. $f_{out} = \begin{cases} 1 & if \;\; P_T \in MAX(L_1, L_2) \\ 0 & else \end{cases}$

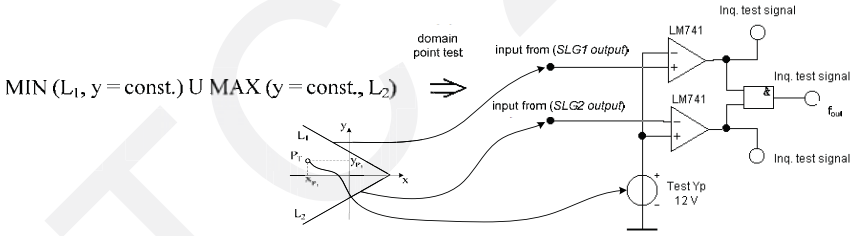

Fig 4. $f_{out} = \begin{cases} 1 & if \;\; P_T \in MIN(L_1, y = const) \vee MAX(y = const, L_2) \\ 0 & else \end{cases}$

Example 2.1. Find, and **graph solution** for linear inequities in *x-y plane* [3]

$$L_1 \equiv 3x + 5y \le 9 \quad (1) \qquad\qquad L_2 \equiv x - 6y \le 3 \quad (2)$$

Mathematical solution:

To get plot of these inequalities we must first find the corresponding straight lines for (1) and (2). The easiest way to plot straight lines in *x-y plane* is to put $y = 0$ and $x = 0$ in equations (3) and (4) to find intercepts with x and y-axis respectively ($^{I}P_X$, $^{I}P_Y$):

For $L_1 \equiv 3x + 5y = 9$ we get $^{I}P_X^1 = (3,0)$ and $^{I}P_Y^1 = (0, 1.8)$ (3). For $L_2 \equiv x - 6y = 3$ we get $^{I}P_X^2 = (3,0)$ and $^{I}P_Y^2 = (0, -0.5)$(4). Now we can plot the corresponding lines in *x-y plane*.

Line L_1 is passing through two points (3, 0) and $(0, 1.8)$ (see Fig. 5.). Line L_2 is passing through two points (3, 0) and $(0, -0.5)$ (see Fig. 5.).

Example 2.2. Find, and graph solutions for linear inequalities in an electronic x-y phase plane:

$$L_1 \equiv 3x + 5y \le 9 \quad (5) \qquad\qquad L_2 \equiv x - 6y \le 3 \quad (6)$$

Electronic solution:

To get plot of this inequalities we must write (5) and (6) in explicit form: $y = m_i x + c_i$. Now we can find x-y-axis intercept points (c_i) and the corresponding straight lines slopes (m_i):

$$L_1 \equiv\ y = -0.6x + 1.8 \qquad (7) \qquad\qquad L_2 \equiv\ y = -0.16x - 0.5 \qquad (8)$$

From relation (7) we can define the slope $m_1 = -0.6$, and intercept $c_1 = 1.8$. The sign and value of m_i and c_1 define parameters of straight line generator (SLG_1):

$$m_1 \Rightarrow \left({}^{L_1}\mathrm{O}_{-m1}, {}^{L_1}R_2 = 0.6[\mathrm{M\Omega}]\right) \qquad\qquad c_1 \Rightarrow U_{B_1} = 4\mathrm{V}$$

where ${}^{L_1}O_{-m_1}$ defines output terminal of SLG_1 [1].

Using c_1=4 we can determine the value of battery U_b in EWB-model of SLG_1 [1]

$$U_{b_1} = -\frac{l}{k} = \frac{-1.8}{-0.6} = 3[\mathrm{V}]$$

In the same manner, from relation (8) we can define the slope $m_2 = 0.166$, and intercept the $c_2 = -0.5$, i.e. parameters of SLG_2:

$$m_2 \Rightarrow \left({}^{L_2}\mathrm{O}_{-m2}, {}^{L_2}R_2 = 0.16[M\Omega]\right) \qquad c_2 \Rightarrow U_{B_2} = 3\mathrm{V}$$

Outputs of SLG_1 and SLG_2 are applied to inputs of MIN-circuit to get corresponding solution area (see and compare Fig. 6. and Fig. 7.).

Now we can take in account the point P_T (–6, 2) that lies in the solution space and do a *math-test* in parallel with corresponding electronic domain test (see Fig. 8.) to check whether that point satisfies the given inequalities. The same test using proposed electronic test circuits can be done for any point in *x-y plane.*

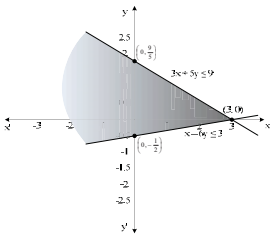

Fig 5. Solution area for the given inequality system

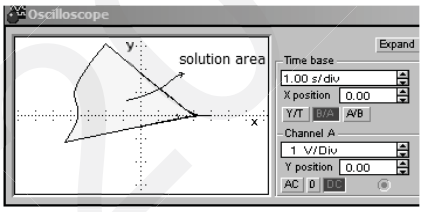

Fig 6. Solution area for the given inequality system in a phase plane

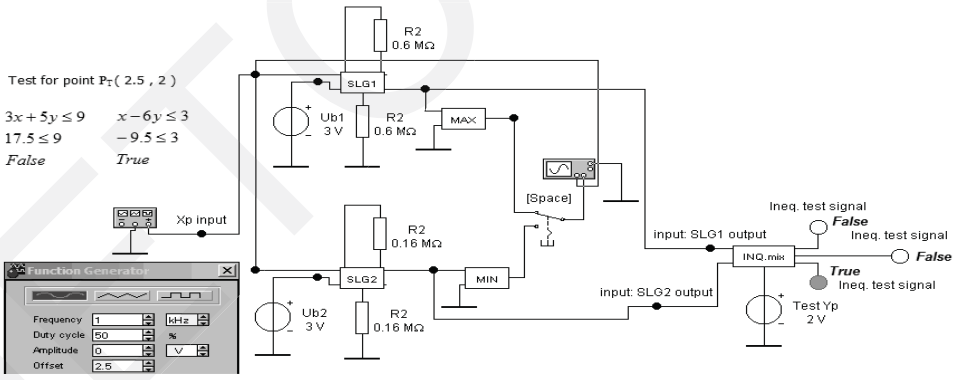

Fig. 7. Electronic model of the given linear inequality system. Point P_T (2.5, 0) is out of the solution space

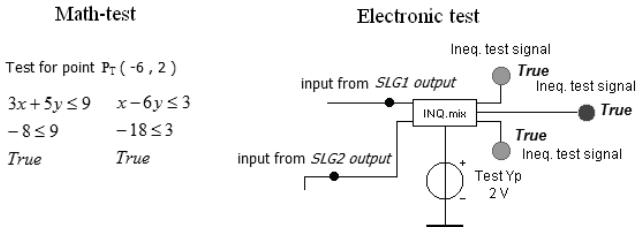

Fig. 8. Testing the solution space in math and electronic environment. Point P_T (-6, 2) is an element of solution space

3. STRAIGHT LINE AND PARABOLA $y = ax^2 + bx + c$

The second order curves can be defined electronically and displayed in a phase plane [1]. The first step in an electronic solution of a second order inequality system is to design (or to take from a circuit library) a straight line generator (SLG). There are many ways to design SLG

[1]. One different design approach is related to differential OP – amplifier (see Fig. 9.). The transfer characteristic of the differential OP – amplifier is represents as a straight line in an electronic phase plane [1].

The straight line slope *m* and y – intercept *c* are parameters depending on outside resistors R_2 and battery U_b; $m = R_2/R_1$, $U_b = - c/m$ (see Fig 9.). To get a particular straight line one must chose the value of resistor R_2 and set up the battery voltage U_b (see Fig. 9.).

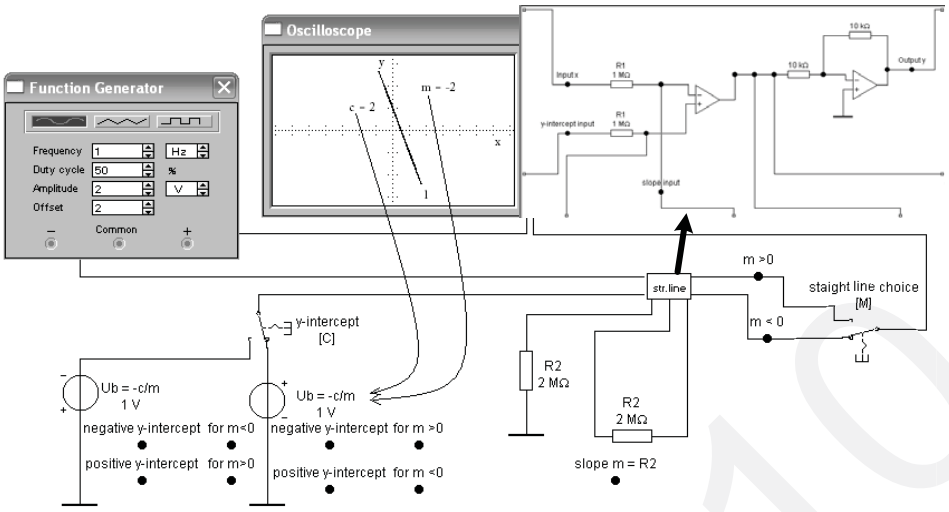

Fig. 9. General EWB model of the straight line generator

The second step is to design an electronic parabola generator. The design is simple as EWB – component library includes a multiplier with variable gain to achieve so called direct approach [1].

Multiplier is used to design a *squarer*, i.e. an elementary block of *general parabola generator* (GPG). A *squarer* provides at its output a voltage proportional to the square of the input, multiplied by a dimensional constant (ax^2). The EWB - dimensional constant (*a*) can be changed, i.e. its sign and absolute value can be set up from one example to other.

Operational amplifier OP-1 generates the relative shift of parabola vertex. The configuration of the operational amplifier OP-2 (inverting or non-inverting amplifier) depends on a polarity of constants (*bx*). The switch „*E*" shunts the summing amplifier OP-2 to get $y = f(x) = ax^2$ (see Fig 11.). Using and changing resistor net and corresponding battery voltages around operational amplifiers in GPG it is possible to generate different parabolas in the EPP (see Fig. 10.). An input summing inverting amplifier is added to achieve parabola (vertex) shift along x – axis. Another inverting amplifier is added to the output to get negative half of a parabola. Now we can assemble SLG, GPG and MIN/MAX-circuits in one complex circuit: *general parabola-straight line inequality system model* (see Fig. 11.). The inequality system solver is designed; electronics and mathematics are mixed together in a new way.

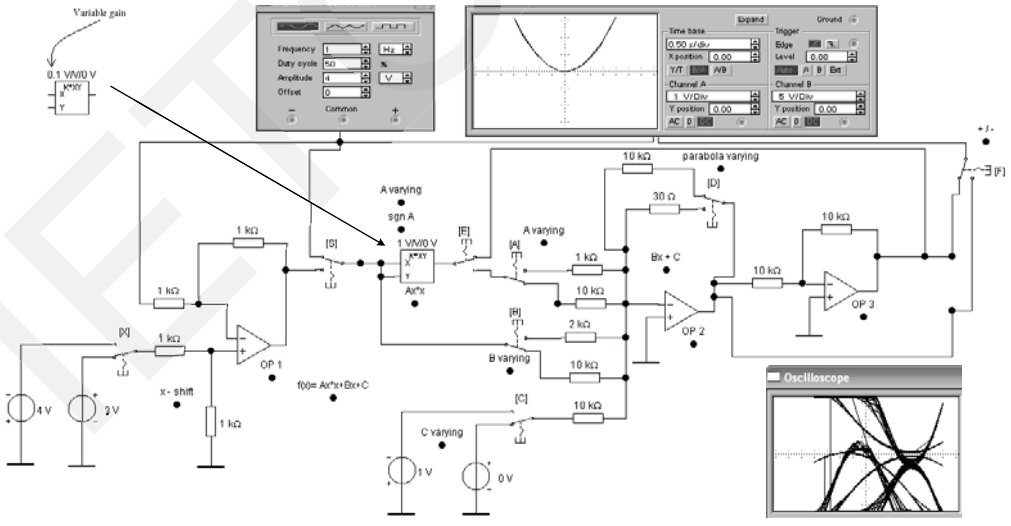

Fig. 10. General form of a parabola generator; $y = ax^2 + bx + c$

Example 3.1. Solve the inequality systems using electronic circuitry only.

$A \equiv -x + 3y - 1 > 0$
$B \equiv y - 0.5\,x^2 > 0$ (11)

$A \equiv -x + 3y - 1 < 0$
$B \equiv y - 0.5\,x^2 < 0$ (12)

Solution

Once when the given parameters of the given straight line are chosen by setting the battery voltage V_b (parameter c) and resistance R_2 (parameter m), the straight line is plotted on the phase plain. Then parabola's parameters are chosen ($a = 0.5$ and $g = -1/2$) to plot the parabola on the same phase plain (see Fig 11.).

The inequality areas are deduced and painted for clarity; observed oscillogram is copied as a bit map in EWB and pasted in „Paint“ to fill certain inequality areas in different gray areas (see Fig. 11).

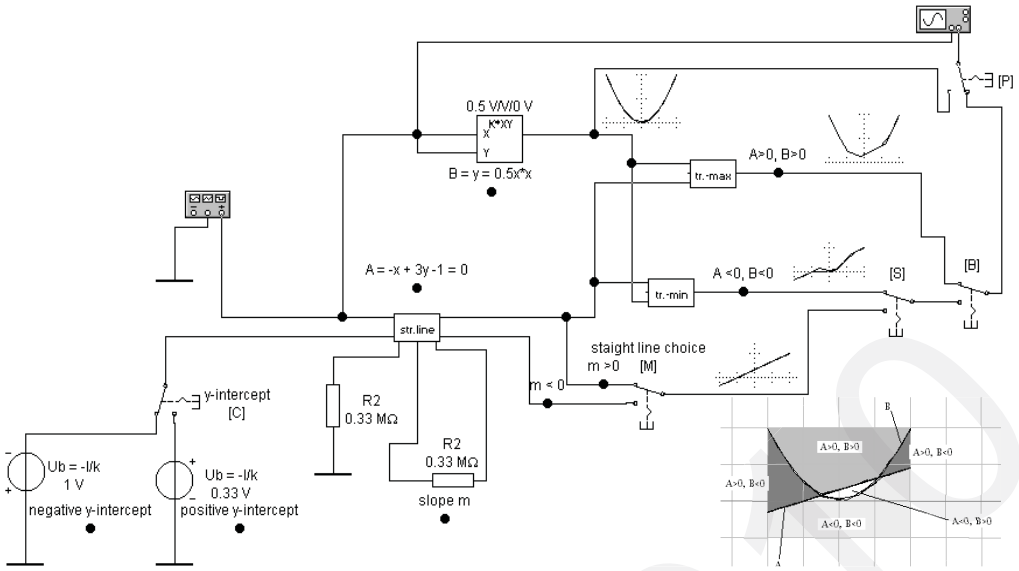

Fig. 11. *Parabola – straight line inequality system electronic solver*

CONCLUSION

In this paper we have showed that MIN, SLG, GPG and MAX circuits can be used as a problem solving tool in areas that are not strictly related to direct hardware applications so far. Using these circuits along with curve generators it is possible to solve simple inequality system in an electronic phase plane.

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ELEKTRONİK MATERYAL TASARLAMAYA YÖNELİK ÖĞRENCİ GÖRÜŞLERİ

STUDENT'S OPINIONS ON DESIGNING ELECTRONIC MATERIALS

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Özet

Bu çalışma, bilişim teknolojilerinin etkin olarak kullanıldığı eğitimde materyal tasarımı ve kullanımı dersinde öğrencilerin materyal tasarlama sürecinde karşılaştıkları sorunlar, materyal tasarlarken dikkat ettikleri özellikler ve tasarladıkları materyallerin hangilerini kendi alanlarında kullanmak istediklerine dair görüşlerini ortaya çıkarmak amacıyla yapılmıştır. Bilgisayar ve öğretim teknolojileri öğretmenliği programı 2. Sınıfta öğrenim görmekte 17 öğrencinin görüşleri alınarak yapılmıştır. Öğrencilerin elektronik materyal tasarlamaya yönelik görüşlerini almak amacıyla açık uçlu sorular yöneltilerek uygulamaya yönelik süreç değerlendirmesi yapılmıştır. Veriler betimsel analiz yöntemi kullanılarak değerlendirilmiştir. Eğitim sürecinin her aşamasında öğrenci katılımını sağlayacak biçimde yapılandırılan öğrenci merkezli bir eğitim için, öğrencinin ilgi ve ihtiyaçlarını da göz önüne alarak materyaller tasarlanması öğrencinin derse motivasyonunu sağlamada daha etkili olacağı düşünülmektedir. Elde edilen bulgulara göre, öğrenciler materyalleri tasarlama sürecinde materyalde kullanmak için düşündükleri görsel obje, ses gibi öğeleri bulmakta zorlanmakta, hazırladıkları materyalde tasarım öğelerini ve ilkelerini uygulayamama kaygısı yaşamakta, materyal tasarlarken daha çok görsel tasarım ilke ve öğelerine göre ara yüz hazırlamaya dikkat etmektedir.

ANAHTAR SÖZCÜKLER: Materyal Tasarlama, Elektronik Materyal Tasarlama, Materyal Tasarımı Ve Kullanımı

Abstract

The aim of this study was to investigate the problems that students faced during the material design stage of the "material design and use in education" course. Also, students' special attention on designing and selecting materials to be used in their own fields were studied. The participants of this study were 17 second year students from the department of computer education and instructional technologies. Data were collected through open ended questions that were answered by students. Descriptive analysis method was used to analyze the obtained data. The suggestions for main activities and methods to be used in "material design and use in education" course were provided based on the results of this study.

Keywords: material design, electroniic material design, material design and use

GİRİŞ

Bilimde ve teknolojideki hızlı değişmeler eğitim alanını da etkilemiş, eğitimde yeni teknolojiler yada teknolojinin eğitime entegrasyonu kavramlarını ortaya çıkarmıştır. Özellikle bilgisayarın eğitimde kullanılması öğrenme kaynaklarının zenginleşmesine, sınıf ortamında geleneksel yaklaşımların elektronik materyaller ile desteklenmesi önem kazanmaktadır.

Alkan'a (2005) göre Çağdaş teknolojinin eğitim için yarattığı sonuçlar üç başlık altında toplanabilir. Bunlar, 1. Dinamik bir eğitim gerektirme, 2. Bireye dönük bir eğitim düzeni oluşturma, 3. Yeniden yapılanma gereksinimi yaratma. Dijital dünyanın bize kazandırdıkları arasında bilgiye daha hızlı ve etkin erişim, daha derin analizler yapabilme gücü, planlama ve öncelikleri belirleme gücüne katkı, başkalarını daha iyi anlayabilme ve alternatif bakış açılarına hızla ulaşabilme gibi yeterlikler gösterilebilir (Akbulut, 2009). Ancak Demirel'in (2008) belirttiği gibi teknoloji sadece var olduğu için kullanılmaya çalışmamalı ya da teknoloji kullanılmadığında çağ dışı kalınacakmış gibi bir korkuya kapılmamak gereklidir.

Öte yandan gelecek nesillerin yetiştirilmesinde büyük rolü olan öğretmenlerin yetiştirilmesinde görev alan kurumlar görevlerini en iyi bir şekilde yerine getirebilmek için bir takım standartlara gereksinim duyarlar. Son yayınlanan NETS standartlarına göre öğretmenlerin yeterlikleri beş başlık altında toplanmıştır: Gerek yüzyüze gerekse çevrimiçi öğrenme ortamlarında öğrenmeyi kolaylaştırmak (2) dijital çağa uygun gerçek öğrenme deneyimleri ve ölçme değerlendirme süreçlerini tasarlayıp geliştir, (3) dijital çağa uygun çalışma ve öğrenmeye model olma (4) dijital vatandaşlığı ve sorumluluğu teşvik etme, (5) sürekli mesleki gelişim için çaba gösterme (NETS, 2010). Bu bağlamda geleceğin öğretmenleri dijital çağa uygun özellikte bilgi ve becerilere sahip olmalıdır. Eğitim öğretim sürecinde elektronik materyalleri tasarlaması önemlidir.

Öğretmen adaylarının bilgi teknolojileri ile ilgili eğitimi iki aşamada gerçekleştirilmelidir: Teknoloji okur-yazarlığı becerilerinin kazandırılması. Var olan teknolojileri öğretme-öğrenme süreçlerinde kullanabilme yeterliliklerinin kazandırılması. (Gündüz ve Odabaşı, 2004). Bilgisayar ve Öğretim Teknolojileri Öğretmenliği Programı'nda öğrenim görmekte olan öğretmen adaylarını bu iki kazanımın yanı sıra bilişim teknolojilerini etkin olarak kullanabilecek ve bu konuda öncülük edebilecek bilgi toplumu üyeleri olarak yetiştirilmesi ve topluma kazandırılması önemlidir.

Bu çalışma, Bilişim teknolojilerinin etkin olarak kullanıldığı Eğitimde Materyal Tasarımı ve Kullanımı dersi ile ilgili öğrenciye açık uçlu sorular yöneltilerek uygulamaya yönelik süreç değerlendirmesi yapılması amaçlanmaktadır. Bu süreçte, öğrencilerin materyal tasarlamada karşılaştıkları sorunlar, materyal tasarlarken dikkat ettikleri özellikler ve tasarladıkları materyallerin hangilerini kendi alanlarında kullanmak istediklerine dair görüşleri ortaya çıkarılmak istenmektedir. Materyal tasarımı yapan öğrencinin ilgi ve ihtiyaçlarının tespit edilmesi ve bu görüşlerin dersin öğretim planlanması aşamasında dikkat edilmesi öğrenci merkezli öğretim için önemli görülmektedir. Eğitim sürecinin her aşamasında öğrenci katılımını sağlayacak biçimde yapılandırılan öğrenci merkezli bir eğitim için, öğrencinin ilgi ve ihtiyaçlarını da göz önüne alarak materyaller tasarlanması öğrencinin derse motivasyonunu sağlamada daha etkili olacağı düşünülmektedir.

YÖNTEM

Örneklem ve Veri Toplama Aracı

Araştırmanın örneklemi Başkent Üniversitesi Bilgisayar ve Öğretim Teknolojileri Öğretmenliği Program'ında öğrenim görmekte olan 17 öğrenciden oluşmuştur.

Bu çalışmada öğrencilerin elektronik materyal tasarlamaya yönelik görüşlerini almak amacıyla açık uçlu sorular sorulmuştur ve betimsel analiz yöntemi kullanılarak değerlendirilmiştir. Betimsel analiz yönteminde elde edilen veriler, daha önceden belirlenen temalara göre özetlenir, yorumlanır (Yıldırım ve Şimşek, 2000). Betimsel analiz dört aşamada gerçekleştirilmiştir. Bunlar; betimsel analiz için bir çerçeve oluşturma, tematik çerçeveye göre verilerin işlenmesi, bulguların tanımlanması ve bulguların yorumlanmasıdır.

Türkiye'de Eğitim Fakültelerinde "Öğretim Teknolojileri ve Materyal Geliştirme" dersi ile, öğretmen adaylarının teknolojiyi dersleri ile bütünleştirmesine yardımcı olunmak hedeflenmektedir (Gündüz ve Odabaşı, 2004). Bu nedenle öğrencilerden ders sürecinde bulmaca, sesli mesaj veya video, ders notu, çalışma yaprağı, ders sunusu ve kavram haritası materyallerini elektronik ortamda tasarlamaları istenmiştir.

Eğitimde Materyal Tasarımı ve Kullanımı dersi Bilgisayar ve Öğretim Teknolojileri Öğretmenliği Programı 2. sınıf öğrencilerine, 2009-2010 Güz yarıyılında, Web temelli Öğretim Yönetim Sistemi kullanılarak verilmiştir. Görüşme soruları Öğretim Yönetim Siteminde yer alan forum modülü yardımıyla sorulmuş, veriler yine foruma katılan öğrencilerden toplanmıştır.

BULGULAR

Bu bölümde öğrencilerin açık uçlu anket sorularına verdikleri yanıtlardan elde edilen bulgulara yer verilmiştir. Bulgular aşağıdaki başlıklar altında ele alınarak yorumlanmıştır:

- Materyalleri tasarlama sürecinde karşılaştığınız sorunları belirtiniz. Bu sorunları çözmek için neler yaptınız?
- Bu zamana kadar tasarladığınız materyallerde dikkat ettiğiniz unsurlar nelerdi? Birden fazla öğeyi sıralayabilirsiniz?
- Mesleğe başladığınızda, derste tasarladığınız materyallerin hangilerini kendi alanınızda kullanmak istersiniz?

"Materyalleri tasarlama sürecinde karşılaştığınız sorunları belirtiniz. Bu sorunları çözmek için neler yaptınız? " sorusu ile elde edilen verilerin sınıflandırılması ve araştırmaya katılanların görüşlerinden yapılan doğrudan alıntılar Tablo 1'de verilmiştir.

Tablo 1: "Materyalleri Tasarlama Sürecinde Karşılaştıkları Sorunlar ve Bu Sorunları Çözmek İçin Neler Yaptıkları" Sorusuna Ait Frekans Tablosu

Sorunlar	**f**
Çalıştığım platform (bilgisayar), materyalimi özgün bir şekilde oluşturmama imkan vermedi.	1
Materyali tasarlamam için verilen zaman yetmedi.	2

Elektronik ortamda tasarım yapmak için kullanılan yazılım hakkında fazla bilgi sahibi olmadığım için sorunlar yaşadım.	5
Materyalde aktarılan içeriğin öğrenci seviyesine uygun olup olmadığını konusunda tereddüt yaşadım.	1
Tasarım öğelerine ve ilkelerini hazırladığım materyalde uygulayamama kaygısı yaşadım.	7
Materyalde kullanmak için düşündüğüm görsel obje, ses gibi öğeleri bulmakta zorlandım.	11
Çözüm	
Bireysel çabam ve öğretim elemanı desteği ile sorunlarımı çözdüm.	4

Görüşmeye katılan 11 öğrenci "Materyalde kullanmak için düşündüğüm görsel obje, ses gibi öğeleri bulmakta zorlandım" görüşünü belirtmişlerdir (Tablo1). 7 öğrenci "Tasarım öğelerine ve ilkelerini hazırladığım materyalde uygulayamama kaygısı yaşadım" ve 5 öğrenci "Elektronik ortamda tasarım yapmak için kullanılan yazılım hakkında fazla bilgi sahibi olmadığım için sorunlar yaşadım" görüşlerini sorunlar olarak sıralamışlardır. 4 öğrenci ise yaşadığı sorunları "Bireysel çabam ve öğretim elemanı desteği ile sorunlarımı çözdüm." şeklinde yanıt vermişlerdir.

"Tasarladığınız materyallerde dikkat ettiğiniz unsurlar nelerdi? Birden fazla öğeyi sıralayabilirsiniz?" açık uçlu sorusuna öğrencilerin verdikleri yanıtların analizi ve araştırmaya katılanların görüşlerinden yapılan doğrudan alıntılar Tablo 2'de verilmiştir.

Tablo 2: "Tasarladığınız Materyallerde Dikkat Ettiğiniz Unsurlar Nelerdi?" Sorusuna Ait Frekans Tablosu

Dikkat Edilen Unsurlar	**f**
Materyal hangi ortamda daha etkili tasarlanır?	1
Görsel tasarım ilke ve öğelerine göre ara yüz hazırlama	13
Öğrenci seviyesine uygunluk	9
Etkileşim	2
İçerik aktarımı	1
Görsel öğelere yer verme	4
Bilgilerin doğruluğu	1
Verilen içerik ile ilgili yeterli örnek ve açıklamaların alması	1
Açık ve anlaşılabilir içerik aktarımı	4
Dikkat çekme	4
Soyut kavramları somutlaştırmaya	1

Tablo 2'de yer alan veriler doğrultusunda materyal tasarımı yaparken 13 öğrenci görsel tasarım ilke ve öğelerine göre ara yüz hazırlamaya, 9 öğrenci, öğrenci seviyesine uygunluğuna dikkat ettiklerini belirtmişlerdir. Bu görüşlerin yanı sıra görsel öğelere yer verme, açık ve anlaşılabilir içerik aktarımı ve dikkat çekme gibi görüşlere de yer verilmiştir.

"Mesleğe başladığınızda, tasarladığınız materyallerin hangilerini kendi alanınızda kullanmak istersiniz? Nedenini belirtiniz. " sorusu ile elde edilen verilerin sınıflandırılması ve araştırmaya katılanların görüşlerinden yapılan doğrudan alıntılar Tablo 3'de verilmiştir

Tablo 3: "Mesleğe Başladığınızda Derste Tasarladığınız Materyallerin Hangilerini Kendi Alanınızda Kullanmak İstersiniz? Nedenini Belirtiniz." Sorusuna Ait Frekans Tablosu

Materyal	**f**	**Neden bu materyali kullanmak isterim?**	**f**
Kavram Haritası	7	Öğrenci kavramı kapsayan bütün öğeleri rahatlıkla görebilir.	1
		Öğrencinin kavram yanılgılarını tespit edilebilir.	1
		Daha fazla dikkat çekmek.	2
		İçerik aktarılmasında katkı sağlamak.	3
		Materyali hazırlaması kolay.	1
		Kalıcı öğrenmeye yardımcı oluyor.	1
		Ayrıntılı içeriği özetliyor.	1
Eğitim yazılımı	2	Etkileşimli öğrenme ortamı sağlanıyor.	1
		Öğrencilerin derse motive olmasına katkı sağlıyor.	1
Ders Notu	2	İlgi çekiyor.	1
		Derse katılıma teşvik ediyor.	1
Sesli Mesaj veya Video	9	Dikkat çekmek.	5
		İçerik aktarılmasında katkı sağlıyor.	1
Çalışma Yaprağı	4	Öğrenciden dönüt alabilmek.	2

		Katılım sağlamak.	2
Tüm Materyaller	8	Öğrenme süreçlerinde yerinde kullanmak.	1
		Bireysel farklılıklarına göre kullanmak.	1
		Motivasyonu sağlamak.	1
		Kalıcı öğrenmeye yardımcı olmak.	1

Tablo 3'de yer alan veriler doğrultusunda öğrencilerin büyük bir kısmı sesli mesaj veya video (9 öğrenci), kavram haritası (7 öğrenci) tasarladıkları materyalleri kendi alanlarında kullanmak istediklerini belirtmişlerdir. Bunun yanında 8 öğrenci, öğrenme süreçlerinde uygun ortamda, öğrencilerin bireysel farklılıklarına göre, öğrenci motivasyonuna ve kalıcı öğrenmeye katkıda bulunmak gibi nedenlerle tüm materyalleri kullanabileceklerini belirtmişlerdir.

Tasarladıkları materyali hangi öğrenme sürecinde kullanabilecekleri hakkında öğrencilerden dolaylı olarak veriler de alınmıştır. Örneğin, çalışma yaprağını öğrenciden dönüt almak, kavram haritasını öğrencinin kavram yanılgılarını tespit etmek, eğitim yazılımını etkileşimli öğrenme ortamı sağlamak için kullanmak istiyorlar. Bu bulgu ile Eğitimde Materyal Tasarımı ve Kullanımı dersinde öğrenciler hangi materyali hangi öğrenme sürecinde kullanabileceklerine dair üst bilişsel düşünme becerileri kazanabildikleri söylenebilir.

SONUÇ VE ÖNERİLER

Bu çalışmada Bilgisayar ve Öğretim Teknolojileri Öğretmenliği 2. sınıf öğrencilerinin Eğitimde Materyal Tasarımı ve Kullanımı dersine yönelik görüşleri belirlenmiştir. Edinilen bulgulara göre sonuçlar aşağıdaki maddeler halinde verilmiştir.

- Öğrenciler materyalleri tasarlama sürecinde, materyalde kullanmak için düşündükleri görsel obje, ses gibi öğeleri bulmakta zorlanmakta, tasarım öğelerini ve ilkelerini hazırladıkları materyalde uygulayamama kaygısı yaşamaktadırlar. Bazı öğrenciler bu sorunlarını bireysel çabaları ve öğretim elemanı desteği ile çözmektedir.
- Öğrenciler materyal tasarlarken daha çok görsel tasarım ilke ve öğelerine göre arayüz hazırlamaya, tasarımın öğrenci seviyesine uygun olmasına dikkat etmektedirler. Görsel öğelere yer verme, açık ve anlaşılabilir içerik aktarımı yapabilme ve öğrencilerin dikkatini çekebilme gibi konulara da dikkat ettiklerini belirtmişlerdir.
- Kendi alanlarında sesli mesaj veya video, kavram haritası, çalışma yaprağı gibi materyalleri kullanmak isterken PowerPoint ile hazırlanan ders sunusu ile ilgili görüş belirtmemeleri önemli sayılabilir. Halbuki Bilgisayar ve Öğretim Teknolojileri Öğretmenliği programında çoğu derslerde materyal olarak PowerPoint sunuları kullanıldığı bilinmektedir. Ders sunularını kendi alanlarında kullanmak istediklerini özellikle belirtmemelerinin sebebi değişik bir materyal kullanmak istemelerinden veya ders sunusu materyalinin kullanımını kabullenmeleri olarak yorumlanabilir.
- Ayrıca öğrenciler hazırladıkları tüm materyalleri öğrenci motivasyonuna ve kalıcı öğrenmeye katkıda bulunmak üzere uygun durumlarda ve bireysel farklılıklarına kullanmak istiyorlar.

Öneriler:

- Öğrencilere materyal tasarımı sırasında karşılaşabilecekleri sorunları çözebilmeleri için daha fazla destek verilebilir. Örneğin; elektronik ortamda materyal tasarlarken yararlanabilecekleri çevrimiçi kaynakların sunulması, kullanılacakları yazılım ile ilgili bilgi ve beceriler kazandırılması gibi.
- Eğitim sürecinin her aşamasında öğrenci katılımını sağlayacak biçimde yapılandırılan öğrenci merkezli bir eğitim için, öğrencinin ilgi ve ihtiyaçlarını da göz önüne alarak materyaller tasarlanması öğrencinin derse motivasyonunu sağlamada daha etkili olacağı düşünülmektedir.
- Bu çalışma Eğitim Fakültesi "Eğitimde Materyal Tasarımı ve Kullanımı" dersinde yürütülmüştür. Aynı çalışma farklı programlarda ve farklı gruplar üzerinde tekrar yapılması bulguların genellenebilirliğini açısından önemlidir.

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Emergence of Epistemic Agency in College Level Educational Technology Course for Pre-Service Teachers Engaged in CSCL

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This is mainly a descriptive study for identifying epistemic agency, defined as pursuing one's own and/or collective epistemic goals, which is believed to emerge within the collective inquiry in a community of learners, especially in CSCL environments using social network analysis to analyze the contact between students.

Written interaction within the students of a college educational technology course for senior and junior pre-service teachers were analyzed to detect and rank those students in terms knowledge sharing, pushing for deeper inquiry and the number of partners they communicated with. Social network analysis techniques were employed to rank students in terms of their centrality using a betweenness value in the network, where higher values indicated more communication flow occurred through that person. An aggregate score is calculated for each student and they were ranked into four levels of epistemic agency ranging from exceptional to low.

The data were collected over two summer courses one year apart with 20 and 21 students who exchanged 429 and 693 distinct written communications respectively over a six week period and these communications were written online in addition to a similar oral discourse students engaged in three times a week for two 50 minute class meetings. These courses was taught with knowledge building pedagogy and supported by Knowledge Forum, a second generation Computer Supported Collaborative Learning (CSCL) environment, where students worked on six problems of understanding regarding educational technology for the entire semester.

The results indicate that nearly half of the students in both courses were rank in the lowest level of epistemic agency interpreted as following mostly their own epistemic goals with minimal knowledge sharing with few partners and mediating little of knowledge sharing and collective inquiry. There were two to three students in each course with outstanding score in all of the five criteria and the others dispersed evenly from moderate to high. Both courses gave a low network centrality value indicating that the communication was not concentrated over a few individual but evenly scattered among the members.

Epistemic agency is defined and analysis and ranking are elaborated with tables and charts.

Introduction

Basically, epistemic agency is working to understand something individually or collectively. Traditionally teachers assume and manage the cognitive aspects of thinking and problem solving in the classrooms. A knowledgeable teacher who maybe able to skillfully gauge subject complexity so that students aren't overwhelmed in reaching the learning goals, but such teachers are far too few and sometimes a deeper understanding is not likely in direct instruction. Some students would be more interested and persistent about pursuing their own epistemic goals for a personal and deeper understanding, which normally requires more time and support in traditional task completion oriented classrooms could afford. Some pedagogical structures such as self-regulated and co-operative learning and guided discovery are some known attempts to have more student role in learning. Collaborative learning is also about working for shared understanding such as in project-based and problem-based learning but neither the projects nor the problems are about knowledge per se. Students can assume more of epistemic agency in knowledge building, a pedagogy based on production and continual improvement of ideas of value to a community. Student ideas are offered individually and then improved collectively, where all members share the cognitive responsibility and feel the epistemic agency at varying levels (Bereiter, 2002; Scardamalia and Bereiter, 1994). Epistemic agency is not merely concerned with epistemological elements (knowledge in itself), but also with the complex combination of qualities that permit a student to deal with knowledge, with learning in collaboration, and to be efficient when learning. The knowledge building model is widely employed in schools as well as businesses and organizations with a focus on knowledge work. Epistemic agency is regarded as assuming cognitive responsibility in knowledge building which is more about shared epistemic goals and collective knowledge advancement as opposed to more personal epistemic goals.

A common metaphor of learning is acquisition where an individual is thought to acquire pieces of knowledge as a matter of personal construction to reside in his mind as personal property and are expected to show itself as a capability to apply this knowledge in new situations. Acquisition is an individual cognitive process with emphasis on outcomes.

Another widespread metaphor for learning is a matter of participation in a social process of knowledge construction in various cultural practices and shared learning activities. Knowledge, however, does not exist either in a world of its own or in individual minds but is an aspect of participation in cultural practices. Participation is situative with emphasis on durability of individual knowledge.

This distinction in metaphors has it roots in different perspectives of learning: cognitive and situative. Cognitive approaches emphasize computational models of mind, and the aim is to simulate the way the individual mind operates with knowledge. While a cognitive perspective emphasizes *knowledge*, situated approaches emphasize situatedness of human cognition, and participation in interactive, social processes as basic processes in learning. A situated approach emphasizes participation in social *practices* and *action.*

Knowledge creation is a new metaphor that appears to rise above the dichotomy between acquisition and participation metaphors by emphasizing the process of acquisition rather than the outcomes, and participation in terms of the constant flux of knowing rather than having the knowledge.

Cognitive (the acquisition metaphor) and the situative (the participation metaphor)

Three models of innovative knowledge communities

	Nonaka & Takeuchi	Engeström	Bereiter
Type of processes focused on	Emphasis on the knowledge spiral, based on tacit versus explicit knowledge.	Emphasis on material object-oriented knowledge activities and practices.	Emphasis on knowledge building with conceptual artifacts.
Source of innovation	Transforming tacit knowledge into explicit knowledge.	Overcoming tensions, disturbances, and ambiguities through expansive learning.	Working deliberately to create and extend knowledge objects.
Scope of framework	Ontological levels (individual, group, organizational, and inter-organizational)	Activity systems and networks of activity systems.	Knowledge- building communities.

(Paavola and others, 2004 p.563)

Epistemic agency is the cognitive authority and responsibility for knowledge advancement. Traditionally teachers manage and monitor the thinking and problems solving in classrooms.
Knowledge Forum is a second generation CSCL environment that supports the learning of individual students by structuring the inquiry, providing tools for keeping a record of activities, and by pointing out essential phases of the process by using tools that direct the student's meta-cognitive awareness and enhance reflection. Knowledge Forum is distinguished from other learning management systems with its promotion of processes such as "defining problems and hypothesizing, researching and collecting information, analyzing and collaborating". Knowledge Forum, previously CSILE, has been in development over two decades with substantial research on how to use it to support collaborative work with knowledge (Scardamalia and Bereiter, 1994; Scardamalia, Bereiter, McLean, Swallow, and Woodruff, 1989). Knowledge Forum database is completely generated by participants. Notes, created and stored online as objectification of collective knowledge, can be searched and reworked by others. Participants can give other notes in the Forum as references in their notes, thus forming a visible web of incorporated ideas that mirrors the interwoven and dialogical nature of knowledge.

We all pursue epistemic goals when our efforts are directed for an understanding. How are going to understand anything, however, is affected by our goals be it for meeting the requirements of a course or turning our understanding into practice. Traditionally epistemic goals are set, monitored and evaluated by teachers who lead students to mastering preconceived knowledge and skills. One could pursue their own epistemic goals, on the other hand, if their natural motives are directed for understanding something, which can only be surpassed by a collective effort towards a shared understanding where new insights are added through a sustained inquiry. Scardamalia (2002) defines epistemic agency as what emerges when students set forth their own ideas, negotiate a fit between their personal ideas and that of others, and take charge of their own knowledge advancement, all of which are also abilities required for sustained work in order to advance and elaborate ideas across situations and contexts (Muukonen and others, 2009).

Inquiry is a process mediated by shared knowledge objects (questions, working theories and explanations) it's not only a dialog between partners but a three way interaction between the participants and the shared knowledge object of inquiry. They cyclical parts of the inquiry process are follows:

Setting up research questions: The questions are generated when input or stimulus is at odds with their world knowledge when people face contradictions, anomalous information, obstacles to goals, uncertainty and obvious gaps of knowledge (Otero & Graesser, 2001). Six problems of understanding are pre-selected by the instructor as representing the core problems for a deeper understanding of educational technology as meaningful and complex problems. Students start out with their questions and explanations. Secondly, students are expected to use their own knowledge before consulting information sources and come up with some working theories. This process is likely to make students' intuitive conceptions visible and give them change to see the coherence of their thoughts in their effort to explain them to others. Thirdly, critical evaluation the ideas for their weaknesses and strengths as well as the inquiry process itself follow. Students are provided with some relevant text on the problems but searching deepening knowledge is thought to be a good change for students for self-directed inquiry. A student once commented in a similar course that he was googling for weeks to get answers to the questions like "why is something worth learning?" but couldn't come up anything. Students are likely to refocus their inquiry by generating subordinate questions and learning more about these questions will probably give way to new and improved working theories.

Functionality or scaffolding is used to support the inquiry process. We use cultural-historical signs and tools to mediate our activities. Categorize contribution according to essential aspects of inquiry (thinking types) (Bereiter and Scardamalia, 1993). These scaffolds allow participant to represent their knowledge and ideas invite them engage in an extended dialog with collectively accessible ideas rather than a mere dialog between minds.

This descriptive study aims at identifying epistemic agency, defined as pursuing one's own and/or collective epistemic goals, which is believed to emerge within the collective inquiry in a community of learners, especially in CSCL environments using social network analysis to analyze the contact between students.

Patterns of participation in collaborative inquiry: share, inquire. Communities are formed through the accumulation of relations and influences among participants (Frank, 1998)
Pairwise relations of social actors through social interactions: commenting, collaborating, seeking for advice, mediating knowledge, providing socio-emotional support
Access to knowledge and other resources is provided by structural context of relations ship, direct or indirect contacts/links. KF is a networked learning environment that provides a shared space to the participants for producing, searching, classifying, commenting on, and linking knowledge together (Bereiter, 2002; Scardamalia & Bereiter, 1994)

Methodology

Students contribute to the written part of knowledge building of the class by logging on the Knowledge Forum in order to read, create and/or revise notes or annotate notes. Student can either create a stand alone new note or build on another note implying that this particular note is further work on the idea embedded in the note built on. Annotations, similar to sticky notes posted on objects can be written by students in any number in any note. New notes as that appears to be stand alone may either be meant for all to see or a creation of the author for various reasons. The written interaction among the students of a college educational technology course for senior and junior pre-service teachers were analyzed to detect and rank those students in terms knowledge sharing, pushing for deeper inquiry and the number of partners they communicated with. Student notes and annotations are relational because they can be interpreted as to be from one student to another even though it is for all to see. Social network analysis techniques were employed to rank students in terms of their centrality using a betweenness value in the network, where higher values indicated more communication flow occurred through that person. An aggregate score is calculated for each student and they were ranked into four levels of epistemic agency ranging from exceptional to low.

The data were collected over two summer courses one year apart with 20 and 21 students who exchanged 429 and 693 distinct written communications respectively over a six week period and these communications were written online in addition to a similar oral discourse students engaged in three times a week for two 50 minute class meetings. These courses was taught with knowledge building pedagogy and supported by Knowledge Forum, a second generation Computer Supported Collaborative Learning (CSCL) environment, where students worked on six problems of understanding regarding educational technology for the entire semester.

Students were introduced to knowledge building pedagogy and Knowledge Forum software at the beginning of the course and appropriate examples given and support was provided during the course by the instructor. All six problems of understanding, four about education and two about educational technology, were introduced in the first week of the course and students were informed that the work or knowledge building course would continue orally in the class and online over the Knowledge forum for the duration of the course. Students also prepared two electronic portfolios using all student notes in the middle and the end of the course. After the introduction of each problem students would offer their ideas in their effort to understand and explain the problem. For instance, after the problem of "where lies the Knowledge Forum as an educational technology in terms of classical time and space quadrant of instruction", typical classroom instruction taking place in the same time and same place and classical distance education over the web taking place with instructional elements separated in term of time and space, student offer ideas and their ideas are critically listened and improvements are offered. Soon the discourse moves to Knowledge Forum which is designed to support and sustain idea improvement and makes the ideas and the process visible and workable with such tools as scaffolds to help writer and the readers to interpret the idea, "my theory" for instance is a conjectural explanation and "this theory cannot explain" is a criticism of an idea and "I need to understand" is asking for ideas clarification, and annotations which are akin to sticky notes, in which participants may be commenting on some aspect of the note, such as spelling or an urgent need to let the note owner know that he agrees with her, which is normally not considered note material for it does not have a material contribution to the discourse (see the appendix x for a pictures of Knowledge Forum View, Note and Annotation, and appendix XX for an exemplary discourse on "The good, the bad and the ugly" sides of technology problem). Students share knowledge and demand and push for further inquiry in the class as well as online. Problems of understanding are question that are deemed as to address the core of the area of educational technology that will require students to getting deeply into subject matter and into the cognitive developmental and instructional research in the various domains. Here is how a student describes how the class runs.

...the class opens with being introduced to a few new books and we always get heavily criticized by our professor about these books we haven't read. Speaking for myself only, I end up criticizing myself afterwards. Then a pilot is selected who will access the Knowledge Forum for us in the class. We start discussing about either one of the topics in KF or any other topic that happens to be talked at the moment. None of us is afraid of being criticized because no matter what one says, true or false, he will be criticized by all others in the class anyway. The criticism is never aimed for belittling or justification. The only aim is to be able to get the best possible understanding of what is said. One of things this course will give you is to be able to listen to someone, listen well and enjoy the satisfaction of having listened to someone so well. None of the topics the course reached a conclusion. That is, once a topic is opened we all begin discussing about it in the class. As one of the discussants in the class our professor says a few things as well, but he never makes us feel that his view is the "truth" and he leaves it open for discussion. The class discussion necessarily ends by the end of the period but the discussion goes on seven days a week and twenty four hours a day on the KF.

Knowledge Forum is accessed using the computer in the class with its screen being projected for all to see. This particular student is blind and naturally emphasizes the oral aspects. Talking about books in the beginning of the course was a conversation starter as well as encouraging outside reading.

Another student describes the state of the mind in the course as follows:

In the beginning of this term I thought we would be expanding our horizons by discussing the topic during the term in a way we have never discussed before. It turned exactly the same way but I suffered in the process a lot more than I anticipated. Simply because, feeling the necessity to say something about the topics both in the class and in the (Knowledge) forum all the time catches one off guard even in some unexpected occasions as the mind gets busy with the problems. Now I see that this was how we constructed our knowledge.

Another student depicts the life afterwards and the knowledge building process as follows:

It is over now. No doubt that I will get used to the life without KF but the way of thinking I have developed will change quite a few things in my life. Some of my friend already complain about my inquiries and tell me that life is not all that deep and being a bit more lighthearted about matters would be good for me. Thinking is more of an involuntary action for me now. I already was a careful person and I paid attention to details wherever I was, intending on getting a deep understanding. But KF made that deeper. I don't know if I needed that. Time will tell. Who knows, perhaps it was just an ordinary class that is over now and I'll just leave and never think about it again. Perhaps we were already knowledge builders in life but we didn't know about it. This course made us aware, that's all. But writing about this to KF is definitely a product of this class.

Hamdi Erkunt Identifying the Epistemic Agency Draft

Most of the oral and written student activity is about sharing what they know and pushing for a deeper inquiry. Epistemic agency is more likely to show itself through knowledge sharing for it that is when students contribute to the advancement of the collective knowledge of the class. Here are some knowledge sharing (KS) examples:

As social needs change what's worth learning will also change. Therefore things worth learning may differ among cultures and societies.

I wrote in the beginning of the term that KF was independent of time and space. But I have changed my mind when it was said in the class the other day that "knowledge may change in space and time and may acquire different meanings." When KF was shut down for a short while it made its time dependent nature quite clear. But I still cannot convince myself of the idea that it is also space dependent.

I also think that technology is unavoidable but I disagree with the claim that technology may have lost purpose and gotten out of our control because technology does not get out of control. It exists to make people's lives easier and raise the quality of life. If people use technology for their own evil goals, however, that only shows that people are out control not technology.

Distribution of regulative inquiry (DRI) is about clarifying meaning, spotting what known and needs to be known as well stating that a satisfactory level has been reaches in the inquiry. Here are some examples:

A very nice point of view, indeed. You question if "humanity was able to reach its expected humanistic goals by cars, trains or planes." Do your really think we use technology to reach those goals? Or what do you really mean by expected humanistic goals?

What about things that we learn out of necessity, would they be considered automatic learning? For example, is learning to get in line when waiting for a bus in the bus stop an automatic learning according to your theory?

I really like your examples on peace and happiness. They couldn't have been more explanatory than that. Sometimes examples serve like a magnifying glass in understanding a topic.

Results

The results indicate that nearly half of the students in both courses were rank in the lowest level of epistemic agency interpreted as following mostly their own epistemic goals with minimal knowledge sharing with few partners and mediating little of knowledge sharing and collective inquiry. There were two to three students in each course with outstanding score in all of the five criteria and the others dispersed evenly from moderate to high. Both courses gave a low network centrality value indicating that the communication was not concentrated over a few individual but evenly scattered among the members.

Density refers to the number of observed links (network ties) in a network divided by the possible number of connections (Borgatti et al., 1996, p. 78; Scott 1991, p. 74). Connections in binary matrices indicated either by 0 for no connection and by 1 for connection. Knowledge Forum readily calculates densities by a build-in tool in terms of note reading, build-on's, references given and annotations. Build on and annotation densities combined is the relational network density for the group in term of contacting and contributing through others. The respective densities for group A83 and B93 were 52.1 % 51.7 %. Another density measure includes only the contact made either for KS or DRI that was calculated after coding and eliminating some student input that was not deemed as KS or DRI. data of build-ons and annotations are considered as ties and abstracted as 1. These adjusted densities for G1 and G2 respectively were 37% and 41.7%.

Cluster Centers for Relational Measures of Epistemic Agency

G1	Level of Epistemic Agency			
Variables	Level 1	Level 2	Level 3	Level 4
Outdegree of knowledge-sharing comments	11	15	29	14
Outdegree of distributed regulation of inquiry	3	7	7	1
Betweenness of knowledge-sharing comments	20	24	66	70
Betweenness of distributed regulation of inquiry	7	63	55	0
Number of dialogue partners	10	15	17	11
Number of students	12	4	4	3

Cluster Centers for Relational Measures of Epistemic Agency

G2	Level of Epistemic Agency			
Variables	Level 1	Level 2	Level 3	Level 4
Outdegree of knowledge-sharing comments	30	16	41	69
Outdegree of distributed regulation of inquiry	7	2	15	14
Betweenness of knowledge-sharing comments	19	4	16	42
Betweenness of distributed regulation of inquiry	20	2	48	63
Number of dialogue partners	13	7	14	17
Number of students	12	4	4	2

360-083	Size of network		Knowledge-sharing network		Distributed regulation of inquiry		
ID	Dialog partners	Indegree	Outdegree	Between-ness	Out-degree	Between-ness	Levels of epistemic agency
01m	18	17	21	48	7	33	2
02f	19	41	31	76	13	61	4
03m	20	27	42	55	2	60	4

04m	15	15	5	19	15	22	1
05f	11	18	9	16	4	1	1
06m	12	9	24	18	0	0	2
07f	18	18	14	11	13	58	3
08f	16	17	17	25	2	11	2
S09m	11	12	20	29	5	20	2
10m	17	28	29	37	8	55	4
11f	12	16	19	64	2	0	2
12m	10	8	12	62	1	0	1
13m	12	4	12	23	4	30	3
14m	10	5	10	86	1	1	1
15f	8	7	15	31	2	0	1
16f	12	8	3	15	3	0	1
17f	7	2	14	0	2	0	1
18m	12	8	23	85	5	65	2
19f	17	22	7	24	1	62	3
21f	8	6	7	43	1	0	1
22m	7	3	9	24	4	79	1
23m	6	4	4	20	0	0	1
24m	5	1	5	1	1	0	1

360-093	Size of network		Knowledge-sharing network		Distributed regulation of inquiry		
ID	Dialog partners	Indegree	Outdegree	Between-ness	Out-degree	Between-ness	Levels of epistemic agency
01m	4	11	5	12	1	0	1
02f	4	4	7	0	3	0	1
03m	4	7	6	2	3	7	1
04m	9	7	16	5	3	6	1
05f	7	7	10	0	2	0	1
06m	12	27	30	11	3	9	2
07f	7	7	18	4	0	0	1
08f	2	4	3	0	1	3	1
09m	15	51	64	49	17	76	4
10m	0	2	24	0	3	0	1
11f	11	30	24	15	3	2	1
12m	18	66	74	34	10	50	4
13m	16	32	40	14	9	27	2
14m	0	10	11	0	1	0	1
15f	13	6	31	4	3	0	1
16f	14	40	45	19	11	41	3
17f	17	16	23	5	6	3	1
18m	10	15	24	3	2	0	3
19f	16	44	31	12	27	59	3
21f	12	47	48	17	6	45	3
22m	15	39	35	18	12	23	2

Discussion

Cluster analysis was most revealing for the exceptional and strong levels of epistemic agency. Ideally, students with high values in the five criteria used for cluster analysis would be expected to rise to higher levels of epistemic agency. The higher F values in the cluster analysis indicate that centrality of the students in terms of knowledge sharing (KS) and distribution of regulative inquiry (DRI) were more effective clustering. Therefore, cluster analysis is only used for clustering the group and not ranking among the clusters. Ranking is done in terms of combinatory ranking of each variable, namely number of partners, centrality of the student in KS and DRI, as well student's their Outdegree of KS and DRI.

Outdegree of KS indicates how many contacts a student made in an attempt to share his knowledge with others. Outdegree of DRI, on the other hand, indicated how many contacts are made in an effort to deepen the inquiry by a student. Freeman's Betweenness value indicates how central a student is in term of KS and DRI in the network.

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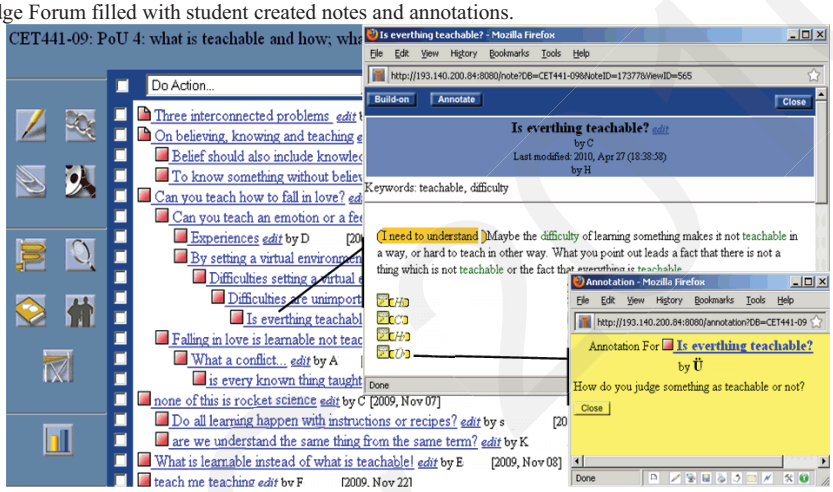
Appendix A: Knowledge Forum filled with student created notes and annotations.



Appendix B: En example of student knowledge building on the problem of technological determinism and neutrality, presented here under the movie title The god, the bad and the ugly.

This particular piece of discussion took place within last ten days of the intense summer course. Names are left as initials and indentations indicate they build ons. Italicized text within bolded brackets are the scaffolds used by the students. Underlined texts between the parentheses are the clickable references for other notes in the database. The text blocks in italics are the annotations made in the immediate note above. These notes have been translated from Turkish with minor corrections leaving the rest intact.

Instructor Problem of understanding: The good, the bad and the ugly.

It appears that technology, whatever that is, creates just as many, if not more, problems than it intends to solve. Besides the aforementioned paradox, technology is also attributed an agency; an entity that can create a difference by itself. This could be a misunderstanding language may be forcing on us, but may be there is some truth to it. Moreover, technology is thought of as value-free; good with the good and bad with the bad. Is that really so?

F. K. Even if what I said is true, mine is not the only truth. [2009, Jul 24]

[*My Theory***]** It seems we are stuck with certain ideas in this discussion: "technology is good itself but we misuse it", technology is out of control not us, "technology has side effects", technology serves capitalism, "the problem is out of our hands and technology does not make you lazy" etc… All of them have some valid points. That is, they all can be considered right from a certain point of view. Our problem, however, is over generalizing. We seem to think only of telephone, TV, computers, weapons and such when thinking of technology. If we could only think about drugs that heal, homes we live, drinking water in Japan, clothes we wear and foods we consume as technology as well, then perhaps we can judge technology better. Therefore, all of the above points of view can claim that they are right, unless it is really obvious, but no one can say that only theirs is the truth.

F. C. I can't decide [2009, Jul 25]

[*Putting our knowledge together***]** Even if I agree with him (Even if what I said is true, mine is not the only truth) that a few examples aren't sufficient to show whether technology is good or bad, just claiming either way does not necessarily make technology good or bad. The opposite could also be true. Thus it seems difficult make a definitive judgment.

T. P. Definitive?? [2009, Jul 26]

I don't think our discussion here is about making definitive judgments. Obviously a topic with clear-cut answers would not naturally come up in this course. I see nothing wrong with everyone making up their own minds. 90% of our lives exclude any sort of definitive judgment. Let it be same here.

M. K. The good is here but can't find the ugly anywhere. [2009, Jul 28]

[*This theory cannot explain***]** Is this the point of this discussion? None of the notes here claims to be the only truth, and our friend who started this discussion says it isn't so here (Definitive??). We are just trying to question the ideas so that we can better see the good, bad and ugly sides of technology. This effort expands our minds and prepares us for persuading others about or refuting the new ideas. We can continue our discussion outside the class 7/24 and that is the good side of technology. The bad side, on the other hand, is that writing

this note leaves me with a stiff neck and bloody eyes late at night. I can't decide about the ugly side yet. Should we wait for someone to offer their only truth?

G. P. Could this be the ugly side? [2009, Jul 29]
[*A better theory***]** Perhaps we can consider our case of not accessing to KF yesterday due to a technical problem as its ugly side. Technology failed all of us. Our technological Knowledge Forum was interrupted because of technology.

F. K. This may be more of disadvantage than the ugly side. [2009, Jul 30]
[*Different opinion***]** It may result in bad consequences but we may not be able to generalize from it. The real problem appears to be our unconditional dependency on KF. We should prepare ourselves for such occurrences if we all accept this system with its good and bad sides. This is similar to services of a government agency coming to a halt due to technical problems. Since we are not going to give up KF just for this, we must therefore be prepared and have alternative solutions.

F. C. I don't think so [2009, Jul 31]
[*Putting our knowledge together***]** As a friend points out here (Could this be the ugly side?) I don't think such a technical foul up can be regarded as ugly because all the good and useful things may have imperfections. And it was a temporary problem and was fixed quickly.

T. S. No offence but there is an ugly side. [2009, Aug 01]
[*I need to understand***]** Luckily we were back on quickly in our case (This may be more of disadvantage than the ugly side) but what if the problem was prolonged, say, a government system was down a long time thereby disrupting many necessary and vital functions only because they were dependent on computers, would we still not call it the ugly side? What if, for example, we need a print out for a course project written only in computers just before it is due only to find out that our work is all damaged beyond recognition when it last saved. We would have nothing. Can we still not claim this as the ugly side of technology?

G. P. This would be the ugliest. [2009, Aug 02]
[*Putting our knowledge together***]** As our friend says in the note (No offence but there is an ugly side) the ugly side reveals itself much better when we expand the situation outside our course, because it scary even just to think about how our lives would have been paralyzed if all the information in the cyberspace evaporated due to technical problems.

F. K. Points of view. [2009, Jul 30]
[*Putting our knowledge together***]** In fact, as I have said before, we won't be able to make definitive judgments about technology such as it being good for certain things therefore indispensable or it being harmful one way of another thus should be dropped immediately. Nevertheless, as you also wrote in this note (The good is here but can't find the ugly anywhere), here we learn about alternative ideas and develop various points of view. I think that the beautiful and the ugly sides of technology will remain relative to the person except for, perhaps, some obvious cases. As I also mention in my course impressions, not only we have learned quite a few new things in this process but also we developed lots of different skills. I think this turned out to be very good.

S. K. If we were to summarize it all… [2009, Aug 03]
[*My Theory***]** I don't understand humans. First they invent bullet-proof vest and then comes the bullet that penetrates that vest. I think we have to consider technology from this perspective as well: it is a field that progresses by disproving itself. Newest innovation discards the previous one. We are engulfed in pollution and chaos. Of course, we humans are the ones doing it. I think we are now well beyond seeking the useful but rather pursue the fantastic. I think the problem that is source of our problems.

M. P. *Dear S. K.. Don't you think that now we see this situation as normal? They even show the pollution as innovation. It is true that it a field progressing by disproving itself and for now any other solution is not in sight, but just for now. I am hopeful for the future :)*

O. A. *I think it is quite normal for humans to discard the older technologies and replace it with new ones. I don't think we should call it neither pollution nor chaos. This is how technology got started: it aims for continuous progress, for the highest peaks.*

M. P. *It true that we are in continuous progress in the field of technology but it is also quite clear that we will stumble upon the hole we dug in this very progress. No need to empty the world in the name of progress (I refrain from using harsher terms here since we are in a virtual environment). We have to be more careful with our steps.*

ENGAGING STUDENTS IN A CONSTRUCTIVIST LEARNING ENVIRONMENT: MALAYSIAN STUDENTS' PERCEPTIONS IN DEVELOPING A MULTIMEDIA PROJECT

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Abstract

Research in Malaysia has shown that using constructivism and multimedia technology is becoming increasingly important in teaching and learning in higher education to enhance the teaching and learning process (wong, kamariah & tang, 2003; lee, 2005) and to allow learning to take place in authentic contexts (herrington, reeves, oliver & woo, 2004). This paper presents a research study that was conducted in the faculty of creative multimedia, multimedia university, malaysia, to investigate students' attitudes and perceptions in developing a multimedia project within a constructivist-based learning environment. They were then given a survey to elicit their perceptions and attitudes towards this learning environment. Results of the study showed that by setting an authentic task, via a multimedia project, into a constructivist learning environment, students became highly motivated learners and active in their learning process. Results strongly support encouragement for malaysian educators to incorporate multimedia technology and constructivist learning into their classrooms.

Introduction

This changing landscape of education focusses on learning, rather than on teaching and pedagogy, curriculum and instruction. It seeks to create a generation of learners whose learning is defined as *"the ability to retain, synthesize, and apply conceptually complex information in meaningful ways"* (Lambert & McCombs, 1998) to encourage better student learning through the learning objectives of project-based learning or learning by doing (Schank, Berman & Macpherson, 1999) and to enable problem-solving, analysis, creativity and communication to take place in the classroom (Bates, 2000). In addition to this, multimedia technology has been shown to affect students' motivation and self-esteem levels, as well as allow them to be creative and self-directed thinkers (Agnew, Kellerman & Meyer, 1996; Yildirim, 2006).

In Malaysia, the traditional mode of learning is still being used in many institutions of learning. However, in the context of introducing technology and multimedia in learning, the Malaysian Government is echoing this learner-centred learning initiative with a call for Malaysian institutions of higher learning to integrate ICT into their classrooms (Mat, 2000). Institutions of higher learning in Malaysia have begun to incorporate multimedia materials in problem-based learning and storytelling environments (Hong, Lai & Holton, 2003), in developing e-learning methods (Lee, 2005; Norhayati & Siew, 2004) and in web-based courses (Rohaida & Kamariah, 2000; Neo, 2005). Research in Malaysia has shown that using constructivism and multimedia technology is becoming increasingly important in teaching and learning in higher education in order to promote and enhance the teaching and learning process (Wong, Kamariah & Tang, 2003; Lee, 2005), to allow learning to take place in authentic contexts (Herrington, Reeves, Oliver & Woo, 2004) and to enablee teachers to better communicate knowledge to their students in the classrooms (Wong et. al, 2003). As such, this study was developed to investigate students' perceptions in using a multimedia project embedded within a constructivist learning environment and its impact on their learning process. This study was designed to show that, through their perceptions and feedback on the project, students would be able to reveal their ability to acquire skills integral to the meeting the demands of the workplace, such as collaborative and teamwork skills, problem-solving, learning motivation, critical thinking and understanding of a topic area, and see the real-world relevance of their work.

The constructivist learning environment

Current research shows that many graduates today are ill-equipped with problem-solving and communication skills needed to meet the demands of the IT industries (Teo & Wong, 2000; Tan, 2000). This mismatch has prompted Malaysian educators to seek new ways to inculcate the appropriate skills and knowledge into the students in order to meet the rising expectations of the IT society. As such this study was designed to investigate the perceptions of students when a multimedia project is embedded within a constructivist learning environment, whereby they would experience learning skills such as problem-solving, critical and creative thinking, collaboration and teamwork, and presentation, oral and reflection skills. Constructivism is defined as "a place where learners may work together and support each other as they use a variety of tools and information resources in their pursuit of learning goals and problem-solving activities". The learning activities in a constructivist learning environment call for students to become active participants in their own learning processes, learn to solve problems and work collaboratively (Heath, 2001; Land & Hannafin, 1996). The learning environment is set in a meaningful, authentic context that allows for learner-centred activities to take place. These activities are social and collaborative in nature, where peers play an important role in encouraging the student's learning process and will expose students to multiple perspectives and solutions to their problems, enabling them to consider "…*varying and discrepant points of view with which to consider the merits of his or her own mental models*" (Oliver, 2000). By working in a group situation, students will have to tap into their group skills and use a variety of activities to accomplish the project's overall objectives. The group would be responsible for their goals and, thus, a collaborative learning experience can be gained. As such, constructivist learning environments are designed so that students will be able to become active participants in their learning process and develop skills that would allow them to think critically, function well as a member of a team, develop collaborative abilities and deepen their understanding of their task and improve student learning. Jonassen (1999) suggested that students would learn better through a constructivist learning environment and proposed several important components that can be incorporated. In addition, Herrington, Reeves, Oliver and Woo (2004) suggested that the learning environment should be authentic and relevant to the student in order to better engage them. Therefore, this study sought to design a constructivist learning environment that would incorporate the components of

Jonassen (1999) as well as set it in an authentic learning setting, as proposed by This learning environment would marry multimedia technology with a learning environment where students would become active participants in their learning process and construct new knowledge through a multimedia project.

Designing the learning environment: The student learning process

The study was made up of 46 students (N=46) in their 2nd year of the degree course. They consisted of students from the Faculty of Management, the Faculty of Information Technology and the Faculty of Engineering enrolled in the Interactive Multimedia course. The objective of this course was to imbue students with multimedia project development skills over a 14-week trimester, which culminated in an interactive group project that was multimedia and authored in Macromedia Director. In order to complete this assignment, the students were given an authentic task, i.e. to develop an interactive multimedia application based on the theme "*Malaysian Culture*" for the Malaysian Tourism Board and to present their prototype application to the class at the end of the trimester. This authentic task was set in a constructivist-based learning environment which was designed to incorporate Jonassen's (1999) CLE components, which consisted of:

- **Conception of the problem**. Students were given the project requirements at the start of the project and told to form groups of 4-5 members, and a theme-based project to develop using multimedia.
- **Interpretation**. Here the students interpret and develop solutions to their problems.
- **Information sources to support the understanding of the problem**. Brainstorming activities, group meetings, delegation of tasks and Group Leader appointments were carried out.
- **Cognitive tools**. Here students used Adobe Director and Flash to assist them in their development process
- **Conversation and collaboration tools**. Students conversed and collaborated within and outside of the classroom walls. Using various methods of communication and collaboration tools, especially Yahoo!'s Instant Messenging service, emails and even telephone SMS (Short Messaging Service) to exchange ideas and files, collaborate, hold meetings and discussions, and keep in touch with each other.

At the end of 14 weeks, each group had to present their completed final applications. When it came to these presentations, the applications that were presented ranged from edutainment to marketing to corporate applications, centred around the theme, "*Malaysian Culture*". Figure 1 shows an example of students' work, as proof as their learning (Winnips and McLoughlin, 2001).

Figure 1 An edutainment application on traditional Malaysian children's games

The projects were assessed on several criteria including originality, technical skills, presentation, design and packaging, teamwork and depth of content. On the whole, the students in the class responded very well to the project and were able to have a positive attitude toward this constructivist learning environment.

Student feedback: Survey results

The student groups (N=46) were also given a survey on their project. The survey consisted of questions to assess their attitudes and perceptions towards doing this multimedia project. The survey also tried to gauge their level of understanding of the subject matter, their creative and critical thinking skills, how they worked as a team, as well as their motivation levels. The survey was measured using a 5-point Likert scale, with 1 for Strongly Disagree (SDA), 2 for Disagree, 3 for Undecided, 4 for Agree and 5 for Strongly Agree (SA). Table 1 shows the overall means for the survey items as the percentage of students who responded favourably on the survey.

Table 1 Means and percentages of students (ranked)

Questions asked	Mean	%
1. I found the project challenging	4.17	91
2. The project allowed me to be creative in my thinking	4.15	91
3. This project allowed me to think critically about the topic	3.98	83
4. The project enhanced my understanding of the subject	3.98	83
5. I felt very motivated doing the project	3.98	76
6. I was able to learn more working with my teammates	3.91	78
7. The group was able to achieve its goals	3.83	76
		N = 46

Results showed that students were able to enhance their understanding of their subject matter after doing the project (see item #4). They also reported being able to be creative and critical in their thinking (see items #2 and #3, respectively). Students found that interaction with team members not only helped them achieve their group goals, but also enabled them learn more from their team members (items #6 and #7, respectively). In addition, motivation (item # 5) was highly rated in the survey, indicating that students enjoyed doing the project, even though they found it challenging (see item #1).

Discussion

Creating a constructivist learning environment in this course helped foster several salient student-centric learning traits. Students demonstrated a deeper understanding of their project's topic and in multimedia development, increased problem-solving and creative skills, and higher motivation towards the project, Team effort was also an important element in the group's success as they had to work together to achieve their goals. It was observed that the teacher, students and technology all played different roles. The students became actively involved in their learning, unlike the traditional classroom, while the teacher's role evolved into that of an active consultant to the students, answering their queries and technical concerns, facilitating and supporting the students in their learning process. Although many of these groups experienced conflicts and disagreements with their teammates, they were able to resolve and work through their problems as a group and find their solutions, in order to collectively complete their projects. These groups were successful in doing so, as evidenced by their submissions and presentations of their final application. Technology became the enabler for this learning to happen. Multimedia technology enabled students to exercise higher-order and creative thinking skills to decide on the best way to represent their concepts.

Conclusion

Multimedia is gaining ground as a way for students to represent the knowledge that they acquire in class and to construct their own interpretation of the information acquired. By using multimedia and a multimedia project to create a constructivist-based teaching and learning environment, students were allowed to develop and experience many important learning skills that would make them more efficient and productive workers in the 21st century, cognizant of problem-solving skills, and in possession of lifelong learning attitudes.

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ENGELLİLER ENTEGRE YÜKSEKOKULU'NDA BİLGİ VE İLETİŞİM TEKNOLOJİLERİNİN ENTEGRASYONU SÜRECİNDE YAŞANAN ZORLUKLAR*

BARRIERS TO INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES AT A SCHOOL FOR THE HANDICAPPED

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Özet:
Bu çalışmanın amacı, engelliler entegre yüksekokulu'nda (e.e.y.o) bilgi ve iletişim teknolojilerinin (bit) entegrasyonu sürecinde karşılaşılan zorlukları belirlemektir. e.e.y.o'nda gerçekleştirilen ve kurumun bit entegrasyonu sürecinin incelendiği bir nitel durum çalışmasının bir bölümünü oluşturan araştırmanın katılımcılarını e.e.y.o'ndaki 3 yönetici, 21 öğretim elemanı ve 60 işitme engelli öğrenci oluşturmaktadır. veriler araştırmacının katılımcı gözlemciliğiyle, yarı yapılandırılmış görüşmeler, açık uçlu anket uygulamaları, araştırmacı günlüğünün geliştirilmesi, belgeler, arşiv verileri ve öğrenci ürünlerinin incelenmesi yoluyla toplanmış, nitel veri analizi yöntemlerinden tümevarım analizi yoluyla çözümlenmiştir. araştırmada elde edilen bulgular doğrultusunda, yöneticilerin bit entegrasyonu sürecinde yaşadıkları zorluklar; 1) yönetici olarak yaşanan sorunlar, 2) yöneticilerin kendilerinin öğretim elemanı olarak yaşadıkları sorunlar şeklinde, öğretim elemanlarının yaşadıkları zorluklar; 1) öğretim elemanı kaynaklı sorunlar, 2) teknik sorunlar, 3) teknik eleman kaynaklı sorunlar, 4) öğrenci kaynaklı sorunlar, 5) e.e.y.o kaynaklı olmayan sorunlar şeklinde ve öğrencilerin yaşadıkları zorluklar; 1) teknik problemler; i) donanım sorunları, ii) yazılım sorunları, iii) internet bağlantısı sorunları, 2) teknik eleman kaynaklı problemler, 3) öğrencinin bilgi eksikliğinden kaynaklanan problemler şeklinde temalandırılmıştır. e.e.y.o'ndaki yöneticilerin, öğretim elemanlarının ve öğrencilerin bit entegrasyonu sürecinde yaşadıkları zorlukların, teknik sorunlar, teknik desteğe ilişkin sorunlar ve bilgi eksikliğinden kaynaklanan sorunlar da kesiştiği belirlenmiştir.

ANAHTAR KELİMELER: Bilgi Ve İletişim Teknolojileri Entegrasyonu, Engeller, Durum Çalışması

Abstract:
The purpose of this study is to determine the barriers to integration of information and communication technologies (ict) at the school for the handicapped (sfh). This study is a part of a case study conducted at the sfh to examine the ict integration process of the sfh. The participants of the study included 3 administrators, 21 faculty members and 60 hearing impaired students from the sfh. The data were collected through the participant observations by compiling the semi-structured interviews, open-ended questionnaires, researcher's journal, documents and the archival records. The data have been analyzed inductively. The barriers that administrators face during the ict integration process turned into themes; 1) barriers faced as an administrator, 2) barriers faced by the administrators as a faculty member, the barriers that faculty members face during the ict integration process turned into themes; 1) barriers arising from the faculty members, 2) technical problems, 3) technical support problems, 4) barriers arising from the students, 5) barriers not arising from the sfh and the barriers that the students face during the ict integration process turned into themes 1) technical problems; i) hardware problems, ii) software problems, iii) internet connectivity problems, 2) technical support problems, 3) lack of knowledge. Technical barriers, technical support barriers and lack of knowledge are the common barriers that the administrators, faculty members and the students face at the sfh.

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Keywords: information and communication technologies integration, barriers, case study

1. GİRİŞ

Gelişen ve değişen dünyada, ülkelerin rekabet güçlerini arttırmaları için sadece bilgiyi kullanmaları değil, bilgiyi üretmeleri de zorunludur. Bununla birlikte bir ülkenin gelişmişliği o ülkenin ürettiği bilgi ve teknoloji ile ölçülmektedir. Bu bağlamda, çağın gerektirdiği teknolojik donanıma sahip mesleki bilgi, beceri, davranış ve genel kültüre sahip bireylerin yetişmesini sağlama ortak amacını güden yükseköğretim kurumlarının rollerinin önemi de giderek artmaktadır.

Bologna Süreci, Avrupa Birliğindeki gelişmeler ve Türkiye'nin Avrupa Birliği'ne tam üye olma çabaları, Türk yükseköğretim kurumlarının, sistemlerini yeniden gözden geçirmelerinde etken olmuştur. Bir yükseköğretim kurumu olarak Anadolu Üniversitesi'nde, Avrupa Üniversiteler Birliği değerlendirme sürecinin ve bunun getirilerinin gelişim çabalarını sürdürmesinde önemli katkıları olacağına inanılmaktadır. Anadolu Üniversitesi'nin 2009–2013 yıllarını kapsayan stratejik planında "eğitimde bilgi ve iletişim teknolojilerinin kullanımının yaygınlaştırılması ve sürdürülebilirliğinin sağlanması" stratejik amacı ile yükseköğretimde BİT entegrasyonuna vurgu yapılmıştır.

Anadolu Üniversitesi'nin belirlediği bu stratejik plan hem özel eğitim gereksinimi olan bireyleri hem de normal gelişim gösteren bireyleri kapsamaktadır. Anadolu Üniversitesi bünyesindeki birimlerde öğrenimlerini sürdürmekte olan çeşitli engel gruplarına sahip öğrenciler bulunsa da, Anadolu Üniversitesi'nin yüksekokullar bünyesinde bulunan E.E.Y.O işitme engelli öğrencilere meslek eğitimi veren Türkiye'deki tek yükseköğretim kurumu olma özelliğine sahiptir. E.E.Y.O'nun ortamı, özel eğitime gereksinim duyan işitme engelli bireylerin eğitim ihtiyaçlarını karşılamaya uygun şekilde geliştirilmiştir. Bu şekilde işitme engelli bireylere yükseköğrenim kademelerinde kendilerine uyan mesleki eğitim programlarında eğitim verilmekte ve topluma üretken bireyler olarak katılmaları sağlanmaya çalışılmaktadır. E.E.Y.O'nda işitme engelli öğrencilerin yükseköğretimin amaçlarına uygun mesleki donanıma sahip bireyler olmalarında öğretme-öğrenme sürecinde BİT'lerin de işe koşulması gerekmektedir. BİT işitme engelli öğrencilerin öğrenme yaşantılarını kolaylaştıran ve zenginleştiren teknolojilerin başında gelmektedir (Carlson, 1996; Lucner, Bowen ve Carter, 2001; National Centre for Technology in Education [NCTE], 2008; Roberson, 2001). Bu öneme bağlı olarak, yükseköğretim sisteminde önemli bir yere sahip olan E.E.Y.O'nda işitme engelli bireylerin BİT'leri etkin bir şekilde kullanmalarında ve bu teknolojilere ilişkin becerilerle donatılmalarında önemli değişkenlerden biri de, BİT'lerin öğretme-öğrenme sürecine entegrasyonudur.

Yükseköğretim kurumlarında yönetim bilgi sistemlerinin yapılandırılmasından, ders değerlendirme şemalarına kadar değişen çeşitli amaçlarla kullanılan BİT'in entegrasyonu, öğrenci öğrenmelerini geliştirmek için sınıf ortamındaki öğrenmelerde bilgiye ulaşmada ve iletişime yardımcı olmada internet ve bilgisayar uygulamalarının kullanılması ve yaygınlaştırılması süreci olarak tanımlanmaktadır (Van Melle, Cimellaro, ve Shulha, 2003). BİT entegrasyonu süreci başta altyapı boyutunu oluşturan teknolojik kaynaklar ve insangücü boyutunu oluşturan paydaşlar olmak üzere birçok öğeyi kapsayan çok boyutlu ve kapsamlı bir süreçtir. Kapsamlı BİT enterasyonu sürecinde, özellikle öğreticilerin öğretme-öğrenme sürecinde BİT'lerin olanaklarından tam olarak yararlanmalarına engel olan her türlü durum BİT entegrasyonu sürecindeki engeller olarak tanımlanmaktadır (Gillespie, 2006). Alanyazında BİT entegrasyonu sürecini etkileyen birçok engel tanımlanmıştır. Williams, Coles, Wilson, Richardson ve Tuson (2000) tarafından öğretme-öğrenme sürecinde BİT kullanımını engelleyen temel faktörler; bilgi, beceri ve destek eksikliği, BİT'lerin eksik oluşu ve teknolojiye erişim şeklinde ifade edilmiştir. BİT entegrasyonunda karşılaşılan en temel sorunun, 26 ülkede gerçekleştirilen bir araştırmanın sonuçlarına göre bilgisayar sayısındaki yetersizlik ve öğretmenlerin bilgi eksikliği olduğu belirtilirken (Pelgrum, 2001), BİT'lerin öğretime entegrasyonundaki faktörleri araştıran diğer bir araştırmada ise öğretmenlerin dörtte üçünün, BİT'leri kendi öğretimleriyle bütünleştirmelerini engelleyen faktörlerin, zaman yetersizliği ve eğitim eksikliği olduğu belirlenmiştir (Rheume, 2001). Brill ve Galloway (2007) tarafından yapılan araştırmada ise altyapı eksikliğinin ve var olan donanımlara erişimin kısıtlı oluşunun BİT entegrasyonu önündeki en önemli engeller olarak görülmekte olduğu belirlenmiştir. Robertson, Grady, Fluck ve Webb (2006) tarafından yapılan araştırmada ise yeterli zamana sahip olmama, yer sıkıntısı, öğretim programının yoğunluğu, kaynak yönetimi eksikliği ve öğretmenlerin yoğun çalışma temposunun BİT entegrasyonu önündeki engeller olduğu belirlenmiştir. Ertmer (2001), öğretmenlerin sınıflarında BİT kullanmalarını engelleyen faktörleri iki kategoride toplamıştır. Bunlar; teknolojiye erişim, zaman ve teknik destek sağlama, kaynaklar, içerik ve eğitim gibi öğretmenlerin kontrolü dışındaki faktörler ile tutumlar, inançlar, uygulama ve süreklilik gibi öğretmenlerin kendilerine ilişkin faktörlerdir.

BİT entegrasyonu sürecini etkileyen engelleri belirlemeye yönelik çalışmalar incelendiğinde BİT entegrasyonu sürecinin altyapı, öğretim ve değerlendirme yaklaşımları, mesleki gelişim, teknik destek, erişim ve politikalar gibi birçok bileşenine ilişkin engeller ile karşılaşıldığı ve bir tek engel türünün bile BİT entegrasyonu çabalarına ket vurduğu görülmektedir. Entegrasyon sürecinin değişik noktalarında farklı engeller ortaya çıkabildiğinden, eğitim kurumları BİT entegrasyonu sürecindeki eğitimcileri desteklemek için çeşitli engel türleri ile baş etmeye ilişkin stratejiler geliştirmelidir. Bu nedenle, etkili BİT entegrasyonu için eylem planları geliştirmeden önce sürece ilişkin engellerin ortaya konarak üstesinden gelinmeye çalışılması önemli görülmektedir.

Bu bağlamda bu çalışmanın amacı, E.E.Y.O'nda BİT entegrasyonu sürecinde karşılaşılan engelleri belirlemektir. Bu amaca yönelik aşağıdaki sorulara yanıt aranmıştır:

1. Engelliler Entegre Yüksekokulu'ndaki
   a. yöneticilere
   b. öğretim elemanlarına
   c. öğrencilere

   göre BİT entegrasyonu sürecinde yaşanan sorunlar nelerdir?

2. YÖNTEM

2.1. Araştırma Modeli

Bu çalışma nitel araştırma yönteminin özelliklerini yansıtan desenlerden biri olan durum çalışması deseniyle gerçekleştirilmiştir. Durum çalışmasında, araştırmacı bir durum ya da durumlara odaklanır. Bu durum bireyden, tüm topluluk, toplum ve kurumlara kadar yayılım gösterir. Veriler doğal ortamında toplanır ve araştırmacıların ve katılımcıların bakış açılarını yansıtır (Gall, Gall ve Borg, 1999).

2.2. Araştırma Ortamı

Araştırma, Anadolu Üniversitesi'nin yüksekokullar bünyesinde bulunan Engelliler Entegre Yüksekokulu'nda gerçekleştirilmiştir. E.E.Y.O, işitme engelli öğrencilere meslek eğitimi veren Türkiye'deki ilk ve tek yükseköğretim kurumudur. E.E.Y.O'nda 1993 yılından beri yürütülmekte olan programlar, Uygulamalı Güzel Sanatlar Bölümünde, Grafik Sanatları Lisans Programı, Seramik Sanatları Lisans Programı; İdari Meslekler Bölümünde, Bilgisayar Operatörlüğü Önlisans Programı; Mimarlık Bölümünde, Yapı Ressamlığı Önlisans Programı'dır.

2.3. Araştırmanın Katılımcıları

Araştırmanın katılımcılarını E.E.Y.O'ndaki biri müdür ikisi müdür yardımcısı olmak üzere toplam 3 yönetici, biri profesör, 4'ü yardımcı doçent, 16'sı öğretim görevlisi olmak üzere toplam 21 öğretim elemanı ve 60 işitme engelli öğrenci oluşturmaktadır.

Bilgisayar Operatörlüğü Önlisans Programı'nda öğretim görevlisi olarak bu çalışmanın birinci yazarı araştırmacıdır. Araştırmanın diğer yazarları da geçerlik komitesini oluşturmaktadır. Bu çalışmanın ikinci ve dördüncü yazarları eğitim teknolojisi alanında, üçüncü yazarı ise işitme engelli bireylerin eğitimi ve nitel araştırmalar konusunda uzmandır.

2.4. Verilerin Toplanması ve Analizi

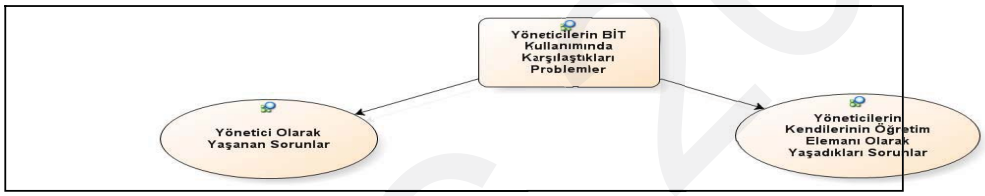
Araştırmanın verileri araştırmacının katılımcı gözlemciliğiyle, yarı yapılandırılmış görüşmeler, açık uçlu anket uygulamaları, araştırmacı günlüğünün geliştirilmesi, belgeler, arşiv verileri ve öğrenci ürünlerinin incelenmesi yoluyla toplanmıştır. Yöneticilerin görüşlerinin belirlenmesinde yarı yapılandırılmış görüşme formu kullanılırken, öğretim elemanlarının ve öğrencilerin görüşlerinin belirlenmesinde açık uçlu anket formundan yararlanılmıştır. Veri toplama araçlarının geçerlik çalışması geçerlik komitesince yapılmıştır.

Araştırma verileri, nitel veri analizi yöntemlerinden tümevarım analizi yoluyla analiz edilmiştir. Her bir döküm okunmuş ve iki alan uzmanı tarafından kodlanmıştır. Kod etiketlerinin verildiği bölümler incelenmiş ve temalara ulaşılmıştır. Ulaşılan temaların geçerlik komitesi tarafından geçerlik çalışması gerçekleştirilmiştir (Creswell, 2005).

3. BULGULAR

3.1. Yöneticilerin Yaşadıkları Sorunlar

E.E.Y.O'ndaki yöneticilerin, BİT'lerin öğretme-öğrenme sürecinde kullanımına ilişkin yaşanan sorunlara ilişkin görüşleri elde edilen veriler ışığında Şekil 1'de görüldüğü şekilde; 1) yönetici olarak yaşanan sorunlar, 2) yöneticilerin kendilerinin öğretim elemanı olarak yaşadıkları sorunlar şeklinde temalandırılmıştır.



Şekil 1. E.E.Y.O Yöneticilerine Göre Bilgi ve İletişim Teknolojilerinin Kullanımında Yaşanan Sorunlar

Yönetici olarak yaşanan sorunlar

E.E.Y.O yöneticilerinin üçü de BİT entegrasyonu sürecindeki öğretim elemanı ve öğrenci gibi paydaşların zaman zaman BİT kullanımına ilişkin sorunlar yaşadıklarını ve kendilerini dile getirdiklerini belirtmişlerdir. Bu sorunlar *öğretim elemanı kaynaklı sorunlar*, *öğrenci kaynaklı sorunlar*, *donanım sorunları*, *yazılım sorunları* ve *teknik elemana ilişkin sorunlar* şeklindedir.

Yöneticiler, E.E.Y.O'nda öğretme-öğrenme sürecinde BİT'lerin kullanımında *bilgisayar sistemlerinin çökmesi*, *yazıcıdan çıktı alamama*, *internete bağlanamama* gibi donanımsal ve *programların güncellenememesi* gibi yazılımsal sorunların yaşandığını da belirtmişlerdir.

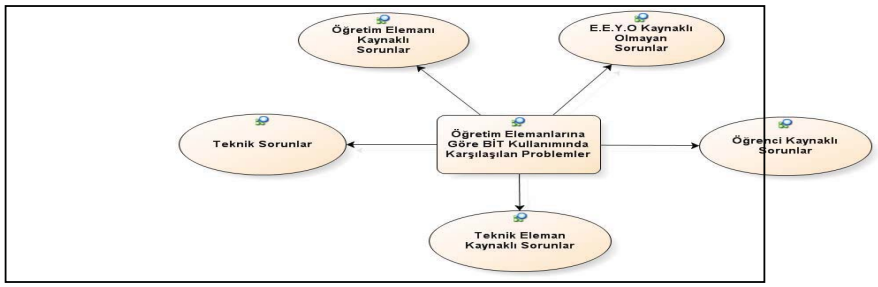
E.E.Y.O'ndaki yöneticilerden ikisi öğretme-öğrenme sürecinde BİT'lerin kullanımında teknik eleman kaynaklı bazı sorunlar yaşanabildiğini dile getirmiştir.

Yöneticilerin kendilerinin öğretim elemanı olarak yaşadıkları sorunlar

E.E.Y.O'ndaki yöneticilerin hepsi öğretme-öğrenme sürecinde öğretim elemanı olarak *teknik sorunlar* yaşadıklarını dile getirmişlerdir. Bu teknik sorunlar bir bilgisayarda yapılan bir sununun başka bir bilgisayarda çalışmaması şeklindeki bilgisayarlar arası ya da programlar arası uyumsuzluk problemleri, bilgisayar ya da taşınabilir bellekten veri kaybetme şeklindedir.

3.2. Öğretim Elemanlarının Yaşadıkları Sorunlar

E.E.Y.O. öğretim elemanlarının BİT'leri kullanırken yaşadıkları sorunlar elde edilen veriler doğrultusunda Şekil 2'de görüldüğü gibi; 1) Öğretim elemanı kaynaklı sorunlar, 2) Teknik sorunlar, 3) Teknik eleman kaynaklı sorunlar, 4) Öğrenci kaynaklı sorunlar, 5) E.E.Y.O kaynaklı olmayan sorunlar olmak üzere 5 tema altında toplanmıştır.



Şekil 2. E.E.Y.O Öğretim Elemanlarına Göre Bilgi ve İletişim Teknolojilerinin Kullanımında Yaşanan Sorunlar

Öğretim elemanı kaynaklı sorunlar
Öğretme-öğrenme sürecinde BİT'lerin kullanımında kendilerinden kaynaklanan sorunlar yaşadığını belirten dört öğretim elemanından üçü bu sorunların bilgisayar programlarını tam olarak kullanamamalarından kaynaklandığını belirtmiş ve bu duruma ilişkin hizmetiçi eğitim isteğini dile getirmiştir.

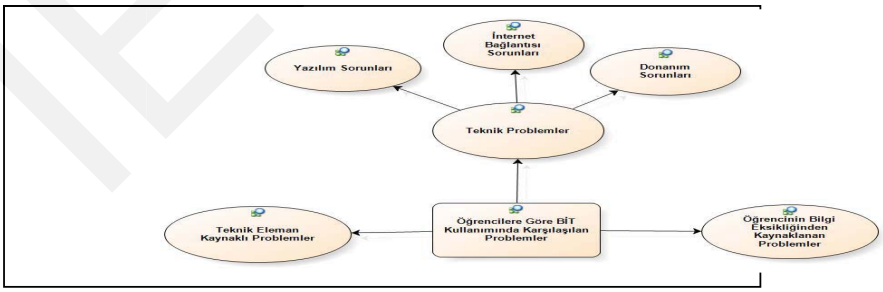
Teknik Sorunlar
Öğretim elemanları öğretme-öğrenme sürecinde BİT'lerin kullanımında çeşitli teknik sorunlar yaşadıklarını belirtmişlerdir. Bu teknik sorunlar 9 öğretim elemanı tarafından "*bilgisayar arızaları*", 4 öğretim elemanı tarafından "*internete bağlanamama*", üç öğretim elemanı tarafından "*Uzatma kablosunun alınması*", bir öğretim elemanı tarafından da "*Çıktı almada problem yaşama*" şeklinde ifade edilmiştir.

Teknik eleman kaynaklı sorunlar
Öğretme-öğrenme sürecinde BİT'lerin kullanımında 11 öğretim elemanı teknik eleman kaynaklı sorunlar yaşadığını belirtmiştir. 11 öğretim elemanından 5'i teknik elemanın işleri keyfine göre yaptığını belirterek örneğin 2'si teknik elemanın bilgisayarlarına yazıcı bağlamadığını dile getirmiştir. Bir öğretim elemanı teknik elemanın sorunları zamanında yerine getirmediğini belirtirken, bir diğeri de, teknik sorunların giderilmesinin uzun zaman aldığını söylemiştir. Bu duruma ilişkin bir öğretim elemanı teknolojik araç gereçlerin sürekli kullanılır durumda olması gerektiğini dile getirmiş, diğer bir öğretim elemanı ise kurumdaki bilgisayar bilen ancak teknik eleman olmayan kişilerden alınan yardımın kısmen işe yaradığını dile getirmiştir. Bu durumda bir öğretim elemanı deneyimli teknik elemanın önemini vurgulamıştır. Bir öğretim elemanı ise teknik elemana ilişkin yaşanan en önemli sorunun teknik elemanın görev tanımının belli olmayışı olduğunu belirtmiştir.

Öğrenci kaynaklı sorunlar
Öğretim elemanları öğretme-öğrenme sürecinde BİT'lerin kullanımında çeşitli öğrenci kaynaklı sorunlar yaşadıklarını belirtmişlerdir. Yaşanan öğrenci kaynaklı sorunlar; üç öğretim elemanı tarafından "*Öğrencilerin yapılmış tasarımları kullanmaya çalışması*", bir öğretim elemanı tarafından "*Öğrencinin bilgisayara virüs bulaştırması*", bir öğretim elemanı tarafından "*Öğrencilerin İnternete aşırı bağlı olmaları*", bir öğretim elemanı tarafından da"*Öğrencilerin konu araştırması yaparken hedef belirlemede zorluk çekmesi*" şeklinde ifade edilmiştir.

E.E.Y.O kaynaklı olmayan sorunlar
Öğretme-öğrenme sürecinde BİT'lerin kullanımında öğretim elemanları E.E.Y.O kaynaklı olmayan birtakım sorunlar yaşadıklarını belirtmişlerdir. Bu sorunlar, iki öğretim elemanına göre "*teknolojinin ekonomik boyutları*", bir öğretim elemanına göre "*Üniversitenin koyduğu firewall'lar*" yine bir öğretim elemanına göre "*Teknolojinin gelişim hızı*" şeklindedir.

3.3. Öğrencilerin Yaşadıkları Sorunlar
E.E.Y.O'ndaki öğrencilerin öğretme-öğrenme sürecinde BİT kullanımında yaşadıkları sorunlar Şekil 3'te görüldüğü şekilde, E.E.Y.O öğrencilerinden elde edilen verilere göre; 1) teknik problemler; i) donanım sorunları, ii) yazılım sorunları, iii) internet bağlantısı sorunları, 2) teknik eleman kaynaklı problemler, 3) öğrencinin bilgi eksikliğinden kaynaklanan problemler şeklinde temalandırılmıştır.



Şekil 3. E.E.Y.O Öğrencilerine Göre Bilgi ve İletişim Teknolojilerinin Kullanımında Yaşanan Sorunlar

Teknik problemler

E.E.Y.O'ndaki öğrenciler, öğretme-öğrenme sürecinde BİT kullanımında en çok *teknik problemler* ile karşılaştıklarını dile getirmişlerdir. Bu teknik problemlerin *yazılımsal, donanımsal* ve *internet bağlantısı*na ilişkin problemler olduğu belirlenmiştir.

Yazılım sorunları
E.E.Y.O. öğrencilerinin bilgisayarlardaki programların eksik olması, programların çalışmaması, programların çakışması, programlardaki dilin İngilizce olması ve bilgisayar virüsleri şeklinde yazılımsal sorunlar yaşadıkları belirlenmiştir.

Donanım sorunları

E.E.Y.O. öğrencilerinin, özellikle Bilgisayar ve Grafik programındaki öğrencilerin bilgisayarların yavaş çalışması, yazıcılardan çıktı alamama ve tarayıcıdan tarama yapamama gibi donanımsal sorunlar yaşadıkları ve dolayısıyla da zaman kaybından şikayetçi oldukları belirlenmiştir.

İnternet bağlantısı sorunları

E.E.Y.O'ndaki her programdaki öğrencilerin, teknik problemler içinde en çok internet bağlantısı konusunda sorun yaşadıkları bu durumunda en çok sabahları yaşandığı belirlenmiştir.

Teknik eleman kaynaklı problemler

E.E.Y.O'ndaki öğrencilerin, özellikle teknik problemler yaşayan Bilgisayar ve Grafik programlarındaki öğrencilerin teknik eleman kaynaklı, *teknik elemanının sorunu zamanında gidermemesi, teknik elemanın sorunu görmezden gelmesi, teknik elemanın eksik programları yüklememesi* gibi problemler yaşadıkları belirlenmiştir.

Öğrencinin bilgi eksikliğinden kaynaklanan problemler

E.E.Y.O'ndaki öğrencilerin, özellikle Seramik programındaki öğrencilerin programların nasıl kullanılacağına ilişkin bilgilerinin olmamasından kaynaklanan sorunlar yaşadıkları ve bu konuda yardım alabilecekleri kişilerin olmamasından şikayetçi oldukları belirlenmiştir.

4. TARTIŞMA

E.E.Y.O'nda öğretme-öğrenme sürecinde BİT'lerin yöneticiler, öğretim elemanları ve öğrenciler tarafından kullanılması ile birlikte tüm paydaşlar açısından bilgisayar arızaları, internete bağlanamama, yazılımların düzgün çalışmaması gibi çeşitli teknik problemler ile karşılaşılabilmektedir. Alanyazında basit teknik sorunların çözümüne ilişkin her öğretmenin eğitime gereksinimi olduğu ancak öğretmenlerden çok karmaşık tanı ve bakım gerektiren problemler ile ilgilenmesinin beklenmemesi gerektiği belirtilmekte, okullarda sürekli ve kesintisiz bir teknik destek ile gerekli araçların tamirinin ve değiştirilmesinin sağlanmasının gerekliliği ortaya konmaktadır (Mumcu, Haşlaman ve Usluel, 2008; UNESCO, 2005). E.E.Y.O'nda yaşanan teknik sorunların çözümü için tüm paydaşlar tarafından teknik elemanın varlığından söz edilmiştir. Ancak alanyazındaki araştırmaların (Akbulut, 2008; Tallent-Runnels ve arkadaşları, 2006) bulgularına benzer şekilde bu araştırmada da, öğretim elemanlarının ve öğrencilerin bilgisayar laboratuarlarında bir sorun yaşadıklarında hızlı ve etkin teknik destek alamadıkları, sorun yaşadıklarında yardımcı olacak teknik personele istedikleri zaman ulaşamadıkları belirlenmiştir. Yapılan araştırmalardan farklı olarak E.E.Y.O'ndaki yöneticiler, öğretim elemanları ve öğrenciler tarafından BİT entegrasyonunun öğretme-öğrenme sürecinde teknik eleman kaynaklı, teknik elemanın işleri keyfine göre yapması şeklinde birtakım sorunlar yaşadıkları dile getirilmiştir. Bu durumun teknik elemanın görev tanımının tam olarak belli olmayışından kaynaklandığı düşünülebilir.

Alanyazındaki araştırmaların tersine (Alampay, 2006; Akbulut, 2008) E.E.Y.O'ndaki BİT entegrasyonu sürecinde, okuldaki BİT kaynaklarına ve uygulamalarına öğretim elemanlarının ve öğrencilerin erişiminin genel olarak sağlandığı görülmekle birlikte, bazı öğretim elemanlarının ve birçok öğrencinin gerektiği anda gerekli BİT donanımına ulaşamadıklarını belirtmeleri, birkaç öğretim elemanının öğretme-öğrenme sürecinde kullanılan BİT donanımlarının öğretim elemanlarına haber verilmeden alınması ile öğretme-öğrenme sürecinde zaman kaybının yaşandığını ve öğrencilerde düzensiz davranışların gözlenebildiğini söylemeleri ile bilgisayar ve datashowun okuldaki birkaç sınıfla sınırlı olduğunu belirtmeleri, bu denli güçlü bir BİT altyapısına sahip olduğu belirlenen bir okul için erişim anlamında birtakım sorunların yaşandığının bir göstergesi olarak değerlendirilebilir.

E.E.Y.O'ndaki tüm paydaşların alanyazındaki araştırmalara (Pelgrum, 2001; Rheume, 2001; Williams, Coles, Wilson, Richardson ve Tuson, 2000) benzer şekilde BİT entegrasyonu sürecinde bilgi eksikliğinden kaynaklanan engeller yaşadıkları belirlenmiştir. Bu durumun BİT entegrasyonu sürecinde özellikle anahtar konumda bulunan öğretim elemanlarının yeteri kadar hizmetiçi eğitim etkinlikleri ile desteklenmediğinden kaynaklandığı düşünülebilir.

5. SONUÇ VE ÖNERİLER

Araştırmanın tüm bulguları incelendiğinde E.E.Y.O'nda BİT entegrasyonu sürecinde çeşitli olumlu uygulamaların yanında çeşitli engellerin yaşandığı görülmektedir. Bu nedenle, bu çalışmayla ortaya konan engellerin giderilmesi ve dolayısıyla etkili BİT entegrasyonunun sağlanmasında araştırmaların yapılması gerekliliği ortaya çıkmaktadır. Bu bağlamda uygulamaya ve ileriye yönelik araştırmalara ilişkin şu öneriler getirilebilir:

- E.E.Y.O'nda öğretme-öğrenme süreçlerinde gerekli teknolojilere gerektiği zaman *erişim* için yönetim destekli bir teknoloji planlaması yapılabilir.
- E.E.Y.O'ndaki *teknik destek* anlamında yaşanan sorunların çözümü için, teknik elemanın görev tanımı yapılabilir.
- Teknik elemanın alan bilgisinin hizmetiçi eğitim ile desteklenmesi ve iş takibinin uygun ödüllendirme sistemleri ile gerçekleştirilmesi sağlanabilir.
- E.E.Y.O'ndaki BİT entegrasyonunda işlemeyen durumların işleyen durumlar dikkate alınarak daha işlevsel hale getirilmesi amacıyla yönetim destekli ve Engelliler Entegre Yüksekokulu'ndaki öğretim elemanlarıyla işbirliği yapılarak bir "eylem araştırması" yapılabilir.
- Araştırmadan elde edilen bulguların genellenebilmesi amacıyla, aynı araştırma, farklı eğitim ortamlarında, farklı katılımcılarla ve farklı araştırmacılar tarafından yinelenebilir.
- Farklı araştırma yöntemleri kullanılarak, E.E.Y.O'ndaki BİT entegrasyonu sürecindeki engelleri ve güdüleyen faktörleri yordayan değişkenleri belirleyecek araştırmalar yapılabilir.
- Farklı engel gruplarıyla çalışan öğretim elemanları ile gerçekleştirilen araştırmalardan elde edilen bulgular, bu araştırmanın bulgularıyla karşılaştırılabilir.

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E-ÖĞRENME ORTAMLARI İÇİN BİR E-KİTAP ŞABLONU TASARIMI

DESIGNING AN E-BOOK TEMPLATE FOR E-LEARNING ENVIRONMENTS

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Özet
Bilginin taşlar ve kâğıt üzerinde süregelen aktarım yolcuğu, e-öğrenme ile birlikte radyo dalgaları, uydu yayınları ve optik kablolar ile elektronik olarak devam etmekte ve gelişmektedir. Günümüzde geleneksel öğrenmeye rakip olarak gösterilen e-öğrenme, çok sayıda ve farklı formatta bilgiyi, öğrenenlere aynı anda sunabilme özelliğine sahiptir. E-öğrenme ortamlarında doc, pdf, pps, mpeg, swf gibi farklı formatlarda bilgi, farklı araçlarla öğrenenlere sunulur. Bu araçlardan biri de, kısaca e-kitap olarak adlandırılan elektronik kitaplardır. Erişim ve kullanım kolaylığı avantajlarına karşılık e-kitapların güncellenmesi, bu alanda yaşanan sorunların başında gelmektedir. Elektronik ortamlarda hazırlanan ve kullanıma sunulan e-kitaplar, sayfaları sabit verilerle doldurulmuş, dinamik olmayan bir yapıya sahiptir. Oysa ki gereksinim duyulan, e-kitap içeriğinin, öğretici tarafından istendiğinde rahatlıkla değiştirilebilmesidir. Bu işlemin profesyonel bir yazılım bilgisine ihtiyaç duyulmadan yapılması, e-kitap şablonunun esnek ve dinamik yapısı, çok önemlidir. Çünkü elektronik ortamlarda içerik hazırlanması ve sunulması, oldukça zaman ve emek isteyen süreçlerdir. Bu çalışmada e-kitap kavramından ve türlerinden bahsedilecek, dinamik bir e-kitap şablonu, bu şablonun tasarım süreci ve üstünlükleri hakkında bilgi verilecektir.
Anahtar kelimeler: e-kitap, e-öğrenme, xml, tasarım, e-kitap şablonu.

Abstract
The ongoing journey of conveying information through stone and paper has been continuing and developing electronically with e-learning via radio waves, satellite transmissions and optic cables. E-learning, which is shown as a rival to the traditional learning today, has the feature of presenting a great number and a great variety of information at the same time to the learners. Information in different formats such as doc, pdf, pps, mpeg, and swf are presented through various tools to the learners in e-learning environments. One of those tools which is named shortly as e-book is electronic books. Despite the advantages of easy access and use, the update of the books is one of the most common problems in this field. E-books which are prepared and presented to be used in electronic environments have a structure that is not dynamic and whose pages are filled by fixed data. However, what is needed is the easy change of e-book contents by the learners whenever they want. Doing this without needing professional software knowledge, dynamic and flexible structure of e-book template, is highly crucial. Because preparing and presenting contents in electronic environments are relatively tiring and time-consuming processes. In this study, the definition of e-book and its types will be mentioned, information about an e-book template, its design process and its advantages will be given.
Key words: e-book, e-learning, xml, design, e-book template.

GİRİŞ

Son yıllarda yaşanan teknolojik gelişmeler ve dünyanın yöneldiği e-dönüşüm bandında, hayatımızda yer alan bir çok kavramın başına "e" harfi eklenmeye başlamıştır. Bilgisayar ve internet teknolojisinin sunduğu olanakların artması ve kullanımlarının yaygınlaşması, bu noktada en önemli unsurlardır. Çünkü bu sayede eğitim, sağlık, ticaret, bankacılık, eğlence, turizm gibi alanlardaki gereksinimler daha hızlı, daha güvenilir ve daha kolay karşılanmaya başlamıştır. Devam eden süreçte de tüm bu kelimelerin başına "e" harfi eklenmiştir (Keser, 2005). E-ticaret, e-devlet, e-bankacılık, e-imza, günümüzde duymaya alıştığımız yeni kavramların başında gelmektedir.

Eğitim öğretim faaliyetlerinin de bilgisayar ve internet teknolojilerinden etkilendiği, alan yazında yer edinen e-öğrenme, e-kitap gibi terimlerle kendini göstermektedir. E-öğrenme kısaca; öğrenme etkinliklerinin elektronik ortamlarda yürütülmesi veya bilgi ve becerilerin elektronik teknolojiler aracılığıyla aktarılmasıdır (Gülbahar, 2009). E- öğrenme, klasik eğitim ve öğretim anlayışını etkileyecek ve eğitim sürecinin niteliğini değiştirebilecek bir gelişme olarak görülmektedir. E-öğrenme ile birlikte, sadece öğretimin şekli değil, öğretim materyalleri de değişime uğramıştır. En bilinen öğretme ve öğrenme aracı olan kitaplar, değişimi en radikal yaşayan materyallerin başında gelmektedir. Günümüzde kitaplar, çoklu ortam teknolojilerinin de desteği ile, ekran karşısında okunabilen, duyulabilen, etkileşim sağlanabilen bir formata dönüşmüştür.

E-KİTAP NEDİR?

Kullanım amacı ve türü temel alınarak yapılmış bir çok e-kitap tanımı mevcuttur. Örneğin, Hillesund (2001)'a göre e-kitap, "elde tutulur okuma cihazında okumak için veya konuşma sağlayan araçtan dinlenmek üzere tasarlanmış dijital nesnelerdir." (Güney, 2007).

Rao (2004)'ya göre e-kitap kelimesi; içeriği, formatı, okuyucu yazılımını ve okuma aygıtını aynı anda tanımlamak için kullanılan bir kelimedir. Burada içerik kelimesi ile anlatılmak istenen iyi özelliğe sahip bileşenler, format kelimesi ile anlatılmak istenen doküman ya da dosya formatı, e-kitap okuyucusundan kastedilen değişik formatlardaki dosyaların okunmasını sağlayan yazılımı temsil eder. E-kitap okuma aygıtı ise e-kitap okuması için taşınabilir uygun donanım anlamını içermektedir (Güney, 2007).

Bu çalışmada esas alınan e-kitap tanımı ise, "klasik kitapların ya da kitap konseptine uygun materyalin, bilgisayarda veya e-kitap okuyucularda okunmak için hazırlanmış, basılı kitapların özelliklerinin yanında görüntü, ses ve etkileşimli bağlantılardan oluşan kitap formatıdır." (Borchers, 1999; Landoni ve Gibb, 2000; Rukancı ve Anameriç, 2003; Şensöz Öngöz ve Baki, 2010).

İnsanoğlunun bilgiye erişiminde en eski ve en çok başvurulan kaynaklardan olan kitapların elektronik ortama taşınmasının, çok sayıda olumlu ve olumsuz yanları bulunmaktadır. Alan yazın taramasında, Rukancı ve Anameriç (2003), Şensoy Öngöz ve Baki (2010) tarafından, e-kitap kullanımının olumlu ve olumsuz yanlarının farklı açılardan ele alındığı görülmektedir. Buna göre, e-kitap kullanımının olumlu yanları şunlardır:

Kolay güncellenebilir.

1. E-posta, CD-ROM ve diğer taşınabilir aygıtlar yardımıyla kolay paylaşılır.
2. Depolama sorunu yoktur.
3. Çevre dostudurlar.
4. Tanınmamış yazarların eserlerini tanıtması kolaylaşmıştır.
5. Basılı kitaplara kıyasla yayın süreci çok daha hızlı işlemektedir.
6. Baskı maliyetini ortadan kaldırmıştır.
7. İçerdiği öğeler (ses, resim, video, bağlantılar, vb.) aracığı ile etkileşimli bir ortam sunabilir.
8. Basılı kitaplara kıyasla erişimi çok daha ucuzdur.
9. Satılamayan kitapların yayınevine iadesi gibi bir sorun ortadan kalkmıştır.
10. Konuşan kelime işlemcilerin kullanımıyla görme engelli okuyuculara için e-kitaplar tasarlanabilmektedir.
11. Birçok e-kitapta bulunan sözlükler yardımıyla okunan ifadelerin anlaşılma seviyesi yükseltilebilir.
12. Art alan aydınlatmasına sahip diz üstü bilgisayar ve e-kitap okuyucu cihazlar sayesinde, karanlıkta ve başkalarını rahatsız etmeden okuma imkânı verir.
13. Metinlerin puntosu okuyucu tarafından büyültülüp, küçültülebilir.
14. E-kitap okuyucu cihazlar yardımıyla onlarca kitabı kolaylıkla taşımak mümkündür.

E-kitap kullanımının olumsuz yanları ise şöyle sıralanmıştır:
1. E-kitap endüstrisinde geçerli uluslararası bir standardın olmaması sebebiyle birbirine uymayan formatlarda e-kitaplar üretilmektedir.
2. E-kitabın yayını, tanıtımı ve pazarlanması tamamen yazarları tarafından yapılmak zorundadır.
3. İnternet ortamında çeşitli güvenlik sorunları ortaya çıkabilir (istenmeyen erişim, güvenlik eksikliği vb).
4. Henüz yatırım değeri taşıyacak boyutta eğitim öğretime yönelik yeterli e-kitap yoktur. Bu sebeple içerik sorunu yaşanmaktadır.
5. Kullanımı için özel bir eğitim gerektirmektedir.
6. Uzun süreli okumalarda baş ağrısı ve göz yorgunluğuna sebep olmaktadır.
7. Türkiye'de e-kitapların telif haklarıyla ilgili sorunlar bulunmaktadır.

Yukarıda sözü edilen artı ve eksiler, e-kitap tasarımı ve geliştirilmesinde önemli yol göstericilerdir. Bu bilgiler ışığında yapılacak tasarımların daha etkin olacağı ve daha az olumsuzluk taşıyacağı açıktır.

E-KİTAP TÜRLERİ

Bu alanda çalışan araştırmacıların birçoğu e-kitapları farklı açılardan ele alarak kategorize etmişlerdir. Allison (2003), elektronik ders kitaplarını "basit", "bileşik" ve "ileri düzey" olmak üzere üç ana grup altında toplamaktadır. Her grup, kendi içinde alt gruplara ayrılmaktadır (Şensoy Öngöz ve Baki, 2010):

1. Basit E-Kitaplar: Yalnızca metin türündeki e-ders kitaplarının başlangıç noktası olarak Michael Hart tarafından yürütülen Gutenberg Projesi kabul edilebilir. 1971 yılında başlatılan bu projenin amacı, Illinois Üniversitesi bünyesinde, halkın ücretsiz olarak kullanabileceği, 10.000 e-kitap kapasiteli bir kütüphane oluşturmaktı. Geçen zaman içinde, proje kapsamında oluşturulan kütüphanenin kullanıcı sayısı giderek artmış ve bu sanal ortam dünyanın dört bir yanındaki insanlara hizmet veren bir kaynak haline gelmiştir. http://www.promo.net/pg/ adresinde hizmet veren kütüphanede, başta telif hakları sona ermiş dünya klasikleri olmak üzere binlerce kitabın elektronik metinlerine dosya transferi (FTP) yoluyla erişim mümkündür.

2. Bileşik E-Kitaplar: Bileşik (kompleks) e-ders kitapları, bilgisayar teknolojisindeki gelişimin bir ürünü olarak son yıllarda ortaya çıkmıştır. Ses, resim, grafik, video, animasyon gibi farklı duyulara hitap eden çok sayıda bileşenden meydana gelir. Bu türü diğerlerinden ayıran en önemli özelliklerinden biri, öğrencilerin ortama erişmek için belli bir ücret karşılığında üyelik almalarıdır. Bu türdeki e-kitaplar, daha çok ticari amaçlı hizmet veren yayınevlerince tercih edilmektedir.

3. İleri Düzey E-Kitaplar: Etkileşimli, grafiksel veya kendi içinde arama yapılabilen elektronik kitaplardır. Diğer iki türden farklı olarak, bu türde okuyucu e-kitap tarafından adeta kendi içine çekilir. Etkileşim son derece öne çıkmıştır.

E-KİTAP TASARIM İLKELERİ

2002 yılında EBONI tarafından, bir e-kitabın sahip olması gereken yazılım ve donanım bileşenlerinin özelliklerinin açıklandığı "Elektronik Ders Kitaplarının Tasarım İlkeleri" adlı bir rehber materyal yayınlanmıştır. Bu kaynakta, bir öğrenme materyalinin "e-kitap" olarak nitelendirilebilmesi için gerekli olan ilkeler ve bu ilkelere ait göstergeler, ayrıntılı şekilde verilmektedir (Wilson ve Landoni, 2002). Bu çalışmada tasarlanması düşünülen e-kitap için, EBONI tasarım ilkelerine uyulacaktır. EBONI tarafından belirlenen, bir e-kitabın sahip olması gereken tasarım özellikleri ve bunlara ait göstergeler aşağıda sıralanmıştır:

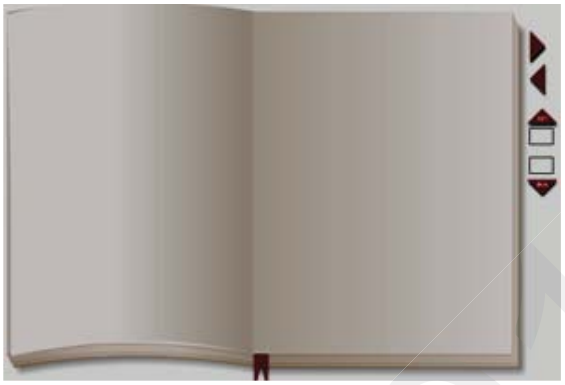
- Kitap kapağı
- İçindekiler
- Dizin
- Arama aracı
- Başlı başına bir kitap olma
- Kısa sayfa içerikleri
- Çoklu bağlantıların kitap içinde ve kaynaklar arasında gezinmeyi kolaylaştırması
- Dizgi tasarımının dikkatlice yapılması
- İçerik ipuçları
- Kitap içi bölüm tanıtıcı bilgilerin verilmesi
- Okunabilir yazı biçimi
- Uyumlu ve gözü yormayan renk kullanımı
- Metinlerin kısa parçalara bölünmesi
- Yazı dışındaki öğelerin dikkatli kullanımı
- Kullanıcıları etkin hale getirecek çoklu ortamlar ve etkileşimli öğeler.

Bu özellikleri taşıyan e-kitapların okuyucuyu daha fazla memnun edeceği, bu sayede başarı ve kaliteyi de beraberinde getireceği söylenebilir. EBONI standartları, günümüzde e-kitap tasarımcıları için büyük önem taşımaktadır. Özellikle ders kitabı niteliğindeki e-kitapların belli standartlara göre tasarımı, e-öğrenmenin esnekliği ve bilginin transfer edilebilirliği ilkeleri ile de örtüşecektir.

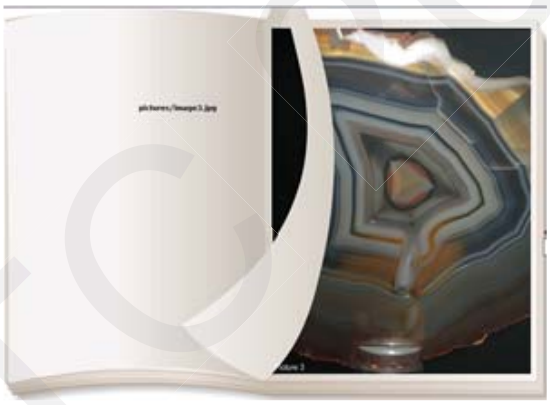
E-KİTAP ŞABLONU TASARIMI İÇİN YAPILAN ÇALIŞMA

Tasarımı yapılmakta olan e-kitap, öğrencinin kendi kendine çalışabileceği, görsel açıdan zengin, öğrencinin öğrenme sürecine farklı yaklaşan bir materyal olarak düşünülmektedir. Elektronik desteğin doğal dinamiklerinden biri olan bilginin basit bir yolla güncellenmesi ve değiştirilmesi tasarımı süren e-kitabın en güçlü yönlerinden biridir.

E-kitabın tasarımında Adobe Flash CS3 programı ve Action Script 3.0 dili kullanılmaktadır. E-kitap içerisinde yer alan bilgiler, XML (eXtensible Markup Language) yardımı ile dinamik bir şekilde kitap içerisine yüklenmektedir. Sayfa dönüş efektleri, sayfanın her bir hareketi ayrı bir film karesinde oluşturulmak suretiyle gerçekleştirilmektedir. Sayfa hareketleri, zemin üzerinde yer alan ileri-geri düğmeleri yardımıyla yapılmaktadır. Ayrıca, bir arama fonksiyonu eklenmiştir. Bu sayede kullanıcı, okumak istediği bölümü ya da bulmak istediği metni arayabilmektedir. E-kitabın genel görünümü Şekil 1'de, sayfa dönüş hareketi Şekil 2'de verilmiştir.



Şekil 1. e-Kitap Genel Görünümü



Şekil 2. E-kitap Sayfa Çevrimi

E-kitap içinde yapılmak istenen herhangi bir güncelleme, sadece XML içinde yer alan metin üzerinde yapılacak değişiklikle gerçekleştirilebilmektedir. Dolayısıyla, içeriklerin XML içinde yer alması, her bir sayfanın yeniden tasarlanması problemini ortadan kaldırmaktadır. Her bir sayfa içinde animasyonların, resimlerin ve video görüntülerinin bulunması halinde, program otomatik olarak sayfa formatında gerekli düzenlemeleri yapmaktadır. Bu özellikleri itibariyle, üzerinde çalışılmakta olan e-kitap şablonu, benzerlerinden rahatlıkla ayrılmaktadır. Ayrıca her tür ders için kullanılabilir olması, şablonun en önemli özelliklerinden biridir.

TARTIŞMA VE ÖNERİLER

Bu e-kitabın tasarlanmasındaki asıl neden, e-öğrenme ortamlarında yaşanan içerik güncelleme işleminin kısa sürede ve sorunsuz bir şekilde yerine getirilmesini sağlamaktadır. Çünkü mevcut durumda, e-içerik güncelleme süreci şöyle işlemektedir: Önce SCORM paketleri Öğretim Yönetim Sistemi'nden (ÖYS) bütünüyle çekilir. Daha sonra, gerekli sayfalarda güncellemeler yapılır. İçeriğin SCORM paketi tekrar oluşturularak ÖYS'ye yüklenir. Bu süreç, bilginin hızlı ve sürekli değiştiği, aynı zamanda öğretim elemanlarının yoğunlukları düşünüldüğünde, hem zaman hem emek açısından kayıplara neden olmaktadır. Üzerinde çalışılan e-kitap şablonunda, bu kayıpların en aza indirgenmesi hedeflenmektedir. Böylece, basit bir animasyonun revizesi esnasında içeriği yeniden oluşturmak yerine, sadece mevcut düzenlemeyi yapmak yeterli olacaktır.

Tamamlanan tasarımın ve programlamanın önce pilot uygulaması yapılacak, ortaya çıkan sorunlar belirlenerek, gerekli düzenlemeler gerçekleştirilecektir. Sonrasında, e-kitap programının tamamlanıp SCORM desteği sağlanarak uygulaması ile birlikte öğrenci ve öğretici boyutlarıyla bilimsel sonuçlara ulaşılacaktır.

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E-ÖĞRENME SİSTEMLERİNDE GÜVENLİK TEHDİTLERİ VE KARŞI TEDBİRLER

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Özet

Bu çalışmanın amacı e-öğrenme sisteminde güvenlik tehditlerini en aza indirilmesi için gerekli güvenlik yapısı ve alınması gerekli güvenlik tedbirlerini ortaya konmasıdır. E-öğrenme sisteminin uygulandığı ortamda ki tehditler, riskler ve güvenlik boşluklarının birbirleriyle ilişkileri ve etkilerinin analizleri yapılmıştır. Bunun neticesinde e-öğrenme sistemindeki tehditler, değerler ve erişim noktalarındaki potansiyel açıklar ortaya konmuştur. Bir e-öğrenme sistemindeki süreç, güvenlik düzeyinde, içerik, öğretme, öğrenme, sınav ve kurumsal yapı çerçevesinde ele alınmıştır. Güvenlik e-öğrenme ortamında bir döngü halinde cert (computer emergency response team) tarafından belirlenen adımlar çerçevesinde etkileşimli çalışan internet güvenlik uygulamaları bazında ele alınmış ve açıklanmıştır. Muhtemel güvenlik tehditlerine karşı alınan karşı tedbirler, yetkilendirme, gizlilik, veri bütünlüğü, inkar edememe, süreklilik ve izlenebilirlilik açısından e-öğrenme ortamında uygulanması ve yönetsel önlemlerin kurumda en üst yöneticiden kullanıcıya kadar kimlik sınaması belirlenen politika ve yöntemler ele alınmasının tehditleri önlemede etkili olacağı değerlendirilmiştir.
Anahtar kelimeler: e-öğrenme sistemi, güvenlik, tehdit, risk, güvenlik açığı, güvenlik yaşam döngüsü, saldırı tespiti, saldırı önleme.

Abstract

The aim of this study is to propound to take countermeasures against security threats in e-learning system. The relationships and impacts among threats, risks and vulnerabilities in e-learning stystem were analized. At the and of this analysis, threats, assets and potential vulnerabilities of access points were determined. The e-learning process was handeled at security level in the view of content, learning, teaching, examination and organizational arthitecture. E-learning security was defined and explained according to secruty life cycle of cert (computer emergeney response team) which contains interdependent working internet applications. Against propable security threats, technical countermeasures were explained. And also organisational administrative rules, procedures were defined and adviced as administrative countermeasures to apply from top to bottom level in an organization in order to prevent security threats.
Keywords: e-learning security, threat, risc, security gap, secruty life cycle, ıntrusion detection, ıntrusion prevention.

GİRİŞ

E-öğrenme bilgi ve iletişim teknolojilerinin gelişmesiyle daha fazla önem kazanmaktadır. Günümüzde e-öğrenme daha çok internet ortamında gerçekleşmekte ve eğitim ortamı zenginliği de artmaktadır (Kritzinger ve Solms, 2006). E-öğrenme ile ilgili araştırmalar yapılmaktadır fakat sistemlere ve katılımcılara yönelik güvenlik tehditlerine ait tedbirlerin şekillenmeleri devam etmektedir. E-öğrenme sistemlerinde, bilgi ve iletişim teknolojileri ortamında bilgi güvenliği tehditlerinin etkisini en aza indirmek için çabalar artarak devam etmektedir (Weippl,2005).

E-öğrenme, öğrenme materyallerinin katılımcılara bilgisayar ağları yoluyla elektronik ortamda teknoloji temelli olarak dağıtılmasıdır (Weippl,,2006). E-öğrenme ortamında tasarımcılar, öğrenciler, öğretmenler, iletişim sistemi kuralları, sunucu sistemleri, veri tabanları ile zararlı kişiler ile programlar bulunabilir.

E-öğrenme sistemleri genel olarak kullanıcıların, uygulamaları bilgisayara indirmesine, bilginin yüklenmesine ve dağıtılmasına müsaade eder. Bu süreçte e-öğrenme sistemine yönelik herhangi bir yerde veya zamanda saldırı olabilir. Güvenlik riskini azaltmak için erişim noktalarını azaltmak e-öğrenmenin doğasına aykırıdır. Farklı noktalardan güvenli erişim, şifreleme, güvenlik yazılımlarını kullanma, yetkilendirme, doğrulama, sertifikalandırma gibi pek çok tedbirin alınmasını gereklidir (Weippl,,2006).

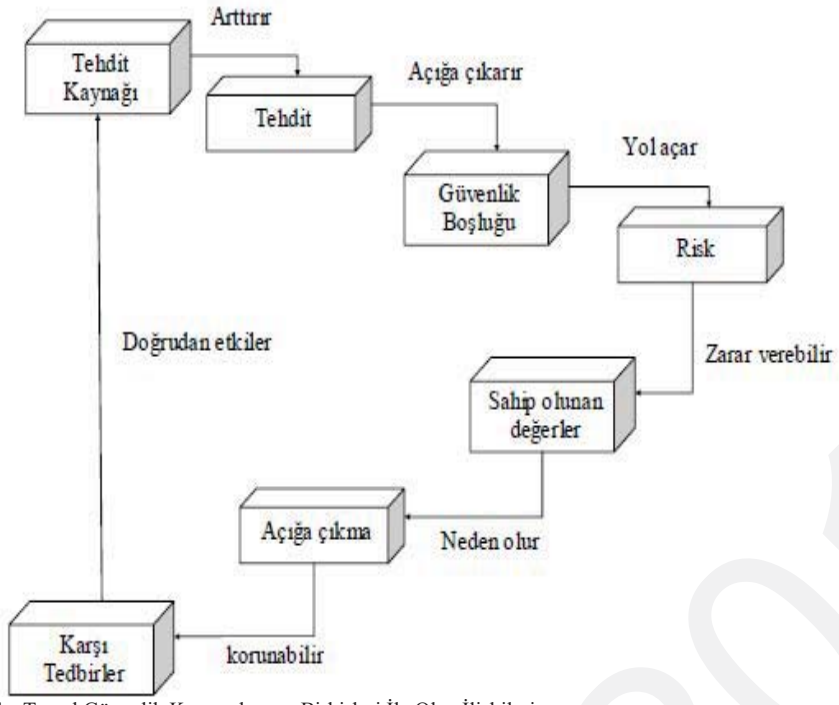
E-ÖĞRENME ORTAMINDAKİ GÜVENLİK TEHDİTLERİ

E-öğrenme ortamında risk, tehdit ve güvenlik boşluğu terimlerini açıklamakta fayda vardır. Bu terimler yanlışlıkla birbirleri yerine kullanılmaktadırlar. *Tehdit*, bir sistemin veya kurumun zarar görmesine neden olan istenmeyen bir olayın arkasındaki gizli neden, olarak tanımlanabilir. Her tehdidin bir kaynağı ve bu kaynağın yararlandığı sistemdeki bir "güvenlik boşluğu" vardır. *"Sistemi neye karşı korumalıyım?"* sorusuna verilecek cevap sisteme yönelik olan tehditleri belirlemekte yardımcı olacaktır (Weippl, (2006).

Güvenlik boşluğu, sistem üzerindeki yazılım ve donanımdan kaynaklanan ya da sistemi işletim kuralları ve/veya yönergelerindeki açık noktalar ve zayıf kalmış yönlerdir. Bir güvenlik boşluğu sayesinde bir saldırgan, sistemdeki bilgisayarlara ya da bilgisayar ağı üzerindeki kaynaklara yetkisiz olarak erişebilir. Yazılım ya da donanımdan kaynaklanan güvenlik boşlukları, program üreticisi ya da başka bir kaynak tarafından geliştirilen bir "yama program" yardımıyla kapatılmalı ve eldeki yazılım ve donanımların üreticilerinin yayınladığı yama listeleri sürekli olarak takip edilmelidir ve çıkan yamalar vakit geçirilmeden sisteme uygulanmalıdır (Pro-G ve Oracle,2003).

Bir tehdit kaynağının, bir sistemdeki güvenlik boşluğundan yararlanarak sisteme yetkisiz erişimde bulunması olasılığı, bu tehdidin *riski* olarak ifade edilir. Risk, kurumsal bir kayıp ölçütü olabilir. Temel olarak tehditler risklere yol açar. Riskler sadece tehditlerden kaynaklanmayıp aynı zamanda ortam ve kurumun doğasından da kaynaklanabilirler (Weippl,2006).

Tehdit kaynaklarının ya da güvenlik boşluklarının azaltılması, tehdide ait riskleri de aynı oranlarda azaltacaktır. Potansiyel riskler, *tedbir*ler yardımı ile azaltılabilirler. Bir tedbir, bir güvenlik boşluğunu ortadan kaldırır ya da bir tehdit kaynağının bir güvenlik boşluğunu kullanması riskini azaltır. Tedbirler, yazılım, donanım ya da geliştirilen bir kullanım yönergesi şeklinde karşımıza çıkabilirler. Tedbirlere, sağlam bir parola yönetim politikası, bir güvenlik görevlisi, bir işletim sistemi üzerinde akıllı kartlara dayalı bir erişim denetim mekanizması, güvenlik konusunda kullanıcıların eğitimi gibi örnekler verilebilir. Şekil-1'de bahsedilen kavramların birbirleri ile etkileşimleri gösterilmektedir (Harris ,2010).



Şekil 1 - Temel Güvenlik Kavramlarının Birbirleri İle Olan İlişkileri
(Shon Harris, CISSP All-in-One Exam Guide,5th Ed.)

Elektronik ortamda e-öğrenme sistemlerinde bilgi güvenliği riskleri fazladır ve aşağıdaki güvenlik risklerini içerebilirler:

- Ders materyalleri yetkisiz kişiler tarafından değiştirebilir.
- Kasten yetkisiz kişiler yanlış ders materyallerini web sitesine yükleyebilir veya web sitesi bilgileri bozulabilir.
- Sitelere yüklenen ödevler yetkisizce çalınabilir, değiştirebilir veya silinebilir.
- Öğrenci sınav puanları değiştirebilir veya silinebilir.
- Sınav sorularına erişilebilir, sorular değiştirebilir veya sınav soruları silinebilir.
- Kötü niyetli kişiler kendilerini öğrenci yerine koyarak öğrenci aleyhine faaliyet yapabilirler.
- Ders sitesi yok edilebilirler veya virüslenerek çalışmaz hale getirilebilir, veritabanı çökertilebilir.
- Kullanılan Web Servisleri aksatılabilir, siteye öğrenci erişimi engellenebilinir.
- Öğrenci, öğretmen, kullanıcı şifre ve adları çalınabilir veya değiştirilebilirler (Kritzinger ve Solms,(2006).

Genel olarak tehdit analizi, saldırganın karakterize edilmesi, değer ve erişim noktalarının belirlenmesi, tehditlerin belirlenip sınıflandırılması şeklinde yapılır. E-öğrenme sistemlerinde güvenlik tehdit analizi yapılırken aşağıdaki beş aşama izlenir (Weippl,2006).

1.Saldırganın karakterize edilmesi: Gerçekte e-öğrenme sistemine saldıracak potansiyel saldırganın kim olduğunu ve kabiliyetlerinin ne olduğunu bilmek zordur. Saldırganlar, açık, gizli ve bazen bilinçsiz olabilirler. Maksatlı saldırganlar, korumalı kaynaklara erişip tahribat yaparlar (Weippl,2006).

2. Değerlerin belirlenmesi: Nelerin korunacağının belirlenmesinde korunacak değerin yeterince öneme sahip olup olmadığı önemli değildir. Maksat değerlerin ortaya çıkarılmasını sağlamaktır. Değerler, e-öğrenme sisteminde kritik işlev yapan unsurlardır. Saldırgan bu değerlere erişmek ister. Değerlerin korunması için önce belirlenmeleri gerekir. Bir e-öğrenme sisteminde değerler:

- E-öğrenme içeriği,
- Kişilerin şahsi bilgisi,
- Mesajlar,
- Grup üyelik bilgileri,
- Ağ bant genişliği,
- Mesaj bütünlüğü ve mevcut bulunabilirliğidir(Weippl,2006).

3.Tehdit ve risklerin hesaplanması: Bu aşamada değerlere yapılacak tehdit ve risklerin belirlenir. Örneğin yangın, donanım için tehdittir. Tehditler belirlendikten sonra tehdidin gerçekleşmesi ve yaratacağı etkiler tahmin edilir. Tehditlerin etkisini ne olacağı doğruya yakın düşünülmelidir. Bir e-öğrenme sistemine erişim noktaları değerlere ulaşma yerleridir. Potansiyel erişme noktaları;

- Kullanılan ağ protokolleri,
- Kullanılan iletişim kanalları,
- Bilgisayarlar,
- Fiziksel ağ altyapısı,
- E-öğrenme oturumlarına ait toplanan kayıt bilgileridir (Weippl,2006).

4.Kontrol tedbirleri ve karşı önlemlerin alınması: Bu aşamada öncelikler belirlenir. Değerlerin hesaplanması onların bağıl önemlerini verir. Risk kontrolleri uygulanır.

5. Karşı tedbirlerin etkinliğini ve risklerini izleme: Bu aşamada alınan tedbirlerin gerçekten isteneni verip vermediği ve hesaplanmayan risklerin oluşmasında neler yapılacağı belirlenmelidir (Weippl,2006).

E-ÖĞRENME TASARIMINDA GÜVENLİK DÜŞÜNCELERİ

Güvenli bir e-öğrenme sistemi tasarımında doğrulama ve şifreleme sistemlerinin kullanılması ve beliren yeni tehditlere karşı önlem almak yeterli olmaz. Bu yaklaşım güvenlik açıklarının tam olarak kapatılmamasına sebep olabilir. Bundan dolayı e-öğrenme sistemi tasarımından itibaren güvenlik düşünülmeli " Neye karşı güvenlik sağlanmalı?", "Kim, neye ve nasıl saldırır ? " soruları ile tasarıma devam edilmelidir. E-öğrenme üç ana süreci içerir; bunlar içeriğin oluşturulması, öğretme-öğrenme-sınav ve kurumsal yapıdır (Weippl,2006).

İçeriğin Oluşturulması: İçerik açısında güvenlik, içeriğe erişimi engelleme teknolojisi olarak bilinir. Güvenlik mekanizmalarının kullanımı ile erişim sağlanır. Yeterli güvenlik tedbirlerinin uygulanması ile sunulan hizmetlerin kullanılması gerekir. Akademik içeriğin sunumunda katılımcıların haricinde erişimin sağlanması istenmeyebilir. Akademisyenlerin en çekindikleri konu kendilerinin oluşturulduğu içeri, kendilerinden izinsiz kullanılmasıdır (Weippl,2006).

E-öğrenmede içerik güvenliğinde bilgilerin dağıtımından ziyade içeriğin sunulduğu öğretme yönetiminde ders ortamının korunması daha önemlidir. E-öğrenmede içerik güvenliğinin sağlanmasındaki ihtiyaçlar şöyledir:

- Okuyucular sunulan içeriğin doğruluğuna duydukları güven,
- Okuyucular izlenmeden okumak istemeleri,
- Yetkisiz kullanıma karşı korunma sağlanması,
- Yetkisiz değiştirme ve tekrar kullanıma karşı koruma olması,
- Bilginin yok edilmesinin önlenmesidir.

Bu yapıda özellikle öğrenciler okudukları her şeyi doğru kabul eder ve kaynağa güvenirler. Bu durumda içeriğin bütünlüğü yazarın kimliği ile beraber önemlidir.

Öğretme, Öğrenme ve Sınavlar

Öğretme ve sınavların e-öğrenme ortamında gerçekleştirilmesinde farklı tehdit ve güvenlik gereklerine ihtiyaç duyulur. Özellikle bu sosyal bilimlerdeki tartışma derslerinde önem kazanır. Uzaktan eğitim ile sınıf içi e-öğrenme uygulamalarındaki temel fark e-öğrenme ortamındakilerin kaydedilmesidir. Güvenlik mekanizmalarının uygulanması ve politikaları açıkça neyin ne kadar süre ile saklanması ile güvenlik risklerinin azaltılması yönündedir. E-öğrenmede etkileşim önem kazanır. Katılımcıların mahremiyeti ve kişisel bilgilerin ifşa edilmemesi gerekir. Katılımcıların bilgileri;

- Sadece öğrenciler için gizli kalabilir,
- Tüm ders katılımcıları için gizli kalabilir,
- Sistem yöneticileri dahil tüm kişiler için gizli kalabilir (Weippl,2006).

Sınavlarda güvenlik, kopya ve haksız olarak sınavları çözmenin önüne geçmektir. Elektronik teknolojilerin e-öğrenme sistemlerinde kullanılmasıyla kopyanın önlenmesine ilaveten sınavların kullanıma hazırlığı ve değerlendirmenin inkar edilmezliği önemlidir. Evde sınav yöntemi öğrencilerin etkileşme ve birbirine yardımlarından dolayı uygun değildir. Kopya ve haksız cevaplanmayı önlemenin yolları;

- Sınırlandırılmış güvenli bir sınav merkezi,
- Dönem boyunca sürekli değerlendirme,
- Soruları minimum sürede cevaplama zorunluluğu,
- Sınavların yüz yüze yapılması şeklinde olmalıdır.

Güvenli sınav cevaplamanın yanında sınav uygulamalarının çalışmaz hale getirilmesi ile mevcudiyetin sonlandırılması, öğrencinin sınava katılımını inkar etmesi ve sistem güvenliğinin sağlanmaması da güvenlik problemleridir (Weippl,2006).

Kurumsal Yapı

Güvenlik, kurumlar için ek bir maliyet gerektirir. Eğitimde güvenliği uygulaması idarecinin sorumluluğu olup eğitime katılanlara anlatılıp uygulaması sağlanmalıdır. Yeni teknolojik sistemler ve ortamlar öğrenmeyi arttırıcı maksatlı kullanılır. Güvenlik konuları uzaktan eğitimle teknik olmakla beraber kurumsal özellik de taşır. Basit anlaşılır güvenlik tedbirleri daha etkindir. Örneğin açık anahtar altyapısı sistemi ve sadece yetkili kılınmış personelin öğrenci notlarını e-posta ile göndermesi, telefon ile e-postaların daha basit ve garantili varış yöntemidir (Weippl,2006).

E-ÖĞRENME SİSTEMİNİN GÜVENLİK YAŞAM DÖNGÜSÜ

Tehditlerin sürekli olarak yenilenmesi ve çeşitlilik kazanması, kullanılan altyapıların sık aralıklarla güncelleme, iyileştirme, genişleme ve benzeri değişikliklere uğraması ve yazılım sistemlerindeki sürekli değişimler, herhangi bir anda güvenli kabul edilebilecek bir sistemin takip eden sürede

güvenli kalmasını garanti edemez. Bu nedenle, güvenlik çalışmaları bir yaşam döngüsü ile modellenmektedir. Genel kabul görmüş yaklaşımlardan biri olan CERT (Computer Emergency Response Team) tarafından önerilen yaşam döngüsü, aşağıdaki adımları içermektedir:

- Sistem Güçlendirme (Harden / Secure)
- Hazırlık (Prepare)
- Saldırı / Sorun Tespiti (Detect)
- Tespit edilen olaya özgü önlemlerin alınması / kurtarma(Respond)
- İyileştirme, tespit edilen olayın tekrarını önleyecek önlemler (Improve) (Karaarslan ve diğerleri, 2008).

E-öğrenme sistemlerinin güvenliğinin sağlanmasında birbiriyle etkileşimli çalışan pek çok süreç ve uygulama vardır. Bu adımların tekrarlı bir biçimde gerçekleştirilmesi sayesinde, sürekli olarak potansiyel sorunlar tespit edilebilir ve zamanında önlem alınarak sistem güvenliği azami seviyede korunmaya çalışılır. Bunları şöyle sıralayabiliriz :

1. Standartlaştırma
2. Güvenli kodlama
3. Sistem farkındalığı
4. Eğitim ve ön deneme
5. Saldırı tespit
6. Saldırı engelleme
7. Kurtarma
8. Zararlı Program Taraması Kullanma
9. Sistem Olarak Birlikte Çalışmadır (Karaarslan ve diğerleri, 2008).

1. **Standartlaştırma:** İstikrarlı ve güvenli bir e-öğrenme sisteminin sağlanması için standart, kural ve politikaların oluşturulup uygulanması gerekir. Örneğin web sunucu düzenlemeleri, işletim sistemi ve yapmalarının yüklenmesi, sitelerde güvenlik açıklarının tespiti, şablonlarının uygulanması, açıkların tespiti gibi durumlarda WC3 standartlarının uygulanması.

2. **Güvenli Kodlama:** Tasarım sürecinden itibaren The Open Web Application Security Project (OWASP)'ın güvenli kodlama ilkelerini uygulamaktır.

3. **Sistem Farkındalığı :**Internet ve WEB ortamında nelerin yaşanmakta ve yaşanacağının bilinmesi gerekir. Internet ortamında korunması gereken aygıt ve değerleri şuan ki durumları, tehditler ve saldıraya açık noktaların bilinmesini içerir.

Web Bilgi Sistem Farklılığı: Web sunucularında çalışan uygulama ve sunulan içeriğin ayrıntılarının saptanması ve belirlenmesidir. Sunucu ve uygulamaların servis, port tarayıcısı ve ağ dinleyicilerinin etkileşimili çalışması önerilir. Arama motoru ile içerik endekslenmelidir.

Saldırıya Açıklık Çözümlemesi : Sistem ve web uygulamalarında güvenlik açıkları ve zafiyetler belirlenmelidir. Web uygulamalarında açık kutu sınaması(Web yazılımı kaynak kodu üzerinde yapılan analiz) ve kapalı kutu sınaması (dışarıda web kodlarına yapılan ve erişim değiştirme analizi) yapılmalıdır.

Web Sunucu İzleme : Web sunucularının olağan dışı faaliyetlere karşı sürekli izlenmesi gerekir. Ağ yönetim protokolü, trafik izlemesi, işleme gücü, bellek ve süreç istatistikleri SNMP ile toplanıp izlenebilir, incelenebilir.

4. Eğitim ve Ön Deneme : E-öğrenme sistemlerini barındıran ve çalıştıran kurumlar çalışma grupları, eğitim portalları ve deneme sunucuları oluşturarak gerekli güvenlik alt yapı kılavuzları ve standartları uygulayabilirler.

5. Saldırı Tespiti : Ağlara yapılan olağandışı ve zararlı erişimlerin belirlenmesi için saldırı tespit yazılımları, kayıt kontrolleri ve saldırıları yanıltmak için saldırgan tuzakları kullanılabilir.

6. Saldırı Engelleme : Ağ ortamında engelleme risk azaltıcı sistemler kullanılmalıdır. Erişim denetimi (dışa açık ve kapalı olma durumuna göre sistemleri kullanmanın kontrolü), sunucu yerel güvenliği (işletim sistemi, donanım ve üzerinde çalışan uygulama güvenliği) ve web uygulama güvenlik duvarı (sunucu veri tabanına erişim emniyeti, yazılımları değiştirilme ihtimalini önleme) tedbirleri uygulanmalıdır.

7.Kurtarma : Saldırı sonrasında nelerin yapılması gerektiği, saldırı etkilerini temizleme, yeniden kurulumu ve çalıştırma, kullanıcıları bilgilendirme ve düzenlemelerinin yapılmasıdır.

8. Zararlı Program Taraması Kullanma : Her sistemde sistemin çalışmasını engelleyecek virüs temizleyiciler kullanılmalıdır.

9. Sistem Olarak Birlikte Çalışma :E-öğrenme sistemi için kullanılan bu düzeneklerin beraber uyumlu ve çok katmanlı güvenlik uygulamaları şeklinde birbiri açıklarını kapatacak şekilde eşgüdümlü olarak çalıştırılmasıdır (Karaarslan ve diğerleri, 2008).

E-ÖĞRENME SİSTEMİNDE TEHDİT KARŞI TEDBİRLERİ

E-Öğrenme sistemlerinde artan güvenlik tehditleri neticesinde teknik ve yönetsel karşı tedbirler uygulanır (Kritzinger,2006). Genel olarak güvenlik tehditleri ile mücadelenin üç ana maksadı vardır. Bunlar;

- Belirli saldırı ve önlemlerin önceden tahmin edilmesi ile tasarım güvenliğini arttırmak,
- Oluşabilecek bir saldırının sonuçlarını ve muhtemel etkisini tahmin etmek,
- Belirli saldırılar olmadan önce müdahale planları oluşturmaktır (Nickolova ve Nickolov,2007).

Teknik Karşı Tedbirler :
Von Solms'a göre teknik tedbirler eğitim ortamında bilgi sistemleri için icra edilebilir. Bu tedbirlerle öğrenci, öğretmen ve sunulan bilginin muhtemel güvenlik tehditlerine karşı korunması sağlanır. E-öğrenme sistemlerine yönelik tehdidi ve saldırıları iyi analiz edilip, doğrulama,

yetkilendirme, güvenlik, bütünlük, inkar edilmezlik ve kullanılabilirlik şeklinde kategorilere ayrıp bunlara yönelik karşı tedbirler alınmalıdır(Kritzinger,2006).Belirtilen bilgi güvenlik teknik karşı tedbirleri aşağıdaki gibidir:

Doğrulama -Kimlik Sınaması
Ağ güvenliği açısından kimlik sınaması; alıcının, göndericinin iddia ettiği kişi olduğundan emin olmasıdır. Bunun yanında, bir bilgisayar programını kullanırken bir parola girmek de kimlik sınaması çerçevesinde değerlendirilebilir. Günümüzde kimlik sınaması, sadece bilgisayar ağları ve sistemleri için değil, fiziksel sistemler için de çok önemli bir hizmet haline gelmiştir. Akıllı karta ya da biyometrik teknolojilere dayalı kimlik sınama sistemleri yaygın olarak kullanmaya başlanmıştır (Harris ,2010). Doğrulama saldırıları saldırgan kendini gizleyerek yetkili bir kullanıcıymış gibi e-öğrenme sisteminde bilgilere erişebilir, bilgiyi değiştirip diğer yetkili kullanıcıların sistemdeki bilgilerini inkar edebilir.

Yetkilendirme
Bilgiye erişim sürecinde yetkilendirme, bilgiye doğru kişinin ulaşıp ulaşmadığını kontrol eden alt sistemdir. Gündelik işlerimizde hemen her bilgisayar ağ kaynağına eriştiğimizde yetkilendirme çözümlerini kullanmaktayız. Yetkilendirilmiş kullanıcının erişilecek bilgiye veya e-öğrenme sisteminde yetkisinin olmadığına bakılır(Harris ,2010). Belirli kaynaklara hakkının erişim olup olmadığına bakılır. Yetkilendirmede uygulanacak karşı tedbir ise erişim kontrolüdür. Yetkilendirme konusunda dikkat edilmesi gereken, bilgi sistemlerinde geçerli olan "en az bilgi" kuralıdır.

Gizlilik
Bilginin yetkisiz kişilerin eline geçmesinin engellenmesidir. Gizlilik, hem kalıcı ortamlarda saklı bulunan veriler hem de ağ üzerinde bir göndericiden bir alıcıya gönderilen veriler için söz konusudur. Saldırganlar, yetkileri olmayan verilere birçok yolla erişebilirler. Parola dosyalarının çalınması, sosyal mühendislik, bilgisayar başında çalışan bir kullanıcının, ona fark ettirmeden özel bir bilgisini ele geçirme bunlardan bazılarıdır(Harris ,2010). Bunun yanında trafik analizinin, yani hangi gönderici ile hangi alıcı arası haberleşmenin olduğunun belirlenmesine karşı alınan önlemler de gizlilik hizmeti çerçevesinde değerlendirilir. Bilgiye yetkisiz kişilerin erişiminden korunmayı hedefler, amaç bilgi ve verinin yetkisiz kişi veya varlıklara ifşa edilmesinin önlenmesidir.

Veri Bütünlüğü
Bu hizmetin amacı, veriyi göndericiden çıktığı haliyle alıcısına ulaştırmaktır. Bu durumda veri, haberleşme sırasında izlediği yollarda değiştirilmemiş, araya yeni veriler eklenmemiş, belli bir kısmı ya da tamamı tekrar edilmemiş ve sırası değiştirilmemiş şekilde alıcısına ulaşır. Bu hizmeti, geri dönüşümü olan ve olmayan şekilde verebiliriz. Bütünlüğün amacı bilginin doğru, ilk ve istenen orijinal halinde olduğunu garanti etmektir (Harris ,2010). Sadece yetkililer bilginin içeriğini değiştirebilir. Bütünlüğün sağlanmasında mesaj doğrulama kodlarının kullanılması iyi bir karşı tedbirdir.

İnkâr Edememe
Bu hizmet sayesinde, ne gönderici alıcıya bir mesajı gönderdiğini ne de alıcı göndericiden bir mesajı aldığını inkâr edebilir. Bu hizmet, özellikle gerçek zamanlı işlem gerektiren sistemlerde kullanım alanı bulmaktadır ve gönderici ile alıcı arasında ortaya çıkabilecek anlaşmazlıkların en aza indirilmesini sağlamaya yardımcı olmaktadır(Harris ,2010). Bu hizmetler, zaman içinde bilgisayar sistemlerine karşı ortaya çıkmış tehditler ve yaşanmış olaylar sonucunda ortaya konmuştur. Yani her bir hizmet, belli bir grup potansiyel tehdide karşı sistemi korumaya yöneliktir, denilebilir. E-öğrenme sistemlerinde yapılan işlerin inkar edilmesini önlemede en önemli karşı tedbir sayısal imza sistemleridir (Kritzinger ve Solms,2006).

Süreklilik
Bilişim sistemleri, kendilerinden beklenen işleri gerçekleştirirken, hedeflenen bir başarım vardır. Bu başarım sayesinde memnuniyet artar, elektronik işe geçiş süreci hızlanır. Süreklilik hizmeti, bilişim sistemlerini, kurum içinden ve dışından gelebilecek başarım düşürücü tehditlere karşı korumayı hedefler. Süreklilik hizmeti sayesinde, kullanıcılar, erişim yetkileri dahilinde olan verilere, veri tazeliğini yitirmeden, zamanında ve güvenilir bir şekilde ulaşabilirler. Bilgisayar yazılımlarındaki hatalar, sistemin yanlış, bilinçsiz ve eğitimsiz personel tarafından kullanılması, ortam şartlarındaki değişimler (nem, ısı, yıldırım düşmesi, topraklama eksikliği) gibi faktörler sistem sürekliliğini etkileyebilir(Harris ,2010).
Kayıtlı ve doğru kullanıcılar için tüm elektronik kaynak ve hizmetler kullanıma hazır olmalı ve yetki oranında erişim sağlanmalıdır. Süreklilik, yedekleme ve sistemin yedekten çok çabuk yeniden tesisi ile sağlanmalıdır (Kritzinger ve Solms,(2006).

İzlenebilirlik ya da Kayıt Tutma
Bu hizmetin hedefi sistemde gerçekleşen olayları, daha sonra analiz edilmek üzere kayıt altına almaktır. Burada olay dendiğinde, bilgisayar sistemi ya da ağı üzerinde olan herhangi bir faaliyeti anlayabiliriz. Bir sistemde olabilecek olaylara, kullanıcının parolasını yazarak sisteme girmesi, bir web sayfasına bağlanmak, e-posta almak göndermek ya da icq ile mesaj yollamak gibi örnekler verilebilir. Toplanan olay kayıtları üzerinde yapılacak analiz sonucunda, bilinen saldırı türlerinin örüntülerine rastlanırsa ya da bulanık mantık kullanılarak daha önce rastlanmayan ve saldırı olasılığı yüksek bir aktivite tespit edilirse alarm mesajları üretilerek sistem yöneticileri uyarılır (Harris ,2010).

Yönetsel Karşı Tedbirler:

Yönetsel önlemler, bilişim güvenliği açısından en yukarıdaki üst yöneticilerden en alttaki son kullanıcılara kadar, hiyerarşik bir sorumluluk yapısını ortaya koyar. Önce, nelerin hangi düzeyde bir güvenlik ihtiyacı olduğu belirlenmelidir. Yasal platformda, yürürlükte olan ve bilişim güvenliği konularını da kapsayan kanunların ve tanımlanan sorumlulukların anlaşılması ve kurumun bir bütün olarak bu sorumlulukları yerine getirmesinin sağlanması, yönetsel önlemler açısından değerlendirilmelidir. Bu durumda, bir kurumun güvenlik yönetimi biriminin temel görevi, güvenlik yönetimine yönelik yönerge ve direktifler oluşturmak değil, öncelikle üst yönetimden güvenlik yönetimi ile ilgili gelen istekleri yerine getirmek olmalıdır(Kritzinger,2006).

Yönetsel karşı tedbirler güvenliğin e-öğrenme ile ilgili idari boyutunu oluşturur. Bilgi güvenliği sadece teknik boyutu ile ele alınmamalıdır. E-öğrenme sisteminde güvenliği sağlanması politika ve yöntemlere bağlıdır. E-öğrenme sistemleri kullanan kurumlar sadece bilgi güvenliği politikaların doğru tasarlandığını değil aynı zamanda doğru uygulanması gerektiğinden emin olmalıdırlar. Güvenlik uygulamaları kurum yönetimi tarafından da önemsenmelidir. Bu tedbirler ;

- Bilgi Güvenliğinin Yönetiminden Emin Olmak : Kurumdaki veya sistemdeki bilgi güvenliğinden kimin sorumlu olacağının kesinlikle belirlenip sorumlu olarak görevlendirilip belirlenmesidir.
- Bir E-öğrenme Bilgi Güvenliği Politikası Uygulamak : Bir e-öğrenme bilgi güvenlik politikasını oluşturarak neyin yönetileceğinin ve nasıl olması gerektiğinin belirlenmesidir.
- E güvenlik Risk Yönetim Politikası Oluşturmak : Eğitsel yönetim kurumu yöneticileri eğitim öğrenme ve değerlendirme faaliyetleri için bütünleşik platformlar sağlamalı muhtemel güvenlik risk ve tehditlerini azaltma yollarına başvurmalıdırlar.
- Bilgi Güvenliği Tedbirlerini Düzenli Olarak İzlemek : Bilgi güvenliği tedbirlerinin uygun çalışıp çalışmadığını izlemek için süreç ve yöntemlerin uygulanmasını ve çalışıp çalışmadığını kontrol etmek gerekir.

Teknik ve yöntemsel tedbirler sadece oluşturup bırakılmamalıdır aynı zamanda e-öğrenme ortamında bunlar anlaşılmalı, uygulanmalı ve zorlanmalıdır(Kritzinger,2006).

SONUÇ VE ÖNERİLER

Bu çalışmada e-öğrenme sistemlerine yönelik güvenlik tehditlerinin ve bunlara karşı alınabilecek tedbirlerin neler olduğu belirtilmiştir. E-öğrenme sistemleri katılımcılara güvenli bir ortamda hizmet verebilmesi için gerek teknik gerekse yönetsel olarak düzenlemelere tabi kılınmalıdır.Bu bağlamda tehdit ve riskler e-öğrenme tasarımından itibaren düşünülmeli, tehdit ve risk kaynaklarına karşı bilgisayardaki ,sunucudaki ,iletişim altyapısındaki açıklar ve insan faktörünün bilinçli veya bilinçsiz girişimleri takip edilip önlemler alınmalıdır.Bu önlemler CERT (Computer Emergency Response Team) tarafından belirlenen sistem güçlendirme,hazırlık,saldırı tespit,saldırı önleme,kurtarma ve yeniden tesisi kapsamalıdır.Ayrıca CERT tarafından belirtilen güvenlik yaşam döngüsü çerçevesinde e-öğrenme sistemlerinde standartlaştırma,güvenli kodlama,sistem farkındalığı,eğitim ve ön deneme,saldırı tespit,saldırı engelleme,kurtarma ,zararlı program taraması kullanma ,sistem olarak birlikte çalışma, eğitsel,teknik ve yönetsel boyutta kurumun ,katılımcıların ve öğreticilerin üzerinde önemle durması gereken uygulanması gereken süreçlerdir.Özellikle akademik çevrelerde ve internette uzaktan eşzamanlı ve eşzamansız eğitimlerde güvenlik mülahazalarına uyulmaya çalışıldığı fakat tam olarak gerek bilgi güvenliği ve teknik konuları ile idari boyutunun uygulanmadığına rastlanmaktadır.E-öğrenme sistemlerinin daha güvenli bir ortamda hizmet verebilmeleri için, doğrulama, yetkilendirme, güvenlik, bütünlük, inkar edilmezlik ve kullanılabilirlik prensiplerinin uygulanabileceği sistemler kurulmalıdır.

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E-ÖĞRENME SÜRECİNDE BİR ALTERNATİF: SENARYO TABANLI ÖĞRENME

AN ALTERNATIVE APPROACH TO E-LEARNING PROCESS: E-SCENARIO BASED LEARNING

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Özet:
Gerçekliğin en mükemmel öğrenme ve öğretme yöntemi olduğu düşüncesinden hareketle, daha iyi öğrenme ortamlarının nasıl olması gerektiği sorusuna verilebilecek cevaplar geleneksel eğitim anlayışından giderek uzaklaşmaktadır. Bu arayış gerek örgün gerekse uzaktan eğitim alanında yeni alternatiflerin gündeme gelmesine neden olmaktadır. İşte bu alternatiflerden biri de senaryo tabanlı e-öğrenmedir. Senaryo tabanlı e-öğrenme yaklaşımını temel alan programların gerçekleştirilmesine yönelik uygulamalar gelişen teknoloji ile birlikte çeşitlenmektedir. Duruma ve amaca uygun çeşitli hikayelerin aktarılması ve çözüm yollarının ortaya konulması temeline dayanan uygulamalar animasyon ya da simülasyon gibi çeşitli teknolojilerin kullanılması ile daha da etkili bir şekilde gerçekleştirilebilmektedir. Dolayısıyla aktarılacak konuya ve öğrenme amaçlarına en uygun yöntemin seçilmesi, diğer eğitim yaklaşımlarında olduğu gibi senaryo tabanlı öğrenme yaklaşımında da önemli ve belirleyici bir unsur olarak karşımıza çıkmaktadır. Ancak, beklenen sonuçlara ulaşılması için doğru tasarımların yapılması, bunun için de öncelikle neden ve ne zaman senaryo tabanlı öğrenme gibi soruların ayrıntılı olarak cevaplanması, senaryo tabanlı e-öğrenmenin temel özelliklerinin ortaya konulması gerekmektedir. Senaryo tabanlı e-öğrenme bu kapsamlarda ele alındıktan sonra, güncel gelişmeler ve teknolojik öngörüler çerçevesinde bu yaklaşımın geleceği üzerine yorum yapılması mümkün olacaktır. Bu çalışmada, senaryo tabanlı e-öğrenme sürecine ilişkin görüşlerin, temel özelliklerin, geleneksel e-öğrenme ile kıyaslandığındaki potansiyelinin ve tasarımında dikkate alınacak unsurların ele alınması, bu şekilde senaryo tabanlı e-öğrenmenin uzaktan eğitim uygulamalarına kazandıracaklarına dikkat çekilmesi amaçlanmaktadır.

Abstract: From the point of view that the reality is the best educational method, the answers for the question of "what can be done for a better learning environment?" Are estranged from the traditional educational understandings. This searching causes that the new alternatives are put into practice in both traditional (in class) and distance education and one of these alternative learning method is scenario based learning. The applications for e-scenario based learning are varied by the developments in the information and communication technologies. Adapting stories that are related to the educational activities/goals and putting forward the solutions for educational problems realized more effectively by modern technologies like animation and simulation. So choosing the best method and the reasonable story related to the subject is determinative and important for e-scenario-based learning as the other educational approaches. But to make right decisions about these subjects and make appropriate designs isn't easy as it seems. To realize the expected results from the educational process it is needed to make right designs; but firstly it is necessary to answer some questions like why, how and when e-scenario-based learning is needed. Also it is necessary to put forward the basic characteristics of e-scenario based learning. By this way, it is possible to clarify the differences between traditional e-learning and e-scenario based learning. After dealing up basic characteristics of e-scenario based learning approach, it will be possible and more appropriate to make comments about the future applications based on the frame of current technological developments and foresights. In this study, it is discussed and dwelled upon the basic characteristics of e-scenario based learning, the conditions it is needed and the special features for e-scenario based learning design. Also it is thought that this study attract attention the advantages of e-scenario based learning within the distance education applications.

Senaryo Tabanlı Öğrenme Nedir?

Senaryo tabanlı öğrenme, durumlu öğrenme teorisinden yola çıkılarak temellendirilmiştir. Durumlu öğrenme, birbiriyle bağlantılı ve gerçek dünyadan esinlenen senaryo ve konuların öğrenme sürecinde kullanılması üzerinde durmaktadır. Bu şekilde anlamlı ve gerçek bilgilerin kazanımını savunmaktadır (Akins and Crichton, 2003). Durumlu öğrenmenin neleri kapsadığına baktığımızda, karşımıza bu anlamda kullanılan farklı kalıplar çıkmaktadır. Sorgulayıcı öğrenme, problem tabanlı öğrenme, senaryo tabanlı öğrenme ve alan çalışmaları da bu kavramlar arasında yer almaktadır (Hale, 2005, s:4).

Gerçek yaşamdaki olaylar dizisi sorun çözmeyi, olayları bir bütün içerisinde görebilmeyi ve bir bağlam çerçevesinde değerlendirebilmeyi gerektirmektedir. Bu durum yıllardır tartışılan okul ile gerçek yaşam arasındaki kopukluğu gündeme getirmektedir. İşte bu kopukluğu olabildiğince azaltmak ve okulu yaşama yaklaştırmak yönünde var olan kuramlardan, tartışmalardan ve öğrenme–öğretme süreçlerinden yararlanılarak senaryo tabanlı öğrenme kavramı ortaya çıkmıştır.

Gündelik yaşam içerisinde bireyler kendilerini bazı durum ve sorunlarla karşı karşıya bulmakta ve bu durumlara çözüm üretmek zorunda kalmaktadır. Yeni becerilerin öğretilmesinde, bireylerin neyin önemli olup olmadığına kendilerinin karar verdikleri, hatalarından ya da başarılarından öğrendikleri, kararlarının sonuçlarına katlandıkları bir ortam yaratılması daha etkili olmaktadır. Bu da hedef odaklı senaryolar ya da hikâye temelli uygulamalar ile mümkün olabilmektedir (Whiteside,2002,s:4).

Senaryo, genellikle henüz olmamış ancak olması muhtemel durumlar olarak tanımlanmaktadır. Bir senaryoda karakterler, zaman, temel unsurlar ve bazı olayların tanımlandığı görülmektedir. Senaryoların eğitim amacıyla eğitim sürecinde kullanılması ise senaryo tabanlı öğrenme olarak tanımlanmaktadır (Lim, 2004).

Senaryo tabanlı öğrenme kapsamında kullanılan senaryoların yararlandığı en temel unsurların başında hikâyeler (öyküler) gelmektedir. Mevcut durum ile ilişkilendirilen hikâyeler, bilginin keşfedilmesi ve aktarılmasında büyük rol oynamaktadır. Keşfedilen bilginin kolayca izlenmesi ve öğrenilenlerin hatırlanması için anlamlı bir yapı oluşturulmasında hikâyelerin işlevsel bir değeri vardır. Brown (1989) hikâyeleri yeni bir durum oluştuğu zaman, bilgiye erişimin, aktarımın ve depolamanın yapıldığı bir uzman sistem olarak değerlendirmektedir. Bu açıdan hikâyeler diğer bir değişle geliştirilen senaryolar bir öğretim stratejisi olarak kullanılmaktadır. Bu bağlamda senaryolar ya da hikâyeler düzenlenirken gerçek dünyayla ilişkili, sorun çözmeye yönelik durumlar yaratmalarına dikkat edilmelidir (Whiteside,2002,s:7). Burada amaçlanan, birbiri ile bağlantılı ve araştırmaya sevk eden aktivitelerin öğretim amaçları ile ilişkilendirilerek sırlanmasıdır. Öğrencilerin sadece bilgi edinmekten daha fazlasını yapması, edindikleri bilgileri karşılaştıkları sorunları çözmede, açıklama ve tahminler yapmada kullanması beklenmektedir (Bhargava, Kyle and Sabnis, 2004, s:4).

E- Öğrenme Sürecinde Senaryo Tabanlı Öğrenme Yaklaşımı

E-öğrenme ortamları, bireylere sınırsız ve çok sayıda bilgi kaynağına ulaşma ve çok yönlü etkileşim imkânı sunmaları nedeniyle günümüz eğitim sistemi içerisinde giderek daha fazla önem kazanmaktadır.

E-öğrenme programlarına bakıldığında metin ya da anlatımların kullanıldığı bazı temel araçlar ile öğretimin gerçekleştirildiği görülmektedir. Bir rehber ya da sanal bir danışman programın özeliklerini göstermekte, bu özelliklerin neden önemli olduğunu ve program bileşenleri arasında etkileşimi açıklamaktadır. Şimdi ise metin ya da video uygulamaları ile bireyler gerçekçi bir senaryoya dâhil edilmektedir. Durumun tanımladığı ve kişilerin üstlenmesi gereken misyonun belirtildiği programlar gündeme gelmektedir. Kişi farklı bakış açılarını içeren olası çözüm yollarının arayışına girmektedir. Sonucun ya da çözümün iyi ya da kötü olması ise, seçilen hareketler sonucunda şekillenmektedir. Anlaşılacağı üzere ilk bahsedilen yöntem eğitimci kontrolü ve bilginin dağıtımı temeline dayanan geleneksel yaklaşımı; ikinci ise bilginin doğrudan ve basitçe sunulmadığı, öğrencilerin sunulan veriler ile kendi bilgilerini yapılandırdıkları senaryo tabanlı öğrenme yaklaşımını ifade etmektedir (Lim, 2004).

Eğer öğrenme amaçları, bilginin uygulanması ve performansın geliştirilmesi ise ve programın vurguladığı nokta yetenek, yaratıcılık ve sorumluluğun geliştirilmesi ise bu amaçların genellikle tek yönlü öğrenme imkânı sunan geleneksel e-öğrenme yaklaşımı ile tam olarak karşılanması güçtür. Geleneksel e-öğrenme yaklaşımında sunulacak bilgiler eğitimciler tarafından seçilmekte, şekillendirilmekte ve iletilmekte; öğrenciler ise kendilerine hazır sunulan bilgiyi doğrudan almaktadır. Senaryo tabanlı öğrenme, öğrencilerin yetenek ve problem çözme becerilerini geliştirmede geleneksel e-öğrenme yaklaşımından daha uygun bir yaklaşımdır. Öğrenciler kendilerini bir durumun ya da sorunun içerisinde bulduklarından, çözüm için daha fazla çaba harcamakta ve bunun sonucunda da öğrenme gerçekleşmektedir. Senaryo tabanlı öğrenme gücünü öğrenmenin gerçekleşmesinde "gerçek dünya" ya ilişkin durumların kullanılmasından almaktadır (Lim, 2004).

Öğrencilerin yaşayarak, yaparak, araştırarak ve uygulayarak öğrenmesinin daha sağlıklı ve olumlu sonuçlar verdiği üzerinde durulmaktadır. Ancak bu yöndeki uygulamalara yer veren ve geleneksel öğretim yöntemine alternatif olarak ortaya koyulan ya da geleneksel eğitim yöntemini zenginleştireceği ileri sürülen uygulamaların öğrenme ortamlarına aktarılması ve uyarlanmasında bazı sorunlar ve güçlüklerle karşılaşılmaktadır. Lim (2004), bu sorunların öğrenci ve öğretmenlerin yeni uygulamalara yaklaşımlarından, örnek oluşturacak uygulamaların sınırlılığından, yüksek maliyetten, tasarım ilkelerinin yetersizliğinden ya da teori ve yöntemlerin idealist yapılarından kaynaklanabildiğini belirtmektedir. Bu noktada geleneksel yaklaşımın güçlü yönlerini, yapısalcı yaklaşım çerçevesinde yüksek maliyetlerden kaçınarak değerlendirmek önem kazanmaktadır. İşte bu dengenin sağlanmasında senaryo tabanlı öğrenme bir alternatif olarak karşımıza çıkmaktadır.

Geleneksel E-Öğrenme ve Senaryo Tabanlı E-Öğrenme

Senaryo tabanlı öğrenmede, öğrencilerden kendilerine sunulan davranış listesinden problemi en iyi şekilde çözümleyecek olanı seçmeleri beklenmektedir. Senaryo tabanlı öğrenmenin püf noktasını da bu yaklaşımı oluşturmaktadır. Çünkü geleneksel eğitimde öğrencilere sadece enformasyon sunulmakta ve daha sonra öğrencilerden kendilerine sunulan bu enformasyonu doğru şekilde hatırlamaları ve söylemeleri beklenmektedir. Belirlenen doğru ve yanlış cevaplar öğrencilerin hatırlaması beklenen durumları yargılamakta kullanılmaktadır. Doğru verilen cevaplar ve geçilen testler ile kriz durumları ile karşı karşıya kalınan durumlara sonuca ulaşılamamaktadır. Senaryo tabanlı öğrenmede ise verilen cevaplar ve sergilenen davranışlar daha iyi ya da daha kötü şeklinde ele alınmaktadır. Öğrencilere kendilerin verilen durumda neler yapılabileceğine ilişkin seçenekler kategoriler altında sunulmaktadır. Bu seçenekler ise konu uzmanlarının gerçek uygulamalardaki deneyimlerine dayanmaktadır. Öğrenciler yaptıkları seçimler doğrultusunda senaryo çerçevesinde farklı ekranlar ile karşılamakta, bazen başarılı olarak olumlu geribildirim almakta, yanıldıkları takdirde ise istenilen sonuca ulaşılana kadar düzeltici geribildirimler ile karşılaşmaktadırlar (Maier & Kavanagh.& Kindley & Carrington & Baron, 2004, s.57)

Senaryo tabanlı öğrenmenin geleneksel yaklaşımdan hangi özelikleri ile ayrıldığının ve hangi durumlarda uygun olduğunun bilinmesi oldukça önemlidir. Kindley (2002), senaryo tabanlı ve geleneksel öğrenme yaklaşımlarını, kapsam, odak, stil, amaçlar, tasarım ve konu tipleri başlıkları altında kıyaslamış ve özet bir tablo oluşturmuştur.

Özellikler	Geleneksel Yaklaşım	Senaryo Tabanlı Öğrenme Yaklaşımı
Kapsam	Konular, içerik, doğru ve yanlış cevaplar uzmanlar tarafından test edilerek belirlenir	Uzmanlar konu ile ilgili tecrübelerini paylaşmak için bir araya gelerek, başarılı sayılabilecek sonuçları, başarılı ve başarısız davranışların tanımlarını belirlerler.
Temel Nokta	Konuya ve amaçlara hâkimiyet	Öğrenci davranışları
Öğrenme Amaçları	Belirtilen amaçlar, gerekli bilgi ve beceriler ile ilgili yargılara dayanmaktadır. Dersin gözden geçirilmesine kadar dersin yapılandırılmasına bağlıdır.	Öğrenme sonuçları kullanılan araçlara ve etkileşime dayanmaktadır. Senaryo etkinliklerinin akışı çerçevesinde dinamik bir süreçtir ve belirli amaçlar izlenilen yola ve sonuçların gözden geçirilmesine bağlıdır. Dersin tamamlanmasına kadar tamamen bilinemez.
Öğrenmenin doğası ve öğrenme deneyimlerinin yapısı	Hiyerarşik, doğrusal ve kural temelli • Bölümlere ayrılmış yapı • Eğitimci kontrolü • Örnekler / yapmacık içerik • Verilerin erişilebilirliği düşük • Derecelendirme • Notlandırma • Doğru ve yanlış cevaplar	Sistematik, alternatif geribildirimler içeren doğrusal olmayan yapı, değerlendirmeye yönelik • Karar noktaları • Öğrenci kontrolü • Gerçekçi içerik • Kontrollü ve çok çeşitli yollar • Verilerin ulaşılabilirliği yüksek • Tavsiye ve rehberlik • Problem içerikli çözümler • Performansa yönelik geribildirim
Öğrenme Stilleri	Çeşitlenebilir ancak genellikle durağan	Genellikle görselliği yüksek ve hareketli
Tasarım Süreci	Sistematik örnekleme	Faaliyet araştırmaları
Konu Çeşitleri ve Yapısı	Birbiri ile ilişkili ve basit, yüksek düzeyde bilgi gerektiren, iyi bilinen ve iyi yapılandırılmış başlıklar Bilgi odaklı	Yüksek etkileşim oranı ya da alıştırma gerektire karmaşık başlıklar Performans odaklı

Tablo 1. Geleneksel ve Senaryo Tabanlı Öğrenme Yaklaşımlarının Kıyaslanması

Tabloda da belirtildiği gibi senaryo tabanlı öğrenme, öğrencilerin doğrusal olmayan bir öğrenme sürecinde çalışmalarına imkân tanımaktadır. Bu da öğrencilerin eş zamanlı aktivitelere aktif katılımını ve bilginin yapılandırılması sürecinde belirli görevleri tamamlayarak ileri ya da geri hareket özgürlüğünü sağlamaktadır. Bu uygulamalar çoklu zekâ ve çoklu ortam uygulamaları ile desteklenebilmektedir (Akins and Crichton, 2003).

Hale (2005), eğitimci ve öğrencilerin farklılaşan ihtiyaçlarının karşılanmasında farklı şekillerde kullanılan senaryoların programa, eğitimcilere ve öğrencilere esneklik sağladığını belirtmektedir. Çünkü bu yöndeki pek çok uygulamada sadece bir doğru cevap ya da uygulama bulunmamaktadır. Bu da katılımcılara daha geniş bir bakış açısı kazandırmaktadır. Diğer yandan, Hale (2005) konu ile ilgili gerçekçi ve uygulamaya yönelik verilen örnek ve senaryoların, öğrencilerin dikkatlerini çekmede, cesaretlendirmede ve yaratıcı fikirler ortaya koymada da eğitim sürecine katkı sağlayacağını belirtilmektedir.

Eğitimciler açısından bakıldığında ise, eğitimcilerin geleneksel yaklaşımdaki bilgi kaynağı rollerinin, senaryo tabanlı öğrenmede bilgiye ulaşmada öğrencilere rehberlik etmeye dönüştüğü görülmektedir. Senaryo tabanlı öğrenmede, genellikle eğitimcilerin alan ile ilgili önceki deneyimlerine dayanan bilgi sağlama işlevinin, öğrencilere tanınan problemler ile birlikte gelişme imkanı sayesinde, öğrenciler ve öğretmenler arasında paylaşıldığı görülmektedir (Hale,2005,s:14).

Senaryo tabanlı öğrenme araştırmalarında değerlendirme ise öğrenciler üzerinde yoğunlaşmakta ve daha çok performansa dayalı değerlendirme yapılmaktadır. Bu süreçler eğitimcinin öğrencilere sürekli olarak geribildirim vermelerine imkân vermektedir, yani etkileşim imkânı sunmaktadır (Akins and Crichton, 2003).

Geleneksel e-öğrenmenin tasarım sürecinde rol alan eğitimci ve öğretim tasarımı uzmanları konuları ve bilgileri öğrencilerin öğrenmesini teşvik edecek biçimde düzenlemektedirler. Ancak senaryo tabanlı öğrenme yaklaşımında, öğretim yöntemleri hakkında özel eğitimlerden geçirilmemiş ama direkt olarak konu ile ilgili bir ortamda çalışan, konu ile ilgili problem çözümlerini en iyi şekilde kavramış alan uzmanları rol almaktadır. Senaryolar bu alan uzmanları tarafından geliştirilmektedir. Uzmanlar, kendi deneyim ve tecrübelerini paketleyerek bu senaryolar kapsamında öğrencilere sunmaktadırlar (Maier & Kavanagh.& Kindley & Carrington & Baron, 2004, s.57). Ayrıca, zaman faktörü de bu iki kavram arasında fark yaratmaktadır. Geleneksel senkron ya da asenkron e-öğrenmede içerik belirli zamanlara bölünmüştür. Ancak iyi bir uzaktan eğitim ve senaryo tabanlı eğitimde öğrencilerin modülleri belirli zaman periyotları içerisinde bitirmeleri gerekmemektedir (Kindley, 2002,s.2).

Hale (2005), yukarıda değinilen özellikler ile ön plana çıkan senaryo tabanlı öğrenmenin hızlı yükselişinde, uzaktan eğitim, e-öğrenme ve bilgisayar destekli öğrenme de meydana gelen gelişmelerin etkili olduğunu belirtmektedir.

Neden ve Ne Zaman Senaryo Tabanlı Öğrenme?

Senaryo tabanlı öğrenme, cevapların doğru ya da yanlış olmasının gerekli olmadığı, başarılı ya da başarısız öğrenci davranışlarının önemli olduğu durumlarda kullanılmaktadır. Diğer bir ifade ile, performansın ve problem çözmenin önemli olduğu, şüpheli ve karmaşık başlıkların gerçekçi bir yapıda kullanıldığı durumlarda kullanılması en uygun yaklaşımlardan biri senaryo yabanlı öğrenmedir (Way & Bridgeman, 2004, s.3).

Genel olarak eğitime baktığımızda, istendik davranış değişikliği tanımı ile karşılaşmaktayız. Bu doğrultuda öğrenenlerin kendilerine sunulan materyaller aracılığıyla kendi bilgilerini şekillendirdikleri ve bu bilgileri gerçek hayatlarında uygulamaları bir öğrenme ortamının oluşturulmasına ihtiyaç duyulmaktadır. Gerçek hayattaki koşul ve durumlar ile eğitim ortamları ve materyalleri arasındaki ilişkinin üzerinde duran senaryo tabanlı öğrenme yaklaşımı çerçevesindeki etkinlikler, gerçek hayattaki durumlara yakınlıklarından dolayı öğrencilere sunulan içeriği daha anlamlı kılmaktadır. Ayrıca alternatiflere ve araştırmaya açık olması da öğrencilere kazandırılması istenilen beceriler üzerinde de etkili olmaktadır (Bhargava, Kyle and Sabnis, 2004, s:7).

Way ve Bridgeman (2004), senaryo ve gelecek ile ilgili olarak risk kavramına da değinmiş; risk, gelecek ve senaryo ile ilgili olarak çeşitli görüşlere yer vermişlerdir. Bu kapsamda Grosse (1988), senaryoları, risk yönetiminin ve risklerin belirlenmesinin kalbi olarak nitelendirmektedir ve Ona göre risk yönetiminin amaçlarının ortaya konulması ve sentezi senaryolar ile mümkün olmaktadır. Ayrıca Way ve Bridgeman (2004), Shell'in web sitesinde senaryoların geniş ve kapsamlı düşüncelerin somutlaştırıldığı, yaygın ve kullanışlı biçimlerde bütünleştirilebilen bir form kazandığı geleceğe yönelik ustalık gerektiren hikayeler şeklinde tanımlandığına da değinmiştir. Tüm bunlardan hareketle, günümüzdeki popüler kavramlardan risk ve kriz yönetimi konusunda da senaryo tabanlı öğrenme yaklaşımından yararlanılması gündeme gelmektedir. Senaryo tabanlı öğrenmenin üzerinde durduğu problem çözme ve yaratıcı düşünme becerileri kriz ve risk yönetiminde önem kazanmakta ve tercih edilmektedir.

Bireylerin düşüncelerine vurulan sınırlara esneklik kazandırması, yaratıcı düşünceyi desteklemesi ve alternatiflere açıklığı senaryo tabanlı öğrenmenin; zaman ve mekân sınırlılıklarını hafifletmesi, hatta ortadan kaldırması ise uzaktan eğitimin temel özellikleri arasında yer almaktadır. Bu ortak özelliklerden yola çıkarak sınırlara esneklik getirme açısından iki yaklaşım arasında benzerlikler olduğunu söylemek mümkündür. Düşünceleri, alternatifleri ve tercihleri özgür bırakan, ayrıca zaman ve mekan bağımlılığından kurtulan öğrenme kavramı ile zaman ve mekân kaygısı olmayan bilgi ile birlikte yol almak mümkün olacaktır. Bu gereklilik de göz önüne alındığında "Neden senaryo tabanlı öğrenme?" sorusunun cevabı da netlik kazanmaktadır.

Senaryo Tabanlı E-Öğrenmenin Özellikleri ve Tasarımı

Öğrencileri içerikte sunulan bilgiyi keşfetmeye odaklayan etkileşimli eğitim senaryolarının geliştirilmesi önerilmektedir. Bu kapsamda ses, animasyon ve video görüntüleri içeren hareketli sunumlar ve elektronik ortamdaki metinler kullanılabilmektedir. Öğrenciler, anlamlı bir şekilde yapılandırılan içerik içerisinde aktif bir araştırmacı olarak bulunmaktadırlar. Yeni çevrimiçi araçlar sayesinde, öğrencilerin öğretim materyallerinin uygulandığı gerçek hayata ilişkin durumlar içerisinde konumlandırılması mümkün olmaktadır (Bhargava, Kyle and Sabnis, 2004, s:3).

Bu senaryoların geliştirilmesi aşamasında uzmanlar öncelikle kendi deneyimlerini paylaşacakları bu senaryolarda önemli noktaları tanımlamaktadır. Bu kapsamda senaryo nedir? neden önemlidir? sorularını cevaplandırdıktan sonra öğrencilere davranışsal seçenekler sunan durumları tanımlamaktadırlar. Yapılacak seçimler doğrultusunda birbirleri ile ilişkili durumlar zinciri oluşturulmakta ve mümkün olduğunda öğrenci seçimlerinin sınırlandırılmamasına dikkat edilmektedir (Maier & Kavanagh.& Kindley & Carrington & Baron, 2004, s.57). Bu kapsamda birbirini takip eden ekranlar, simülasyonlar ya da rol oynama aktivitelerin yer verilebilmektedir.

Bu kapsamda kullanılan senaryolar dört başlık altında toplanmaktadır. Bunlardan "beceri temelli senaryolar", belirli yetenek, beceri ve kavramaların gösterimine yöneliktir. Problem temelli senaryolar, öğrencilerin bir ikilem ya da problemi çözmelerini gerektiren bir senaryonun sunulduğu kategoridir. Burada vurgu problemin çözümü üzerine değil, problem çözme süreci üzerine yapılmaktadır. Kuramsal senaryolarda ise, insan davranışları ve insan davranışlarının sonuçları ile ilgili tahminlere yönelik bilgi üreten senaryolardır (Way & Bridgeman, 2004, s.4).

Bir senaryonun oluşturulması kolay bir işlem değildir. Orijinal olabilmesi için senaryonun mümkün olduğunca gerçekçi olmasına çalışılmalıdır. Senaryo öğrencilerin oynayacağı rolü, kullanacakları araçları, dahil olacakları gerçek aktiviteyi birbiri ile ilişkilendirerek sunmalıdır. Senaryo içerisindeki görevlerin geliştirilmesi aşamasında, üzerinde çalışılan konu ile ilgili uzmanlardan yardım alınması son derece önemlidir. Bu şekilde çalışmanın özgünlüğünü sağlamak mümkün olacaktır (Akins and Crichton, 2003). Aynı zamanda senaryoların uygulamaya dönük olası da önem taşımaktadır. Bu şekilde öğrencileri bu sürece daha aktif şekilde katılmalarını sağlamak da mümkün olacaktır. Öğrenciler öğrenme sürecinde aktifleştikçe, sürecin sonucunda ortaya çıkacak bilgiyi öğrenmede de daha başarılı olacaklardır (Hale,2005, s:6).

Kindley (2002), senaryo tabanlı öğrenme sürecinin işleyişinde dikkate alınan unsurlar üzerinde durmaktadır. Bu kapsamda, senaryo tabanlı öğrenmenin avantajlarından yararlanılması için öğrencilerin konu ile ilgili bazı temel bilgileri bilmeleri gerektiği üzerinde durmaktadır. Bu temel üzerinde şekillendirilecek bilgilerin düzenlenmesinde ise, bilişsel amaçlar değil, davranışsal amaçlar dikkate alınmaktadır. Bu davranışsal amaçların ise, beceri temelli değil, uygulamaya yönelik olmasına dikkat edilmektedir.

Senaryo tabanlı öğrenme içerisinde konu ile ilgili deneyimlerin paylaşılması, istenilen sonuçların tanımlanması, başarılı sonuçların göstergelerin belirlenmesi, gerekli stratejilerin belirlenmesi, bu stratejiler ile ilgili başarılı ve başarısız davranış tanımlarının yapılması, diğer bir değişle değerlendirme kriterlerinin belirlenmesi gerekmektedir. Tüm bunlar belirlendikten sonra, katılımcılara hazırlanan senaryonun akışı ile ilgili görüş ve duyguları sorulmakta ve senaryo bu şekilde gözden geçirilmektedir. Davranışlar hakkında yargıda bulunarak senaryo kapsamındaki öğrenci performanslarının test edilmesi ve alınan geribildirimler senaryoların iyileştirilmesine yardımcı olmaktadır. Daha sonrasında hazırlanan senaryo için önceden belirlenen sınırlar çerçevesinde genel bir başlangıç ve sonu olan kareler oluşturulmaktadır. Bu karelerin aktarılmasında kullanıcıların motivasyonunu ayakta tutacak en uygun aracın seçilmesi gündeme gelmektedir. Standart e-öğrenme programlarının çoğunun tasarımında animasyonlardan yararlanılmaktadır. Bu kapsamda basit animasyonlu gif'ler, flash animasyonlar, dijital video, oyunlar ve daha ileri teknolojiler kullanılabilmektedir. Burada önemli olan öğrencilerin beklenen sonuçlara ulaşması ve uygun davranışları sergilemesine en iyi şekilde yardımcı olacak tekniklerin kullanılmasıdır. Senaryo tabanlı öğrenme sürecinin etkileşimli ortamların kullanıldığı hareketli koşullarda daha etkili sonuçlar verdiği de unutulmamalıdır (Kindley,2002). Video kamaralar,ses kayıt aletleri, üç boyutlu görüntüler, similasyonlar,... senaryo tabanlı öğrenme yaklaşımını destekleyen teknolojilerdir.

Sonuç ve Tartışma

Örgün eğitim uygulamalarında olduğu gibi e-öğrenme uygulamalarında da edinilen bilgilerin uygulamaya geçirilmesi önem taşımaktadır. Uygulama olmadan edinilen ya da sunulan bilginin değersiz görülmesi de bu yaklaşımın sonucudur. Dolayısıyla sunulan içeriğin ya da uygulanan yöntemin mümkün olduğunca gerçek yaşantılarla ilişkili olması gerektiği düşünülmektedir. İşte üzerinde durduğumuz senaryo tabanlı öğrenme yaklaşımının püf noktasını da bu düşünce oluşturmaktadır. Senaryo tabanlı öğrenmenin özelliklerinin, gerek eğitimcilere gerekse öğrencilere kazandıracaklarının farkında olunması ve bu yaklaşımın özellikle e-öğrenme sürecinde işe koşulmasının, son günlerde giderek önem kazanan problem çözme becerilerinin ve yaratıcı düşüncenin geliştirilmesinde etkili olacağı düşünülmektedir.

Bu kapsamdaki uygulamalar gelişen teknoloji ile daha da zenginleşmektedir. Dolayısıyla gün geçtikçe daha da gerçekçi ortamların yaratılması mümkün olmaktadır. Teknolojik yeniliklerin ortaya çıkması birtakım yaratıcı yeni fikirlere ve değişik konulardaki bilimsel ve teknolojik bilgilere ulaşmaya bağlıdır. Her yeni fikir diğerine basamak teşkil etmektedir. Dolayısıyla senaryo tabanlı öğrenmenin de gelecekte farklı boyutlar kazanabileceğini söylemek yanlış olmayacaktır. Ancak bu alandaki uygulamaları daha ileri taşıyabilmenin ön koşulu da, bu alandaki mevcut uygulamaları yakından takip etmek ve senaryo tabanlı öğrenmeyi etkili ve verimli bir şekilde kullanabilmektir.

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E-ÖĞRENMEDE POWERPOİNT'LE KULLANILAN YAZILIMLAR VE ÖRNEK UYGULAMA OLARAK QUİZ YARATMA

THE SOFTWARES USED WITH POWERPOINT IN E-LEARNING AND CREATING A QUIZ AS AN EXEMPLARY APPLICATION

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Özet

Öğretme ve öğrenme süreçlerinde iletişim teknolojilerinin kullanılması bağlamında "e-öğrenme" kavramı yaygın olarak kullanılır. E-öğrenme, günümüzde farklı teknolojilerle gerçekleştirilmektedir. Bunlardan biri powerpoint programıdır. Eğitimciler derslerde anlattıkları konuları genellikle powerpoint programı ile sunmaktadırlar. Bundan sonraki aşama bu sunumun e-öğrenme ortamına uyarlanmasını içerir ki bu açıdan eğitimciler powerpoint'e bazı programları ekleyerek etkili ve öğrenciyi sıkmayan e-öğrenme programları hazırlayabilirler. Bu amaçla powerpoint programına eklenebilen programlar; ispring pro powerpoint to flash converter 4.3, ispring ultra 3.5, edu-learning for powerpoint 2007 en 1.10.9 , wondershare ppt2flash pro xmas offer 4.5.5, ispring presenter 4.3, authorpoint for rapid e-learning 3.8, wondershare ppt2flash professional 5.0.0, cyberlink stream author 4, reallusion talkingslide 1.1, powerpoint to video dvd 2.8, flashdemo powerpoint to dvd builder 1.26'dır. Bu çalışmada powerpoint programının e-öğrenme ortamlarına uyarlanabilen ve yeni sayılabilecek bir boyutunun ele alınması, genel özelliklerinin açıklanması ve powerpoint'e eklenebilen e-öğrenme amaçlı yazılımlarının tanıtılması amaçlanmaktadır.

Anahtar kelimeler: e-öğrenme, web tabanlı eğitim, powerpoint, eğitim teknolojileri.

Abstract

Within the scope of using communication technologies in teaching and learning processes, concept of "e-learning" is commonly employed. Presently, e-learning is performed via diversified technologies one of which is powerpoint program. Instructors usually present their lesson subjects by making use of powerpoint program. The next step includes adaptation of this presentation to e-learning environment. To that aim, instructors can add certain programs to powerpoint thus prepare effective and delightful e-learning programs for students. The programs which can be added to powerpoint to serve this aim are: ispring pro powerpoint to flash converter 4.3, ispring ultra 3.5, edu-learning for powerpoint 2007 en 1.10.9 , wondershare ppt2flash pro xmas offer 4.5.5, ispring presenter 4.3, authorpoint for rapid e-learning 3.8, wondershare ppt2flash professional 5.0.0, cyberlink stream author 4, reallusion talkingslide 1.1, powerpoint to video dvd 2.8, flashdemo powerpoint to dvd builder 1.26. In present study the objective is to discuss a new dimension of powerpoint program which can be adapted to e-learning environments, to clarify its general characteristics and to present e-learning softwares associated with powerpoint.

Key words:e-learning, web based education, powerpoint, education technology

GİRİŞ

Bilgi çağında yeni teknolojilerin getirdiği yenilik ve gelişmeler, eğitim alanında da kendini göstermeye başlamış, yeni teknolojiler geleneksel eğitim yöntemlerini büyük ölçüde etkilemiş, geleneksel eğitim kurumlarının yanı sıra sanal üniversite veya okul gibi ortamlar da eğitim hizmetleri vermeye başlamışlardır. Bu yönüyle gerek okul içinde gerekse okul dışında öğrenci ve öğretmenlerin bilgiyi mesaj haline getirmede, bilgiye ulaşmada ve birbirleriyle haberleşmede sunduğu olanaklar ile bilgisayarların ve internetin eğitim sürecine katkısı tartışmasız bir gerçek olarak karşımıza çıkmaktadır.

Bilginin toplanmasında, işlenmesinde, depolanmasında, ağlar aracılığıyla bir yerden bir yere iletilmesinde ve kullanıcıların hizmetine sunulmasında yararlanılan ve iletim ile bilgisayar teknolojilerini de kapsayan bütün teknolojiler "bilgi teknolojisi" olarak tanımlanabilir. Bilgiyi toplamak, işlemek, düzenlemek, depolamak, bir yerden bir yere aktarmak ve bu bilgiye erişmek için kullanılan bilgi teknolojisi, ekonomik yapılarda da köklü bir dönüşüm yaratmıştır (Tonta, 1999:363-375). Bilgi teknolojisinde önemli bir yer tutan e-öğrenme ortamları, eğitmen ile öğrenenin zamandan ve mekândan bağımsız yaşadıkları eğitsel iletişim ve etkileşim ortamları olarak tanımlabilir. Eğitsel içerik, bu ortamlarda, web teknolojisine uygun olarak tasarlanıp üretilmiş metin, resim, canlandırma, ses ve görüntü dosyalarının, etkileşim katılarak dağıtılabilmesine olanak sağlamaktadır.

Genellikle öğretim yönetim sistemi, içerik yönetim sistemi, öğretim içerik yönetim sistemi ya da eğitim portalları gibi birtakım yazılımlar kullanılarak çevrimiçi e-öğrenme aktiviteleri gerçekleştirilmektedir. Örgün eğitimde çevrimiçi e-öğrenme ortamları eğitmenler ve öğrenenler için birçok araç sunmaktadır(Karaaslan, 2008: 85). E-öğrenmenin etkili olabilmesi için dikkatli bir planlama, eğitimde verilecek olan ders gereklerinin anlaşılması ve öğrenci ihtiyaçlarının göz önünde bulundurulması gerekmekte, kullanılacak teknoloji seçiminde bunlara dikkat edilmesi gerekmektedir. E-öğrenmenin üç temel özelliği vardır (Rosenberg, 2001:17).

- E-öğrenme bir ağ sistemidir.
- Bilginin paylaşımı, dağılımı, depolanması, güncellenmesini sağlamaktadır.
- Genel anlamda ele alındığında bir e-öğrenme uygulamasında aşağıdaki öğelerin bulunması beklenir:
    - Öğrencileri öğretim amaçları doğrultusunda yönlendirir.
    - Bilgiyi öğrenciye çeşitli biçimlerde sunar.

- Öğrencinin etkileşimli uygulamalar yapabilmesini sağlar.
- Öğrencilerin sınavlar ve ödevlerle değerlendirilmesini sağlar.
- Değerlendirilme sonuçlarının öğrenciye geri bildirilmesine olanak verir.

Günümüzde e-öğrenme ile sadece kayıtlı öğrenci grubuna değil, toplumun her kesimine, her yerden, her veriye ulaşma olanağı sunulabilmektedir. Bu olanaklar, bilişim teknolojilerindeki gelişime paralel olarak gittikçe daha yoğun olarak gerçekleşebilmektedir. Diğer taraftan, e-öğrenme kapsamında eğitim alan bireylere kendi zamanlarını yönetebilme olanağı da sunulmuştur. Artık birey istediği zaman, istediği ders içeriğine ve veriye ulaşabilme olanağına sahiptir (Gökdaş & Kayri ;2005).

Online eğitim giderek yaygınlaşan bir eğitim şeklidir. Artan eğitim gereksinimi ile eğitim ve öğretimde yazılım araçları önem kazanmaktadır. Eğitim alanında birçok farklı amaca hizmet eden değişik yazılımlar geliştirilmiştir. Ancak bu yazılımlar herkes tarafından kullanılamayabilir. Çünkü belirli bir bilgi birikimi ve deneyim gerektirmektedir. Microsoft Powerpoint Programı ise herkes tarafından sunum yapmak için kullanılan bir program olarak bilinmektedir. Özenle hazırlanmış ve dikkatle planlanmış öğrenme amaçlı sunum etkinliği olarak PowerPoint (Garmston&Wellman; 1992: 1-2) diğer öğrenme programlarına göre birçok açıdan avantaj sağlayabilmektedir. Ayrıca Powerpoint programı e-öğrenme amaçlı yazılımlarla desteklenerek de kullanılmaktadır. Buna karşın e-öğrenme için Powerpoint'in kullanılması henüz çok yaygın değildir. Öğretim yazılımlarında üzerinde durulması gereken önemli özelliklerden biri de, hazırlanan yazılımının eğitsel özelliklere ve anlaşılır bir içeriğe sahip olması ve öğrenciyi güdüleyici unsurlar içermesidir. Tasarlanan PowerPoint sunusu hangi amaca yönelik olursa olsun basit ve açık olmalıdır. Slaytlar karmaşıklaştıkça ilgi dağılacaktır (Koers, 2007:263). Slaytlarda uygun boşluklar bırakmak, tüm görselin ve yazı elemanlarının uyumlu ve dengeli şekilde yansıtılması , grafik ve şekillerden yararlanılması etkili öğrenme açısından önem taşımaktadır(Campbell, 2002:168-169). Web tabanlı eğitim için hazırlanan yazılımlarda ekran tasarımına önem verilmelidir. Yaşam boyu öğrenilen bilgilerin yaklaşık %90'ını görsel kanallardan öğrenilenler oluşturmaktadır. (Bradburry; 2006:84-85). Örneğin; animasyonlar, ekranda kullanılan renkler, yazı stilleri, grafikler, eğitici oyunlar ve etkileşim gibi faktörler öğrenciyi öğrenmeye teşvik etmeleri nedeniyle oldukça etkilidir. (Bülbül, 1999) Ayrıca renkli hazırlanan PowerPoint sunumlarının daha çok ilgi çektiği (Campbell, 2002:209) görülmektedir. Hedef kitlenin yaşına göre uygun rengi seçmek gerekmektedir (Mills; 2007:105). Küçük çocuklar parlak renklere ilgi duyarken yaş ilerledikçe tercih edilen renkler daha pastel tonlara doğru kaymaktadır.

PowerPoint, birçok farklı animasyona, renk kullanımına, grafik tasarımına olanak veren bir Office programıdır. Ayrıca PowerPoint programı multimedyayı kulanma açısından büyük avantaj sağlar. Birçok araştırmada multimedya özelliklerinin hedef kitleyi ikna etme açısından başarılı olduğu ortaya konulmaktadır (Finkelstein, 2002: 5). Powerpoint'e bazı programlar eklenerek daha da etkili ve öğrenciyi sıkmayan e-öğrenme programları hazırlanabilmektedir. Bu amaçla Powerpoint'e eklenebilen programlar; iSpring Pro PowerPoint to Flash Converter 4.3, iSpring Ultra 3.5, Edu-Learning for Powerpoint 2007 EN 1.10.9 , Wondershare PPT2Flash Pro Xmas Offer 4.5.5, iSpring Presenter 4.3, authorPoint for Rapid E-learning 3.8, Wondershare PPT2Flash Professional 5.0.0, Cyberlink Stream Author 4, Reallusion TalkingSlide 1.1, PowerPoint to Video DVD 2.8, FlashDemo PowerPoint to DVD Builder 1.26'dır.

iSpring Pro PowerPoint to Flash Converter 4.3

iSpring Pro, sunumları doğru ve eksiksiz olarak Flash formatına dönüştüren Powerpoint programına eklenebilen bir yazılımdır. İSpring pro ile yaratılan Flash filmleri, tam olarak Powerpoint içeriği gibi görünmekte, Powerpoint sunumlarında herhangi bir karışıklığa neden olmaksızın, her sunuma eklenebilmektedir. iSpring Pro, Flash tabanlı sunumlara yerleştirilen Flash filmlerini, videolarını, Powerpoint animasyon efektlerini, slayt geçişlerini, bağlantılara tamamen dönüştürür. Program, bir pencerede bütün çoklu medya seçeneklerini ve sunum yapısını kolaylıkla yönetmeye izin vermektedir. Sunum yapan kişi, slaytlara, video, senkron iletişim araçları için yorumlar kaydedebilmektedir. Ayrıca gerektiği zaman YouTube videoları eklenebilmektedir. iSpring Pro, profesyonel içerik paylaşımı ve online hizmet ile sunumları etkili olarak dağıtmaya ve sadece tek bir tıklama ile sunumları yayınlamaya, aynı zamanda da Flash filmlerinin görüntüsünü ve tekrar gösterimini ayarlamaya izin vermektedir. Flash sunumlarının büyüklüğü ve ölçeği, çoklu medya için sıkıştırma modu, web bağlantıları, iSpring ile yönetilebilmektedir. Her Powerpoint slaytı veya birleşik Flash dosyaları için ayrı dosyalar oluşturulabilir ve oluşturulan dosyalar, *.exe veya *.zip gibi farklı uzantılarda kaydedilebilir. Ayrıca *.html olarak kaydedildiğinde web sitelerine veya bloglara doğrudan Flash filmleri olarak yerleştirilebilmektedir (http://www.fileguru.com). Windows2000, Windows2003, Windows Vista Business, Windows Vista Business x64, Windows Vista Enterprise, Windows Vista Enterprise x64, Windows Vista Home Basic, Windows Vista Home Basic x64, Windows Vista Home Premium, Windows Vista Home Premium x64, Windows Vista Starter, Windows Vista Ultimate, Windows Vista Ultimate x64, Vista, XP, WinXP işletim sistemlerinde çalışmakta ve "iş ve ofis araçları" kategorisinde bulunmaktadır.

iSpring Ultra 3.5

Powerpoint'te e-öğrenme Flash içeriği yaratmak için eklenebilen, Scorm 1.2 veya Scorm 2004 standartlarına uyumlu, her öğrenme yönetim sistemi ile yayınlanabilen bir yazılımdır. Ayrıca, toplam sunum kontrolü ile HTML tabanlı sistemler veya Flash içine Powerpoint içeriğinin kesintisiz yerleşmesi için Action Script API sağlamaktadır. Powerpoint araç çubuğuna yerleştirilen iSpring Ultra ile, Powerpoint'de herhangi bir karışıklığa neden olmaksızın Flash formatındaki her sunumun dönüşümünü eksiksiz sağlayabilmektedir. iSpring Ultra ile yaratılan Flash filmleri, tam olarak Powerpoint sunumu olarak görünmektedir. iSpring Ultra, Powerpoint animasyon efektlerini, slayt geçişlerini, yerleştirilen filmleri, ses dosyalarını, yönetebileceğiniz web bağlantılarını, Flash sunumlarını tam olarak dönüştürülebilmektedir(http://www.softpedia.com). Flash sunumlarının farklı seçeneklerde dosyası oluşturulabilmekte, her Powerpoint slaytı exe, zip dosyası gibi ayrı bir dosya olarak kaydedilmektedir. Windows Milennium, Windows NT, Windows XP, Windows Vista, Windows 2000 işletim sistemlerinde çalışmakta ve "eğitim" kategorisinde bulunmaktadır.

Edu-Learning for Powerpoint 2007 EN 1.10.9

Edu-Learning for Powerpoint 2007 EN 1.10.9, Microsoft Office 2007 Powerpoint ile olduğu gibi Microsoft Office 2007 Word ve Microsoft Office 2007 Excel modüllerini de kapsamaktadır. Programın demo versiyonu 10 ders uygulaması için kullanılmaktadır. Full versiyonu ise 44 ders ve 900 görev uygulaması içermektedir. Yeni başlayanlar ve ileri kullanıcılar için Edu-Learning Windows 7 ile uyumlu, Vista için lisanslıdır. Şirketlerin e-öğrenme çözümleri için şirket versiyonu, yöneticilere online araçlar sunmaktadır(http://wareseeker.com). Microsoft Office 2007 Powerpoint, bu modül 12 ders uygulaması için e-öğrenme hazırlamaya izin vermektedir. Windows 2003, Windows Vista Business, Windows Vista Business x64, Windows Vista Enterprise, Windows Vista Enterprise x64, Windows Vista Home Basic, Windows Vista Home Basic x64, Windows Vista Home Premium, Windows Vista Home Premium x64, Windows Vista Starter, Windows Vista Ultimate, Windows Vista Ultimate

x64, Vista, XP, WinXP işletim sistemlerinde çalışmaktadır .Edu-Learning for Powerpoint 2007 EN 1.10.9. için office programının İngilizce versiyonunun kullanılması gerekmekte ve bu program, "eğitim" kategorisinde hizmet vermektedir.

Wondershare PPT2Flash Pro Xmas Offer 4.5.5

Bu program, e-öğrenme ve online eğitim için Powerpoint dersleri ve Flash sunumları yaratmak için kullanılmaktadır. Bu programın standart sürümüne ek olarak, profesyonel sürümü öğrenme yönetim sistemleri için SCORM /AICC içerik yaratabilme özelliğini kapsamaktadır. Söz konusu program, kullanılan temel Powerpoint'i Flash'a dönüştürme aracından daha fazla imkan sunmakta; daha kapsamlı ve yenilikçi sunumlar oluşturmaya olanak vermekte ve kişisel kullanıcılarla e-öğrenme geliştiricilerine kolaylık sağlamaktadır. İlk bakışta, programın anahtar özelliği, Powerpoint'le uyumlu veya bağımsız program olarak kullanılabilmesidir. Orijinal dosya büyüklüğünü %90 oranında azaltmaktadır (http://wareseeker.com).Ayrıca *.swf dosyalarını veya birleşik *.swf dosyalarını yaratabilme özelliği vardır. Wondershare PPT2Flash Pro Xmas Offer 4.5.5, Ftp ile sunucu güncelleme, CD için paketleme, web, LMS, eposta için sonuç çıktıları yayımlamakta, 170'den fazla metin üzerinde animasyon, grafik, ve diyagramı ve Powerpoint içindeki tüm geçişleri büyük oranla desteklemektedir. Slaytların birleştirilmesi için özelleştirilmiş Flash player kullanılabilmekte, Flash film eklenebilmekte ve slaytlar ile mükemmel bir uyum sağlanabilmektedir. Hazırlanan dokümanların korunması için şifre konulabilmektedir. Windows XP, WinXP işletim sistemlerinde çalışmaktadır. "Çoklu medya" kategorisinde bulunmaktadır.

iSpring Presenter 4.3

Powerpoint'te e-öğrenme Flash içeriği yaratabilmek için tasarlanmış Powerpoint'e eklenebilen bir yazılımdır. Bu programda, SCORM/AICC uyumlu her öğrenme yönetim sistemine içerik yaratabilme özelliği bulunmakta, etkili, Flash tabanlı quizler yaratabilmek için Powerpoint programını destekler. Quizlerde çeşitli soru tipleri yaratılabilir, kayıt yapılabilir, slaytlara yorumlar seslendirerek eklenebilir. Yeni profesyonel sunumların paylaşılabildiği bir servistir. Bu program sadece, profesyonel sunum paylaşma portalı değil, aynı zamanda öğrenme içerik aktivitelerini izlemeye izin veren yeni bir öğrenme içerik yönetim sistemidir(http://www.ispringsolutions.com). iSpring Presenter ile Powerpoint içine araç çubuğu yerleştirilir ve karmaşık olmadan her sunum Flash'a dönüştürülebilmektedir. Program ile kolayca web bağlantıları, Flash büyükleri yönetilmektedir. Dosyalar, *.swf, *.exe, *.zip, *.html gibi farklı uzantılarda kaydedilebilmektedir. *.html olarak kaydedildiğinde web sayfasına eklenmek için hazır halde bulunmaktadır. Powerpoint içeriğinin kesintisiz yerleşmesi için Action Script API sağlar. Windows2000, Windows2003, Windows Vista Business, Windows Vista Business x64, Windows Vista Enterprise, Windows Vista Enterprise x64, Windows Vista Home Basic, Windows Vista Home Basic x64, Windows Vista Home Premium, Windows Vista Home Premium x64, Windows Vista Starter, Windows Vista Ultimate, Windows Vista Ultimate x64, 2000, 2003, Vista, XP, WinXP Windows işletim sistemlerinde çalışmaktadır. "Eğitim" kategorisinde bulunmaktadır.

AuthorPoint for Rapid E-learning 3.8

Author Point, Flash sunumlara uyumlu SCORM/ADA için Powerpoint'i Flash'a dönüştürmektedir. Yazılım, gerektiğinde, video, audio ile birleştirilebilmektedir. Sunumlara video eklenebilmektedir. AuthorPoint for Rapid E-learning 3, aynı zamanda, sunumları yönetmek için içerik yöneticisi içermektedir. E-öğrenme sunumları kolaylıkla içerik yöneticisi tarafından yönetilebilmektedir. Bağlantılar otomatik olarak güncellenebilmektedir.

Web tabanlı uzaktan eğitim için SCORM uyumlu web tabanlı dersler yaratmak için kullanılmaktadır. Bu dersler, öğrenme yönetim sistemlerinin sunucularına gönderilmektedir. Sunumlar iş organizasyonlarında, personel eğitimlerinde, intranet, seminer ve eğitim oturumları aracılığı ile kullanılmaktadır. Windows XP, Windows 2000, işletim sistemlerinde çalışmaktadır. "Eğitim" kategorisinde bulunmaktadır (http://www.softsia.com).

Wondershare PPT2Flash Professional 5.0.0

Program Powerpoint'le bağlantılı veya bağımsız olarak kullanılmaktadır. Orijinal dosya büyüklüğünü %90 oranında azaltmakta, ayrılabilen *.swf ve birleştirilmiş *.swf dosyalarını yaratabilmektedir. CD için paketleme, eposta, LMS, web, FTP ile sunucu güncelleme için son çıktı yayımlayabilir. Öğrenme yönetim sistemleri için SCORM/AICC içeriği yaratabilme özelliği bulunmaktadır. 170'den fazla animasyon, grafik ve diyagram içermektedir. Powerpoint içindeki bütün dönüşümleri destekler. Dokümanların korunması için şifre konabilir. Windows2000, Windows Vista Business, Windows Vista Business x64, Windows Vista Enterprise, Windows Vista Enterprise x64, Windows Vista Home Basic, Windows Vista Home Basic x64, Windows Vista Home Premium, Windows Vista Home Premium x64, Windows Vista Starter, Windows Vista Ultimate, Windows Vista Ultimate x64, 2000, Vista, XP, WinXP işletim sistemlerinde çalışmaktadır. "Çoklu medya araçları" kategorisi içinde bulunmaktadır (http://www.fileguru.com).

Cyberlink Stream Author 4

Cyberlink Stream Author 4, video, audio, Powerpoint slaytları ve diğer eğitim materyallerini kullanarak, zengin sunumlar yaratmak için güçlü araçlar sunmaktadır. Profesyonel olmayan kullanıcılar için kolay kullanılan arayüzü ile, hızlı, daha ekonomik ve yüksek kaliteli e-öğrenme içeriği üretebilirler. Eğitmenler, Microsoft word formatında testler yaratmak için bu yazılımı kullanabilirler. Böylece, belirli içerik izleme kuralları ile değerlendirmeler birleştirilerek yeni konuya geçmeden önce eğitmenler içeriğin anlaşılıp anlaşılmadığını ölçebilirler. Ayrıca test soncu da öğrenciye rapor edilebilir. Bu program, profesyonel e-öğrenme içeriği yaratmak için, üç uygun çalışma modeli önermektedir. Kolay sunum modeli, Full-ekran Sunum modeli, stüdyo modeli. Kolay sunum modu; üç kolay adımda daha etkin içerik yaratabilme, Powerpoint slaytları ekleme, güncel sunumlar ile içeriği kaydetme ve yayınlama özelliğine sahiptir.Full-ekran sunum modu; birkaç dakikada içerik yaratmak için hızlı çözümler sağlar, online seminerleri canlı sunumlara dönüştürmektedir. Stüdyo modeli, kullanıcılara özelleştirme imkanı sunar ve sunumlarının içeriklerini kontrol etmelerini sağlayan güçlü düzenleme araçları ile birleştirilmiş bir arayüze sahiptir (http://www.cyberlink.com).

Stream Author, öğretmen, eğitici veya satış personeli gibi sunum yapan kişiler için, bilgi verici, ikna edici ve hızlı sunumlar yaratmaya izin vermektedir. Ayrıca, sunum yapan kişilerin Intranet, web ve eposta aracılığı ile dağıtabilecekleri e-öğrenme materyallerini yaratabilmelerine imkan vermektedir. Sunum yapanlar, hem eğitim hem de test içeriğini birleştirebilirler ve çok sayıda öğrencinin kullanması için online yayınlayabilirler.

Windows2000, Windows Vista Business, Windows Vista Business x64, Windows Vista Enterprise, Windows Vista Enterprise x64, Windows Vista Home Basic, Windows Vista Home Basic x64, Windows Vista Home Premium, Windows Vista Home Premium x64, Windows Vista Starter, Windows Vista Ultimate, Windows Vista Ultimate x64, Vista, XP, WinXP işletim sistemlerinde kullanılmaktadır. "Çoklu medya ve sunum araçları" kategorisinde bulunmaktadır.

Reallusion TalkingSlide 1.1

Reallusion TalkingSlide 1.1, ile fotoğraf koleksiyonlarına, iş sunumlarına, e-öğrenme ve eğitimsel içeriklerine yeni boyutlar eklenebilmektedir. TalkingSlide ile sorunsuz bir şekilde etkileşimli konuşma rehberi veya audio ekleyerek, dinamik zengin konuşma animasyonlu sunumlar ve fotoğraf slayt gösterileri yaratılabilmektedir. Powerpoint slaytlarına, dijital fotoğraflar, görüntüler, Flash, video veya *.html içeriklerinin tamamı, slaytların içeriği olarak yüklenebilmektedir. Windows2000, Win95, Win98, WinME, 95/98, XP, WinXP işletim sistemlerinde kullanılmaktadır. "Çoklu medya ve sunum araçları" kategorisi içerisinde yer almaktadır (http://rbytes.net).

PowerPoint to Video DVD 2.8

Powerpoint to DVD Converts, Powerpoint sunumlarına video dosyaları eklemek için kullanılan bir yazılımdır. Bu program aracılığı ile video dosyaları üzerinde, Powerpoint dosyası içinde özel efektler ve orijinal animasyonlar kullanılabilmekte ve mikrofondan, CD player'dan ses de eklenebilmektedir. Windows 95, Windows 98, Windows Millennium, Windows NT, Windows XP, Windows2000, işletim sistemlerinde kullanılmaktadır. "İş uygulamaları" kategorisinde bulunmaktadır (http://www.updatestar.com).

FlashDemo PowerPoint to DVD Builder 1.26

FlashDemo PowerPoint to DVD Builder ile Powerpoint animasyon efektlerine dönüşüm, slayt dönüşümleri, audio ve son derece yüksek kalitede videolar kolaylıkla ve doğru şekilde eklenebilmektedir. Dönüşüm esnasında hiçbir bilgi kaybedilmemektedir. Program, çok esnektir ve Powerpoint sunumları YouTube gibi siteler aracılığı ile kolaylıkla dağıtılabilmektedir. Powerpoint 2007 versiyonunda çalışmaktadır. *.pptx ve *.ppsx formatlarında kaydedilebilir. Windows XP, Windows 2000, işletim sistemlerinde çalışmaktadır. "Çoklu medya" kategorisinde bulunmaktadır (http://shareme.com).

Yazılımların Özellikleri Açısından Karşılaştırılması

Tablo 1'e bakıldığında yazılımların kategori olarak iş, eğitim ve çoklu medya kategorileri olmak üzere üçe ayrıldığı görülmektedir. Video ve audio kaydetmek yazılımların hepsinde mevcuttur. YouTube dosyalarının eklenmesi sadece iSpring Pro PowerPoint to Flash Converter 4.3 yazılımda bulunmaktadır. iSpring Pro PowerPoint to Flash Converter 4.3, iSpring Ultra 3.5, Wondershare PPT2Flash Pro Xmas Offer 4.5.5, iSpring Presenter 4.3, authorPoint for Rapid E-learning 3.8, Wondershare PPT2Flash Professional 5.0.0, Cyberlink Stream Author 4 yazılımlarında farklı uzantılarda kaydedilme özelliği mevcuttur. Yazılımların çoğu birçok işletim sisteminde çalışmaktadır. Bu yazılımların yaygın olarak kullanılmasında etkili olmaktadır. Ayrıca yazılım tercihinde ücret de önemli rol oynamaktadır. Demo versiyonları bulunmaktadır. Ancak 30 gün ile sınırlıdır. Sadece Wondershare PPT2Flash Pro Xmas Offer, yazılımı dokumanları korumaya izin vermektedir. Edu-Learning for Powerpoint 2007 EN 1.10.9, FlashDemo PowerPoint to DVD Builder 1.26 yazılımları için Powerpoint 2007 versiyonu gerekmektedir.

Tablo 1: Powerpoint'e e-öğrenme amaçlı eklenebilen yazılımların karşılaştırılması

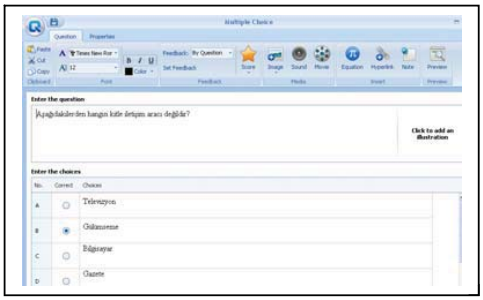
	Video, audio kaydetmek	YouTube dosyalarının eklenmesi	Farklı kaydetme	İşletim sistemi	Kategori	Şifre	2007 Versiyonu
iSpring Pro PowerPoint to Flash Converter 4.3	Var	Var	Var	17	İş/Ofis	Yok	Yok
iSpring Ultra 3.5	Var	Yok	Var	5	Eğitim	Yok	Yok
EduYokLearning for Powerpoint 2007 EN 1.10.9	Yok	Yok	Yok	16	Eğitim	Yok	Var
Wondershare PPT2Flash Pro Xmas Offer 4.5.5	Var	Yok	Var	2	Çoklu medya	Var	Yok
iSpring Presenter 4.3	Var	Yok	Var	17	Eğitim	Var	Yok
authorPoint for Rapid EYoklearning 3.8	Var	Yok	Var	3	Eğitim	Yok	Yok
Wondershare PPT2Flash Professional 5.0.0	Var	Yok	Var	17	Çoklu medya	Var	Yok
Cyberlink Stream Author 4	Var	Yok	Var	17	Çoklu medya	Yok	Yok
Reallusion TalkingSlide 1.1	Var	Yok	Yok	8	Çoklu medya	Yok	Yok
PowerPoint to Video DVD 2.8	Var	Yok	Yok	7	İş	Yok	Yok
FlashDemo PowerPoint to	Var	Yok	Yok	3	Çoklu	Yok	Var

DVD Builder 1.26					**medya**		

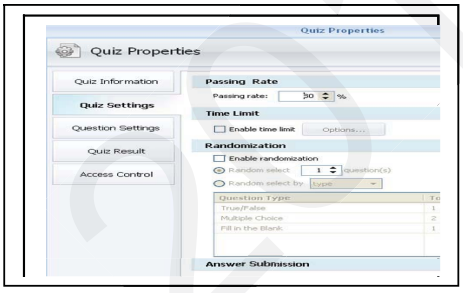
E-öğrenme amaçlı Powerpoint yazılımlarında Quiz Yaratma

E-öğrenme amaçlı Powerpoint yazılımlarında ses ekleme, quiz yaratma bölümü kullanılarak quiz oluşturma, Flash dosyaları ekleme gibi seçenekler bulunmaktadır. Bu seçenekler e-öğrenme için gerekli dokümanları oluşturmamızı sağlamaktadır. E-öğrenmenin en önemli özelliklerinden biri de öğrencilerin değerlendirilmesini sağlayan sınavlardır. Öğrenci bu yöntemle kendi kendini değerlendirebilir, eğitmen için de bu yöntem geribildirim almayı sağlar. Wondershare Quiz Creator programı ile hazırlanıp, Powerpoint içeriğine sınavlar, doğru/yanlış, çoktan seçmeli (Şekil 1), boşluk doldurma, eşleştirme gibi kategorilere ayrılmaktadır. Wondershare Quiz Creator aracılığı ile yaratılan sınavlar, quiz özellikleri (Şekil 2) bölümünde bulunan quiz bilgisi ve ayarları gibi seçeneklerle düzenlenmektedir. Henüz bu yöntem birçok profesyonel eğitim planlamacıları ve eğitimciler tarafından bilinmemektedir.

Wondershare Quiz Creator, programlama becerileri olmaksızın, sınavlar için, eğitimcilere ve eğitmenlere güçlü Flash quizler yaratabilme imkanı sağlamaktadır. Quizlere, Flash videoları, sesler, görüntüler eklenebilir. Quiz yönetim sistemi ile quiz sonuçları izlenebilmekte, program aracılığı ile 9 farklı tipte quiz sorusu hazırlanabilmektedir. Tek bir butonu tıklayarak Flash tabanlı interaktif quizler içine Excel quiz ve her soruya görüntü, ses ve Flash video eklenmektedir. Quizlere, denklem editörü ile matematik semboller ilave edilebilir ve testlere başlanmadan önce katılımcılar için konuyu anlatan sayfalar konabilir. Sınavlarda rastgele soruların gelmesi sağlanabilir ve zaman limiti ile şifre konularak korumalı quizler yaratılabilir. Öğrencinin sınav sonucu ile performansı ölçülebilir. Template galerisi, renk galerisi, müzik ve ses efektleri eklenerek profesyonel ve dikkat çeken quizler oluşturulabilir. Wondershare Quiz Creator ile Windows platformlarında, Macintosh, PC veya laptop gibi her ortamda Flash tabanlı quizler yaratılabilir. *.exe uzantılı olarak cd'ye kaydedilebilir. Çıktı için word ve excel dosyası olarak kaydedilebilir.



Şekil 1:Çoktan Seçmeli Soru Ekleme



Şekil 2: Quiz Özellikleri

SONUÇ:

PowerPoint sunu programının eğitsel amaçlı tasarlanan, web tabanlı yazılımlarla da desteklenen boyutu eğitim açısından oldukça yeni bir alandır. Henüz çok sınırlı sayıda olan ve Powerpoint kullanılarak gerçekleştirilen web tabanlı eğitim yazılımlarının birçok yönden kullanıcılara avantaj sağladığı görülmektedir. Gerek tasarım gerek sunum açısından kolaylık sağlayan E-Powerpoint yazılımları dünya genelinde de giderek yaygınlaşarak kullanılan yeni bir alana işaret etmektedir. Microsoft Powerpoint Programı herkes tarafından sunum yapmak için yaygın şekilde kullanılır. Ancak Powerpoint programının e-öğrenme amaçlı yazılımlarla desteklenerek de kullanılması henüz çok yaygın değildir. Öğretim yazılımlarında üzerinde durulması gereken önemli özelliklerden biri de, hazırlanan yazılımının eğitsel özelliklere ve anlaşılır bir içeriğe sahip olması, öğrenciyi güdüleyici unsurlar içermesi; ekran tasarımına önem verilmesi ve etkileşime olanak sağlamasıdır. Tüm bu yönleri ile E-PowerPoint e eklenebilen yazılımlar iSpring Pro PowerPoint to Flash Converter 4.3, iSpring Ultra 3.5, Edu-Learning for Powerpoint 2007 EN 1.10.9 , Wondershare PPT2Flash Pro Xmas Offer 4.5.5, iSpring Presenter 4.3, authorPoint for Rapid E-learning 3.8, Wondershare PPT2Flash Professional 5.0.0, Cyberlink Stream Author 4, Reallusion TalkingSlide 1.1, PowerPoint to Video DVD 2.8, FlashDemo PowerPoint to DVD Builder 1.26 eğitimcilere büyük ölçüde kolaylık sağlamaktadır. Söz konusu yazılımların taşıdığı özelliklerin profesyonel eğitim planlamacıları ve eğitimciler tarafından tam olarak bilinmemesi ise e-öğrenmenin yaygınlaştırılması ve etkinliği açısından önemli engeller olarak karşımıza çıkmaktadır.

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E-ÖĞRENMEYE DESTEK AMAÇLI MOBİL ÖĞRENME SİSTEMİNİN GELİŞTİRİLMESİ

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Özet:

Çalışmanın amacı uzaktan eğitim öğrencilerinin ihtiyaçlarını karşılamaya yönelik geliştirilen mobil öğrenme sisteminin analiz, tasarım ve gerçekleştirme aşamalarını tanıtmaktır. Mobil öğrenmenin sınırlılıkları nedeniyle sadece mobil öğrenme yerine mobil öğrenmenin e-öğrenmeye yardımcı bir ortam olarak geliştirilmesinin daha uygun olacağı düşünülmüştür.

Bu çalışma kapsamında geliştirilmekte olan m-öğrenme sistemi tanıtılacak, sistemin geliştirilme aşamaları hakkında bilgi verilecek ve m-öğrenme yazılımı geliştirilirken yaşananlar ve dikkat edilmesi gereken boyutlar tartışılacaktır.

Anahtar kelimeler: mobil öğrenme, e-öğrenme, uzaktan eğitim,yazılım geliştirme

DEVELOPMENT OF A MOBILE LEARNING SYSTEM TO SUPPORT E-LEARNING

Abstract: purpose of this research is to introduce analysis, design and implementation stages of developed mobile learning system. Due to the limitations of mobile learning, it was considered to develop the system to support e-learning instead of developing it as an individual system.

ın this study, developed mobile learning system will be presented and experiences on developing software processes will be discussed.

Keywords: mobile learning, e-learning,distance education, software development

Giriş

Son yıllarda hızla gelişen mobil ve iletişim teknolojileri hayatımızda vazgeçilmez hale gelmiştir. Bu teknolojiler her alanda olduğu gibi eğitim alanında da kullanılmaktadır. Mobil ve iletişim teknolojileri bireylere zaman ve mekan bağımsızlığı açısından tam bir özgürlük sunmaktadır. Bu sayede "Her zaman ve Her yerde Eğitim" imkanı sağlanabilmektedir.

Son zamanlarda mobil telefonların kapasitelerinin hızlı gelişimi ve 3G teknoloji altyapısı sayesinde daha etkili ve zengin mobil uygulamalar geliştirme imkanı doğmuştur. Ülkemizdeki genç nüfusun bu gelişmiş mobil telefonlara yaygın olarak sahip olması nedeniyle mobil teknolojilerden öğrenme alanında yaygın olarak faydalanılabileceği düşünülmektedir.

Ülkemizde uzaktan eğitim ve e-öğrenme uygulamaları büyük ilgi görmektedir. Son beş yılda bir çok üniversite özellikle önlisans düzeyinde uzaktan eğitim vermeye başlamıştır. Uzaktan eğitim öğrencilerinin ihtiyaçları göz önünde bulundurularak uzaktan eğitime yardımcı mobil öğrenme sistemi geliştirilmesi, uzaktan eğitim öğrencilerinin eğitim-öğretim etkinliklerine daha fazla katılmalarını sağlayacaktır.

Uzaktan eğitim; öğretmen ve öğrencinin farklı yerlerde, farklı zamanlarda öğrenme öğretme ilişkilerini iletişim teknolojileri veya posta ile gerçekleştirdikleri bir eğitim sistemi olarak tanımlanır (İşman ,1998).

California Uzaktan Eğitim Projesi(2006)' ne göre uzaktan eğitimin ana unsurları aşağıdaki gibi sıralanmaktadır;

1. Eğitim sürecinin büyük bir bölümünde eğitmen ve öğrencinin farklı yerlerde bulunmaktadır.
2. Eğitmen ve öğrenciyi birleştirmek ve ders içeriğini iletmek amacıyla özel olarak hazırlanmış eğitim ortamının kullanılmasıdır.
3. İki yönlü iletişimlerin eğitmen, öğrenci ve eğitim kurumu arasında sağlanmasıdır.
4. Yer ve/veya zaman bağımsızlığının sağlanmasıdır.
5. Eğitmenin ve/veya diğer başka faktörlerin etkisi altında olmaksızın, öğrencinin kendi isteği ile öğrenmesidir.

E-öğrenme eğitim ve öğretim için iletişim teknolojilerini kullanarak bilginin iletilmesidir. Bilgi ve iletişim teknolojilerindeki ilerlemeler ile e-öğrenme modern bir eğitim paradigması olarak ortaya çıkmaktadır. E-öğrenmenin en büyük avantajı, öğrenci öğretmen, öğrenci öğrenci arasındaki zaman, mekan ve kaynak sınırlılığını eşzamanlı ve eşzamansız özgürleştirici etkileşimler ile ortadan kaldırmasıdır (Katz, 2000; 2002; Trentin, 1997).

Son yıllarda cep telefonları ve Kişisel Dijital Yardımcı (PDA) gibi farklı mobil ürünlerin kullanımı hızla artmış, aynı zamanda mobil bilgisayarlar ve bilgi teknoloji alanlarında da gelişmeler yaşanmıştır. Yüksek band genişliği, kablosuz iletişim ve diğer el cihazları gibi mobil teknolojiler e-öğrenmeyi m-öğrenmeye doğru taşımaktadır. (Sharples, 2000). Mobil öğrenme mobil cihazlar ve e-öğrenmenin kesişimidir ve kişisel öğrenme ile her yerde ve her zaman öğrenmeyi birleştirir. Mobil öğrenmenin avantajları esneklik, düşük maliyet, küçük boyut, kullanım kolaylığı ve zaman tasarrufu sağlamaktadır(Jones & Jo, 2004). Mobil öğrenme genelde e-öğrenme olarak düşünülse de Georgiev, Georgieva, ve Smrikarov (2004) mobil öğrenmeyi e-öğrenmenin alt dalı yada bir parçası olarak tanımlamaktadırlar. Mobil öğrenme için yapılan diğer tanımlar ise aşağıda verilmiştir:

- Mobil öğrenme, herhangi bir yerde, herhangi zamanda mobil teknolojileri kullanarak tutum ve davranışlarda değişiklik meydana getiren bilgi ve beceri kazanımıdır (Geddes (2004).
- Mobil öğrenme, her yerde ve her zaman öğrenmeye erişme yeteneğidir (Mitchell, 2003).

- Mobil öğrenme ile e-öğrenme alanlarının birlikte değerlendirilmesi sonucunda ortaya çıkan ve belirli bir yere bağlı olmadan e-öğrenme içeriğine erişebilme, dinamik olarak üretilen hizmetlerden yararlanma ve başkalarıyla iletişimde bulunmayı sağlayan bir öğrenme biçimidir (Mutlu, Yenigün ve Uslu 2006).

Mobil öğrenmenin e-öğrenmeye benzer yapısı nedeniyle benzer avantajları olmasına karşın kullanılan cihazlara bağlı olarak yaşanan bazı sorunlar da söz konusudur. Neil (2003) mobil cihazların öğrenme faaliyetlerinde kullanımında karşılaşılan sorunları şu şekilde ortaya koymaktadır:

- Ekranları genelde çok küçük olması ve basit tasarımlar dışında kulanımının zor olması.
- Veri iletişimi ve bellek bakımından sınırlı kaynaklara sahip olması.
- İşletim sistemi ve uygulama bakımından bir standardın oluşmaması.
- Mevcut uygulamaların m-öğrenme için uyarlanmasının çok zor olması.
- Mobil teknolojiler çok hızlı gelişmekte olması ve sahip olma maliyetinin yüksek olması.
- Klavye fare gibi araçlarının olmaması ve bu yüzden kullanıcı ile etkileşimin sınırlı olması.

Bu sınırlılıklar nedeniyle çalışma kapsamında mobil öğrenme yerine mobil öğrenmenin e-öğrenmeye yardımcı bir ortam olarak geliştirilmesinin daha uygun olacağı düşünülmüştür.

Özcan (2008) tarafından yapılan "*Cep Bilgisayarları (PDA) için bir Mobil Öğrenme Ortamı Tasarım ve Uygulaması*" adlı yüksek lisans tezinde PDA'lar üzerinde çalışacak bir uygulama geliştirilmiştir. Bu çalışmada kullanıcı internet bağlantısı ile ders içeriklerini kendi PDA'sına indirebilmekte ve PDA'sına yüklediği uygulama ile bu içerikleri görüntüleyebilmektedir. Bu uygulama da kullanıcı her ders içeriğinden sonra sınav olmakta ve belirli bir başarıyı sağlarsa diğer konuyu internetten indirip derse devam edebilmekte aksi takdirde aynı konuya tekrar dönmesi gerekmektedir.

Kış (2006) "*SCORM Tabanlı, Kullanıcı Uyumlu Mobil Öğrenme Sistemi Gerçekleştirimi* " adlı yüksek lisans tezinde geliştirdiği uygulamada RFID teknolojisi kullanarak kullanıcının konumu hakkında bilgi toplayıp, toplanan verilere göre kullanıcıya coğrafi konum bilgisi ve eğitim içeriği gönderilmektedir. Bir e-öğrenme sisteminin içeriği mobil cihazların ekranları için küçük ve çok küçük boyutlarda yeniden tasarlanmıştır. Sistemin oluşumunda RFID etiketi ve okuyucuları RFID takip kütüphaneleri kullanılmıştır. Uygulama daha çok deneme amaçlı olmakla beraber gelecekte oluşturulacak benzer projelere kaynak niteliğindedir.

Mahmoud (2008) dünya da bu alanda yapılan çalışmalarda eğitim içeriklerini öğrencilere ulaştırmak için üç seçenek kullanıldığını belirtmiştir;

Çözüm 1: Internet servisi (Podcast, RSS) Podcast servisleri ve mobil RSS okuyucular önceden belirtilmiş sunuculara eklenen içeriklerden haberdar olmayı ve mobil telefon üzerine kaydetmeyi sağlarlar. Podcast ve RSS okuyucuların eğitim içeriğine erişimini ve kullanıcıların bu içerikleri mobil cihazlarına yüklemelerini sağlayacak yapının kurulmasını gerektirmektedir. Bu yöntem ile öğrenciler sadece sunulan içeriklere erişebilmektedir ve kullanıcı ile etkileşim sağlamak mümkün olmamaktadır. Bunun için ayrıca forum özellikleri taşıyan bir sistem de oluşturulmalıdır.

Çözüm 2: Mobil telefonlar üzerinden çevrimiçi içeriğin tamamına erişim Tercih edilen çözüm bu seçenektir . Hızlı ve düşük maliyetli olmasına rağmen en karmaşık çözümdür. Tüm çevrimiçi eğitim içeriğinin mobil cihazlar için yeniden tasarlanması gerekmektedir. Maliyet-fayda analizi yapılmalıdır. Diğer önemli nokta da mobil cihazların özellikleri ve erişimleri dikkate alınmalıdır.

Çözüm 3: İndirip-çevrimdışı çalışma İçeriğin mobil cihaza indirilip çevrimdışı çalışılmasıdır. Bu içerik HTML olabilir, tarayıcı ile erişilebilir yada mobil cihazda çalışabilecek uygulamalar olabilmektedir. İçerik güncellendiğinde kullanıcıda içeriği mobil cihazına tekrar yüklemesi gerekmektedir.

Çözüm 1'deki gibi bir uygulama geliştirmek için daha çok araştırma gerekmektedir. Sınırlılıkları ve maliyet-fayda açısından da yeterli olmaması sebebiyle tercih edilmemektedir.

Çözüm 2 gelecek için en ideal çözüm olabilir. Çevrimiçi içeriğin aynısının mobil cihazlar içinde tasarlanması ile aynı içeriğe mobil erişim sağlanabilmektedir. Mobil cihazların özellikleri, erişebilirlikleri düşünüldüğünde tüm çevrimiçi içeriğin yeniden tasarlanması gerekmektedir. Kalifiye eleman ve yüksek kaynaklar gerekmektedir.

Çözüm 3'de ise çevrimiçi çalışma olmadığı için ve etkileşim eksikliği bakımından tercih edilmemektedir. Ayrıca mobil cihazlardaki farklılıklardan dolayı her cihaz için farklı uygulamalar geliştirilmesi de gerekmektedir.

Yöntem

Örneklem

Uzaktan eğitim öğrencilerinin öğrenme öğretme süreçlerinde yaşadıklarını ve ihtiyaçlarını ortaya çıkarmak amacıyla Gazi Üniversitesi Uzaktan Eğitim Meslek Yüksekokuluna devam eden öğrencilerle görüşmeler yapılmıştır. Ayrıca meslek yüksekokulunda uzun süredir çalışan öğretim elemanları ile görüşme yapılarak öğrencilerin ne tür ihtiyaçlarının olduğu konusunda görüşmeler yapılmıştır.

Veri toplama araçları

Öğrencilerin ihtiyaçlarını belirlemek için yapılandırılmamış görüşmeler gerçekleştirilmiştir. Elde edilen veriler içerik analizi ile incelenerek ihtiyaçlar belirlenmiş ve öncelik sırasına konulmuştur.

Mobil Öğrenme Sisteminin Geliştirilme Süreci

Gimenez López ve arkadaşlarına(2009) göre mevcut mobil uygulama geliştirme araçları C++, J2ME, ve Flash Lite'dır.

C++ en etkili araç olarak görülmektedir ama yazılım süreci karmaşıktır. Uzman yazılımcılar gereklidir ve bu araç hızlı uygulama geliştirmek için uygun değildir. C++ uygulama aracı genelde büyük projeler için kullanılmaktadır ve maliyeti yüksektir.

JavaME(J2ME) mobil uygulama geliştirmek için en yaygın araçtır. Mobil cihazların konfigürasyonlarına uygun eklentiler, kütüphaneler yüklenmeden çalışması hemen hemen imkansızdır.

Flash Lite, diğer araçlarla karşılaştırıldığında en hızlı ve en kolay geliştirme aracı olarak görülmektedir. Basit uygulamaların hızlı geliştirilmesine olanak sağlamaktadır. Herhangi bir eklenti gerektirmeden Flash Lite yüklü cihazlarda çalışmaktadır. Mobil cihazlardaki farklılıklar nedeniyle yükleme ve çalışma esnasında sorunlar çıkabilmektedir.

Yukarıdaki uygulama araçlarının tümü için de mobil cihazlar üzerine eklenti ve uygulama kurulması gerekmekte ve her cihazda aynı performansı vermemektedir. Son dönemlerde bu tür mobil cihazlar üzerinde çalışan yerel uygulamalar yerine web üzerinden mobil cihazlar için uyumlu uygulamalar geliştirilmesi uygun görülmektedir.

Qing Tan ve Kinshuk (2009) yaptıkları çalışmada 3G ve WI-FI teknolojileri ve mobil cihazlarda artık standart hale gelen web tarayıcı özellikleri ile bu uygulamalara erişim daha kolay ve standart hale gelebileceğini söylemektedirler. Qing Tan ve Kinshuk (2009) mobil yazılım geliştirilirken dikkat edilmesi gereken tasarım ilkelerini beş madde de toplamaktadırlar:

1.Platform bağımsızlık

Symbian OS, BlackBerry, Windows Mobile, iPhone OS, Palm OS, Android gibi mobil işletim sistemlerine uyumlu olmalıdır. Yazılım için standart uygulamalar seçilmelidir.

2. Kaynak kullanımı

Mobil cihazlar sınırlı kaynaklara sahiptir. Bu yüzden mobil cihazları olabildiğince istemci gibi kullanıp işlemlerin çoğu sunucu tarafından gerçekleştirilmelidir.

3.Kullanıcı-cihaz etkileşim azlığı

Küçük ekran ve klavye kullanımı zorluğu kullanıcıların mobil cihazları ile etkileşimini zor hale getirmektedir. Bunun için kullanıcı ile mobil cihaz arasındaki etkileşim en aza indirilmelidir.

4. Küçük veri ve band genişliği

Band genişliğine ve mobil cihazların özelliklerine uygun veri transferi yapılmalıdır. Büyük veri transferleri kullanıcılara yüksek maliyetler çıkarabilir bu sebeple en az band genişliği ve küçük veri transferleri tercih edilmelidir.

5. Ek donanım gerektirmeme

Maliyet ve kullanım zorluğu düşünülerek, ek donanıma gerek duyulmamalıdır.

Bulgular

Öğrencilerin ihtiyaçlarına yönelik bulgular

Çalışma kapsamında uzaktan eğitim idarecileri, öğretmenleri ve öğrencileri ile görüşülmüştür. Öğrencilerin bazen iş ve kişisel nedenlerle eğitim hizmetlerini öğrenme yönetim sistemi üzerinden takip edemedikleri belirlenmiştir. Öğrenme yönetim sitemine çeşitli nedenlerden dolayı düzenli giremeyen öğrenciler, bu süreç içerisinde de derslerle ilgili yapılan değişiklikler, sınav, sunum tarihi gibi duyurulardan haberdar olamadıklarını ve sıkıntılar yaşadıklarını belirtmişlerdir.

Fulton (2002), mobil öğrenme etkinliklerinde öğrencilerin sadece kendine sunulan içeriklere ulaşmaması, öğretmen ve diğer öğrencilerle e-posta, forum gibi araçlarla etkileşime geçmesi gerektiğini de belirtmiştir.

Yapılan ihtiyaç analizi sonucunda uzaktan eğitim öğrencilerinin ihtiyaçlarını gidermeye yönelik bir m-öğrenme sistemi geliştirilmesine karar verilmiştir. Geliştirilmekte olan e-öğrenmeye yardımcı mobil öğrenme sisteminde ders videolarının yayınlanması, ders içerik bilgileri, çevrimiçi sınav, çevrimiçi anket uygulamaları, öğrenciler arasında etkileşim sağlamak için mesaj panosu ve özel mesajlaşma özellikleri bulunmaktadır. Öğrencilerin cep telefonlarına SMS (kısa mesaj) gönderilebilecek ve güncellemelerden haberdar olmaları sağlanacaktır. Öğrencilere ayrıca sanal sınıf, sınav, sunum tarihi gibi etkinliklerden önce hatırlatma SMS'leri gönderilecektir. Bu SMS'ler öğrencinin kendini önemli hissetmesini ve öğrenme için motive olmasını sağlayacaktır. Böylece e-öğrenmenin mekandan bağımsızlık ilkesi m-öğrenme sistemi ile tam olarak karşılanmış olacaktır.

Mobil Öğrenme Sisteminin Geliştirilmesi Sürecine ilişkin bulgular

Bu çalışmada e-öğrenmeye destek amaçlı mobil öğrenme sisteminin geliştirilme ortamı olarak PHP 5 programlama dili, MYSQL veritabanı, sunucu olarak da Linux'un Ubuntu dağıtımı kullanılmıştır. Arayüz için CSS kullanılarak mobil cihazların küçük ekranlara uygun HTML formatında web sayfaları oluşturulmuştur.

Aşağıda geliştirilen mobil öğrenme sisteminin ekran görüntüleri bulunmaktadır.

şekil 1

şekil 2

şekil 3

şekil 4

şekil 5

Mobil cihazlar üzerinden mobil öğrenme sistemine girildiğinde Şekil 1'deki giriş ekranı gelmektedir. Öğrenciler kendilerine önceden verilmiş kullanıcı adı ve şifreler ile giriş yaptıklarında Şekil 2'deki sistemin anasayfa ekranını görülmektedir.

Şekil 2'deki anasayfa ekranında sistemde bulunan çevrimiçi öğrenciler ve alınan özel mesaj uyarıları bulunmaktadır. "Online Kişiler" modülünde o anda sistemde bulunan öğrenciler görülmekte ve istenildiğinde çevrimiçi öğrencilerle anlık mesajlaşılabilmektedir. "Gelen Kutusu" modülünde gönderilen özel mesajlar görüntülenmektedir. Şekil 3'de görülen "Mesaj Panosu" modülünde her öğrencinin görebileceği mesajlar bulunmaktadır. Bu modül öğrenciler arasında tartışma, yardım isteme, duyuru gibi ihtiyaçları karşılamak için geliştirilmiştir.

Şekil 4'deki "Ders İçerikleri" modülünde haftalık ders konularının ana başlıkları yer almaktadır. Şekil 5'deki Ders Videoları modülünde uzaktan eğitim sisteminin sanal sınıf uygulamalarının kaydedilmiş videoları yer almaktadır. Bu modülde öğrenci geçmiş derslerin videolarına erişebilmekte ve bu videoları çevrimiçi izleyebilmektedir.

Modüller içerisinde anasayfa ve ilgili sayfalara yönlendirme linkleri bulunmaktadır ve öğrenciler modüller üzerinde çalışırken bu linkleri kullanarak istediği sayfaları görüntüleyebilmektedirler.

Sisteme giriş ve sayfalarda gezinme kayıtları sistemde tutulmaktadır. Böylece öğrencilerin sisteme giriş ve kullanım oranlarına erişilebilinecektir. Bu kayıtlar sayesinde modüllerin öğrenciler tarafından kullanım sıklığı bilgisine de ulaşılacaktır.

Mobil Öğrenme Sisteminde öğrenciye gelen özel mesaj, sisteme ders içerikleri ve ders videosu eklenmesi gibi durumlar öğrencilere SMS ile bildirilmektedir. Sistem hareketleri yanı sıra öğrenciler uzaktan eğitim hizmetleri hakkında yapılan değişikliklerden ve duyurulardan da SMS ile haberdar edilebilmektedir.

Öğrencilere SMS gönderme işlemi için TURKCELL firmasının Akıllı Mesaj uygulaması kullanılacaktır. Bilgisayara kurulan bu uygulama ile telefon defteri oluşturma, kullanıcı grubu oluşturma, toplu SMS gönderme, ileri tarihli SMS gönderme işlemleri bilgisayar üzerinden yapılabilmektedir.

Mobil cihazların sınırlı bellek ve veri transferi kapasitesi olduğu için fazla veri içeren sayfaların görüntülenmesinde sorunlar yaşanmaktadır. Bu sorunun yaşanmaması için mümkün olduğunca az resim dosyası kullanmalı ve sayfa yapısı sadeleştirilmelidir.

Mobil cihazlarda fare klavye gibi etkileşim araçları olmadığı dikkate alınarak uygulama geliştirilirken basit yönlendirmeler kullanılmalı ve veri girişi en aza indirilmelidir.

Mobil cihazlar da web üzerinden video izlemek istenildiğinde sorunlar çıkabilmektedir. İnternet de yayınlanan videoların çoğu Flash formatında (flv) dosyalardan oluşmaktadır. Windows Mobile işletim sistemine sahip mobil cihazlarda ve iphone cihazlarında flv uzantılı videoları web üzerinden görüntülemekte sorun yaşanmaktadır. Yapılan araştırmalar sonucunda bu sorunların çözümü için mobil cihazlarda kullanmak üzere geliştirilmiş SKYFIRE tarayıcısı önerilmektedir. www.skyfire.com adresinden işletim sistemlerine göre kurulum dosyası indirilip ücretsiz kurulabilmekte ve flash videolarını web üzerinden görüntülenmesini sağlamaktadır.

Sisteme web adresinden ulaşılabilmektedir. Bu adrese direk masaüstü yada dizüstü bilgisayardan da giriş yapılabilmektedir bu yolla öğrenci isterse kendi kullanıcı adı ve şifresiyle mobil cihazı haricinde internet bağlantısına sahip bir bilgisayar üzerinden sisteme girip modülleri kullanabilmektedir. Bu da mobil öğrenme sistemi loglarında ve kullanım oranlarında yanlışlığa yol açabilir. Sisteme sadece mobil cihazlardan erişim sağlanması için tarayıcı yada çözünürlük tespiti sağlandıktan sonra sonuca göre erişim yönlendirmeleriyle çözülebilmektedir.

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ERGENLERDEKİ SALDIRGANLIK DÜZEYLERİNİN İZLENEN TELEVİZYON YAYINLARI AÇISINDAN İNCELENMESİ
INVESTIGATING LEVEL THE RATE OF AGRESSIVENESS IN YOUNGSTERS IN RELATION TO TELEVISION PROGRAMMES

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Özet
Bu araştırmanın amacı, ergenlerin saldırganlık düzeylerinin izlenilen televizyon program türü ve sosyo-demografik özellikleri açısından incelenmesidir.
Çalışmanın evrenini Kıbrıs'ta öğrenim gören üniversite öğrencileri oluşturmuştur. Çalışma örneklemini, uluslararası Kıbrıs üniversitesinde okuyan ve amaçsal örnekleme yöntemi ile belirlenen 175 öğrenci oluşturmuştur.
Araştırmada veri toplama aracı olarak uyarlaması Tuzgöl (1998) tarafından yapılan cronbach-alpha güvenirlilik katsayısı .84 olan ''saldırganlık ölçeği'' uygulanmıştır.
Verilerin analizinde araştırmanın amaçları doğrultusunda yüzdelik dökümleri, aritmetik ortalama, t-testi ve tek yönlü varyans analizi (anova), istatistiksel hesaplama kullanılmıştır. Bu araştırmada önem düzeyi .05 alınmıştır.
Araştırma sonucunda ergenlerin saldırganlık düzeyleri izlenilen televizyon program türü değişkeninden etkilenmediği, cinsiyet değişkeninden ise etkilendiği ve ergenlerin saldırganlık düzeylerinin de orta" düzeyde olduğu saptanmıştır.
Anahtar kelimeler: televizyon yayınları, ergen, saldırganlık.

Abstract
The aim of this reserch is to investigate the relationship between the level of aggressiveness of the adolescents and tv broadcasts. The population of the study consists of the university students in north Cyprus. The sample consists of 175 students at ınternational Cyprus university selected according to purposeful sampling.
In this study the ''aggressiveness scale'' developed by tuzgöl (1998) and the croancbach's alpha reliability coefficient of .84 were used as data collection instruments.
Considering purposes of the study, the percentage documentation average, aritmetic average, t-test, anova, techniques were used in data analysis. The statistical significance level was accepted as .05 in the study.
Of adolescents who viewed the results, levels of aggression in television programs are not affected by such variables, the impact of gender on adolescents' aggression levels, and whether the medium "level was found to be.
Keywords: tv broadcasts, adolescent, aggressiveness.

GİRİŞ
Başlangıcında insanların hayatını kolaylaştıran ve onun çevresini kontrol edebilmesinde çok önemli işlevler yerine getiren teknoloji, özellikle son yüz yılda çok hızlı bir değişim geçirmiştir. Bireylerin tutum ve davranışlarını en çok etkileyip yönlendirebilme gücünü bünyesinde taşıyan teknolojik gelişmelerin en başta gelenlerinden birisinin, ses ve görüntülerin dalgalar halinde iletilip-yayınlanması esasına dayanan televizyon olduğu, kuşku götürmez bir gerçektir. Teknolojinin insanlığa en büyük armağanlarından biri olan bu harika alet, bilinçli ve amaca uygun olarak kullanılmadığında, insanlar, özellikle de çocuklar ve ergenler üzerinde çok ciddi olumsuz etkilere yol açabilmektedir. Televizyon hem olumlu, hem de olumsuz etkileme gücünü potansiyel olarak bünyesinde barındıran, diyalektik yapılı bir kitle iletişim aracıdır. Onun özellikle olumsuz işlevlerini ön plana çıkarmada güdülen amaç, böylesine önemli araçların mülkiyetini ya da kontrolünü ellerinde bulunduranlara taşıdıkları insani, ahlaki, toplumsal ve kültürel sorumluluklarının boyutlarını hatırlatmak; olumsuz etkileri minimuma indirgeyerek, bu teknoloji harikası sihirli kutudan daha etkin ve verimli şekilde yararlanmanın yollarını aramaktadır.
İnsana hem işitsel, hem görsel açıdan hitap eden ve eğlence dünyasının renkliliğinden yararlanarak belli bilgileri aktarma gücüne sahip olan televizyonlar, günümüzde genellikle, birey ve topluma yönelik olumsuz işlevler görmektedir. Bu işlevler, başlıca şu konular üzerinde yoğunlaşmaktadır. 1. Bireylerin Ruhsal ve Zihinsel Yapılarını Yönlendirme İşlevi 2. Çocuklara, Gençlere ve Aile Bireylerine Yönelik Diğer Olumsuz İşlevler.
Televizyonların çocuk ve gençler üzerindeki etkisi, toplumun diğer kesimlerine oranla çok daha fazladır. Bu etki televizyonların sadece bilgi aktarmaları yoluyla olmayıp, daha ziyade belli davranış modelleri sunmaları suretiyle cereyan etmektedir. Bu tipler özellikle çocuklar için büyük bir taklit kaynağı olan modellerdir (Yavuzer, 1996).

Bireylerin ruhsal gelişiminde ve insan ilişkilerinin oluşumunda oldukça önemli bir işleve sahip olan taklit etme, televizyonun temel öğretme biçimine uygun düşmektedir (Gövsa, 1998). Ancak bilinçsiz özentiyle taklit söz konusu olduğundan ve taklit kaynağı tiplerin millî değerlerin güçlenmesi bağlamında, olumsuz yönleri özendirildiğinden, çocuk ve gençler yaratıcı güçlerini ortaya çıkaramamakta ve düşünme yeteneklerini kullanmada ciddi sorunlar yaşamaktadırlar (Yörükoğlu, 1998). Televizyondaki taklit kaynağı tipler ve yaşam tarzları, çocuk ve gençlerin toplumun kültürel değerlerini yaşatabilmeleri açısından ayrı bir önem arz etmektedir. Buradaki model kelimesi kişinin kendini özdeş tuttuğu ve duyuş, düşünüş ve davranışlarını taklit etmeye çalıştığı kimseleri ifade etmektedir (Yavuzer, 1998). Buna karşılık televizyon yapımcı ve yayıncılarının bu hususta yeterli hassasiyeti gösterdiklerini söyleme imkânına sahip değiliz. Bu görüşümüzün daha iyi anlaşılabilmesi için sadece bazı TV yayınlarına göz atmamız yeterli olacaktır. Çocuklar ve gençler arasında oldukça önemli bir konu da şiddet ve porno içerikli yayınlardır. Bu tür yayınlar çocukları henüz erken dönemde yetişkin problemleriyle karşı karşıya bırakma, kendi dönemiyle arada çatışma yaşamaya itmenin yanı sıra, özellikle ergenlik dönemi gençlerini aşırı uyarmakta, gelişim çağlarına uygun davranışlar yerine, sadist davranışları özendirmektedir. Bu tür yayınlar, günümüz televizyon yayıncılarının en sık kullandıkları yayınlardır. Bu yayınlar sonucudur ki, saldırgan davranışlar idealize edilmekte ve çocuklarda bu eğilim güçlendirilmektedir. Nitekim yapılan pek çok araştırma, TV'lerdeki saldırgan davranışları izleyenlerin, saldırgan tepkilerinde artış olduğunu doğrular (Dönmez, 1994). Ayrıca bu eğilimin maddî imkânı yetersiz ailelerde çocukların, hatta aile büyüklerinin doyumsuz isteklerinin pekiştirilmesi ve daha fazla şeyi elde etme etkisiyle suç işlemeleri söz konusu olabilmektedir. Çünkü çocuklar izledikleri reklamların etkisiyle daha fazla talepte

bulunmakta ve özellikle dar gelirli aileler bu talepleri asgari düzeyde bile karşılamakta zorlanmaktadırlar. Gelir düzeyi düşük olmayanlar da, çocuğun her istediğini almayı doğru bulmayarak talepleri geri çevirebilmektedirler. Bu durum, çocukta yoksunluk ve kırgınlık duygusu oluşturabilmektedir. Tüketim kapitalizminin sanal formu diye nitelenen reklamlar, bütün bu olumsuzlukları peşinde getirmektedir (Karaçoskun, 2010).

Kitle iletişim araçlarının erişkinlerde saldırganlık ve şiddet olaylarının ortaya çıkmasında ve artmasında bir payının bulunup bulunmadığı, varsa derecesinin ne olduğu hala tartışma konusu olmasına rağmen 3500 üzerinde çalışmanın neredeyse tamamı medyadaki şiddetin çocuklar ve ergenler üzerinde olumsuz etkilendiklerinin olduğunu ortaya koymaktadır (M. Tokdemir ve diğerleri, 2000).

1980'li yılların ortalarında, ABD'de yapılan bir çalışmada, katılımcıların %65'i dünya görüşlerinin temel olarak TV aracılığıyla biçimlendiğini belirtmişlerdir. Son zamanlarda, TV'nin izleyenler üzerindeki etkilerini gösteren çok sayıda çalışma yapılmıştır. Bu çalışmalarda ortaya çıkan etkiler fiziksel, ruhsal ve cinsel saldırganlığı, anti-sosyal kişilik yapısını, asiliği, isyankarlığı, daha çabuk öfkelenmeyi, suistimali, cezalandırmayı, alkol ve sigara kullanmayı ve yemek yeme alışkanlıklarındaki değişiklikleri kapsamıştır (Ayrancı, Köşgeroğlu ve Günay, 2004).

Ayrıca çok fazla televizyon seyreden çocuklarda yağlı, şekerli yiyecek reklamlarından dolayı yeme alışkanlıklarının bozulduğu ve çok geç yatmaktan dolayı da gelişimlerinin geri kaldığı ve gündüz daha az başarılı oldukları üzerinde durulmaktadır (Ayrancı, Köşgeroğlu ve Günay, 2004).

TV'nin en büyük tüketici kitlesi çocuklardır (American Psychiatric Association, 1998). Günümüzde çocuklar, günlük yaşamları içerisinde çok uzun süre TV'ye bağlı kalmaktadırlar. Onlar, en iyimser olasılıkla 3-4 yaşından başlayarak 12-13 yaşına kadar günde ortalama en az 1-2 saat TV izlemektedirler. TV'ler en yıkıcı etkisini, etkiye en fazla açık durumdaki çocuklar ve gençler üzerinde göstermekte; onların davranışlarına, sözlerine ve oyunlarına yansımaktadır (Akarcalı S, 1996). Araştırmaların (Çaplı, 2001) ortaya koyduğu bir başka gerçek, çocukların TV'de yalnız çocuk izleyici kitlesi dikkate alınarak hazırlanmış çocuk programlarını değil, yetişkinlere yönelik programları da izledikleridir. Özellikle yetişkinlere yönelik programları izlemelerinin çocuklar için olumsuz etkileri vardır. Çok fazla televizyon programları, özellikle şiddet içeren programları izleyen çocukların ileri yaşlarda dikkat eksikliği ortaya çıkmakta; bilişsel, duygulanım ve davranışsal süreçlerinde olumsuz değişikliklere neden olmakta ve sonuçta izleyenlerde yaşam olaylarına karşı duyarsızlaşma başlamaktadır (Ayrancı, Köşgeroğlu ve Günay, 2004)

Şiddet psikolojik, sosyo-kültürel ve sosyo-ekonomik boyutları ile kitle iletişim araçlarında ve özellikle TV'de yer alırken; bireysel/toplumsal, yasal/yasal olmayan ya da fiziksel/sözel/ruhsal yönlerden toplumsal yaşama yansımakta ve toplumsal yaşamı etkilemektedir (Yörükoğlu, 1998). Çocuklar, yetişkinliğe adım atarken rol modelleri ararlar. Bu modeller kimi zaman bir aile üyesi, kimi zaman sokaktan birisi, ya da çocuğun seyrettiği film kahramanlarından birisi olabilir (Dökmen, 1995).

Örneğin, Nisan 1999'da ABD'nin Colorado eyaletinde iki öğrencinin bir liseyi basarak 12 öğrenciyi ve bir öğretmeni öldürmesiyle sonuçlanan olayda, bu eylemi gerçekleştiren öğrencilerin katliamdan önce ''Katil Doğanlar'' filmini defalarca seyrettikleri öğrenilmiştir (Hasgür, 1999). Çocuğun şiddet filmlerinde gördüğü bir figürü model alması durumunda trajik sonuçlar ortaya çıkabilmektedir. Bazı kriminal şiddet olaylarıyla TV programlarında sunulan kurgusal olaylar arasında dikkat çekici benzerlikler görülebilmekte, hatta bunların açıkça model alındığı saldırılara, tecavüzlere, cinayetlere rastlanmaktadır.

Özellikle çocuklar yetişkinler için hazırlanan programlardan doğrudan etkilenmektedirler. Yetişkinler filmlerdeki saldırgan davranışların sonuçları üzerinde dururken, çocukların süreçten etkilendiği belirtilmektedir (Nevvson 1995). İzleyicilerin kurban yerine suçluyla özdeşleşmeye itilmesi, diğeri medyada şiddet seyretmenin hayal bile edilemeyecek davranışların taklit edilmesine yöneltmesidir. G. Comstack 30 yıl gibi bir sürede televizyondaki şiddetin etkisi üzerine yapılmış bir çok araştırmayı gözden geçirmiş ve şiddet içeren bölümleri seyretmekle çocuklarda anti-sosyal davranışlar arasında güçlü bir ilişki bulmuştur. Öte yandan, sadece çocukluk döneminde değil yetişkinlik döneminde de etkili olduğu saptanmıştır. 20 yıllık bir izleme çalışmasında çocukluk döneminde (yaklaşık 8 yaşlarında) televizyonda şiddet içerikli film seyretmekle, genç yetişkinlikte şiddet içeren bir suç ya da eş ve çocuğun istismarının ilişkisi ve bu sonucun tüm sosyo ekonomik düzeyler için geçerli olduğu bulunmuştur (Nevvson, 1995). Freedman ve Sears (1993) adlı iki sosyal bilimci Televizyonda şiddet içeren davranışların sergilenmesine bağlı olarak araştırıcılar insanların şidete karşı giderek duyarsız hale geleceğini diğer yandan bir çözüm yolu olarak yeni saldırgan davranışları öğreneceklerini ileri sürerek eleştirmektedirler Öte yandan, sadece çocukluk döneminde değil yetişkinlik döneminde de etkili olduğu saptanmıştır. 20 yıllık bir izleme çalışmasında çocukluk döneminde (yaklaşık 8 yaşlarında) televizyonda şiddet içerikli film seyretmekle, genç yetişkinlikte şiddet içeden bir suç ya da eş ve çocuğun istismarının ilişkisi ve bu sonucun tüm sosyo ekonomik düzeyler için geçerli olduğu bulunmuştur (Nevvson, 1995).

Gençlik yıllarında müzik, sahne, televizyon yıldızları, sporcular vb. kahramanlar taklit edilmektedir. Televizyon yayınlarının da bu süreçte etkili olduğu bilinmektedir. Olumsuz düşünce ve davranışları olan kişilerin kahraman olarak sunulması, bunlarla olan benzeşme süreçlerini artırmaktadır.

Huesmann ve arkadaşlarına (2003) göre, medyada şiddet olgusu ergenleri ve yetişkinleri kısa süre için etkilerken, uzun süreli etkileri daha çok çocuklarda görülmektedir. Evrensel olan bu durum herhangi bir sosyo-ekonomik kesimdeki herhangi bir aile içinde geçerlidir.

Hiç kuşkusuzdur ki, ana-babalar ve öğretmenler de bu konularda yerine getirmeleri gereken sorumluluklara sahiptirler. Ancak, gelişmiş ülkelerdeki durumun aksine, eğitim düzeyi ortalaması son derece düşük olan ülkemizde bu konudaki en büyük sorumluluğu yalnızca ana-babalara bırakmanın doğru bir tercih olamayacağı kanaatindeyiz (akt. Palabıyıkoğlu R, 1997).

Postman (1995) televizyon aracılığı ile çocukların, yetişkin dünyasına ait parasal, toplumsal ve cinsel ilişkilere, kavga, çatışma ve şiddet olaylarına, hastalık ve ölümle ilgili 'sırlara' maruz kaldığına, bunun ise çocukluğun yok olusu anlamına geldiğine işaret eder. Yine Postman'a göre, bebekliğin tersine çocukluk biyolojik değil, toplumsal bir insandır ve bu sosyal gerçekliğe sahip çıkarak çocukların mutluluğunu gözetmek, sağlıklı bir toplum görüsünü savunmak demektir. Öte yandan televizyon haberlerinde ve dizilerde tanık olduğumuz olaylar ve kavramlar, çocuk dünyasına girmesi uygun görülmeyen yetişkin ilişkilerini aksettirmektedir. Çocukluğun yitirilmesinde televizyon tek basına bir aktör değildir. Tüketim toplumu içinde çocukluk ile yetişkinlik arasındaki ayırıcı çizgi hızla aşınmakta ve çocukluğun kendisi de hızla tükenmektedir. Ayrıca birbirine benzeme, marka tutkusunun yaygınlaşması, çocuk oyunlarının giderek yitmesi, sürekli can sıkıntısı halinin kalıcılaşması, çocukluğun tüketim kültürü içinde yeniden biçimlenmesinin, yitirilişinin işaretleri olarak alınabilir (Akçalı, 2003).

Ergenlik döneminde öfke yaşantısı incelendiğinde, ergen kendi kaderini tayin edebilmek ve denetleyebilmek için mücadele etmekte ve bağımsız olmak istemektedir. Bu nedenle ergenlikte öfke en yoğun şekilde, aile içinde yaşanmaktadır. Ergenin öfkesi çoğunlukla, aile içinde öfke patlamaları şeklinde ani ve sert olmaktadır (Bauhman, 1997). Diğer taraftan gelişimsel zorluklar da ergenin öfke ve saldırganlık duyguları yaşamasına neden olabilmektedir. Bu dönemde özellikle sosyal destekten yoksun olma ergeni saldırgan yapabilir.

Araştırma sonuçlarının akademisyenlere, tv program yapımcılarına, eğitimcilere, sivil toplum örgütleri yöneticilerine, ana-baba okulu program yapımcılarına, eğitim bakanlığına ve aile yaşantılarına ışık tutacağı düşünülmektedir.

Araştırmanın Amacı

Bu araştırmanın amacı, ergenlerin saldırganlık düzeylerini izlenilen televizyon program türü ve sosyo-demografik özellikleri açısından incelenmesidir.

Araştırmanın Problem Cümlesi

Araştırmanın problem cümlesi, "Ergenlerin saldırganlık düzeyleri izlenilen televizyon programı türüne ve sosyo-demografik özelliklerine göre farklılaşmakta mıdır?" şeklinde ifade edilmiştir.

Bu temel problem doğrultusunda aşağıdaki alt problemlere cevap aranmıştır: Ergenlerin saldırganlıkları;

1. cinsiyete göre anlamlı olarak farklılık göstermekte midir?

2. şiddet içerikli film izleme sıklığına göre farklılaşmakta mıdır?
3. boş zaman değerlendirme biçimlerine göre farklılaşmakta mıdır?
4. kalınan (yaşanan) yere göre anlamlı bir farklılık var mıdır?
5. hangi düzeydedir?

YÖNTEM

Araştırmanın modeli

Bu araştırma, betimsel türde ilişkisel tarama modeli ile gerçekleştirilmiş bir çalışmadır. Yaygın olarak kullanılan betimleyici yaklaşım, istenen durumu tanımlamayı amaçlamaktadır. Tarama modelleri ise var olan durumu, var olduğu şekliyle betimlemeyi amaçlayan araştırma yaklaşımıdır (Karasar, 2009).

Evren ve Örneklem

Arştırmanın evrenini Kıbrıs'ta öğrenim gören üniversite öğrencileri oluşturmuştur. Araştırma örneklemini, Uluslararası Kıbrıs Üniversitesi'nde öğrenim gören ve uygun örnekleme yöntemiyle belirlenen %37.4(n=65)erkek, %62.85(n=110) kız olmak üzere toplam 175 öğrenciden oluşmuştur. Uygulamanın yapıldığı gün ve saatlerdeki derslerde bulunan gönüllü öğrenciler araştırma örnekleminde yer almışlardır.

Veri Toplama Araçları

Araştırmada, Tuzgöl (1998) tarafından geliştirilen Cronbach-alpha güvenirlilik katsayısı .84 olan "Saldırganlık Ölçeği" kullanılmıştır. Saldırganlık Ölçeği gençlerde açık, gizli, fiziksel, sözel ve dolaylı saldırganlıkla ilgili davranışları ölçmeye yönelik 45 maddeden oluşmaktadır. Ölçekteki 30 madde olumlu, 15 madde ise olumsuz ifadeler şeklinde düzenlenmiştir. Olumsuz ifade olarak düzenlenen maddelerin puanlanması tersine çevrilerek yapılmaktadır. Ölçek 5'li derecelendirme ve kendini ifade türündedir. Birey okuduğu ifadenin kendine ne derece uygun olduğunu belirtmek için Hiçbir Zaman (1), Nadiren (2), Ara Sıra (3), Sıklıkla (4), Her Zaman (5) seçeneklerinden birini işaretlemektedir. Ölçekteki ters ifadeler 6 sabit sayısından o soruya ilişkin işaretlediği seçeneğin puanı çıkarılarak değerlendirilmektedir. Bu işlemden geçirilen ters ifadelerin ve düz ifadelerin toplamı saldırganlık puanını vermektedir. Ölçekte puanının yükselmesi saldırganlık düzeyinin artmasına işaret etmektedir. Saldırganlık ölçeğinden alınabilecek en düşük puan 45, en yüksek puan ise 225' tir. Ölçeğe ek olarak araştırmacı tarafından oluşturulan "kişisel bilgi formu" uygulanmıştır.

Verilerin Analizi ve Yorumlanması

Verilerin çözümlenmesinde, bilgisayarda, SPSS-16 istatik proğramı kullanarak, ortalama, standart sapma, tek yönlü varyans analizi (ANOVA), t, Scheffe anlamlılık testleri ve pearson korelasyon katsayıları hesaplanmıştır. Araştırmada önem düzeyi .05 olarak alınmıştır.

BULGULAR

Bu bölümde, araştırmanın problemlerinin test edilmesi için yapılan istatistiksel analizler sonucunda elde edilen bulgular sunulmuştur.

Araştırmanın birinci alt problemi "Ergenlerin saldırganlık düzeyleri cinsiyete göre anlamlı olarak farklılık göstermekte midir?" biçiminde ifade edilmiştir.

Tablo 1: Saldırganlık düzeylerinin cinsiyete göre t-tesi sonucu

Bağımlı-Bağımsız Değişken		n	$\bar{x}$	ss	sd	t	p
Saldırganlık	Kız	110	125,418	11,332	173	3,058	0,003*
	Erkek	65	130,953	11,965			

*p<0,05

Cinsiyete göre saldırganlık puan ortalamaları arasında istatistiksel olarak anlamlı bir değişimin olup-olmadığını belirleyebilmek amacıyla t-testi uygulanmıştır. Yapılan t-testi sonucunda, ergen saldırganlıklarının cinsiyete göre anlamlı olarak farklılaştığı saptanmıştır [$t_{(173)}$=3,058 p<0,05]. Yani erkek öğrencilerin ($\bar{x}$=130,953), kız öğrencilere göre ($\bar{x}$=125,418) saldırganlık düzeylerinin daha yüksek olduğu bulunmuştur. Bu durumda, erkek öğrencilerin daha saldırgan bir yaklaşım içerisinde oldukları söylenebilir.

Araştırmanın ikinci, üçüncü ve dördüncü alt problemleri "Ergenlerin saldırganlık düzeyleri şiddet içerikli film izleme sıklığına, boş zamanını değerlendirme biçimine ve kalınan yere göre farklılaşmakta mıdır?" biçiminde ifade edilmiştir.

Tablo 2: Saldırganlık düzeylerinin Şiddet İçerikli Film İzleme Sıklığına, Boş zamanını değerlendirme biçimine ve kalınan yere göre F-tesi sonucu

Bağımsız Değişkenler		n	$\bar{x}$	ss	sd	F	p	Anlamlı Fark
Şiddet İçerikli Film İzleme Sıklığı	Hiçbirzaman	32	125,125	13,769	4 170 174	1,554	0,189	-
	Nadiren	69	126,231	11,085				
	Arasıra	60	128,800	11,780				
	Sıksık	11	133,272	9,498				
	Herzaman	3	133,333	10,692				
	Toplam	175	127,474	11,845				
Boş zamanını değerlendirme biçimi	tv seyrederek	17	124,117	12,854	4 170 174	1,841	0,123	-
	kitap okumakla	16	129,625	16,977				
	spor yapmakla	14	127,214	14,697				
	bilgisayar kullanma	94	129,127	10,088				
	müzik dinleyerek	34	123,676	11,226				
	Total	175	100,0	100,0				
Kalınan yer	yalnız	7	130,000	7,874	4 170 174	0,290	0,884	-
	aile	57	126,315	10,590				
	arkadaş	35	128,428	14,134				
	yurt	74	127,729	12,162				
	kardeşi ile	2	125,500	2,121				
	Total	175	127,474	11,845				

Şiddet içerikli film izleme sıklığına, boş zamanını değerlendirme biçimine ve kalınan yere göre saldırganlık puan ortalamaları arasında istatistiksel olarak anlamlı bir değişimin olup-olmadığını belirleyebilmek amacıyla tek yönlü varyans analizi (ANOVA) uygulanmıştır. Yapılan ANOVA testi sonucunda, ergenlerin saldırganlık düzeylerinin şiddet içerikli film izleme sıklığına, boş zamanını değerlendirme biçimine ve kalınan yere göre anlamlı olarak farklılaşmadığı saptanmıştır.

Tablo 2'den de görüleceği üzere, şiddet içerikli film izleme sıklığı incelendiğinde her zaman şiddet içerikli film izlediklerini belirten ergenlerin hiçbir zaman şiddet içerikli film izlemediklerini ifade eden ergenlere oranla daha saldırgan bir yapıda oldukları söylenebilir. Ne var ki bu fark istatistiksel olarak anlamlı bulunmamıştır. Yine boş zamanlarını bilgisayar kullanarak ve kitap okuyarak geçiren ergenlerin müzik dinleyenlere göre daha saldırgan oldukları görülmektedir. Ayrıca yalnız yaşayan ergenlerin kardeşiyle yaşayanlardan daha saldırgan tutum içinde oldukları görülmekle birlikte her iki durumda da istatistiksel olarak anlamlı bir fark görülmemiştir.
Araştırmanın beşinci alt problemi "Ergenlerin saldırganlıkları hangi düzeydedir?" şeklinde ifade edilmiştir.

Tablo 3'te Ergenlerin saldırganlık puanlarının aritmetik ortalaması, standart sapması verilmiştir. Ergenlerin saldırganlık genel puan ortalamasının ($\bar{x}$=127,474) orta düzeyde olduğu belirlenmiştir. Bu durumda, örnekleme dahil edilen ergenlerin orta düzeyde saldırgan oldukları belirlenmiştir.

Tablo 3: Ergenlerin Saldırganlık Düzeylerine İlişkin Ortalama ve Standart Sapma Değerleri

	n	$\bar{x}$	ss
Saldırganlık Düzeyi	175	127,474	11,845

SONUÇ, TARTIŞMA VE ÖNERİLER

Araştırma sonucunda, Uluslararası Kıbrıs Üniversitesinde öğrenim gören erkek öğrencilerin kız öğrencilere göre saldırganlık düzeylerinin anlamlı olarak daha yüksek olduğu, sıklıkla şiddet içerikli film izleyenlerin hiç izlemeyenler göre, bilgisayar kullanmayı ve kitap okumayı boş zaman etkinliği olarak algılayan öğrencilerin daha saldırgan tutum içerisinde olduklarını söyleyebilir. Aynı zamanda yalnız yaşayan ergenlerin kardeşleriyle yaşayanlardan daha agresif davrandıkları da görülmektedir.
Çalışmamıza paralel olarak Huesmann ve arkadaşlarının da televizyondaki şiddetin etkileriyle ilgili yaptıkları pek çok araştırmadan birinde (akt. Ledingham, Ledingham & Richardson, 1993) ilkokul üçüncü sınıf öğrencilerinin TV programı tercihleri incelenmiş ve 10 yıl sonraki saldırgan, davranışlarıyla olan ilişkilerine bakılmıştır. Bulgular şiddet içerikli programları tercih etmenin erkek çocukların saldırganlığını öngördüğünü göstermiştir. Aynı gruplarla yapılan izleme çalışmaları da şiddet programlarını tercih eden erkeklerin 30 yaşında ciddi suçlar işlediklerini göstermiştir.
Ergenlik döneminde televizyon karakterlerinden etkilenme ve kimlik oluşturma diğer dönemlere göre daha az olmakla birlikte bu yaşlardaki gençler televizyondaki şiddet ya da suç davranışlarını taklit ederek bu dönemin tipik davranışlarından olan "geleneksel olarak otoriteye meydan okuma davranışını" sergileyebilmektedirler (Josephson, 1995).
Ayrıca Uluslar Kıbrıs Üniversitesinde öğrenim gören öğrencilerin genel olarak saldırganlık düzeylerinin "orta" düzeyde olduğu bulunmuştur.
Araştırma sonuçları doğrultusunda kısa vadede uygulanacak şu önerilerde bulunulmuştur.
1. Şiddet içermeyen, sevgi, hoşgörü, barış gibi olumlu davranışların sunulduğu sosyal davranışları özendiren programların sayısını artırmak, yapılmasını özendirmek.
2. Bilgisayar kullanmanın, kitap okumanın ve spor yapma gibi aktivitelerin boş zaman değerlendirme olmadığı, bu etkinliklerin sosyal ihtiyaç olduğu eğitim kurumlarında benimsetilebilir.
4. Öğretmenler ve ana-babalar için şiddet içerikli filmlerin niteliği, içeriği, o programın izlenilme süresinin azlığı ya da çokluğu ile ilgili olumsuz etkilerini, nasıl azaltabileceklerini, anlatan eğitim paketleri geliştirmek, okullara, rehabilitasyon merkezlerine dağıtımını ve uygulanması sağlanabilir.
5. Bu araştırma farklı üniversite ve fakültelerde de uygulanabilir.

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EŞZAMANSIZ ÇEVRİMİÇİ ORTAMLARDA ÖĞRENME BİÇİMLERİNE İLETİŞİM ORTAMLARI ZENGİNLİĞİ KURAMI AÇISINDAN BİR YAKLAŞIM

AN APPROACH TO LEARNING STYLES THROUGH MEDIA RICHNESS THEORY IN ASYNCHRONOUS ONLINE ENVIRONMENTS

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Özet

Uzaktan eğitimde günümüzde en yaygın kullanılan araç internet olup internet üzerinden gerçekleşen öğrenme çevrimiçi öğrenme olarak adlandırılmaktadır. Öğrenen ve eğitim içeriği sunumunun farklı zamanlarda olması durumuna göre, çevrimiçi öğrenme eşzamanlı ya da eşzamansız olarak gerçekleşebilir. Öğrenme sürecindeki farklılıklardan biri de öğrenen boyutunda bireysel farklılıklardır. Yaş, cinsiyet, kültür, öğrenme biçimi gibi farklılıklar bireysel farklılıkları oluşturmaktadır. Bu çalışmada, eşzamansız çevrimiçi öğrenme ortamlarından söz edilmiş, bu tür ortamların tasarımında dikkat edilmesi gereken bir etken olarak öğrenme biçimi ele alınmıştır. Alanyazında adı geçen öğrenme biçimi modellerinden en çok kullanılan ve en etkili olanlardan biri olarak kabul edilen kolb'un öğrenme biçimi modeline daha detaylı olarak yer verilmiştir. Çevrimiçi öğrenme ortamlarında önemli bir başka nokta ise ortam zenginliğidir. Ortam zenginliği düzeyinin yüksek olması öğrenmeyi olumlu yönde etkilemektedir. Bu amaçla, çalışma kapsamında iletişim ortamları zenginliği kuramı da incelenmiştir. Sonuç olarak eşzamansız öğrenme ortamlarında öğrenme biçimleri, iletişim ortamları zenginliği kuramı açısından ele alınmış ve yapılacak tasarımlara ilişkin öneriler sunulmuştur.

Abstract

Internet is being used as the most common technology in distance education today and learning through internet is called online learning. Online learning can be in synchronous or asynchronous form depending on being at different time situations in terms of learners and content presentation. Another aspect that makes a difference in learning process is learners' individual differences. Individual differences are the ones such as age, sex, culture, learning style. In this study, asynchronous online learning environments were mentioned and learning style was considered as one of the factors when designing such environments. Kolb's learning style model was given in more detail because of its common use and acceptance in literature. Media richness is another important issue in online learning environments . High level of media richness affects learning positively. Accordingly, media richness theory was also involved in this study. Finally, learning styles in asynchronous environments were examined from the perspective of media richness theory and suggestions for designs were presented.

Anahtar sözcükler: eşzamansız öğrenme ortamları; öğrenme biçimleri; iletişim ortamları zenginliği kuramı

1. GİRİŞ

Teknolojideki gelişmelere paralel olarak eğitim alanındaki uygulamalar da değişmektedir. Yüzyüze eğitimde teknoloji desteği artmaktadır; uzaktan eğitimde ise kullanılan teknoloji ve ortam 'öğrenme türü' olarak anılabilecek düzeyde öğrenme sürecinde önemli ve etkili olmaktadır. Nitekim öğrenmenin elektronik ortamlarda gerçekleştiğini ifade etmek için 'e-öğrenme', mobil cihazlar kullanılarak gerçekleştiğini ifade etmek için 'm-öğrenme' gibi kavramlar yaygın olarak kullanılmaktadır. 2005 yılında 'yüzyılın son çeyreğinin en iyi 25 yeniliği' sıralamasında ilk sırayı alan internet (Massachusetts Teknoloji Enstitüsü, 2005) uzaktan eğitim alanına da hızla girmiştir. İnternet, diğer teknolojilerin sağlayabildiği metin, ses, resim, video ortamlarının tümünü kapsamakta; dolayısıyla çoklu ortam uygulamalarına izin vermektedir. İnternetin öğrenme ortamı olarak kullanılması çevrimiçi öğrenme olarak adlandırılır, e-öğrenme kavramı da çoğu zaman aynı anlamda kullanılmaktadır. İnternetin sağladığı üstünlük ve olanakların optimum şekilde kullanılmasıyla etkili bir öğrenme gerçekleşmesi beklenir. Ancak, öğrenmeyi etkileyen birçok etken ya da etken grubu vardır. Bireysel farklılıklar da bu etken gruplarından biridir. Bireysel bir farklılık olan öğrenme biçimi, etkili öğrenmenin gerçekleşmesi için öğrenme ortamlarının tasarımında dikkate alınması gereken bir etkendir. Öğrenme biçimi, kısaca bireyin öğrenme sürecindeki aşamalara karşı var olan yaklaşımıdır. Bireyler görsel, işitsel, duyusal…vb. algılar açısından farklı duyarlılıklar gösterebilirler. Tümevarımcı ya da tümdengelimci bir zihin işleyişine sahip olabilirler. Benzer şekilde, öğrenme biçimleri ile ilgili yapılan çalışmalarda farklı profiller ileri sürülmüştür. Öğrenme ortamlarında, bireylerin öğrenme sürecini aksatmayacak ve verimli kılacak şekilde öğrenme biçimlerine uygun durumlar sağlanmalı, aynı zamanda zayıf olan yönlerini de geliştirmeye fırsat veren tasarımlar gerçekleştirilmelidir.

Öte yandan, öğrenme sürecinde kullanılacak olan iletişim ortamları ne kadar zenginse bilginin işlenmesi ve anlamanın doğru gerçekleşmesi o kadar olanaklı olacaktır. İletişim ortamının zenginliği; sağlanan geribildirim, ses, mimik gibi göndergeler, sayısal-sözel anlatım dilinin kullanımı ve kişisel duygu ve tepkilere bağlı olarak tanımlanır.

Bu çalışmada, eşzamansız çevrimiçi öğrenme ortamlarında öğrenme biçimleri, iletişim ortamları zenginliği kuramı (media richness theory) açısından incelenerek tasarımda dikkate alınabilecek öneriler geliştirilmiştir.

2. EŞZAMANSIZ ÇEVRİMİÇİ ÖĞRENME ORTAMLARI

İnternetin ortaya çıkışı ve kullanımının yaygınlaşması ile eğitim için de kullanımı söz konusu olmuştur. Kolay ve ucuz erişime, iletişime olanak vermesi, çoklu ortamları desteklemesi gibi üstünlükleri nedeniyle kısa sürede çevrimiçi (e-) öğrenme, uzaktan eğitim uygulamalarında ilk sıraya yükselmiştir.
Özkök (2009), çalışmasında, Walker ve Fraser (2005)'e göre çevrimiçi öğrenme ortamlarının, yüzyüze ve uzaktan öğrenmenin bir araya getirildiği karma öğrenmeden, tamamen çevrimiçi ortamda gerçekleştirilen öğrenme aktivitelerini kapsayan internet-tabanlı uzaktan eğitim ve öğrenme ortamları araştırmalarının birleşimi olduğunu belirtmiştir.
Çevrimiçi öğrenmede, öğrenme materyali internet teknolojileri, televizyon, mobil iletişim araçları gibi elektronik ortamlarda, metin, ses, hareketli video, grafikler, animasyon gibi araçlar kullanılarak dağıtılmaktadır (Gümüş, 2007).
Çevrimiçi öğrenmeyi de kapsayan uzaktan eğitimin genel bir özelliği olarak öğrenme etkinliğinde, öğretici ile öğrenen farklı yer ve/veya farklı zamandadır. Yer ve zaman farklılığı açısından oluşan birleşimlere göre, çevrimiçi öğrenme eşzamanlı ya da eşzamansız olarak gerçekleşebilir. Eşzamanlı çevrimiçi öğrenmede, öğrenme etkinlikleri öğretici ve öğrenenler için aynı zamanda ve farklı yerde gerçekleşirken, eşzamansız çevrimiçi öğrenmede ise farklı zamanda ve farklı yerde gerçekleşir.
Çevrimiçi öğrenmede, özellikle zamandan bağımsızlık sağlayan eşzamansız öğrenme ortamları, öğrenenlere kendi hızlarında öğrenme esnekliği sağlamakta, düşüncelerini daha iyi organize etme ve yansıtmalarına olanak tanımakta ve diğer öğrenenler ile paylaşımlarını artırabilmektedir. Eşzamansız öğrenme e-ders, e-posta, tartışma forumları gibi ortamlarda gerçekleşmektedir. E-ders ile daha çok öğrenme materyali sunulurken, e-posta ile akademik ya da teknik destek verilmekte, tartışma ortamı ile ise ders içeriğiyle ilgili konular tartışılmakta ve öğretici-öğrenen etkileşiminin yanı sıra öğrenen-öğrenen arasında da etkileşim sağlanmış olmaktadır. Öğrenen-içerik arasındaki etkileşim ise, sunulan aynı yapıya rağmen bireylere göre değişiklik gösterebilir. Bunun nedeni bireysel farklılıklar, daha spesifik olarak ise öğrenme biçimleridir.

3. ÖĞRENME BİÇİMLERİ

Öğrenme biçimi, öğrenme sürecinin etkinliğini ve dolayısıyla bireyin başarısını etkileyen bir etkendir. Bireysel bir farklılık olan öğrenme biçimi araştırmacılar tarafından çeşitli şekillerde tanımlanmıştır. Bu tanımlara dayanarak Şimşek (2004), öğrenme biçimini bireyin bilgiyi algılama, işleme, düzenleme ve anlamlandırma konusundaki karakteristik ve tutarlı yaklaşımları olarak özetlemiştir.
Farklı zamanlarda farklı araştırmacılar tarafından çok sayıda öğrenme biçimi modeli geliştirilmiştir. Bu konuda kapsamlı bir çalışma, Newcastle Üniversitesi Öğrenme ve Beceriler Araştırma Merkezi (Learning and Skills Research Centre, Newcastle University) tarafından yapılmış ve '16 Yaş Sonrası Öğrenmede Öğrenme Biçimleri ve Pedagoji' (Coffield v.d., 2004) adıyla raporlaştırılarak 2004 yılında yayınlanmıştır. Sözü edilen çalışmada, öğrenme biçimleri ile ilgili alanyazın taranarak 71 yaklaşıma ulaşılmış, belli kriterlere göre 13 modelin 'etkili' olduğunu belirlenmiş ve etkili olduğu belirlenen modeller (Tablo.1) derinlemesine incelenmiştir.

Tablo 1. Öğrenme biçimi modelleri (Coffield v.d., 2004'ten uyarlama)

Öğrenme Biçimi Modelleri
Allinson and Hayes' Cognitive Styles Index (CSI)
Apter's Motivational Style Profile (MSP)
Dunn and Dunn model and instruments of learning styles
Entwistle's Approaches and Study Skills Inventory for Students (ASSIST)
Gregorc's Mind Styles Model and Style Delineator (GSD)
Herrmann's Brain Dominance Instrument (HBDI)
Honey and Mumford's Learning Styles Questionnaire (LSQ)
Jackson's Learning Styles Profiler (LSP)
Kolb's Learning Style Inventory (LSI)
Myers-Briggs Type Indicator (MBTI)
Riding's Cognitive Styles Analysis (CSA)
Sternberg's Thinking Styles Inventory (TSI)
Vermunt's Inventory of Learning Styles (ILS)

Bu çalışmada, alanyazında yaygın kullanıma sahip olan 'Kolb'un öğrenme biçimi modeli' ele alınmıştır.

3.1. Kolb'un Öğrenme Biçimi Modeli

Kolb'un öğrenme biçimi modeli, öğrenme sürecinde deneyimin önemini vurgulayan "deneyimsel öğrenme kuramı"na (experiental learning theory) dayanır. Öğrenme; somut yaşantının gözlem ve yansıtmaya temel oluşturduğu, bireyin bu gözlemleri bir düşünce, genelleme ya da 'kuram' oluşturmak için kullandığı, bu kuramdan yola çıkarak eyleme geçirilecek yeni uygulamaların çıkarsanabildiği 4 evreli bir döngü şeklinde tanımlanır. Dolayısıyla öğrenenlerin 4 tür yeteneğe sahip olması gerekmektedir: 1) aktif deneyim (active experimentation), 2) yansıtıcı gözlem (reflective observation), 3) soyut kavramsallaştırma (abstract conceptualization), 4) somut yaşantı (concrete experience). Ancak, bir bireyin bu farklı uçlarda yer alan yeteneklerin hepsine birden yüksek derecede sahip olması beklenemez (Kolb, 1981).
Kolb (1981), çoğu kişinin bu yeteneklerden oluşan ve söz konusu yeteneklerden bazılarının diğerlerinden daha baskın olduğu öğrenme biçimleri geliştirdiğini belirtmiştir. Öğrenme biçimlerindeki farklılıkları ölçmek amacıyla 1976'da uyguladığı envanter sonucunda, birbirinden çok farklı durumlar ortaya çıkmış fakat istatistiksel olarak yaygın olan 4 öğrenme biçimi saptanmıştır. Bunlar; Ayrıştıran (Converger), Değiştiren (Diverger) Özümseyen (Assimilator), Yerleştiren (Accommodator) olarak adlandırılmıştır.
Bu sınıflamaya göre her türde ön plana çıkan özellikler şu şekilde özetlenebilir:
*Ayrıştıran*ların baskın öğrenme yetenekleri soyut kavramsallaştırma ve aktif deneyimdir. En güçlü özellikleri, düşüncelerin pratikteki uygulamalarında yatar. Bilgiyi organize ederken tümevarımcıdırlar, insanlardan çok olaylarla ilgilenmeyi tercih ederler. Çoğunlukla fiziksel bilim alanında uzmanlaşma eğilimleri vardır.
*Değiştiren*ler, somut yaşantı ve yansıtıcı gözlem konusunda en iyidir. Hayal güçleri çok kuvvetlidir. Somut durumları birçok perspektiften görebilir ve birçok ilişkiyi anlamlı bir 'gestalt'a dönüştürebilirler. Düşünce üretmede iyidirler. İnsanlarla ilgilidirler ve duygusal olmaya eğilimlidirler.
*Özümseyen*lerin baskın öğrenme yetenekleri soyut kavramsallaştırma ve yansıtıcı gözlemdir. Kuramsal modelleri oluşturmadaki yetenekleri, en güçlü yanlarıdır. Tümdengelimci özellik taşırlar. İnsanlarla ve kuramların uygulamaları ile pek ilgilenmezler, soyut kavramlarla daha ilgilidirler.
*Yerleştiren*ler ise, somut yaşantı ve aktif deneyim konusunda en iyidirler. En güçlü yanları bir şeyleri yapmak, planları, deneyleri uygulamak ve yeni deneyimlerde yer almakta yatar. Diğer kişilere göre daha risk-alıcıdırlar. Koşulların hızlı değişmesine uyum sağlamada üstündürler.

Bireylerin öğrenme biçimleri açısından farklılık göstermesi, her bir bireyin etkili bir öğrenme gerçekleştirmesini sağlamak amacıyla öğrenme ortamlarının tasarımında dikkate alınmalıdır. Ortamların özelliklerinden kaynaklanan bazı üstünlük ve sınırlılıkları söz konusudur. Bilginin niteliğine göre, hangi ortamın ya da ortamların öğrenme sürecini nasıl etkileyeceği göz önünde bulundurulmalıdır. İletişim ortamları zenginliği kuramı, bu noktada ortam zenginliğine ilişkin kriterler sunarak değerlendirme konusunda yol göstermektedir.

4. İLETİŞİM ORTAMLARI ZENGİNLİĞİ KURAMI

Daft ve diğerleri (1987), örgüt kuramı ve örgütsel iletişim alanındaki araştırmaların bilgi işlemeyi etkileyen iki kavramı ortaya çıkardığından söz etmiştir; belirsizlik (uncertainty) ve çok anlamlılık (equivocality). 'Belirsizlik', bilginin yokluğundan kaynaklanmakta iken 'çok anlamlılık', birden fazla birbiri ile çelişen bilginin varlığı anlamına gelmektedir. Bilgi miktarı ile belirsizlik ters orantılıdır. Bilgiyi elde etme ve verileri analiz etme yoluyla belirsizlik giderilebilir. Bunun için periyodik raporlar, kurallar ve prosedürler ya da grup toplantıları kullanılabilir. Çok anlamlılık ise muğlaklığı ifade eder; çoğu zaman karmaşa, aynı fikirde olmama, anlayış yoksunluğu anlamına gelir. Bilgi elde etmek zordur; bunun için hangi soruların sorulması gerektiği net olmayabileceği gibi, bir cevap sağlayabilecek nesnel veriler de yoktur. Çok anlamlılıkla başa çıkabilmek önsezi, tartışma ve sosyal destek gerektirmektedir.

Kurama göre, 'zengin' ortamlar muğlak ve çok anlamlılığın söz konusu olduğu durumların daha çabuk ve daha iyi anlaşılmasına olanak sağlayacak ve dolayısıyla bu konuda performansı artıracaktır. Bunun aksine, daha 'yalın' ortamlar ise çok anlamlılığın olmadığı durumlar için daha uygundur; çünkü zengin ortamlar çok fazla bilgi ve gereğinden fazla mesaj içerebilir. İletişim ortamları zenginliği kuramı, yapılan ilk araştırmalarda aksi uygulansa da ortam seçimi ile ilgili değildir, her bir ortamın hangi durumda en etkili olduğunu tartışır. (Dennis & Kinney, 1998).

İletişim ortamlarının çok anlamlılığın önüne geçebileceğini ve bu açıdan farklı kapasitelere sahip olduğunu belirten Daft ve diğerleri (1987), 'paylaşılan anlam'ı sağlama kapasitesini 'zenginlik' olarak nitelemiştir. İletişim ortamları zenginlik bakımından düşük ya da yüksek olarak sınıflandırılabilir. Bir iletişim ortamının zenginliği 4 kritere bağlı olarak açıklanmaktadır (Daft v.d., 1987): 1) geribildirim, 2) çoklu göndergeler, 3) dil değişkenliği ve 4) kişisel odak.

Geribildirim: Anında geribildirim, soruların sorulmasına ve düzeltmelerin yapılmasına olanak verir.

Çoklu göndergeler: Mesajın fiziksel bulunuş, ses tonlaması, beden dili ve jestler, sözcükler, sayılar ve grafik sembolleri içerebilen bir parçasıdır.

Dil değişkenliği: Sayılar ve sözcükler gibi dil sembolleri ile ifade edilebilen anlam aralığıdır.

Kişisel odak: Kişisel duygu ve coşkular iletişime katıldığında mesaj daha iyi ifade edilebilecektir.

Bu bağlamda sınıflandırılan iletişim ortamları içinde yüzyüze ortam, en zengin olarak değerlendirilmektedir. İzleyen ortamlar, telefon, yazılı adresli dokümanlar (mektup vb.) ve adressiz dokümanlardır (bülten vb.). Yüzyüze ortam, anında geribildirim sağlamakta, aynı zamanda beden dili ve ses tonu sayesinde çoklu göndergeler de sağlamaktadır ve mesaj içeriği doğal dilde ifade edilmiş olmaktadır. Telefon konuşmaları sözcükler, vurgu ve sessizlik gibi sözel göndergelere izin verse de beden dili ve görsel göndergeleri aktaramaz (Sun & Cheng, 2007). Yazılı dokümanlarda geribildirim yavaştır, sesli gönderge yoktur ve görsel gönderge sınırlıdır (Daft v.d., 1987). Daft ve diğerleri (1987)'nin yaptığı bu sınıflamadan sonra yeni ortamları da bu sınıflamaya dahil etmek amacıyla çalışmalar yapılmış ve yapılmaktadır.

Ortamların zenginlik derecesi ile birlikte bireylerin öğrenme biçimlerine göre bir yaklaşım sunulan bu çalışmada, tasarım aşamasında kullanılabilecek öneriler geliştirilmiştir.

5. ÖĞRENME BİÇİMLERİNE GÖRE ZENGİN ÖĞRENME ORTAMI TASARIMI İÇİN ÖNERİLER

Önceki bölümde de belirtildiği gibi, zengin ortamlar çoğunlukla çok anlamlılığın söz konusu olabileceği durumlar için daha uygundur. Yoruma dayalı, göreceli, tartışmaya açık konularda zengin ortam kullanılmalıdır; fakat belli verilerle belli enformasyonun sağlanacağı ortamlar daha yalın tasarlanmalıdır. Bu çalışmada, Tablo 2'de verilen öneriler, bireylerin öğrenme biçimleri ile paralel doğrultuda hazırlanmış olup temel içeriğin kavranması aşamasında uygulanması tavsiye edilmektedir. İçerikle ilgili ek uygulamalarda belli oranlarda farklı yaklaşımların kullanılması, bireylerin zayıf yanlarını geliştirmeleri konusunda yarar sağlayacaktır. Böylece, öğrenme döngüsünü oluşturan dört evreye ait yeteneklerini geliştiren bireyler daha iyi öğreneceklerdir. Sunulan önerilerin (Tablo.2) içeriğin özelliğine göre uyarlanarak ve geliştirilerek kullanılması daha etkili sonuçlar alınmasını sağlayacaktır.

Tablo 2. Öğrenme biçimlerine göre zengin öğrenme ortamı tasarımı için öneriler

Öğrenme Biçimleri / **Zenginlik Kriterleri**	**Ayrıştıran**	**Değiştiren**	**Özümseyen**	**Yerleştiren**
Geribildirim	Pratikteki uygulamalardan örnekler kullanma	Düşünce üretmeyi sağlayacak (gerektiğinde ipucu vererek) soruya soruyla karşılık verme	Soyut kavramlar kullanarak, kuramlarla açıklama yapma	Etkileşimli uygulama yaparak sonuçları görmesine izin verme

Çoklu göndergeler	Metin ya da ses ile günlük hayattan ilginç örnek olaylar sunma	Resim, video (ve ses) ile örnek olay sunma. Duygusal ifadeleri yansıtan sunucu görüntüsü kullanma	Metin ya da ses ile kuramsal anlatma	Etkileşimli seçenekli uygulamalar yaptırma, ses ve sunucu videosu ile tepki gönderme
Dil değişkenliği	(Sayı ve sözcüklerin dengelendiği anlatım kullanma)	Sayısal sembolleri ağırlıklı kullanma	(Sayı ve sözcüklerin dengelendiği anlatım kullanma)	Sayısal sembolleri ağırlıklı kullanma
Kişisel odaklılık	(Kullanılan sözcükleri özenle seçme)	Duygusal tepkileri görüntülü ya da sesli gönderme	Kullanılan sözcükleri özenle seçme	Duygusal tepkileri görüntülü ya da sesli gönderme ağırlıklı olmak üzere kullanılan sözcük seçimine dikkat etme

6. SONUÇ

Çevrimiçi öğrenme, zamanla daha da yaygın olarak kullanılan bir öğrenme şeklidir. Eşzamansız çevrimiçi öğrenmede bireyler, öğrenme materyallerine istedikleri zaman ya da diğer öğrenme şekillerine kıyasla daha esnek zaman dilimleri içerisinde ulaşmak durumundadırlar. Bu nedenle eşzamansız öğrenme ortamları çok daha fazla bireyin tercih nedeni olmaktadır. İnternetin çoklu ortamı desteklemesi, zengin öğrenme ortamlarının geliştirilmesi açısından fırsatlar sunmaktadır.

Diğer taraftan öğrenmenin etkili bir biçimde gerçekleşebilmesi için öğrenme sürecini etkileyen diğer etkenler de göz önünde bulundurulmalıdır. Bu noktada, bireylerin öğrenme biçimlerindeki farklılık önem taşıyan bir konudur. Öğrenme sürecinde verimin sağlanması için bireylerin öğrenme biçimlerine uygun tasarımlar yapılmalıdır. Uzun vadede bireyin öğrenmesine katkıda bulunmak için ise, zayıf olduğu yeteneklerini geliştirmesine izin verecek uygulamalara da yer verilmelidir.

İletişim ortamları zenginliği kuramı, koşullara göre en etkili ortamın sağlanması için bir çerçeve sunmaktadır. Eşzamansız çevrimiçi öğrenme ortamlarının tasarımında ortam zenginliğini belirleyen kriterler içeriğe uygun olarak dikkate alınmalıdır.

Bu çalışmada, eşzamansız çevrimiçi öğrenme ortamlarında öğrenme biçimlerine iletişim ortamları zenginliği kuramı açısından bir yaklaşım öne sürülmüş, buna dayanarak tasarımda dikkate alınabilecek öneriler geliştirilmiştir. Eşzamansız çevrimiçi öğrenme tasarımcıları ile konu uzmanları işbirliği içinde sözü edilen gereksinimlere cevap verecek etkili öğrenme ortamları tasarlamalıdırlar.

İleriki çalışmalarda, öğrenme ortamlarının tasarımında kişilik, yetenek, inançlar, cinsiyet, motivasyon unsurları gibi diğer etkenler de göz önünde bulundurularak öneriler geliştirilebilir.

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E-TAJ: AN E-LEARNING SYSTEM FOR TAJWEED

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Recitation of the Holy Quran is governed by a variety of rules called "Tajweed rules" (Correct pronunciation of the Holy Quran) (Habash, 1986). Reciting the Holy Quran in the appropriate way is very important for all Muslims and is indispensable in Islamic worshiping such as prayers. It is quit different from the reading of a normal Arabic text due to the pronunciation rules that have to be respected during the recitation. As an example, consider the duration of vowels that may vary from 2 to 6 times that of a single consonant depending on the context. In deed, there are two kinds of vowels in the Arabic language, short vowels which are keystrokes placed either above or below the preceding consonant and long vowels which denotes a certain repeation of short vowels. There are also other tajweed rules related to:

a) types of nasalization (called "ghunna"),
b) heaviness and lightness (called "tafkheem" and "tarqeeq"), which means making some sounds emphatic or non-emphatic,
c) types of stops which means making a voiceless break at a Quranic word for a brief moment (called "waqf"),
d) degrees of vibrations or unrest (called "qalqalah") which means producing the voiced stop consonants with a schwa-like sound at the end,
e) etc.

To preserve the Holy Quran from any alteration in its pronunciation and then to guarantee its perfect reading, early Muslim scholars described Quranic recitation methods very accurately by textual rules as well as sound ones. These descriptions are classified into categories depending on some sound properties or features. They are often summarized as (www.qurancomplex.org):

a) "Noon sakina" and "Tanween", which means
b) "Meem sakina"
c) "Qlaqala"
d) "Tafkheem" and "Tarqeeq"
e) Etc.

Teaching how to apply Tajweed rules during Quranic recitation was transmitted, since its revelation to the prophet (PBUH), orally from teachers to learners throughout generations. Such method has been considered as the only way to learn tajweed until the twenteenth century, where technology produced recording systems and electronic devices that are able to keep both text and sound of the Quran with tajweed rules. With the new era of computers, it becomes possible to automatically learn Tajweed, but this need an appropriate description of these rules. To the best of our knowledge, there was no attempt to describe them by a scientific algorithm which could be processed automatically by a machine. This was a conclusion from a large survey we conducted on the Quranic software currently available on the market (Elhadj & Alsughayeir, 2005; Alsughayeir & Elhadj, 2006).

As a part of our work on a project for learning the Holy Quran and its sciences (Computerized teaching of the Holy Quran "CTHQ") (Alghamdi et al, 2007; Alsughayeir & Ohali, 2007; Alsughayeir et al, 2009; Elhadj et al, 2009a; Elhadj et al, 2009b; Elhadj et al, 2009c; Elhadj, 2010a; Elhadj et al, 2010b), we developed a mathematical formulation of tajweed rules that can be easily processed by a machine. For instance, in the category of "Noon Sakina" and "Tanwin" if any letter "Noon Sakina" or diascritic "Tanwin" appears at the end of a word followed by any of the following characters "ي م ر ل ون" then the 2 letters should be assimilated. Moreover, this category is subdivided into two sections where the assimilation could be with "Ghunnah" (a sound effect) or without when the letter is followed respectively by "ي م ون" or "ر ل". This textual description of rules could be transformed into machine readable rules as follows (see the table below):

a) "C" means the character treated and "S" its diacritic
b) "C+1" or "C-1" represent respectively the character (or characters separated by a comma) immediately following (rep. preceding) the character treated.
c) And in the same way we define "C+2", "C+3",… or "C-2", "C-3",… according to the extent of the rule.
d) "*" is used as a wildcard character to replace any letter or diacritic.
e) "Space" represents a space character.
f) "Text" is human comprehensible message to be displayed to the user if needed.
g) And finally the "Ruling" of the rule.

Table 1: Rules describing a couple of cases of assimilation with Ghunnah.

C = * ; S = ً ;	C = ن ; S = ً ;
C + 1 = Space ; S = * ;	C + 1 = Space ; S = * ;
C + 2 = ي,و,م,ن ; S = * ;	C + 2 = ي,و,م,ن ; S = * ;
Text = يُدغم التنوين بغنة في حروف(ي،و،م،ن)	Text = تدغم النون الساكنة بغنة في حروف (ي،و،م،ن)
Ruling = IdghamRhonna	Ruling = IdghamRhonna
(*Table 1.A*)	(*Table 1.B*)

C = م ; S = ْ ;	C - 1 = * ; S = ْ ;
C + 1 = Space ; S = * ;	C = ا ى ; S = * ;

C + 2 = م ; S = * ; Text = تُدغم الميم في الميم إدغامًا شفويا بغنة Ruling = IdghamRhonna

(*Table 1.C*)

C + 1 = Space ; S = * ; C + 2 = ي,و,م,ن ; S = * ; Text = يُدغم التنوين بغنة في حروف(ي،و،م،ن) Ruling = IdghamRhonna

(*Table 1.D*)

Table 1.A (resp. Table 1.B) describes a rule stating that if any character with a "tanwin" diacritic (resp. a "Noon" character with "Sakin" diacritic) at the end of a word followed by a word starting by any of "ون م ي" letters then there is assimilation with Ghunnah. Table 1.D describes a special case of the rule in Table 1.B where "tanwin" is followed by a "lenghthening". Finally, Table 1.C deals with a "Meem" character with "Sakin" diacritic as last letter in a word followed by "Meem" character with any diacritic as first letter in the next word and where the ruling is the same as previously.

Using this technique of writing "tajweed" rules, we finished describing those of 5 most important categories (or chapters): "Al Mad" (lengthening), "qalqala" (unrest), "Noon Sakina" and "Tanwin", "Meem Sakina", and "Raa". The last three categories are subdivided into two or three big sub-categories for a total number of more than one hundred rules.

In this paper, we will discuss how this kind of formulation was proposed and how it was programmed in an efficient plug-in engine. The development of an e-learning system for tajweed rules that uses this engine will also be presented.

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EVALUATION OF THE FEASIBILITY OF 'SEEING WITH SOUND SYSTEM (SWSS)' DEVELOPED FOR THE EDUCATION OF THE VISUALLY IMPAIRED STUDENTS

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Abstract

Various practices that could ease the daily life and support the educational needs of visually impaired people were developed by means of the technology. One of the recent applications is providing the vision of the images for the visually impaired people through the sound signals that transmit the mental imageries of the images. The main purpose of the present study is to introduce a software program, namely "seeing with sound system (swss)", which was developed for the education of the visually impaired students and share its feasibility results that conducted with 10 visually impaired primary school students. Throughout the feasibility study, the participants were trained on how to use the software within the framework of action research design and at the end of the training process, they were asked to verbalize the locations and figures of 10 randomly selected two-dimensional objects. It is observed that, the use of the software - seeing with sound system- in the education of the visually impaired students reached almost 85 % of achievement in terms of the participants' success in verbally visualizing the objects. The findings of the feasibility study were analyzed quantitatively and additional supports for the feasibility of the software were obtained.

INTRODUCTION

Generally, learning of individuals is formed through what they have acquired from their environments with their sensations. By means of sensorial organs, individuals get the information about their surroundings, interpret it, make sense out of it and consequently form the new knowledge. It is clear that dysfunction in any of the sensorial organs might impede the learning of individuals (Tüfekçioğlu, 2003). Although each sensorial organ plays important role in forming individuals' learning, the eye is assumed as the most important sensorial organ in learning as long as it provides wealthy sensations (Ataman, 2003). The fact that there are more transmitting neurons for visualization and more visual fields in the brain than that of other sensational organs, is the physiological evidence of the eye's role in the learning process of individuals (Crick, 2000). Human beings use their visual sensations in learning if they do not have any visual dysfunction. However, eyes can come across various hazards easily. Therefore, loss of sight or dysfunction in visualization might be a frequently observed phenomenon (Ataman, 2003). A study conducted by World Health Organization (WHO) revealed that there are roughly 37 million visually impaired people in all over the world (WHO, 2004). According to this data, it can be claimed that developing some equipments and techniques to ease the daily life and education of visually impaired people is very crucial.

Today, various instruments such as embossed writing systems, specifically designed apparatus with sound functions, book readers, software and hardware that enlarge the frame width on the screen, text vocalizer software for the computers, or screens with embossed features are developed for and used by visually impaired people. Nowadays, there are some initiatives that intend to transform visual features into audio signals along with the developments in computer technologies. These initiatives might be limited to the frames of images on the computer screens or real images (Meijer, 2007). Nevertheless, although they have great potentials, it is considered that studies related to visualizing the objects with sound were not successful enough as it was desired (Matta, 2004). Therefore, it is obvious that every attempt or technique to contribute to the studies related to seeing the objects with sounds might be very helpful for the visually impaired people to ease their daily life as well as their education. Such practices might be very contributive especially when the visual elements have important role in learning. In this respect, a 'seeing with sound' software, which supposed to help visually impaired individuals visualize two-dimensional objects, was developed and its operational principles were established through an action research in 2009 (Kuzu and Şahin, 2009). The present study attempts to advance Kuzu and Şahin's (2009) study to a further step and evaluate its feasibility in terms of its accomplishment in providing visualization the objects with sounds for visually impaired individuals.

SEEING WITH SOUND SOFTWARE (SWSS)

The SWSS enables drawing the shapes of two-dimensional objects as well as it vocalizes the features of the drawn objects such as their location, form, length and width. The SWSS describes the objects as vector graphics, not as pixel patterns. Accordingly, this program records the geometric parameters of the objects such as their center points, radius, or side lengths instead of recording each pixel pattern of the objects. Hence, the shape, location and the width of each object on the screen could be transformed into sound system easily. The software computes the vertical width of the objects and transfers the data into frequency modulation that might be claimed inversely proportional value that was computed before. For instance, while the program generates a low-frequency sound when there is a thick vertical plane, it generates a high-frequency sound when there is a thin vertical plane on the top-down scanned object. Since the top-down scanning of the objects is time depended, the height of the objects were also visualized indirectly. The horizontal locations of the objects are visualized through adjustments in the sound levels of the two sound channels. Accordingly, a high magnitude level sound is generated from the sound channel, which is close to the objects, whereas, a low magnitude level sound is generated from the sound channel, which is far from the objects.

The SWSS utilizes predetermined visual-sound transformation functions in order to transform the visual data into sound codes (Kuzu and Şahin, 2009). Accordingly, the functions were defined as follows:

G: Magnitude;
F: Frequency;
X: The distance (in pixel) of the object, that will be visualized through sound, to the border of the source of the sound.
Y: The width (in pixel) of the edges of top-down scanned object that will be visualized through sound.
G=5X and F=1200-5X

Additionally, a 25-millisecond standby time is used for each pixel while top-down scanning the object.

SWSS, of which the operational functions described above, was designed as uncomplicated, functional and flexible software. It has various tools, which enable to draw and display the vectorial shapes of the two-dimensional objects, as well as flexible adjustment options, which enable visualization of the objects via sounds. The screenshot of the software, which has a simple interface, is given in Figure 1.

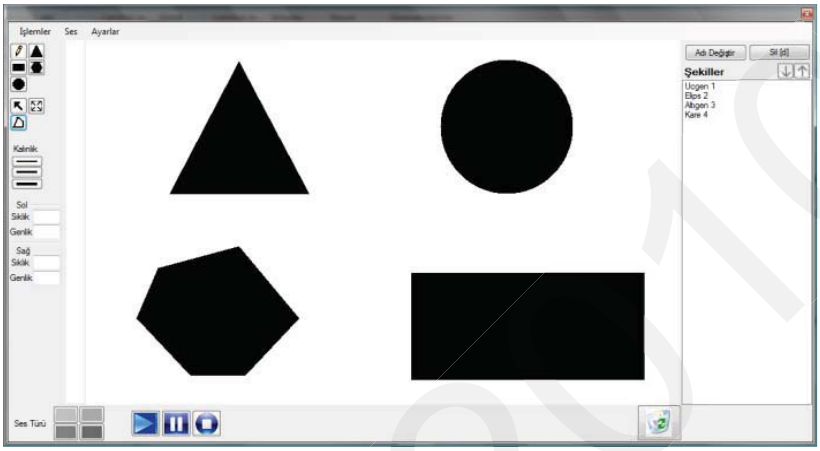

Figure 1. *The interface of the SWSS*

Since SWSS enable to deform the drawn images, drawing of complicated images, as it was illustrated in Figure 2, and visualization of those complicated images via sounds can be possible. However, the geometric modeling of these images was limited to the figures of triangle, circle and square.

Figure 2. *A picture drawn by seeing with sounds software*

The pictures drawn by means of the SWSS can be saved as a document in the computer and they can be accessed whenever it is needed. The visual-sound transformation functions and standby time of the software can be adjusted by a menu embedded in the program.

The software focuses on the top of each drawn image and scans it through top down order. During this scanning process, the standby time on each pixel is determined through a variable called pixel standby time. When it comes close to the image that will be visualized via sounds, the software starts to calculate the width of each pixel parameter and generate the sound frequency concerning the vertical section through its associated function. As it was explained before, location of horizontal sections defines the magnitude value that will be generated in each channel and this process maintains until the whole scan of the image is completed. The same process is repeated until all of the drawn images are transformed into sound forms. Meanwhile, if there is any image, which will be excluded from sound transformation, it could be deactivated by means of an interface in the program.

Although there are a number of applications, which were developed for the use of visually impaired individuals in terms of taking advantage of visual materials, these applications have some limitations in general. For instance, either such applications require too expensive hardware to afford or they are not effective as they are supposed to be. Therefore, it is essential to develop and experiment applications such as SWSS, which could be produced in low prices and which could be utilized in the education processes of visually impaired individuals.

PURPOSE

The purpose of the present study is to evaluate the feasibility of SWSS in terms of its success in visualizing the images through sounds in various dimensions. With reference to this purpose, the present study sought answers for the following questions;

1. To what extent does default setting of SWSS successful in visualizing the fundamental shapes through sounds?
2. What is the average training time for the accurate visualization of the location and forms of the geometrical shapes?
3. To what extend does the size of the images contribute to the accomplishment of visualization?
4. To what extend does the location of the images contribute to the accomplishment of visualization?
5. To what extend does the individual differences effect the accomplishment of visualization?

METHODOLOGY

Method and Participants

The present study was conducted as an experimental study. Since availability of visually impaired students in primary school level is a challenge and since the research process is a time-consuming and hard process, availability sampling technique was employed in sample selection procedures of the present study. The participants of the present study were 10 visually impaired students in primary school level. The participants are accessed by the help of the database of Eskisehir GORSEM (Solidarity foundation for visually impaired people) and Ankara Mithat Enç visually impaired primary school. The ages of the participants ranged between 10 to 15 years. Participants do not have any other handicaps except being visually impaired. The study was held at GORSEM with six of the participants, at Ankara Mithat Enç visually impaired primary school with three of the participants and at the home of one of the participants in Sögüt district of Eskişehir.

Data Gathering Instruments

The data of the present study was gathered through "seeing with sound" software. Observational data were gathered by means of audio/video recorders and the quantitative data were gathered through data gathering forms that were developed for the present study.

Procedure

In order to evaluate the feasibility of the SWSS, the participants were given an achievement test subsequent to a training session related to the use of the software. The training session, which intends to define the location, shape and size of the geometric figures (images), was organized concerning the views of four experts, two of which were expert in information technologies and two of which were experts in the education of visually impaired students. The participants' training sessions were structured as 120-minute training sessions. Subsequent to the training sessions, participants were asked to define randomly selected 10 geometric figures with varying locations and shapes as achievement test. The duration of the achievement test was adapted concerning the pace of the participants; however, the time allocated for this test, which was 120 minutes, was not exceeded. The locations and shapes of the geometric figures that were used in the achievement test were illustrated in Figure 3 (Note: Since geometric figures 1 and 5 are located at the same place, they were illustrated with different colors in the Figure 3).

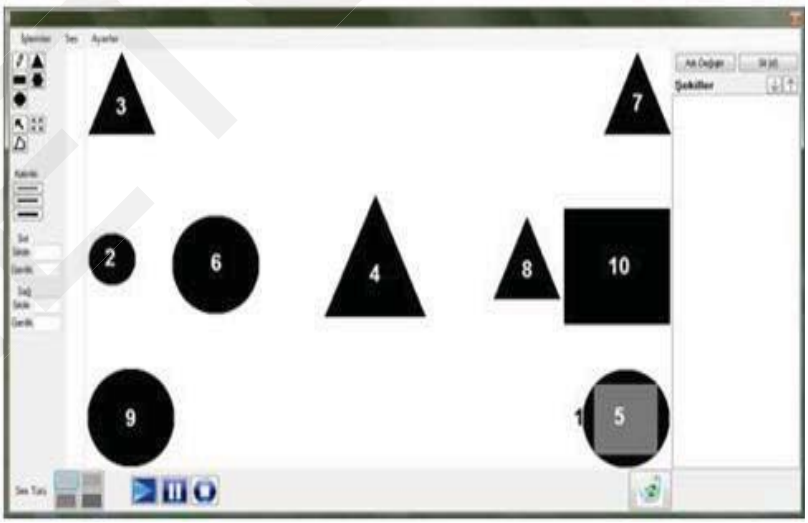

Figure 3. *The locations and shapes of the geometric figures used in the achievement test.*

The grading of the achievement test was organized with reference to the views of experts in the field and accurate visualization of each figure by the participants was graded. Accordingly, if the participant locates the horizontal position of the object accurately, s/he was given 3 points; if the participant locates the vertical position of the object accurately, s/he was given 2 points; 3 points were given for the accurate description of the objects; and 2 points were given for the accurate definition of the size of the objects. The total grades of the participants were calculated when the participants have listened to the description of previously determined and randomly selected 10 objects through SWSS and described (visualized)

them verbally. Consequently, with reference to the views of the experts, the participants were assumed as successful if they got 70 or over grades in the achievement test.

FINDINGS AND DISCUSSION

The data related to the duration of the training, duration of the achievement tests and the achievement tests scores that were obtained through analysis of video recordings, audio recordings and other quantitative data gathering forms were illustrated in Table 1.

Table 1. *Total training durations and achievement test scores of the participants*

Participants	Training Duration	Assessment Duration	Achievement Test Scores
Participant 1	35 minutes	13 minutes	98
Participant 2	111 minutes	14 minutes	79
Participant 3	56 minutes	8 minutes	100
Participant 4	70 minutes	12 minutes	85
Participant 5	75 minutes	9 minutes	88
Participant 6	45 minutes	14 minutes	91
Participant 7	51 minutes	14 minutes	84
Participant 8	38 minutes	12 minutes	76
Participant 9	36 minutes	10 minutes	80
Participant 10	58 minutes	8 minutes	71

As it is seen in Table 1, duration of the training of the participants range between 35 minutes (minimum) to 111 minutes (maximum). The mean ($\bar{X}_{es}$) of the training duration is 57.50 minutes. The reason behind getting a higher standard deviation (S_{es} = 23.27) in the duration of the training might be resulted due to the need of a participant to spend extra time (111 minutes) for the training process than the other participants. If the data obtained from this participant was assumed as an extreme value and excluded from the analysis of the data, the mean score for the training duration becomes 51.56 minutes, whereas the standard deviation becomes 14.55 minutes. With reference to findings of the present study and regarding the fact that SWSS was unfamiliar to the subjects and since participants got its training for the first time, it could be claimed that the average duration for the training process to establish the standards for SWSS is 60 minutes. Nevertheless, although it was paid attention to spend the same amount of time for the training sessions for all of the participants, the difference in their learning times, the difference in their scores in achievement tests as well as the fact that there is not any significant relation between achievement test scores of participants and their training duration lead the researchers to consider the individual differences as an important factor which have strong effects on the accomplishment of SWSS.

All of the participants were successful in the achievement test that they took after they got familiar with SWSS. The lowest score that the participants get from the achievement test was 71/100. The mean ($\bar{X}_b$) of the achievement scores is 85.70. When the participants' scores were compared with the standards that defined by the experts in the field and other assessment and evaluation criteria, it can be claimed that all of the participants achieved the desired success level. Accordingly, this success level revealed that SWSS could be used with its default settings. The default setting of the software was as follows;

G: Magnitude;
F: Frequency;
X: The distance (in pixel) of the object, that will be visualized through sound, to the border of the source of the sound.
Y: The width (in pixel) of the edges of top-down scanned object that will be visualized through sound.

$$G=5X$$
$$F=1200-5X$$

Additionally, it can be claimed that a 25-millisecond standby time for each pixel can be used while top-down scanning the objects.

The participants could get utmost 20 points for each of their correct responses in the exam questions asking the vertical location and size of the objects, whereas, they could get utmost 30 points for each of their correct responses in the exam questions asking the horizontal location, shape and size of the objects. The mean scores and standard deviations of achievements of participants with reference to their ability to visualize the vertical location of the objects, the horizontal location of the objects and describing shape and size of the objects are illustrated in Table 2.

Table 2. *Descriptive statistics related to visualization of vertical location, horizontal location, shape and size of the objects*

	N	$\bar{X}$	S
Vertical	10	19.60	.84
Horizontal	10	25.80	3.52
Shape	10	24.60	5.62
Size	10	15.20	2.35

Since the data related to participants' visualization of vertical location, horizontal location, shape and size of the objects were gathered through different metrical measures, it was rather difficult to make a meaningful comparison of the means and standard deviations of the participants' scores related to these four data sets. In this case, instead of using standard deviations, a coefficient of variation, which is defined as the standard deviation divided by the mean, multiplied by 100 percent (CV = (S / $\bar{X}$) *100), could be used in such estimations (Arıcı, 2001; Özdamar, 2004). The coefficient of variation gives insight into the quantity of the variations between the measurements (Köklü, Büyüköztürk ve Çokluk Bökeoğlu, 2006). In the within groups comparisons, the group which has lowest coefficient of variation is considered as more homogeneous than the group which has higher coefficient of variation. The means, standard deviations and the coefficient of variations of four data sets are illustrated in Table 3. Accordingly, participants have the lowest coefficient of variations in the vertical location of the objects. Similarly, the participants' mean scores of vertical location of the objects are the highest among others. With reference to the findings, it can be claimed that participants have a very high homogeneity in terms of vertical location of the objects, thus, it can also be claimed that the vertical location of the objects is the easiest factor for participants when it is compared to other factors. Accordingly, this finding indicated that the standby time (25 ms) that was used for each pixel while

top-down scanning the objects is an adequate standby time. Horizontal location of the objects is in the second rank in terms of the group homogeneity (V = 13.64). It is followed by the description of size of the objects (V = 15.46). The highest change in the achievement of the participants is seen in the description of the shape of the objects (V = 22.85). This finding revealed that participants have differing achievement scores in the description of the shape of the objects, that is, participants have difficulty in describing the shapes of the objects. Consequently, it can be claimed that participants were less successful in the description of the shape of the objects than the other variables/factors.

Table 3. *The coefficient of variations related to visualization of vertical location, horizontal location, shape and size of the objects*

	N	$\bar{X}$	S	CV
Vertical	10	19.60	.84	**4.29**
Horizontal	10	25.80	3.52	**13.64**
Shape	10	15.20	2.35	**15.46**
Size	10	24.60	5.62	**22.85**

Scores of the participants with reference to each question in the achievement test and the mean/average scores of the questions are shown in Table 4.

Table 4. *Scores of the participants with reference to each question in the achievement test*

Questions	**Participants**										**Average Score**
	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10	
1	10	8	10	10	10	10	**10**	**10**	**10**	7	9,5
2	10	7	10	10	10	**10**	10	**7**	**10**	5	8,9
3	10	7	10	10	10	8	8	**5**	**8**	5	8,1
4	10	7	10	8	10	**10**	**10**	**10**	7	10	9,2
5	10	10	10	0	8	**8**	**5**	10	10	7	7,8
6	10	10	10	10	7	**10**	**7**	**10**	10	7	9,1
7	8	8	10	10	7	**10**	**10**	5	10	8	8,6
8	10	2	10	7	8	**10**	**4**	5	5	2	6,3
9	10	10	10	**10**	8	8	10	10	0	10	8,6
10	10	10	10	10	10	7	10	5	10	10	9,2

As it was illustrated in Table 4, the participants were obviously less successful in giving accurate responses to the fifth and eighth questions in the achievement test. When the features of the objects in these questions were scrutinized, it was found that their sizes were smaller than the other objects. Similarly, participants were less successful in giving accurate responses to the third question in the achievement test; thus, it was observed that its reason was originated from the same problem mentioned in the fifth and eighth questions. It is also observed that the sizes of the most of the objects (75 %) were bigger in the first, fourth, sixth and tenth questions in which participants get a higher-level achievements. These findings indicated that the visualization of the location and shape of the smaller objects by the visually impaired students is rather difficult than the visualization of the location and shape of the bigger objects.

RESULTS AND IMPLICATIONS

The findings of the present study revealed that the default setting of the SWSS was successful enough both in terms of its ease in use and in terms of its feasibility in visualization of the location and shapes of the fundamental geometric figures. Additionally, it was found that the training duration, which was performed prior to use of the software, requires a reasonable time span, hence, this feature could be assumed as encouraging side of the software. Nevertheless, it should be noted that the achievement test was given to the participants just following the training process. Further studies, which will employ SWSS, might use a delay time between the training process and achievement test, thus, forthcoming studies might examine the retention of the achievement that obtained after the training process. Moreover, in order to obtain more successful results in the accomplishment of SWSS, it is worth to examine its feasibility with different frequency/magnitude alteration functions and with different standby times that was used for each pixel while top-down scanning the object. It is hoped that further studies on the efficacy and usability of SWSS in the education of visually impaired students might also contribute to the growing body of the related literature.

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EXAMINING ATTITUDES OF TOWARD E-LEARNING: A CASE STUDY OF THE ATATÜRK TEACHER ACADEMY IN NORTH CYPRUS

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Abstract
The aim of this research is to determine the level of attitude aimed at e-learning of atatürk teacher academy students'and if there is one to determine the difference of socio- demographic character.

It has been chosen in atatürk teacher academy students' as a universal study type.as a sample with a goal method 65% (n=65) female and 35% (n=35) male in a number of 100 atatürk teacher academy students' have been included in this research. As a data collecting go-between dedeveloped by dikbaş (2006) and cronbach alpha trusted coefficient .87 has been used in e-learning as a attitude measure. In the analysis of data, t-test and anova analysis techniques are used. The significance level is .05.

As a result of the research, attitudes of candidate teachers of atatürk teacher academy towards e-learning differentiate in terms of gender, having personal computer, using computer at home or at school; and their attitudes towards e-learning was determined as "mid" level.

Key words: e-learning, attitude, atatürk teacher academy students', north cyprus

INTRODUCTION

E-learning that is so popular today expresses internet based learning (Wang 2000:2). In the study Oral (1994) analyzed whether there are difference among teachers' thoughts about "Computer Assisted Learning" application and as according to the results of the study teachers, who can use computer thought "Computer Assisted Learning" helps students, support this idea the most and teachers who cannot use computer thought "Computer Assisted Learning" helps students, support the least. In other words, teachers who can use computer prove characteristics that are accepted as advantage for students in "Computer Assisted Learning" application more than teachers who cannot use the computer and they do not prove characteristics that are accepted as disadvantages.

In the study that was held by Kılıçoglu and Altun (2002) on 1303 secondary school students, they indicated that students who had get computer training have higher attitude towards "Computer Assisted Learning" than students who had not got training on computer in advance.

In his study that Francis (1993) held with 378 first grade university students, he could not find any differences between male and female students attitude towards the computer.

On the other hand, in the studies that were held by Mussoud (1991) and Aksoy (1989) data that was handled was not consistent. In his study Mussoud (1991) found meaningful difference in favor of males in the attitudes of males and females towards the computer.

In the study of Akkoyunlu (1996) that was held on 204 trainer specialists, it was found that computer experience decreases computer anxiety and it affects positively them in loving computer, trust on computer and its benefits.

Training managers and teachers who have the vital role in application of new technologies is as important as equipping education organizations with technological facilities. Meeting with technology is not enough for ones who are going to apply these technologies. It is required that teaching techniques should be gained to teachers who prepare training activities by using technology and new teaching techniques (Percival and Ellington, 1988).

It is thought that this study will contribute academicians who study on this subject, curriculum constructivists, and trainers in national education.

Purpose of the Research

The aim of this research is to determine the level of attitude towards e-learning of candidate teachers of Atatürk Teacher Academy and analyze them in terms of socio-demographic characteristics.

The Statement of the Problem

The question of the research was expressed like this: "Do the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning differentiate in terms of their socio demographic characteristics?"

In this the light of this question, answers are sought to sub-questions below.

1. Do the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning differentiate statistically in terms of gender?
2. Do the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning differentiate statistically in terms of having personal computer?
3. Do the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning differentiate statistically in terms of using computer often at home or at school?
4. Do the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning differentiate statistically in terms of level of using computer (self-perception)?
5. At what level are the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning?

RESEARCH METHODOLOGY

Research Design

This research was realized in survey model. Survey models are research approaches that aim to determine the situation that is existent now as it is. The case, event, individual or object that is the subject of the research are tried to be defined in their own conditions and as they are (Karasar 2006).

Universe and sample
The universe of the research consists of the students in Teacher Training Academy that trains primary education teacher candidates in TRNC. Purposeful sampling method was used in the study. In total 141 students construct the sample, 61% (n=87) of the attendants were females and 39% (n=54) of them are males.

Data collection tools
"E-learning attitude scale" that was developed by Dikbaş (2006) and whose Cronbach-alpha reliability coefficient is 0.87, was used in the research.

Analysis of data and interpretation
In the analysis of data, mean, t-test and one-way analysis of variance (ANOVA) was used. The significance level was accepted as .05.

RESULTS
In this part, findings are presented as a result of analysis of data collected in the research.

The first sub-question of the research was expressed as "Do the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning differentiate statistically in terms of gender?" t-test was applied in order to determine if there is a meaningful statistical differentiation among score means in terms of gender. As a result of t-test, it was determined that attitudes of candidate teachers of towards e-learning differentiate meaningfully in terms of gender [$t_{(139)}$=2,493 p<0,05]. That is to say attitudes of male students ($\bar{x}$=107,277) towards e-learning are found higher than female students ($\bar{x}$=98,080). In this situation, it can be said that male students have higher attitude towards e-learning.

Table 1: t test results of attitude levels of candidate teachers according to gender, having personal computer, place of using computer

Demographic characteristics		n	Mean	Std. Dev.	df	t	p
Gender	Female	87	98,080	19,598	139	2,493	0,014*
	Male	54	107,277	23,795			
Having personal computer	Yes	132	102,363	22,050	139	2,880	0,013*
	No	9	90,444	11,001			
Place of using computer	House	120	99,066	20,090	139	3,446	0,001**
	School	21	116,095	25,147			

*p<0,05 **p<0,01

The second sub-question of the research was expressed as "Do the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning differentiate meaningfully in terms of having personal computer?"

T-test was applied in order to determine if there is a meaningful statistical differentiation among score means in terms of having personal computer. As a result of t-test, it was determined that attitudes of candidate teachers of towards e-learning differentiate meaningfully in terms of having personal computer [$t_{(139)}$= 2,880, p<0,05]. As it is seen from Table 1, it was determined that attitudes of students who have personal computer towards e-learning are found higher than students who do not have personal computer. In this case, having personal computer is effective on attitudes towards e-learning.

The third sub-question of the research was expressed as "Do the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning differentiate meaningfully in terms of using computer often at home or at school?" t-test was applied in order to determine if there is a meaningful statistical differentiation among score means in terms of using computer often at home or at school. As a result of t-test, it was determined that attitudes of candidate teachers of towards e-learning differentiate meaningfully in terms of using computer often at home or at school [$t_{(139)}$= 3,446, p<0,01]. As it is seen from Table 1, it was determined that attitudes of students who often use computer at school towards e-learning are found higher than students who use computer at home. In this situation it was determined that independent variable of using computer often at home or at school is effective on attitudes towards e-learning. This situation can be interpreted as it is a natural result of using computer for more educational purposes.

The third sub-question of the research was expressed as "Do the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning differentiate meaningfully in terms of level of using computer (self-perception)?"

Table 2: ANOVA results of e-learning attitude levels according to internet knowledge levels

Knowledge level		n	Mean	Std. Dev.	df	F	p	Significance level
Knowledge of using computer (self perception)	Inadequate	31	100,838	16,685	2 138 140	1,346	0,264	p>0,05
	Medium	86	100,046	20,483				
	High	24	108,166	29,915				
	Total	141	101,602	21,689				
Knowledge of using internet (self perception)	Inadequate	6	113,000	32,397	2 138 140	1,672	0,192	p>0,05
	Medium	80	99,150	18,673				
	High	55	103,927	24,154				
	Total	141	101,608	21,689				

One way variance analysis ANOVA was applied in order to determine if there is a meaningful statistical differentiation among score means in terms of knowledge level of using computer and internet (self-perception). As a result of ANOVA test, it was determined that attitudes of candidate teachers towards e-learning do not differentiate meaningfully in terms of Knowledge of using internet (self-perception).

The fifth sub-question was expressed as "At what level are the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning?"

Mean and standard deviation scores of candidate primary school teachers of Atatürk Teacher Academy towards e-learning were given in Table 3. Attitude score mean of Atatürk Teacher Academy towards e-learning was that it is at medium level ($\bar{x}$=101,602).

Table 3: E-learning attitude mean and standard deviation values

	n	Mean	Std. Dev.
Level of e-learning attitude	141	101,602	21,689

CONCLUSION, RESULTS AND SUGGESTIONS

As a result of the research, it was determined that the attitudes of candidate teachers of Atatürk Teacher Academy towards e-learning were affected by gender, having personal computer, place of using computer independent variables and they were not affected by using computer and internet (self-perception) independent variable. Relation between e-learning and gender was not found in the researches of Şendağ and Gündüz (2007), Levy (2007), Tezer and Bicen (2008), Karataş and Üstündağ (2008). These researches are not consistent with the results of this research. In the study of Çavuş and Göktaş (2006), it was found that e-learning was affected by gender, that is to say it differentiated meaningfully. This result was consistent with the study at hand. Moreover, attitude score mean of Atatürk Teacher Academy towards e-learning was that it is at medium level. These are suggested as a result of the research:

1. When it is thought that using computer at school affects e-learning attitude, computer knowledge and skills can be gained to teachers by organizing in-service trainings.
2. When it is thought that attitudes of students who have personal computer towards e-learning are found higher than students who do not have personal computer having personal computer affects e-learning attitude, personal computers can be provided for teachers by the ministry of education.
3. Their attitudes can be increased by using e-learning to promote cooperative learning and knowledge sharing.
4. Doing presentations by using computer technologies can increase their knowledge of computer and internet.

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EXAMINING THE INFORMATION TECNOLOGIES LITERACY LEVEL OF UNDERGRADUATES IN VARIOUS ASPECTS OF VARIABLES

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Abstract
In our age, which is characterized by the importance of knowledge & information technology, vocational schools are responsible for the provision of qualified middle-level personnel mostly needed in industrial & service sector. Thus, the provision of high quality it training & education at these vocational schools is very important. We aimed at determining the knowledge levels of vocational school student at it courses, and also developing some recommendations to solve the problems found out at the end of the current research study. In our research study, we took a group of students as sample who are still studying in our vocational school in the education year of 2008-2009, and they were asked to answer the questions previously prepared by other research groups and also applied by us. The results obtained from this study were investigated separately from the perspective of various dimensions, and they were also evaluated by means of cross-relationship in term of several variables.

Key words: it literacy, computer awareness, computer literacy, internet usage.

1. INTRODUCTION

For the extent of the knowledge increases day by day in our time, the knowledge can be recorded in different mass media tools in various styles. In other words, it has become gradually an inevitable necessity for people to get at knowledge and to use these countless sources effectively which are recorded like this and called as numerical knowledge. For this reason, it can be said that it is an obligation to be a "knowledge literate" in our time (Ercegovac and Yamasaki, 1998).

In these days in which the computer age has been lived, the main aim of education is to give the individuals the qualities which the computer society requires. These qualities are to get at knowledge, to arrange knowledge, to evaluate knowledge, to present knowledge and to communicate. In our schools the basic condition to equip students with these qualities is to spend more time on technological application in education (Karahan, 2001: 17).

The critical thought and creativity have become a standard for the 21th century individuals. In spite of the materials produced by science and technology and consumers' duty is getting easy, it is necessary for all individuals to think and have an idea while using the techno-scientific outputs not only in individual and society socio-economic point of view but also in the view of societal problems' solution. All the individuals of developing society have to be interested in both consumption and production (Akpınar, 1999: 148).

It is inevitable for every individual to be connected with knowledge who has been adapted to be his/her age and who tries to proceed his age through his thought and attitude. The societies need individuals who plan, decide, interpret the data every time, get at a result, constitute new knowledge on this result, think about the social and technical problems. The computer age gives the right of life to these individuals. Using of computer effectively and individuals who are successful in human-human and human-knowledge communication and who solve problems will prepare a dynamic society. It is the duty of the universities and all institutions to train individuals who have the qualities to meet these necessities (Akpınar, 1999: 149). Because of the rapid developments in science and technology, some abilities acquired in the period of training a profession member lose their validity or become insufficient in a short time. While the profession members are working, they also feel the necessity of getting new knowledge and developing it. In short, in order to be successful in profession, profession members should become adapted to changes and developments and renew themselves everytime. In this process, reaching at knowledge sources is important.

The fact that the opportunities of technologies and knowledge sharing have been developing rapidly has made the computer technologies the primary condition to be a members of high quality in our time (Akt. Yıldırım and Bahar, 2009: 654). In whatever field of expertise you are, the first condition is your definitely using the computer technologies. In our age in which knowledge and computer technologies have gaining importance day by day,it has become a very important matter of the Higher Profession Education Schools which had the mission of training intermediate member of high quality required by the industry and service sectors giving the BT education in required quality. In the field of investigation, the short definitions of computer terms in literature are summarized below.

2. BASIC INFORMATION THEORIES

Awareness of computer is to know computer's history, how it studies and what can be done with it. Computer awareness is the beginning of computer literacy. It is having information on the structure of computer, the styles of using computer and computer's effects on daily life rather than only using it (Akkoyunlu, 1998: 39).

Computer literacy is the ability of using computer. It is the ability of controlling computer and its programmes, using computer in applications, having information, communicating and solving the problems in people's reaching at their aims. In general mean, a student who is a computer literate is a student who can use computer effectively in order to get at his aim. Using a cd-rom, drawing a picture in a computer, preparing projects, scanning the subject in internet are some of the stages of computer literacy (Orhan, 1999: 72).

Information literacy is just a new term and there are various definitions about this term. According to the definition made by ALA, (1998), the information literacy is "using the knowledge sources effectively, investigating knowledge sources and knowing how to use knowledge technologies and stored knowledge sources. Nowadays, reaching at knowledge, evaluating knowledge, organizing knowledge, using knowledge and sharing it with others have gained great importance. As a result of these, we can say that we will have to use every means by means of which we will reach at knowledge, use it and spread it in the teaching environment (Karahan and İzci, 2001).

Information technologies literacy is the total of computer literacy and information literacy. Nowadays in which the internet has much of knowledge sources and imaginary libraries have been gaining importance day by day, the information technologies literacy has inevitable importance. It has become the basic part of the education in the primary, secondary and higher teaching institutions. Information technologies (IT) are all the means based on computers and used to meet the knowledge processing and information support necessities of an organization. Business enterprises use IT

in three ways; as support knowledge in the process of work, to make innovations, and to work in an environment independent of time and place (Haag, Cummings and Dawkins, 1998: 17).

Information system is defined as a group of pieces which decides in every organization, gathers information to support control and coordination, processes, stores and delivers it. Information systems which support the decisions, coordination and control of business enterprises help managers and workers in their analyzing their problems, imaging the complex matters and constituting new products (Tekin and Ömürbek, 2004: 151). The term "information system" means a computer-based information system which gathers data from various sources, saves it, processes it and makes reports to provide required information in the process of decision of management.

3. RESEARCH PATTERN AND METHOD

In our research study, we took a group of students who are still studying in Inonu University Malatya Vocational School in the education year of 2008-2009. The sample of the research consists of randomly selected 206 students. They were asked to answer the questions previously prepared by other research groups and also applied by us (Karahan and İzci, 2001; Akdağ and Karahan, 2004). Our questionnaire consists of four dimensions: personal information (3 questions), computer awareness (10 questions), computer literacy (10 questions) and internet usage (10 questions). The results obtained from this study were investigated separately from the perspective of various dimensions, and they were also evaluated by means of cross-relationship in term of several variables.

While preparing the scale "Determining Information Technologies Literacy Level", all the resources and related literature were viewed, the curriculum of the lecture was studied, and then the test items were prepared. After consulting a group of experts, the scale and the structural validity of the test items were determined. The test includes 33 items. "Cronbach Alpha" formula was used to test the validity, and the validity coefficient was found to be 0.73.

The frequencies and percentages were used in determining information technologies literacy level of the students, and "chi-square" method was used to determine whether these data vary with respect to some variables or not. T-test, one-way variant analysis, and Tukey tests were used to determine whether information technologies literacy level of the students vary with respect to some variables or not. The data gathered from data collection tools were transferred into computer and SPSS program was used in statistical analysis.

4. FINDING AND COMMENTS

4.1. Demographic Data

According to the results of the questions which are in "Personal Data" part and have three topics; total 206 students who have been studying now at Inönü University Malatya Vocation School 35% (72) of whom are gils and 65% (134) are boys have attended to our research. The 61,7 % (127) of them were graduated from Profession High School, 35,9% (74) from Normal High School and 2,4% (5) from Anatolia High School. The 52% (109) of them are students of Economic and Managerial Programmes, and 47% (97) are the students of Technical Programmes Department.

4.2. Frequencies of Items

According to the obtained data, students have taken internet education before coming to university %30,1 (62), not taken %69,9 (144). The duration of internet usage inside or outside of the school; "All day" %34,0 (70), "Weekly 1-2 day" %32,5 (67), "Weekly 1 day" %16,0 (33) and "Monthly 1 day" %17,5 (36). The aim of internet usage; "Chat" %17,0 (35), "Researching" % 61 (127), "Game" %3,4 (7), "Newspaper and magazines" %14,6 (30) and "Downloading files" %3,4 (7). Frequency of internet usage; "Always" 21,8% (45), "Frequently" 20,4% (42), "Rarely" 53,4% (110) and "Never" 4,4% (9). About this subject, İşman and Altınay, (2003:189) have determined the frequency of internet usage as "Rarely-sometimes" 52%, "Frequently" 16% in their research. The mostly used fields in the internet; "School laboratories" %3,4 (7), "Campus internet center" %2,9 (6), "Internet Cafe" %45,1 (93), "House/dormitory" %38,8 (80) and "None" %9,7 (20) dir. The level of internet usage in scientific studies; "Always" %28,2 (58), "Frequently" %16,5 (34), "Rarely" %51,0 (105) and "Never use" %4,4 (9). The situations of students' having an e-mail account are; "Yes" 78,2% (161), "No,but thinking" 9,7% (20) and "Not need" 12,1% (25). The rates of students who have a personal Web page are; "Yes" 21,4% (44), "No" 44,7% (92), "Thinking of doing it" 17,5% (36) and " Not need" 16,5% (34). Students having a Messenger account are; "Yes" 74,8% (154), "No" 8,7% (18) and " Not need" 16,5% (34). The rates of students who chat with voice and apparition on internet are; "Yes" 81,6% (168), "No" 7,8% (16), "Want to chat" 5,3% (11) and "not need" 5,3% (11).

4.3. The Compression of Knowledge Technologies Literacy Level According to Some Variables

4.3.1. Does the information technologies level change according to the departments to which student are attending?

Total 206 students' average points and standard deviations taken from "Computer Awareness" and "Computer Literacy" who attended the research from the "Economic and Management Department" and "Technical Programmes department" are shown at the table below.

Table1: Average points of information technologies literacy level according to the departments

Department	N	Computer Awareness X	Computer Awareness S	Computer Literacy X	Computer Literacy S
Economic and Management Department	109	54	15,85	68	15,67
Technical Programmes Department	97	55	16,46	66	14,05
Total	206	54	16,12	67	14,94

As it is seen in the table above, there is not a clear difference among the average points of students at each two levels. Generally, the averages of students of each two departments are like; "Computer Awareness" level 54 and "Computer Literacy" level 67 points. If this situation is evaluated

over 100 full points, it can be said that students of higher education institutions aren't good at Information Technologies particularly their awareness levels are lower. The level of awareness of students being low may mean their not knowing completely the functions of Information means that they use. This can be interpreted as they haven't completely acquired this knowledge which they should have gained at the middle teaching level.

4.3.2. Does the IT literacy level change according to the gender?

There are some differences at the awareness level in favor of boys and at the literary level in favor of girls. This relation has been examined with t-test in the table below on purpose of comparing genders and points.

Table 2: t- test results of the differentiation relation of students' awareness literacy levels according to gender

	Gender	N	X	S	Value of t	Level of significance
Awareness	Girl 1	72	51,25	14,91	-2,084	P < 0,05 **Significant**
	Boy 2	134	56,12	16,54		
Literacy	Girl 1	72	69,58	14,67	1,697	P > 0,05 Not Significant
	Boy 2	134	65,90	14,98		

As it is seen in the table above, the average points of students' awareness and literacy have shown a meaningful difference only at the awareness level according to gender (t= -2,084, p<0,05). This finding has shown that there is a meaningful difference in favor of boys at the awareness level among the girls and boys (at the 5% importance level). Akdağ and Karahan (2004), Yıldırım and Bahar (2009), İşman and Altınay (2003) have stated in their researches that students' knowledge levels don't show an important difference according to genders.

4.3.3. Does the IT literacy level change according to the graduation?

Students in the research are; Vocation High School 61,7% (127), High School 35,9% (74) and Anatolia High School 2,4% (5). The results of one-way variance analysis which is about the comparison among the students' high schools from which they were graduated and average points of their knowledge level is shown in the table below.

Table3: Students' High Schools from which they were graduated and the average points of Information Technologies Literacy Level and Standard Deviations

Graduation		Awareness	Literacy
Vocational high school	X	53,62	66,61
	N	127	127
	S	15,82	15,54
High school	X	55,00	68,24
	N	74	74
	S	16,24	14,18
Anatolia high school	X	66,00	66,00
	N	5	5
	S	20,74	11,40
Total	X	54,42	67,18
	N	206	206
	S	16,12	14,94

Table 4: The Variance Analysis of relation level between the average points of information technologies literacy and students' high schools.

		Sum of Squares	df	Mean Square	F	p	Level of Significance
Awareness	Between Groups	776,239	2	388,119	1,501	,225	P>0,05 Not Significant
	Within Groups	52503,858	203	258,640			
	Total	53280,097	205				
Literacy	Between Groups	131,274	2	65,637	,292	,747	P>0,05 Not Significant
	Within Groups	45635,716	203	224,806			
	Total	45766,990	205				

As it is seen in the table above, a meaningful relation hasn't been found between the students' points of Information Technologies Literacy Levels and their high schools in the result of the variance analysis.

4.3.4. Does the IT literacy level change according to the frequency of internet usage?

The table of Variance Analysis which shows the relation between the students' frequency of internet usage and Information Technologies Literacy levels is shown below and it is concluded from this table that there is a meaningful difference only at the awareness level (F=3.573, p<0.05). There is not a difference at literacy level. This conclusion can be interpreted as students' not using internet at enough level.

Table 5: The Variance Analysis of Comparison between Students' Frequency of internet Usage and in formation Technologies Literacy Level

		Sum of Squares	df	Mean Square	F	p	Level of Significance
Awareness	Between Groups	2685,104	3	895,035	3,573	0.015	P<0,05 Significant
	Within Groups	50594,993	202	250,470			
	Total	53280,097	205				
Literacy	Between Groups	962,070	3	320,690	1,446	0.231	P>0,05 Not Significant
	Within Groups	44804,921	202	221,807			
	Total	45766,990	205				

4.3.5. Does the IT literacy level change according to the aims of internet usage?

In the result of the variance analysis, a meaningful relation has been determined between the students' frequency of internet usage and their literary level points from their points of IT literary level (F=3,652, p<0,05).

Table 6: The Variance Analysis of comparison between students' aims of internet usage and information technologies literacy level

		Sum of Squares	df	Mean Square	F	p	Level of Significance
Awareness	Between Groups	1638,099	4	409,525	1,594	,177	P>0,05 Not Significant
	Within Groups	51641,999	201	256,925			
	Total	53280,097	205				
Literacy	Between Groups	3100,669	4	775,167	3,652	,007	P<0,05 Significant
	Within Groups	42666,322	201	212,270			
	Total	45766,990	205				

As it is seen in the table above, there is a meaningful difference among the average points of computer literacy of students who use internet on the purpose of "chat" and "research". These findings show that usages of internet on purpose of chat and research play an important role in the development of information literacy level.

4.3.6. Does the IT literacy level change according to the e-mail account?

The 78% (161) of students have an e-mail account and their average awareness points are 56 and their average literacy points are 69 who say "I have". Students' average awareness points are 50 and literacy points are 58 who say "I haven't". In the result of the variance analysis, it has been determined that there is a meaningful relation between the situations of students' having an e-mail account and their IT literacy level points (For awareness; F=3.213, p<0.05 and for literacy; F=5.796, p<0.05).

Table 8: The Variance analysis of comparison between students' situations of having an e-mail account and IT literacy level

		Sum of Squares	df	Mean Square	F	p	Level of Significance
Awareness	Between Groups	1634,687	2	817,344	3,213	,042	P<0,05 Significant
	Within Groups	51645,410	203	254,411			
	Total	53280,097	205				
Literacy	Between Groups	2472,233	2	1236,116	5,796	,004	P<0,05 Significant
	Within Groups	43294,758	203	213,275			
	Total	45766,990	205				

As it is seen in the table above, there is a meaningful difference among the points of computer literacy of students who have an e-mail account and who haven't. These findings support the idea that having an e-mail account raises the level of computer literacy of students.

4.3.7. Does the IT literacy level change according to the Messenger account?

The 75% (154) of students have a messenger account and their average awareness points are 57 and their average literacy points are 69 who say "I have." Students' average awareness points are 43 and average literacy points 56 who say "I haven't". In the result of variance analysis, it has been determined that there is a meaningful relation between the students' situations of having a messenger account and their information technologies literacy level points (Awareness; F=10.239, p<0.05 and Literacy; F=8.126, p<0.05).

Table 10: The variance analysis of comparison between the students' situations of having a messenger account and their information technologies literacy level.

		Sum of Squares	df	Mean Square	F	p	Level of Significance
Awareness	Between Groups	4882,011	2	2441,006	10,239	,000	P<0,05 Significant
	Within Groups	48398,086	203	238,414			
	Total	53280,097	205				

Literacy	Between Groups	3392,523	2	1696,261	8,126	,000	P<0,05
	Within Groups	42374,467	203	208,741			
	Total	45766,990	205				Significant

As it is seen in the table above, there is a meaningful difference among the computer literacy/awareness points of students who have a messenger account and haven't. These findings support the idea that students' having a messenger account affects their developing information literacy levels ($p<0.05$).

5. RESULTS AND RECOMMENDATIONS

The higher education institution students' information technologies literacy level point averages have been calculated as 54 points at awareness level and 67 points at literacy level (total one hundred points). This situation makes it clear that information technologies literacy levels of students of higher education institutions aren't generally so good. Their awareness averages' being lower can be interpreted as their not knowing completely the functions of information tools that they use. The reason of this is that because in our country computer literacy is not so widespread at middle teaching, the majority of students who have just come to universities are uneducated about this subject. As a solution to this problem, it can be advised that students should be educated with various courses and seminars and they can be diverted into public education courses in summers.

It has been found out that our students of higher education institutions reach at internet in cafes (boys) and in dormitories and homes (girls). This shows that our students in higher education institutions aren't provided with enough opportunities. Our suggestions for this problem is providing the necessary support for students and preparing a substructure for them for their working in their free time. Students can benefit from these technologies with various projects and home works.

It has been found out that higher education institution students' research- based internet usage aims to make positive contributions to their increasing information technologies literacy levels. Students should get more information on internet about their fields to increase these positive contributions.

At the end of researches, it has been determined that students' of higher education institutions having only one mail account and messenger account and one web page make important contributions to their increasing the information literacy levels. To increase this important contribution, students should be surely provided with an e-mail and messenger account and a personal web page during their learning period. Within the period, discussion atmospheres should be created on internet in which all students can join and the lesson should be followed in this way.

In addition to these suggestions; in the light of data taken from the research, some proposals can be listed below which are aimed at our students' increasing their information technologies literacy levels.

Teachers' qualities of instructive and thought supportive should be increased, they should be a person who listens as a guide not a person who always speaks (Akpınar, 1999: 149).

Students' understanding the developments-innovations in their environment with science logic and their creating an "information communication bridge" should be encouraged and prized.

Students' collaborating among themselves and producing projects should be encouraged and they should communicate and have others' ideas using information technologies (Akdağ and Karahan, 2004: 26).

Students should be taught how to learn and they should be told that with information technologies, more speedy and innovative and individual learning occurs.

The environments in which students can try their innovative individual ideas using information technologies should be prepared.

Students should obtain the habit of approaching to the thoughts with suspicion and curiosity and their investigative and interrogative qualities should be improved.

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EXPLORING THE DIFFERENCES BETWEEN FACE-TO-FACE AND CMC

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Abstract:

Computer-mediated communication (CMC) is a mode of communication mediated through computers among people separated in time and/or space (Romiszowski & Mason, 1996). As an alternative to the traditional mode of communication, such as face-to-face interaction, CMC generally depends on text-based communication tools, including e-mail, chat, discussion forums and UNIX talk (Herring, 2002). It is a continuing debate whether computer mediated or face-to-face communication is more advantageous.

The use of CMC in educational settings has especially impacted on teaching and learning. There is evidence that CMC has the potential to promote human learning (Ellis, Calvo, Levy, & Tan, 2004; Machtmes & Ashmer, 2000; Rosse, 2006). Still, literature indicates that more research on CMC needs to be conducted (Hara, et al., 2000). In particular, "research is needed which systematically investigates the effects of the number of participants on communicative phenomena such as amount of participation, turn taking, coherence, politeness, sociability, influence and power dynamics" (Herring, 2002, p.142). Additionally, since educational use of CMC has become so widespread, comparison of CMC and face-to-face communication is "logically required" (Herring, 2002) to explore strengths and limitations of CMC over face-to-face communication. Most of the research studies comparing face-to-face and online communications are based on student discourse (eg. Herod, 1999; R. Ocker, et al., 1995) while only a few of them have focused on teacher discourse (Hawkes, 2000; Hawkes & Romiszowski, 2001; Selwyn, 2000). Exploring the differences between face-to-face and CMC is a worthwhile research goal to inform future practice and research.

When it comes to the gender power differentials, some of the research argue that there are gender power differentials both in F2F and CMC. In her research, Susan Herring found out that there is gender inequality in online communication (1993; 2003). Similarly, several studies point out gender differences in CMC (Barrett & Lally, 1999; Li, 2005; 2006). There is empirical evidence showing that males use more authoritative and negative language in online interactions compared to females (Guiller & Durndell, 2006).

In light on the previous research, the research reported here illustrates some applications of CMC in a multi-year teacher professional development project with the purpose of exploring how diverse members of the mathematics education community (pre-service secondary mathematics teachers, in-service secondary mathematics teachers, university mathematicians and university mathematics educators) talked about a multimedia case study, Making Weighty Decisions (Bowers, Doerr, Masingila, & McClain, 2000), when they interacted face-to-face and online. In this paper, messages like regular e-mail messages were analyzed; so, the online data is a typical form of asynchronous CMC with one-way transmission (Herring, 2001). This study also investigates the gender power differentials off-line and online.

The participants engaged in the case discussions in three different discussion groups. Each of the three discussion groups included one mathematician, one in-service teacher, one teacher educator and three to four pre-service teachers. The groups were similar to each other with respect to the professional backgrounds of the group members; and the compositions of the groups were different regarding the participants' gender. Two of the groups (Groups #1 and #2) were mixed sex and one of them (Group #3) was a same-sex group with six females.

The communication patterns were studied by analyzing the number of words and messages posted by each participant, and the average lengths of the messages. In particular, the following research questions guided the study: Are there notable differences in the number of words, messages and lengths of the messages: (a) between the two modes of communications, F2F and CMC?, (b) among the discussion groups in either mode, F2F or CMC?, (c) between males and females in either mode, F2F or CMC?, and (d) among the professional categories in either mode, F2F or CMC?

To answer the research questions, case discussions of 19 participants throughout several professional conversations were examined by identifying patterns of structure and meaning in language use in CMC. Group membership, gender, professional category and mode of communication were the characteristics. Number of words, and messages or postings/turns in F2F and CMC and the average number of words per posting/turn in F2F and CMC were the critical outcomes. The units of analysis were the number of postings (CMC) or turns (F2F), and the number of words in each posting or turn. In addition, average number of words per posting/turn (lengths of the postings/turns) and average number of words per person were reported.

The results indicated that the postings in the CMC were longer than the turns in F2F (CMC=146.7 words/posting vs. F2F= 24.9 words/turn); whereas, the number of turns in F2F (890) was considerably more than the number of postings in CMC (114). These findings are supported by a synthesis indicating that in a given time frame, the F2F groups produced more remarks, including more number of words or turns than the CMC groups (Bordia, 1997).

Unlike in CMC, usually there are no large gaps between the turns in F2F conversations. Time lag between interactions can be seen as a disadvantage of asynchronous CMC (Benbunan-Fich & Hiltz, 1999; Hiltz, 1995; Ocker, et al., 1995). Evidently, the findings of the current study support the claims about the gaps in asynchronous CMC that the participants posted only a few

CMC messages in a five-week period. In some cases, the gaps between the message and the response were long, and in some other instances, there was no response at all.

Another finding was that there were considerable variations among the discussion groups regarding their amount of contribution to the case discussions. In particular, it was found that the male-dominated group, Group #2, and the female-only group, Group #3, posted more words and messages per person, and relatively longer messages per person in the CMC. These findings are in parallel with previous research. For example, the literature on language and gender indicates that individuals' use of language online can be different in same-sex and mixed-sex groups (Herring, 1994, 2003; Savicki, Lingenfelter, & Kelly, 1996).

In the F2F meetings, regardless of the gender or professional category of the individual members, Group #2 uttered relatively more words and took more turns than Groups #1 and #3. Considering the lengths of the turns, Group #2 took slightly longer turns than others. As previously discussed, although Group #2 is a mixed-sex group, it is also a male-dominated group with four males as opposed to two females. This feature of the group might have been the reason for the relatively longer turns in this group (Herring, 1993, 1994, 2003). Additionally, one of the two female members of Group #2 was the teacher educator of the group, so her professional category was relatively higher than the pre-service teachers in her group. As stated by Sproull and Kiesler (1991), high status members tend to participate more in F2F interactions. It seems that individual characteristics of the members of the group are as important as their gender and professional status (Chen & Caropreso, 2004).

Considering the differences between the CMC and F2F with respect to the discussion groups' participation, it was found that all the groups produced relatively more words in the F2F discussions. Furthermore, the numbers of messages were considerably higher in the F2F discussions; yet the messages or turns were relatively shorter in the F2F. In particular, Group #2 produced considerably more words and messages in the F2F. There is evidence that in the F2F members of a discourse community are likely to contribute more words and messages than in the CMC (Bordia, 1997; Stromso, Grottum, & Lycke, 2007). On the other hand, the messages in the CMC are longer than the F2F messages (Benbunan-Fich & Hiltz, 1999; Hancock & Dunham, 2001; Jonassen & Kwon, 2001; Warschauer, 1996). It should also be logical to claim that the CMC discussions might have given the participants the opportunity to elaborate on their thoughts (Ellis, et al., 2004; Jonassen & Kwon, 2001).

The data analysis also indicated that there were no systematic gender differences in the F2F discussions. However, some major gender differences were found in the analysis of the CMC discussions. The males produced more words (M=974.7 vs. F= 825.2) and posted more CMC messages (M=7.1 vs. F=5.3) than the females. This finding concurs with previous findings that men dominate online discussions (Cook, Leathwood, & Oriogun, 2001; Herring, 2003a; Li, 2002).

Herring reports that CMC does not necessarily provide a more egalitarian and democratic environment for females (2003) despite some evidences showing that low-status group members participate more in electronic discussions (Sproull & Kiesler, 1991; Tan, Wei, Watson, & Walczuch, 1998). In particular, Herring's (1993) research revealed that males posted considerably longer messages than females. In contrast, in the present study females posted longer CMC messages than males. It should be noted that the sample of this study was female dominant, 63% was female; yet, Herring (1993) analyzed two male-dominant discussion lists and only 36% and 42% of the lists were females. Perhaps, being the majority group gave the females of the present study the freedom to contribute longer messages. Also, as the case study discussions took place in a formal educational context, it is expected that in academic electronic discourse, participation would be more egalitarian.

The data analysis also indicated some interesting differences among the professional categories with respect to their participation patterns. For example, during the CMC discussions, the in-service teachers posted fewer words per person (488.3 words) and postings per person (4.3 postings) than the mathematicians, pre-service teachers and teacher educators. It is possible that the teachers did not have enough time to engage in the CMC conversations due to their busy schedules. More importantly, the in-service teachers' web access was restricted by the school district. The mathematicians, on the other hand, posted the highest number of words and messages to the CMC discussions. In the CMC, the mathematicians' average number of words (1376.3 words per person) was significantly higher than the whole group average (833 words per person). They also posted 8.7 online messages per person which is at least 3 messages more than the others' averages. Although the mathematicians posted the highest number of words and messages in the CMC discussions, on average, their postings were relatively short (140.9 words per posting). It was also found out that the pre-service teachers did not produce high number of words or postings/turns in either setting. The relatively limited participation of the pre-service teachers can be due to their status as students. Both in F2F and CMC, high-status group members tended to participate considerably more than low-status group members (Dubrovsky, Kiesler, & Sethna, 1991).

In sum, in the present study, it was found that in CMC the messages were longer which may indicate the depth of discussion, but there was gender difference in CMC in favor of males contradicting to previous findings. This finding is consistent with Postmes and Spears' (2002) study indicating a gender inequality in CMC, and supports the claim that gender differences are transferred to CMC (Herring, 1994). When it comes to the different professional categories, in CMC, in-service teachers contributed to the discussion relatively less than others. Equal participation in CMC versus F2F is contested in terms of internet accessibility (Connor, 2003). Unequal access to online discussions is seen as a pitfall in CMC (Connor, 2003) while limited access negatively affects learning (Harasim, et al., 1995).

In conclusion, it might be suggested that while creating discussion environments in CMC and F2F, gender and status effects might be taken into account. In order to make the learning environment more effective, it is suggested to consider what it is aimed and for whom before deciding on the type of interaction as well as on the emphasis given to different contributors. Understanding the participation patterns of different groups can increase the usefulness of discussion environments.

Keywords: computer-mediated communication, face-to-face communication, case study, mathematics learning

FACEBOOK AND ITS INFLUENCE ON INTERPERSONAL COMMUNICATION

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Abstract

The present study sets out to explore 'facebook' in terms of its influence on interpersonal communication. A questionnaire is prepared and delivered to 100 students studying at the Eastern Mediterranean University. The results suggest that the participants use facebook to fulfil their need of communication. Thus, facebook is a way of maintaining existing relationships, and may not be the primary tool of creating new relations, there is a lack of trust in new relationships about facebook users whom the participants don't know in that cyber community. Social network sites which allow people to build up a public profile within a tied system, they communicate and interact with each other. The concept of public sphere and its platform has changed. Instead of coming together physically to talk and get in relation face to face in public sphere places, they come together in online public sphere platforms.

Introduction

Facebook is one of the most common social grounds that has been widely used lately. Computer mediated communication has a great influence on social ties and networks in which people are involved mostly. In fact people can be differentiated into following categories concerning the gratifications they look that are the main identified problems of the study: Lack of interpersonal communication which is social utility of information in the conversation and Challenge to confirm social identity that is based on value reinforcement and self-understanding.

The social media such as internet is basic sort of platform in which people can easily get connected; therefore different media preferences contain different patterns of exposure and have different outcomes. Before the development of advanced technology, interpersonal relations were more different from today. As a matter of fact that people got used to have fun and spend time with their friends; mainly face to face communication was stronger than today`s conditions. Moreover, they were more gatherings and meetings, and then interpersonal communication and its patterns are to being destroyed by the development of advanced technology. A great deal of such technological improvements caused people to feel lonely and more anti-social minded; those are the outcomes from media-related behaviours. Although modernization comes up with some solutions and easiness to our lives; it creates such kind of interpersonal problems.

Increasing importance of social technologies in everyday life offers digital connections, relationships and networks. Ruggiero (2000) writes that new media like the internet possess at least three attributes: Interactivity, Demassification and Asynchroneity. So in that sense of communication we get contact rapidly by chatting and get response in reciprocally; even if we are interrupted by the problems of internet connection, sooner or later we can get people to talk at the same time. In addition, personal media such as social network sites, instant messenger and cell phones play a remarkable social role in modern societies as a tool for interpersonal communication. Social interaction is seen in a modern societal context, and personal media is to maintain and develop existing social relationships. It is a way of extending social networks that people interact with. Thus, mediated forms of communication have an significant influence on the nature of social ties and networks as well. (Sheldon, 2008, p.03)

Integration of mediated and immediated social spheres between online and offline social spheres have become a characteristic element of social competence in the network societies. Furthermore, mediated social activities are to considered of analyzing the use of personal media for maintaining and developing close social relationships and clarifying how the use of personal media may extend the social networks.

For young adults, who use internet for entertainment and information; individuals use social networking sites to experience selective, efficient and immediate connection with others for their (mediated) interpersonal communication, satisfaction of personal need of interaction and support of other people to seek approval of self-identity. In a brief understanding, the approach of symbolic interactionism focuses on the personal importance of human interaction based on the use of symbols and shared meaning (Blumler, 1969, 1998; Mc Call, 2003:328). As we know language is a sort of sign systems and in our daily life we reflect the things instead of writing such as traffic sign and other most used icons while chatting on internet as symbols. The internet serves interpersonal utility functions such as relationship building, social maintenance, and social recognition as much as entertainment and information utility functions (Leung, 2007, p, 205). People use internet to construct relationship both new or existing to develop or to continue and they perceive internet as a means of maintaining social interactions in the way of being approved of their social recognitions and a way of relationship development. Starkman (2007) has demonstrated that motivations for using the internet are primarily caused by desires for "relaxation, encouragement, and status" (p.211).

Becoming more like friends, a qualitative study of personal media and social life explaining why young adults use facebook through uses and gratifications theory.

Increasing interest of facebook made it more popular than other social networking sites; rather than other social networking sites not only young generation, facebook are used by adults unlike children, teenagers and elder people. It draws attention of us regarding its popularity to understand its role in interpersonal communication in creating digital interaction system as a network community. Its easily differentiated than other social networking sites because of its inviting and enormously effecting nature; rapidly changing usage of technology are shaped by the preferences and needs of facebook users. That's why its influential differences attract people.

Research Questions

The present study focuses on the undergraduate and graduate students studying at the Eastern Mediterranean University in the 2009-2010 academic year's fall term.

1. To what extent facebook has become a significant part of university students' life?
2. Why has Facebook suddenly become one of the more important key elements of university student's social lives?
3. Does cyber networking platform have an influential role of maintaining existing social relationship to expand the social network?

4. Does Facebook,have an impact on interpersonal communication?
5. Does face book have a role to develop relationships?
6. Is the security protection of personal data on facebook trustable?
7. Does facebook help students create social identity they want?

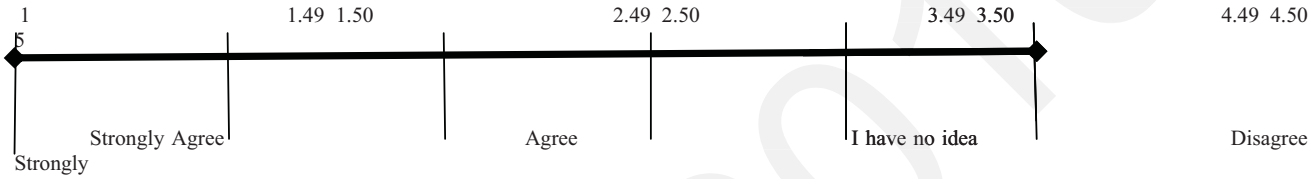
Hypothesis

If there is a gap or desire of interpersonal communication created by the result of conditions of life, social communication networks like facebook fulfils these needs in satisfying relationship development. If you are university student, facebook helps you to establish, maintain, re-establish social relations.

Such social networking sites "facebook" have created a new generation of individuals whose identities are directly defined by their connections and the context they produce online. This issue is related to a vast number of people in all over the world; their lifestyles and interactions, communication attitudes, personal connections are being formed by "facebook"; it fills the gab of a sense of need of interactive and communicative desires.

Data Collection Methods and Procedures

The present study is a case study. The data for the study have been collected through a questionnaire comprising 28 questions and consisting of two sections: questions geared towards collecting demographic information about the participants and likert scale type questions. After collecting the data, it was analyzed descriptively on the SPSS 10. For each question mean, mode, median, maximum and minimum were calculated.



The data collection method of the study is questionnaire, the survey was made with totally 100 participants who were university students studying at Eastern Mediterranean University, Famagusta, North Cyprus. The chart of the rates of the means according to likert scale shows the indication of the values of the means are more significant to be emphasized in analyzing the likert scale typed of survey statistics.

Results

This section sets out to present the frequencies and percentages of the participants' responses to each question. Firstly, 67% of the participants are male and 33% are female. Especially, exception of one participant who is married, all other participants (99%) are single. The nationality of the participants are Turkish, Turkish Cypriot, both Turkish and Turkish Cypriot, Persian, Nigerian and others which are from Jordan and Kazakhstan. 62 % of participants are Turkish, 5% are Turkish Cypriot, 3% are both Turkish and Turkish Cypriot, 10 % are Persian, 15% are Nigerian, and others are 5%. Basically, 24% of them are in the ages of 16-20, 64% are between 24 and 25 ages, 11% are in the ages of 26-30, and 1% is between 31 and 35 ages. 97% of the participants are students, %3 are full time workers.

Total number that is 100% of the participants use facebook. Moreover, 12% of them started using facebook 4 years ago, 33% of them started using 3 years ago, 36% of them started using 2 years ago, 11% started using 1 year ago, and 9% started using it for a period of time that is less than 1 year. In addition, 58% of them use facebook 1-3 times a day, 26% use it more than 3 times a day, 14% use it once a week, 2% use once a month. Furthermore, 25% of them have friends less than 100 on facebook, 45% have friends between 101 and 300, 24% have friends between 301 and 500, 4% have friends between 501 and 700, 1% has friends between 701 and 1000, and 1% has friends more than 1000. In updating personal information on facebook, 14% of the participants update their personal information daily, 26% update weekly, 29% update monthly, 18% update yearly, and 13% of them never update their personal information on facebook. The information the participants listed on their facebook pages are their name, age, date of birth, hometown, political/religious views, photos, phone number, educational information, relationship status, activities/interests, address, employment history and their e-mails. 92.1% of the participants have their names on their facebook pages, 74.3% have defined their ages on their profile, 87.1% have written their date of birth, 75.2% have written their hometowns, 32.7% have put their political and religious views, 87.1% have uploaded their photos, 25.7% of them have their phone number on their profiles, 64.4% have written their educational information, 55.4% of them have defined their relationship status, 40.6% have written about their activities and interests, 19.8% have written their address', 10.9% have mentioned about their employment history, 78.2% have written their e-mails.

Primarily, 12% of the participants strongly agree that interacting with people on facebook makes them feel like a part of a larger community, 38% agree with interaction with people on facebook makes them feel a part of large community, 14% of the participants have no idea about that, 23% of them disagree with this view, and 13% strongly disagree with this idea. 21% of the participants strongly agree about that facebook is a part of their everyday activity, 45% agree with this, 10% of them have no idea, 17% of them disagree about that idea, 7% of them strongly disagree. 16% of the participants strongly agree that they use facebook to get information, 42% of them agree about that, 11% of them have no idea, 24% of them disagree with that view, and 7% of them strongly disagree. 23% of the participants strongly agree that they use facebook to find out about things going on in their friends' lives, 42% of them agree about that, 8% of them have no idea, 17% of them disagree, and 10% of them strongly disagree. 14% of the participants strongly agree that facebook is useful to find people to date, 25% of them agree about that, 19% of them have no idea, 21% of them disagree about that, and 21% strongly disagree. 28% of the participants strongly agree that facebook is helpful to meet new people, 44% agree about that, 12% have no idea, 10% disagree about this, and 6% strongly disagree about this view. 8% of the participants strongly agree that they always use facebook to play games, 22% of them agree about that, 12% have no idea, 32% disagree, 26% of them strongly disagree. 17% of the participants strongly agree that facebook is better to spend their free time, 52% of them agree about that, 16% of them have no idea, 12% disagree with that, 3% strongly disagree with that idea.

In addition, 52% of the participants strongly agree that they use facebook to keep in touch with old friends, 45% agree with this, 2% have no idea, 1% strongly disagree with that idea. 53% of the participants strongly agree that facebook is a good way to find out their old friends, 40% agree with that, 5% have no idea, 1% disagree with this idea, and 1% strongly disagree with that view. 12% of them strongly agree that they are more comfortable to express themselves on facebook, 34% agree with this, 18% have no idea, 25% disagree with that idea, and 11% strongly disagree with that view. 20% of them strongly agree that facebook reinforces their interpersonal communication with people, 40% agree with this, 19% have no idea, 12% disagree with that, and 9% strongly disagree with that idea. 14% of the participants strongly agree that they have accepted a friend request from someone they haven't met, 21% of them agree with that, 8% of them have no idea, 23% disagree with that idea, 34% strongly disagree that they have accepted a friend request from someone they haven't met. 16% of them strongly agree that they have sent a friend request to someone they haven't met, 22% of them agree with that, 7% have no idea, 23% disagree with that, 32% strongly disagree that they have sent a friend request to someone they haven't met.

Furthermore, 20% of the participants strongly agree that facebook's privacy settings are the best way to control their personal information, 37% of them agree with that, 24% have no idea, 16% disagree with that idea, and 3% strongly disagree that facebook's privacy settings are the best way to control their personal information. 8% of the participants strongly agree that they trust the privacy of their data on facebook is secure, 36% of them agree with that, 29% of them have no idea, 20% disagree with that view, and 7% strongly disagree with the thought that they trust the privacy of their data on facebook is secure. 12% of the participants strongly agree with the idea that their profiles on facebook are a reflection of their identities in their imaginations, 28% agree about that, 15% have no idea, 20% disagree with that idea, and 25% strongly disagree with the view that their profiles are the reflection of their identities on their imaginations. In this section means of the data will be presented in Table 1.

Survey Questions	Mean	Likert Scale
1- Interacting with people on facebook makes me feel like a part of a larger community	2.8700	Undecided
2- Facebook is a part of my everyday activity	2.4400	Agree
3- I use facebook to get information	2.6400	Undecided
4- I use facebook to find out things going on in my friends' lives	2.4900	Agree
5- Facebook is useful to find people to date	3.1000	Undecided
6- Facebook is helpful to meet new people	2.2200	Agree
7- I use always facebook to play games	3.4600	Undecided
8- Facebook is better to spend my free time	2.3200	Agree
9- I use facebook to keep in touch with old friends	1.5300	Agree
10- Facebook is a good way to find out my old friends	1.5700	Agree
11- I'm more comfortable to express myself on facebook	2.8900	Undecided
12- Facebook reinforces my interpersonal communication with people	2.5000	Undecided
13- I have accepted a friend request from someone I haven't met	3.4200	Undecided
14- I have sent a friend request to someone I haven't met	3.3300	Undecided
15- Facebook's privacy settings are the best way to control my personal information	2.4500	Agree
16- I trust that the privacy of my data on facebook is secure	2.8200	Undecided
17- The profile on facebook is a reflection of my identity in my imagination	3.1800	Undecided

Table 1: The rates of means

The rate of mean is outlined in the table above regarding the survey questions; the indications of the values of the means are more significant to be emphasized in analyzing the likert scale typed of survey statistics.

Conclusion

To sum up, computer-mediated communication has become more likely to be an inevitable part of people's lives as a social and psychological need. Formerly, the quality of interaction and communication among people were highly remarkable, that's to say people used to spend their time

with people being integrated with community. However, the virtual community or cyber friendship is more a like taking place in people's daily lives as a significant need to be involved with.

Technological developments are core elements that shape our life styles; even our understanding of friendship. In terms of the findings of the survey, a vast majority of the participants think that facebook has become a part of their everyday activity; also facebook is used to find out things going on in their friends' lives. Moreover, facebook is seen to be helpful to meet new people as a tool, and facebook is defined as a better way to spend their free time. Facebook has some worthy and gripping roles on entertainment to utilize students' free time and fulfil their fun-oriented interactions so as long as they pass their free time by using facebook. For these reasons, facebook takes an important role and it has become one of the more significant key elements of university students' social lives. However, the majority of the participants emphasize that they are not sure that they are a part of that cyber community created on facebook, because they may prefer having cyber community as a fun and communication oriented entity, or they may not be able to get inner understanding in the means of the aims and benefits of facebook. they may not feel that cyber community as real as they have in their daily lives that they belong to. In addition, neither facebook may be used to get information nor Facebook may be used to date with other people by a vast number of the participants; because they don't have some clear ideas about either they use it to get information or they use it to date with people. Thus, if they have foggy opinions in dating with people on facebook, it's because that they may not feel safe themselves to share their lives with someone they have met on internet.

Therefore, the results show that facebook may not be preferred to play games by a large number of the participants. They may think that playing games on virtual community could be a reason of becoming anti-social and being stucked on sitting in front of the computer for hours as a waste of time. Notwithstanding, the trend in a wide range of playing games on social networking sites has been increasing day by day.

Basically, cyber networking platform have an influential role of maintaining existing social relationship to expand the social network. A large number of the participants agree that facebook is a good way to keep in touch with their old friends as well as to find them out.

Majority of the participants don't have a clear thoughts that they feel comfortable to express themselves on facebook. That's to say, this result doesn't bear solid explanation whether they are able to feel comfortable to express or not. There could be some reasons for not responding directly in both negative and positive ways about feeling comfortable to express themselves; For instance, they may feel uneased on such networking sites to express easily and without worrying. It could be an interrelation concept between the attempt of protecting private life and the need of securing self information. All in all, it's so normal behaviour to feel apprehensive to express themselves easily on a social networking site as a cyber communication platform such as facebook has become a public sphere in which all kinds of people can readily share their feelings, opinions and special information and whatsoever they want to declare to other people they communicate with. Likewise, they have no idea about that facebook reinforces their interpersonal communication with people. Yet, facebook should not be undermined the fact that it has exactly a remarkable impact on interpersonal communication of the vast majority of the participants.

Based on the results, a vast number of the participants specified that they have no idea about sending a a request for friendship to someone they don't know or accepting any of friend request of someone they haven't met. On that account, they may not realise or pay attention that facebook has a role to develop a relationship which is not existing before, it's because they may resist to uncertainty and insecurity of the identities of the people they don't know, and also they may be anxious in case of having their private information and photos stolen by those people without permission; accordingly it may solely have a strong role to maintain existing relationships of the participants.

Moreover, a larger number of participants think that facebook's privacy settings are the best way to control their personal information, on the other hand, they express that they don't have a clear view that they trust the privacy of their data on facebook is secure. For that reason, a vast majority of the participants may not want to accept any friend request from other people they don't know in the connection of feeling worried that their personal data is secure on facebook as well. So, participants take some prevention about their data as they may not be willingly to add other people they don't know, and they are aware of the privacy settings; but there is a contradictory between acknowledging its privacy settings as a best way and trusting the privacy of their data on facebook. Consequently, the security protection of personal data on facebook may not be seen trustable enough. Being selective to accept other people's friendship invitations on facebook, and having negative manner for those people may be based on lack of trust towards facebook users they don't know, and whom the participants are involved together with in that cyber community.

Mainly, a large number of the participants define that they are not sure about that their profiles on facebook are a reflection of their identities created in their imagination, so facebook may not be a proper way to create the non-existing identity they want; perhaps, it may not be seen as reasonable as they create their self representations in their daily lives. For instance, the way of dressing up, the way of talking, the productions of the things they bring up such as writing a book, or singing a song. They may just use facebook in a natural way of representing themselves; for instance, putting any videos, comments, and applications may be entitled as a reflection of self-identity. Yet, any implementation in reflecting a self-identity may not be seen as a production of dream world. Hence, it is considered as a communication tool to be tied with people whom they want to interact.

In conclusion, facebook is an online platform that has some essential roles of developing people's communication skills; it significantly meets people's communication needs. Besides, it contributes to sustain existing relationship as an important role, rather than creating new relationships; it may not have necessarily basic role of creating new relationships as well. On the other hand, it may help people revitalize and reconstruct their existing relationships and communication connections with their old friends that have been broken before. Thereby, it could be concluded that facebook may have a role of contributing and empowering the relationship development of the partcicipants. The study ensures an understanding on the motivations and behaviors of individuals who are using social networking sites for entertainment and representation of self identity.

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FACEBOOK'UN TASARIM EĞITIMINDE KULLANIMI

İlgi Eldem
Özer Anar
Hatice Öz

Özet:
Facebook son yillarda üniversite gençliği tarafindan da en çok kullanilan sosyal ağlardan biridir. Zamanla internet kullaniminin yayginlaşmasi ve ucuzlaşmasi sosyal ağlarin kullanimini ve sosyal ağlarda geçirilen zamanin artmasini da sağlamiştir. Maltepe üniversitesi iletişim fakültesi görsel iletişim tasarimi bölümü ikinci sinif öğrencileri kendi aralarinda bir facebook grubu oluşturmuşlardir. Akademik danişmanlari ve öğretim elemanlarinin da üye olduklari bu grup araciliği ile derslerine ilişkin bilgi alişverişinde bulunabilmektedirler. Facebook 'un eğitim amaçli kullanimina ilişkin bu örnekten yola çikarak maltepe üniversitesi iletişim fakültesi görsel iletişim tasarimi bölümü ikinci sinif öğrencilerine facebook ve internet kullanim alişkanliklarina ilişkin bir anket yapilmiştir. Anket sonucunda elde edilen verilere göre facebook öğrencilerin hayatinda önemli bir yere sahiptir. Örgün eğitim ortaminin dişina çikarak, ders dişi zamanlarinda da öğrenciye ulaşabilme ve facebook ortamini eğitimi destekleyici bir amaçla kullanabilme konusunda olumlu sonuçlar alinmiştir. Araştirma türkiye'de ve dünyada facebook'un eğitim amaçli kullanim örneklerini incelemekte, örnekler sunmaktadir.

Anahtar kelimeler: facebook, eğitim, tasarim eğitimi, eğitim uygulamalari, sosyal ağlar

FACTORS AFFECTING IN-SERVICE TEACHERS' APPLICATION-BASED EDUCATIONAL TECHNOLOGY AND MATERIAL DEVELOPMENT SKILLS: A CAUSAL ANALYSIS OF A TURKISH CASE

İlhan Varank

Abstract:
The purpose of this study is to investigate the factors affecting in-service teachers' application-based educational technology and material development skills indented to be taught in the newly adopted educational technologies and material development course in turkey. A total of randomly selected 2600 elementary education, science, mathematics, social science and turkish language teachers working in urban elementary and middle schools in turkey was participated in the study. It was found that male and female teachers' application-based educational technology and material development skill levels are not significantly different. Science, elementary and social science teachers' skill levels are significantly higher than turkish language teachers' skill level. It was also found that teachers' application-based educational technology and material development skill level can be predicted by years of teaching experience, teachers' perception on importance of the skills and teachers' perception on school infrastructure supporting to use the skills in the classroom.

Keywords: in-service teachers, educatinal technology skills.

FACULTY EVALUATION OF A LEARNING MANAGEMENT SYSTEM FOR VIRTUAL EDUCATION

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Abstract:
The extraordinary development of information and communication technologies that occurred in the last decades has made possible the emergence of online education, a new mode of teaching and learning that constitutes not only a complement to traditional teaching but an alternative way of learning. Possibilities, interaction style, role, skills, and responsibilities of instructors all change in a virtual mediated environment. Many instructors are faced with a lack of training in using new technologies while trying to develop a course in a virtual environment. The adaptation to these new working conditions comprises various aspects including technological, organizational, and psychological issues. In this work, one of these topics was investigated. The perceived value of a learning management system was evaluated; results of a training program are summarized, analyzed and discussed. Some criteria are proposed for situations where new technologies want to be introduced for the teaching practice.

Keywords: learning management systems, virtual education, faculty training, technology adoption

Introduction

Some of the issues that arise when trying to introduce new technologies in the classroom are the following: What are the criteria to decide whether or not we will call this tool an educational aid for teachers? How do we make professors expend time to learn new tools for teaching?
Different platforms for e-learning are being used in higher education institutions. These platforms are learning management systems (LMS) with many features that require faculty training and motivation to embrace this technology. The adoption of these new tools can be facilitated if instructors can perceive and experiment the LMS possibilities.
In this investigation, we evaluate the perceived value of a LMS through the implementation of surveys for instructors who have taken a training course to learn to develop an online class in a virtual environment. The surveys were administered to four different groups of participants. The items collected were analyzed and results are summarized and discussed. Some of the questions included in the survey are listed below:
What kind of tools and resources have you utilized in the design of your course?
Does the LMS have effective channels for communication between students and teachers?
Does the LMS allow to plan and organize class activities in a clear and effective manner?
The results of this research work can be helpful to those implementing training or development programs for faculty and staff that include technological tools, or intending to prepare them for working in virtual learning environments. The diffusion strategy that is uncovered in this research seems to be effective and could motivate others to follow it.

Theoretical Framework

The use of technologies in education is always a contemporary topic. Among the recent technologies deployed, the relevance of learning management systems to higher education is undeniable. Higher education institutions are investing resources to explore and investigate the value that these e-learning platforms bring to the academy (Britain & Liber, 2004; MacDonald & Thompson, 2005).
For the last decade, LMS have demonstrated that they play a central role in advancing strategic academic goals for educational institutions. The introduction of LMS into teaching practices is in most cases, the first step for faculty to utilize technologies for instruction.
Today, e-learning platforms are the main tool for offering online courses to students in universities throughout the world (Clari & Sanchis-Kilders, 2009). But not much is known about the way faculty use the LMS in their classes and the pedagogical effects on student's learning.
A LMS is software designed to create an environment where teachers and students can teach and learn. Most of these learning systems include course content organization and presentation, interaction/communication tools, monitoring and student evaluation tools, and many other features that help to manage class activities and materials (Janossy, 2008).

Educational media, traditionally recognized as resources deployed by the teacher to produce a pedagogical event (Richey, 2008) work as a communication channel, facilitating - but also regulating and conditioning- interaction between students and instructors. The LMS are therefore vehicles that make possible same kind of interactions between students and teachers, but at the same time restrict some others (Lane, 2007). The design of the LMS determines which kind of interaction is possible, or the most favored.
Because they believe that the LMS reduce control of the instructional environment and the teaching itself, some faculties are reluctant to adopt them as educational aids. These instructors fear that the structure of the LMS could constrain too much their teaching practices.
As the technologies are introduced in the learning process, instructors are faced with changing roles, responsibilities and possibilities. Thus, teaching education must adapt (Pallof & Pratt, 2003). Many instructors lack the sufficient experience in using new technologies in their teaching practices. To get these instructors adapted to the new conditions of teaching is an important but not a simple problem, which includes technical, organizational, and psychological sides. Some of these issues are mentioned here: "Institutional aspects of these studies showed that few universities have written guidelines or policies for online courses. They also confirmed the lack of technical support for both faculty members and students engaged in online instruction. Faculty members want training and course development assistance as well as rewards for preparing courses to be taught online. Few faculty members said that they would require additional compensation for the work if they could get help developing and delivering courses." (Tallent-Runnels et al., 2006, p. 116)
For a LMS to be successfully adopted and used by faculty and educational media developers, training is a key factor (Zellweger-Moser, 2007). This provides a motivation to include the use and experimentation with LMS in the regular graduate courses of future teachers.
According to a recent investigation, the pedagogical reasons instructors give to utilize a LMS in their teaching practices are: supplement course materials so students can augment comprehension, to appeal to different learning styles, increase the time students dedicate to course materials and exercises, increase the communication teacher-student and student-student, to provide more feedback to student in order to improve their learning, and, to increase course transparency.
Even though there is little empirical evidence that the use of a LMS actually improve pedagogy, some study findings suggest, that incorporating a LMS "does invite faculty to rethink their course instruction and instructional environment resulting in a sort of *accidental pedagogy*. This rethinking has the pedagogical side effect of enabling better course organization, providing greater transparency and accountability in the course, and potentially increasing student engagement with the materials." (Morgan, 2003, p.13)

Methodology and Procedures

A research and development (R&D) group at the University of La Pampa has been working since the year 2005 in topics related to platforms for virtual education. During the 2005-2006 period, four instructors pilot tested courses in the e-learning platform that was installed at the Math Department of the institution. These first courses helped to fine-tune the system, adapting it to the local needs. As one of the objectives of the R&D group was the expansion of virtual education initiatives, one strategy devised for the diffusion of the experience and the development of human resources was the implementation of a series of training courses for faculty and teachers. The training program started on 2007 and continued during 2008 and 2009. Participants of these four courses were asked to fulfill an end-to-the-training program survey in order to collect useful information about the training program and the features of LMS used in these courses. A total of 98 out of 125 participants (78.40% response rate) completed the survey after finishing the training courses for faculty and teachers. The training courses were developed with the objective of preparing instructors to teach a class in an online environment. The LMS platform deployed for implementing the training courses was Moodle, a widely used and popular e-learning environment for virtual education. The course had been carried out during 2 months, with 3 face-to-face classes of 2 hours each one and the remaining training was implemented by the LMS environment. The participants of the training courses were teachers and professors from different knowledge areas (language, mathematics, informatics, geography, natural sciences, finances, psychology) that were involved in high school or university level teaching.

The survey was created using SurveyMonkey, a tool for survey design, collection and analysis of questionnaire data. The participants were asked to complete it, and it was an anonymous and non-compulsory activity. Results were summarized using spreadsheet software.

Results and Discussion

In this section, we are going to show and discuss some of the results of the survey. The participants had to complete a final project, which consisted in developing a course for them to teach a pedagogic unit in the subject matter they choose. They were asked to explore and utilize different elements and resources. There were a minimum of items required to get the project approved, which included to incorporate elements to present contents, tasks for students to practice, and evaluation activities. The training course was prepared intentionally to expose the participants with the task of creating original work (small video clips, images and questionnaires). The idea was that the instructors could create new learning objects intended specifically for the virtual environment. They should experience the passage from readers to editors of the materials to be used in the virtual class.

One of the questions of the survey was asking about how many resources of the LMS they had used. Beyond the main inventory intention of this question, this item in the survey served a secondary purpose, which was to become an awareness tool, so to make participants to reflect and realize how much they had experimented with the innovation. The question was: "What kind of tools and resources had you used in the design of your course (final project) in Moodle? Mark all that belongs." The results are displayed in Table 1. Images, forum and text documents were included by almost all the participants in their final projects. Questionnaires and links to external websites were also used extensively in the participant's final projects.

Table 1: Resources used by the participants in their final projects

Resource/Tool	Response Percent (%)
Text documents (word, pdf, etc.)	97
Labels	70
Images	90
Videos	48
Music/Sound Clips	9
Chat	40
Forum	98
Questionnaire	78
Web pages	60
Links to external websites	77
Glossary	74
Wikis	65
Lesson module	40
Scorm, Quizz, Other (*)	19

The chat module, sound and audio clips, and lesson module were the less utilized resources in the projects. Wikis, glossary and the forum resources were the main tools used for collaboration in the projects. Some participants experimented with less common resources of the LMS (19% item "other"), like the incorporation of Hot Potatoes surveys, Geogebra applets (math plug-in), Scorm objects, or embedded slideshow style image presentations.

Besides getting information about the technical resources used by the participants of the training course, the survey gathered important data related to the perception of the instructors taking the course (mostly first time users of a LMS) about the LMS pedagogical capabilities. In Table 2, a group of questions from the survey are shown all together. In these cases, participants were asked about their degree of agreement (or disagreement) with the sentence provided.

Table 2: Several items of the survey shown together

Question	Total Agreement	Agreement	Disagreement	Total Disagreement
The Moodle system allows me to plan and organize my curriculum activities in a clear and effective way	41.84%	57.14%	0.0%	1.02%
The Moodle system allows me to try activities and modify them before presenting to the students	63.27%	35.71%	1.02%	0.0%
The Moodle system has effective channels for communication between students and instructors	45.92%	53.06%	1.02%	0.0%
The interaction media in Moodle (chat, forum, wikis) favor the socialization and	41.84%	54.08%	4.08%	0.0%

exchange of opinions among the course participants				
The Moodle system allows for feedback about the teaching practice	36.73%	61.22%	1.02%	1.02%

It can be seen from the responses to the five questions shown in Table 2 that the participants perceive the Moodle platform as a useful pedagogical tool as it allows to plan and organize curriculum activities, provide feedback to teachers, and has effective channels of communication for students and instructors among their other features. The positive view of the participants in the questions asked in the survey were in the range of 96% to 99%, almost the absolute majority, which clearly indicates that the participant were very satisfied with the LMS as a pedagogical tool.
Another group of questions from the survey are summarized in Table 3. Only 20% of the respondents think that the LMS does not have the adequate tools for evaluating students (note the reverse order of the question of this survey). The vast majority of the responses (around 90%) agree that the virtual platform adapts very well for group and collaborative activities, favors active participation of students, allows monitoring of students work, and is flexible enough to be adapted to different teaching styles and students with a variety of learning experiences and talents.

Table 3: Summary of survey results

Question	Total Agreement	Agreement	Disagreement	Total Disagreement
The Moodle platform does not have the adequate tools for evaluating students	1.02%	18.37%	71.43%	9.18%
It is possible to monitor and follow student's activities inside the Moodle environment	24.49%	71.43%	3.06%	1.02%
Moodle does not adapt very well to group activities	1.02%	14.29%	71.43%	13.26%
It is possible to create activities in the Moodle environment that favor active participation of students	33.67%	65.31%	1.02%	0.00%
The Moodle platform is flexible and can be adapted to the style of teaching of the instructor	32.65%	57.14%	10.20%	0.00%
The Moodle environment allows that users with different levels of experience and diversity of talents to take advantage and use it for learning	26.53%	69.39%	4.08%	0.00%
The Moodle environment has tools that favor the construction of knowledge in a collaborative way.	30.61%	66.33%	3.06%	0.00%

The survey included an open-ended essay type of question asking the following: "Would you use the Moodle platform to develop a course in the future?". The results showed that 89 out of 98 (91%) answered a categorical yes. None of the remaining 9 answered that they would not use the platform to develop a course in the future; instead they showed a different level of reticence or caution for the implementation. The positive answers towards the use of Moodle ranged from just "Yes", to "Yes, absolutely" or "Yes, of course!". Among the nine participants who did not replied affirmatively that they would use it for a course in the future, there were answers like: "I would use it as a complementary instrument, not as an independent course", or "I would use it only if the audience for whom the course was intended had the needed accessibility", and "I would use it only if I had the necessary technical support". Just to sample some of the positive comments, one of the participants answered: "The tools and resources available in the LMS inspires my creativity", another said "I believe this tool [the LMS] is useful not only for those who are fluent with computer tools but also for those who are novices and above all because it makes possible to learn to those whom for different reasons can not do it by conventional ways"

Conclusion

This investigation showed that the participants of the training program had a very positive opinion of the pedagogical possibilities of the LMS. From the virtual campus server records of the college it can be seen that faculty that started using the platform kept using it. The number of users of the platform, both instructors and students, has increased notably after these training courses for faculty. The number of courses developed in the platform has also grown, including undergraduate, graduate and outreach courses. The knowledge area covered by the courses has widen as well, being math and computer sciences the most common topics in the first years that the server was available, and now having a variety of subject matters including natural and social sciences, as well as nursing courses.
Among the barriers for implementation of courses in the virtual platform, the most cited are the technical problems (access to the platform, low bandwidth) and the lack of teacher training. When faculty see that a colleague is implementing a course, they ask to be trained (this is like a "contagious effect"). This bottom up strategy was implemented in our institution, and the diffusion effect is starting to show up.
Another factor that pushes for online education development is that once students had experienced a course with the virtual platform, they expect instructors to use it in their next courses.
The introduction of a new methodology (online education is not just an upgrade of distance education), novel tools and protocols for interaction can not be done with a stroke of magic. But we have seen that when faculties perceive the innovation as a pedagogical improvement with a potential for a positive impact on their class, they embrace it, changing their practices by adopting new approaches.

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FARKLI TEKNOLOJİK EĞİTİM ARAÇLARININ SAĞLIK ALANINDA KULLANILMASI ÜZERİNE BİR ARAŞTIRMA

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Özet

Bu araştırma karamanoğlu mehmet bey üniversitesi sağlık yüksekokulunda verilen doğum-kadın hastalıkları ve çocuk hastalıkları derslerinde, farklı eğitim yöntemlerinin öğrencilerde ders başarısındaki ve derse ilgisindeki artışı ölçmek amacı ile yapılmıştır. Ders programı farklı öğretim yöntemleri kullanılarak yürütülmüş ve öğretim yılının sonunda araştırmacı tarafından hazırlanan veri toplama formunda öğrenciler dersin işlenişine yönelik değerlendirmeler yapmışlardır. Veri analizinde sayı ve yüzde dağılımları, mann-whitney u testi, regresyon analizi kullanılmıştır. Derslerin tamamı görsel materyallerle anlatılmış, konular sık özetlenmiş, kısa konuları da öğrencinin anlatması sağlanarak öğrencinin aktif katılımı sağlanmış, konuyla ilgili uzmanlar derse davet edilmiş, beyin fırtınası, rol-play, örnek vaka gibi bir çok yöntem ile konular anlatılmıştır. Teorik ders ve stajlar ayrı ayrı değerlendirildiğinde teorik derslerden memnuniyet düzeyi stajlara göre daha yüksek bulunmuştur. Öğrencilerin %100'ü derste kullanılan eğitim materyallerini yeterli bulduklarını, derste yeni bilgiler edindiklerini, teorik bilgilerini uygulama alanında kullanabilecek şekilde öğrendiklerini, konuyla ilgili belgesel ve sinema izletilmesiyle konuyu pekiştirdiklerini, her hafta uygulama alanında karşılaşılan bir hastalığı araştırıp rapor etmelerinin öğrenmelerini kolaylaştırdığını ifade etmişlerdir. Öğrencilerin %20,8'i stajda öğrenci sayısının uygun olmadığını, uygulama alanlarında uygun eğitim ortamının olmadığını, %16,6'ı stajda ekip çalışması olmadığını ve %14,8'i stajda sürekli olarak yanında öğretim elemanı olmamasından kaynaklanan sıkıntı yaşadığını ifade etmiştir. Araştırma sonucunda farklı öğretim yöntemlerinin sağlık eğitiminde kullanılması durumunda öğrencilerde ders başarısında ve derse ilgilerinde artış oluşturduğu tespit edilmiştir.

A**nahtar kelimeler:** eğitim, sağlık eğitimi, öğretim yöntemleri

HEALTH EDUCATION IN THE FIELD OF TECHNOLOGICAL MEANS DIFFERENT ON THE USE RESEARCH

Summary

This research is done with the aim of surveying the affects of different education methods in natal-gynecology and pediatry lessons at the health highschool of karamanoğlu mehmet bey university, to students succes in lessons and increment at the relevancy to lessons. Lesson programme is performed with different education methods and at the end of the education term students made evaluation about lessons performing types with using the data collection form which's prepared by researcher.ın the analysing of data, numaral and percentage distribution, mann-whitney u test, regression analysis are used.all of the lessons are teached with visual materials,subjects are frequently summarized, students participation's provided with giving role in explaning simple subjects,professionel peoples invited to lessons,subjects are explained with using some methods such as brain storm,role-play, case study etc.ıt's determined that the satisfaction level of threotical lesson's higher than apprenticeship when threotical lessons and apprenticeship period analysed separately.all of the students said that the education materials that used in lessons's adequate,they learned new information at lessons,they are learning threotical informations as to apply in practical field,they consolidate what they learn in lessons with watching documentary film and cinema, the searching and reporting of an ilness which is faced in practice field is makes easy learning.other results are;20,8 % of them said that the number of student at apprenticeship is not appropriate and there is no appropriate education enviroment in their practice field;16,6% of them said that there's no group working in practice;14,8% of them said that the absence of lecturer whole the day with them in practice is cause to hardness.as a result of research, ıt is determined that there's increment at the succes in lessons and at the relevancy of students to lessons when different education methods used in lessons.

Key words: education, health education, method of ınstruction.

GİRİŞ

Eğitim; "bireyin davranışlarında kendi yaşantısı yoluyla ve kasıtlı olarak istendik değişme meydana getirme sürecidir" veya "kişisel anlayış, zeka, ilgi ve yaşantılar gibi kuvvetlerin etkileşimidir" şeklinde tanımlanabilir. Bu etkileşme sonucunda kişilerin amaçları, bilgileri, davranışları, idealleri ve ahlak ölçüleri değişir. İstendik davranışların kazandırılabilmesi; eğitimin hedeflerinin belirlenmesine, bu hedefleri gerçekleştirici nitelikte öğrenme ortamının düzenlenmesine, istendik durumla ulaşılan durum arasındaki farkın belirlenmesine bağlıdır (Titiz 1997, Özer 1997, Sullivan ve ark 1997).

Sağlık eğitimi, yalnızca kişiye söz ve yazı göstererek bilgi aktarma değil, ona yeni bir davranış kazandırmak, kazandığı bilgiyi kullandırmaya alıştırmaktır. Sağlık ile ilgili eğitim veren okullarda sağlık eğitimi çalışmaları yalnız birey düzeyinde değil, toplum düzeyinde ele alınır. Bu eğitim sürecinde, öğrenciye mesleği için gerekli kuramsal bilgiler verilirken, öğrencinin bu bilgileri uygulama alanlarında beceriye dönüştürebilmesine çalışılır. Hemşirelik hizmetlerinin niteliğinin gelişmesinde en önemli ve öncelikli koşullardan birisi eğitimin niteliğinin yeterli olmasıdır (Kristina ve ark 2006, Ulusoy 2001).

Eğitimde teorik bilgilerin büyük bir kısmı sınıf ortamında öğretilecek ve öğrenilecek olmasına karşın bu bilgilerin uygulamada kullanımı sağlam ya da hasta bireyle temas halindeyken öğretilebilir veya öğrenilebilir. Sağlık Yüksekokullarında hemşirelik bölümünde sağlık eğitiminin genel amacı; öğrenciye profesyonel hemşirelik özelliklerini kazandırmak ve gelecekteki meslek yaşamına hazırlamaktır. Diğer bir deyişle, hemşirelik eğitiminde geliştirilmesi hedeflenen istendik davranış "profesyonel hemşire" davranışıdır. Bu istendik davranışların geliştirilebilmesi teorik ve uygulamalı eğitimin bir arada yürütülmesini zorunlu kılar (Keçeci ve ark 2009, Kristina ve diğerleri 2006, Mannion 2000).

Eğitim sisteminde hemşirelik eğitiminin de kendini yenilemesi, 2000'li yılların değişen koşullarına uyum sağlayarak yeniden yapılanması öngörülmektedir. Yeniden yapılanmada öğrencide analiz, sentez, değerlendirme, ilişkilendirme, soyutlama gibi üst düzey düşünme becerilerini geliştirecek konuların özünü vermek önemlidir. Ayrıca, öğrenilenlerin hemşirelik alanı ile toplumla, hatta dünya ile bütünleştirilebilmesi gerekir.

Ders içeriğinin öğrencilere en etkili biçimde "nasıl" kazandırılacağı sorusu bizi öğretme yollarıyla karşı karşıya getirir. Geleneksel öğretim yöntemlerinde esas rol öğretmen üzerindeyken, çağdaş yöntemlerde ise hem öğretmenin hem de öğrencinin etkinliği söz konusudur. Artık öğrencilerin sınıflarda pasif durumda oturarak öğretim görmesi istenmemektedir (Babadağ 1991, Başer 1996, Davis 1996, Fadıloğlu ve ark.1997, İnan 1994). Sağlık Yüksekokullarındaki öğrenciler, okulda edindikleri bilgileri ve becerileri, hastanedeki kliniklerde bakım verdikleri hastalardan aldıkları verilerle bütünleştirirler. Bu bilgileri de, hemşirelik sürecine göre planlayıp uygularlar. Böylece öğrenciler teorik bilgilerini uygulamaya aktarma fırsatı bularak meslek yaşamlarındaki rollerini öğrenirler. Dersin ve uygulamaların daha iyi pekiştirilmesi amacıyla teknolojik tüm imkânların yanısıra, eğitim alanındaki tüm yeni teknikler de kullanılarak hemşireliğe ilginin artırılması gerekmektedir (Kavuncubaşı 1998, Keçeci 2009, Lindberg 1990).

İletişimi üniversite eğitimi açısından ele alan kaynaklar gençlere/yetişkinlere verilen üniversite eğitiminin, çocuklara ve ortaöğretim gençliğine verilen eğitimden farklı özellikler taşıdığını vurgulamaktadırlar. Oysa yapılan bazı çalışmalar, üniversitedeki birçok öğretim elemanının öğrencilerin psikolojik ve sosyolojik özelliklerine dikkat etmediği ve bu nedenle birçok sorunla karşılaşıldığını göstermektedir. Genel olarak öğrenciler öğretim elamanlarından, etkili ve yeterli kişilerarası beceriler, sabırlı ve hoşgörülü olma, rol modeli olma, kaynak kişi olma, öğrencilere bağımsız düşünme olanağı verme, kendi duygu ve düşüncelerini ifade etmesine olanak sağlama, öğrencilerin anlayamadıkları konular hakkında soru sormaya özendirme, kişisel sorunlarını ders dışında da öğretim elemanlarıyla paylaşabilme, alanında bilgili olabilme, öğrencileri birey olarak algılama, demokratik olma, öğrencileri derslere aktif olarak katılmaya ve soru sormaya özendirme gibi nitelikleri beklemektedirler. (Cimete 1998, Çakmak 1995, Keçeci ve ark 2009)

Hemşirelik meslek derslerinin yürütülmesinde farklı yöntemler uygulama çalışmaları bir çok kurumda yapılmıştır. Bu araştırma, eğitimi daha etkili yaparak öğrencilerde isteklilik oluşturmak, ders başarısını artırmak, eğitimin sonunda öğrencilerin geribildirimlerini değerlendirmek ve konuya farklı bakış açıları kazandırmak amacıyla gerçekleştirilmiştir.

YÖNTEM

Bu araştırma, Karamanoğlu Mehmet Bey Üniversitesi Sağlık Yüksekokulunda Doğum ve Kadın Hastalıkları Hemşireliği dersi alan 46 öğrenci, ayrıca Çocuk Sağlığı Hastalıkları Hemşireliği dersi alan 48 öğrenci ve bir öğretim elemanının katılımı ile gerçekleştirilmiştir. Her iki ders de haftada 6 saat teorik+16 saat uygulama halinde toplam 14 hafta yürütülmüştür. Çalışmada örneklem seçim tekniği kullanılmamış, tüm öğrencilerden izin alınarak öğrencilerin tamamı araştırma kapsamına alınmıştır. Farklı öğretim yöntemleri kullanılarak 2 dönem boyunca ders programı yürütülmüş ve öğretim yılının son haftasındaki teorik derslerin yapıldığı günlerde, araştırmacı tarafından hazırlanan anket formlarını öğrenciler doldurmuştur.

Araştırmanın verileri araştırmacı tarafından 2 bölümlük anket ile elde edilmiştir. İlk bölümde öğrencilerin yaşı, mezun olduğu okul, medeni durum, stajı kaçıncı kez aldığı, doğum eylemini izleme durumu, doğum ve çocuk sağlığı ders stajı ile ilgili duygularını içeren 6 soruluk anket formu vardır. İkinci bölüm, Likert tipinde olup "*katılıyorum*", "*kısmen katılıyorum*" ve "*katılmıyorum*" cevaplarının yer aldığı bir formdur. Bu form Teorik Konuların İşlenmesine İlişkin Değerlendirmeler, Stajın Yürütülmesine İlişkin Değerlendirmeler ve Öğretim Elemanına İlişkin Değerlendirmeler halinde 3 bölümde incelenmiştir. Yıl sonunda anketler uygulanmış ve öğrencilerin kendileri tarafından ortalama 20-30 dakikada doldurulmuştur. Güvenilir cevaplar alabilmek için öğrencilerin isimlerinin gerekli olmadığı belirtilmiştir.

Araştırmanın analizi araştırmacı tarafından SPSS 10.0 paket programı ile yapılmıştır. Araştırma bulgularının analizinde, sayı ve yüzde dağılımları, Mann-Whitney U testi, Wilcoxon eşleştirilmiş iki örnek testi, Kruskal-Wallis varyans analizi kullanılmıştır

Sağlık eğitiminde farklı yöntemleri bir arada kullanarak öğrencinin mesleğe ilgisini çekmek ve ders başarısını artırmak amacı ile 1 yıl boyunca derslerde aşağıdaki yöntemler uygulanmıştır:

Ders döneminin ilk haftasında uygulanacak öğretim yöntemleri öğrencilere ayrıntılı şekilde açıklanmış, dersin işlenmesinde öğrencilerin de katkıları, önerileri alınarak, dönem sonuna kadar neler yapılacağını içeren ayrıntılı bir plan sınıf panosuna asılmıştır.

Derslerin tamamı projektör ile anlatıldığından, sabit projektör bulunan bir sınıfa geçilmiştir. Sınıfta tepegöz, slayt makinesi, renkli fosforlu kalemlerle yazılabilen elektronik tahta, dersle ilgili duyuru ve bilgilerin ilan edilebileceği pano, konuların tamamını kapsayan dersle ilgili afiş-broşürlerin asılabildiği levhalar da bulunmaktadır.

Sınıftaki sabit panoya her hafta öğretim elemanı tarafından dersle ilgili makaleler, öğrencinin konulara önceden hazırlanmasını sağlayan ve ilgi uyandıran yazılar, kadın ve çocuk sağlığı ile ilgili komik-güncel yazılar, şiirler, fıkralar, ingilizce anektotlar asılmıştır.

Dönem başlangıcında panoya asılan dersin işlenişini ayrıntısıyla gösteren program, dönem sonuna kadar aksatılmadan uygulanabilmiştir. İlk 3 hafta süreyle haftada 3 gün teorik ders anlatılmış, daha sonra her hafta 6 saat teorik, 14 saat staj uygulaması yapılmıştır. Her hafta anlatılan teorik konu içerisinde konu ile bağlantılı kısa konular, öğrenci semineri halinde anlatılmıştır.

Öğrenciler, anlattıkları seminerlere gruplar halinde hazırlanmışlardır. Konunun uzunluğuna göre öğretim elemanı tarafından semineri anlatacak öğrenci sayısı önceden belirlenmiştir. Her seminer grubu, kendilerine bir grup ismi vermiştir. Öğrencilerin anlattıkları seminerleri bir çok kaynaktan hazırlamaları, mutlaka görsel-işitsel araç kullanmaları, rol-play yaparak konuyu tekrar etmeleri, konuyla ilgili bir vaka sunumu hazırlamaları istenmiştir. Seminer grubunun konularını slayt haline getirmeleri, bilgisayar ortamına resim eklemeleri vb durumlarda öğretim elemanı tarafından öğrencilere rehberlik edilmiştir. Öğrenci semineri başlamadan önce öğretim elemanı tarafından hazırlanan "Seminer Değerlendirme Formu" tüm sınıfa dağıtılmış ve seminer grubunun anlatımını sınıf arkadaşlarının değerlendirmeleri istenmiştir. Seminer Değerlendirme Formunda konunun sunu düzeni; grup üyeleri ile etkileşimi; görsel-işitsel araç kullanımı; sununun eleştirilerde savunulabilme durumu; konuya ilgi uyandırabilme; vaka üzerinde araştırıcılık durumu; konunun sistematik ele alınışı kriterleri vardır. Bu kriterleri sınıftaki öğrencilerin 100 üzerinden değerlendirmeleri istenmiş, seminer bittikten sonra da puanlar her kriter için ayrı puan ve toplam puan halinde sınıfa duyurulmuştur. Sınıftaki öğrencilerin verdiği bu değer, öğrencinin staj notuna %20 oranında etkilemiştir.

Öğrenciler seminer bitiminde konularıyla ilgili doğaçlama ya da önceden senaryosunu hazırladıkları rol-play'ler sunmuşlardır. Rol-play'in tamamı öğretim elemanına ait kamera ile çekilmiş, rol-play biter bitmez öğrencilere kendi performansları projektör ile gösterilerek anlattıkları konunun yorumu yapılmıştır.

Dersin tamamı projektörle ve resimlerle anlatılmıştır. Bir çok kaynaktan konuyla ilgili resimler, yazılar özetlenmiş, bazı haftalarda konuyla ilgili hastane ortamında elektronik fotoğraf makinesi ile çekilen resimler de slaytlar halinde sunulmuştur. Her dersin bitiminde o gün anlatılan konu soru-cevap şeklinde tekrar edilmiş, konular sık sık özetlenmiştir. Ayrıntı içeren ve daha önemli olduğu düşünülen sorulara cevap veren öğrencilere küçük hediyeler verilerek öğrenciler hoş bir rekabet ortamında tutulmuştur.

Dönemin ilk haftasında digital fotoğraf makinesi ile öğrencilerin resimleri çekilmiş, ders anlatıldıktan sonra yapılan soru-cevap ve tekrar aşamasında öğrencilerden birinin resmi projektör ekranına getirilerek, soruya bu öğrencinin cevap vermesi istenmiştir. Bu uygulama ile, teorik dersi öğrencilerin daha dikkatle dinledikleri gözlenmiştir. Ayrıca, öğrencilerin resimleri slayt haline getirilip ders aralarında klasik müzik eşliğinde sürekli projektör ekranına slayt geçişi halinde yansıtılmıştır.

Teorik derslerin tamamı tek öğretim elemanı tarafından anlatılmıştır. Bazı konular anlatıldıktan sonra ders bitimi saatinde hastanede çalışan doktor, ebe veya hemşireler okula çağrılmış; o günkü konu ile ilgili öğrencilerin klinik ortamında karşılaşacakları durumlar direkt hastane çalışanı tarafından anlatılmıştır. Örneğin normal doğum eylemi konusu öğretim elemanı tarafından anlatıldıktan sonra doğum salonunun sorumlu ebesi okula gelerek öğrencilerin konuyla ilgili sorularına cevap vermiş, doğum salonunda bir hemşirenin yaptığı uygulamaları aşama aşama anlatmıştır. Riskli doğum eylemi konusu öğretim elemanı tarafından anlatıldıktan sonra, ders bitiminde hastanede doğum uzmanı başhekim sınıfa gelerek öğrencilerin sorularına cevap vermiştir. Özel bakım gerektiren yenidoğan konusu öğretim elemanı tarafından anlatıldıktan sonra bir çocuk uzmanı doktor ve çocuk servisinin sorumlu hemşiresi sınıfa gelerek öğrencilere klinik ortamını anlatmışlardır. Uygulama alanlarına çıkılmadan önceki hafta Doğumevi

Başhemşiresi sınıfa gelerek hastane ortamı, sağlık ekibi ve öğrencilerden beklentileri anlatmış, öğretim elemanı ile birlikte profosyonel hemşirelik uygulamaları hakkında bilgi verilmiştir.

Hastane personelinin okula gelerek sınıf ortamında bulunması, hem personelin öğrenci-öğretim elemanıyla sıcak etkileşime girmesini sağlamış; hem de öğrencilerin staj alanına olumlu bakarak hastane personeliyle iletişimini güçlendirmiştir.

Teorik konuların bitiminde soru-cevap tekniği yanında beyin fırtınası tekniği de kullanılmıştır. Örneğin; normal doğum eylemi anlatıldıktan sonra öğrencilerin şehirlerarası bir otobüste aktif faza giren bir gebeye ne şekilde doğuma yardım edebilecekleri sorulmuş ve beyin fırtınası yapmaları istenmiştir.

Teorik dersler anlatıldıktan sonra, bazı konuların daha iyi anlaşılabilmesi için doğaçlama rol-play yapılmıştır. Örneğin; gebe muayenesi öğretim elemanı tarafından anlatılmış, sonra da öğrencilerden birinin gebe rolü üstlenmesi sağlanmış, başka iki öğrencinin de o gün öğrendikleri muayene tekniklerini sırası ile gebeye uygulamaları istenmiştir.

Teorik konular projektörle anlatıldıktan sonra hemen her hafta ders ile ilgili film ve CD'ler izletilmiştir. Örneğin; embriyonun oluşum aşaması ve doğum görüntüleri için Human Body belgeseli; riskli bir doğumda hemşirenin karşılaşabileceği etik sorunlar için Ebenin Başına Gelenler filmi; fenilketonüri tanıtım programı; bebek bakımı; bebek dostu hastaneler; otizm ile ilgili Rain Man ve Şifre Merkür, kendikendine meme muayenesi; aile planlaması yöntemleri tanıtım görüntüleri vb izletilmiştir. Filmler izlendikten sonra öğrencilerin değerlendirmeleri tartışılmış, konu ile ilgili olarak öğrenmeleri gereken önemli noktaları bulmaları sağlanmıştır.

Ders anlatımında öğrencilerin aktif katılımı sürekli olarak desteklenmiş, soru sormalarına fırsat tanınmış, önemli konular vurgulanarak sık sık konu özetlenmiştir.

Stajda öğrencilerin bakım verdiği bazı hastalar digital fotoğraf makinesi ile çekilmiş, o hafta işlenen teorik dersin uygun bir zamanında bu hastaya verilen bakım, öğrenci tarafından özet şekilde anlatılmıştır. Bazı haftalarda hastanedeki bir cihaz (örneğin; perfüzyon cihazının kullanımı vb) öğrenci tarafından arkadaşlarına tanıtılmıştır.

Stajda lohusa servisinde çalışan öğrenciler, rutin işlemleri tamamladıktan sonra hasta ve refakatçilere eğitim vermişlerdir. Ayrıca, ziyaret saatlerinin bitiminde 14.00-14.30 saatleri arasında uygun ortam düzenleyerek, öğrenciler kendi hazırladıkları afişlerle, ya da broşür, şimşek kart vb eğitim materyalleri ile hastaların gereksinimlerine göre eğitim vermişlerdir.

Staj rotasyonunun her değişiminde öğrenciler bakım planı ile birlikte o hafta serviste ilgilerini çeken hastalık, uygulama, ilaç, cihaz vb konuları araştırıp rapor halinde öğretim elemanına teslim etmişler, öğretim elemanının olumlu-olumsuz değerlendirmeleri her hafta öğrenciye sözlü veya yazılı şekilde geribildirim yapılmıştır.

Teorik ve uygulamaların bütünleşebilmesi için öğretim elemanı, hastane çalışanları ile sürekli etkileşim halinde olmuştur. Her 4 haftalık staj bitiminde tüm öğrenciler hastanenin toplantı salonuna alınmış, başhemşire ve servis sorumlu hemşirelerinin de toplantıya katılımları sağlanmış, karşılıklı geribildirim ve staj değerlendirmesi yapılmıştır. Hastane çalışanları da öğrenci ve öğretim elemanından isteklerini ve beklentilerini bu toplantılarda ifade etme fırsatı bulmuşlardır.

Ders bitiminden sonra, öğrencilerin teorik anlatım ve stajlarına yönelik görüşlerini belirtmeleri ve dersi genel olarak değerlendirmeleri istenmiştir. Sözel değerlendirmeler ışığında hazırlanan anket formu öğrenciler tarafından doldurulmuştur.

Tüm yıl boyunca bu farklı öğretim yöntemleri kullanıldıktan sonra öğrencilerin anketleri doldurmaları sağlanmış, sonuçlar araştırmacı ile birlikte aynı üniversitede istatistik dersleri veren öğretim üyeleri tarafından analiz edilmiştir.

BULGULAR VE TARTIŞMA

Bu bölümde önce öğrencilerin sosyodemografik özellikleri, daha sonra öğrencilerin teorik ders ile stajı değerlendirmeleri analiz edilmiştir.

Tablo 1: Öğrencilerin Sosyodemografik Özelliklerine Göre Dağılımı

	N	%
Yaş Grupları		
18-19 Yaş	4	8,3
20-21 Yaş	14	29,2
22-23 Yaş	22	45,8
24 Yaş ve ↑	8	16,7
Mezun Olduğu Okul		
Lise	14	29,2
Sağlık Meslek Lisesi	34	70,8
Medeni Durum		
Bekar	46	95,8
Evli	2	4,2
Çalışma Durumu		
Çalışan	7	14,5
Çalışmayan	41	85,4
Bu Dersi Kaçıncı Kez Aldığı		
İlk kez	40	83,3
İkinci veya Üçüncü kez	8	16,6
TOPLAM	**48**	**100**

Sağlık Yüksekokulu üçüncü sınıf öğrencilerinin %45.8'inin 22-23 yaşında; %70.8'inin sağlık meslek lisesi mezunu; %95.8'inin bekar olduğu; %85.4'ünün öğrenimi sırasında herhangi bir işte çalışmadığı saptanmıştır. Öğrencilerin yaş grubu, mezun oldukları okul, medeni durumları, çalışma durumları ile teorik konuların işlenmesine ilişkin değerlendirme puanları arasında yapılan Mann-Whitney U testinde istatistiksel olarak anlamlı fark bulunmamıştır ($p>0.05$).

Tablo 2: Öğrencilerin Teorik Konuların İşlenmesine İlişkin Değerlendirmeleri

Öğrencilerin Teorik Konularla İlgili Değerlendirmeleri	Katılıyorum		Kısmen katılıyorum		Katılmıyorum	
	N	%	N	%	N	%
Dersin içeriği yeterliydi	46	95,8	2	4,1	0	0
Derste kullanılan kaynaklar yeterliydi	45	93,7	3	6,2	0	0
Ders için farklı kaynaklardan da yararlandım	42	87,5	5	10,4	1	2
Derste kullanılan görsel-işitsel araçlar yeterliydi	48	100	0	0	0	0
Derste yeni bilgiler öğrendim	48	100	0	0	0	0
Dersin teoriği ile uygulamaları bütünleşti	42	87,5	5	10,4	1	2
Ders, doğum, kadın ve çocuk hastalıklarına ilişkin düşüncelerimi olumlu etkiledi	46	95,8	2	4,1	0	0
Derste rol-play yapılması konuları pekiştirmemi sağladı	47	97,9	1	2	0	0
Konu ile ilgili sinema ve belgeseller konuyu pekiştirmemi sağladı	48	100	0	0	0	0
Derste, istediğim an öğretim elemanına soru sorma fırsatım oldu	46	95,8	1	2	1	2
Derste önemli konular vurgulandığı için, konuların önceliklerini belirleyebildim	46	95,8	1	2	1	2
Hastane çalışanlarının sınıf ortamına gelip etkileşim yapmamız, dersi öğrenmeme olumlu etki sağladı	48	100	0	0	0	0
Sınıf panosuna ders ile ilgili asılan bilgilerden yararlandım	47	97,9	1	2	0	0
Öğrenci seminerleri konuya ilgimi artırdı ve daha çok öğrendim	45	93,7	2	4,1	1	2
Doğum ve kadın hastalıkları hemşireliği dersini tek öğretim elemanının anlatması sıkıntı oluşturmadı	46	95,8	1	2	1	2
Stajlarda karşılaştığımız hastalık-uygulama konularını araştırarak hazırladığımız raporlar teorik bilgimi artırdı	48	100	0	0	0	0
Ders anlatırken önemli konuların vurgulanması ve soru-cevap şeklinde özetlenmesi öğrenmemi kolaylaştırdı	48	100	0	0	0	0

Öğrencilerin cevapları incelendiğinde 6 konuda %100 oranında ve yine diğer soruların tamamında da olumlu cevap vermeleri, derslerin teorik anlatımında sorun yaşanmadığını göstermektedir. %87.5 oranında "*Ders için farklı kaynaklardan da yararlandım"* cevabı olumlu bir sonuç olarak değerlendirilebilir. *"Dersin teoriği ile uygulamaları bütünleşti"* cevabında %10.4 oranında öğrencinin kısmen katılması, uygulama alanları olan hastanelerde karşılaşılan bir çok soruna (öğrenci sayısının fazlalığı, öğretim elemanı sayısının yetersizliği, öğretilen konuların hastanelerde uygulanmaması, öğretilen hastalık veya cihazları hastanelerde görememeleri vb) bağlı olarak değerlendirilebilir. %6.2 oranında öğrencinin derste kullanılan kaynakları kısmen yeterli bulması öğretim elemanını daha fazla kaynak kullanımı konusunda uyarıcı bir sonuç olarak değerlendirilmiştir. %4.1 oranında öğrencinin ders içeriğini kısmen yeterli bulması da öğretim elemanını daha fazla konu aktarımına yönlendirmiştir.

Tablo 3: Öğrencilerin Stajın Yürütülmesine İlişkin Değerlendirmeleri

Öğrencilerin Stajın Yürütülmesine İlişkin Değerlendirmeleri	**Katılıyorum**		**Kısmen katılıyorum**		**Katılmıyorum**	
	N	**%**	**N**	**%**	**N**	**%**
Teorik bilgilerimi staj alanında uygulama fırsatı buldum	39	81,2	7	14,5	2	4,1
Staj süresi, doğum ve kadın hastalıkları hemşireliği dersine ilişkin bilgi-becerilerimi pekiştirmem için yeterliydi	45	93,7	1	2	1	2
Stajda hastalara eğitim yaparak teorik bilgilerimi güçlendirdim	46	95,8	2	4,1	0	0
Hastanede belirli aralıklarla yapılan öğrenci-öğretim elemanı-hastane çalışanları toplantılarında stajla ilgili değerlendirmeler yararlı oldu	48	100	0	0	0	0
Kliniklerdeki öğrenci sayısı uygundu	30	62,5	8	16,6	10	20,8
Staj alanında hastane çalışanları tarafından kabul gördüğümü hissettim	42	87,5	5	10,4	1	2
Staj yaptığım klinikte öğretim elemanının sürekli yanımızda olmamasından dolayı sıkıntı yaşadım	39	81,2	2	4,1	7	14,5
Staj yaptığım ortamlarda ekip çalışması yoktu	30	62,5	10	20,8	8	16,6
Kliniklerde olumlu rol modeli (hemşire)yoktu	36	75	5	10,4	7	0
Staj alanında uygun eğitim ortamı oluşturulmadı	31	43,7	7	14,5	10	20,8

Öğrencilerin, stajı değerlendiren ifadelerinde hastanede belirli aralıklarla yapılan öğrenci-öğretim elemanı-hastane çalışanları toplantılarında stajla ilgili değerlendirmelerinin yararlı olduğunu düşünenlerin %100 olması, %95.8'inin stajda hastalara eğitim yaparak teorik bilgilerini güçlendirdiklerini düşünmeleri olumlu bir sonuç olarak değerlendirilebilir. Kliniklerde öğrenci sayısının uygun olmadığını ifade eden %20.8 oranındaki öğrencilerin tespitinin, klinik personeli yanında kliniklerde sağlık meslek öğrencilerinin de bulunmasının çalışmayı engellemesi, kliniklerin fiziki alanının dar olması gibi sebeplere bağlı olduğu düşünülebilir.

Sosyodemografik özelliklerin belirlendiği anket formunun ilk bölümündeki öğrencilerin staj ile ilgili duygularının yazıldığı ifadelere bakıldığında; stajın başlangıcında stresli ve korkulu olduğunu ifade eden öğrenci oranının (%75.0) yüksek olduğu, stajın sonunda ise rahatladıkları ve kendilerine güvenlerinin arttığını (%62.5) ifade eden öğrenci sayısının arttığı dikkat çekmektedir. Kocaman ve arkadaşlarının (1986) yaptığı çalışmada da klinik stajın ilk gününün öğrencilerin %60.29'unda stres oluşturan olaylardan biri olduğu belirlenmiştir.

Farklı öğretim teknikleri kullanılarak, çeşitli araç-gereçlerle desteklenmiş bir eğitim; bireylerin aktif katılımı ve doyumunu sağlayarak eğitim amaçlarına ulaşmayı kolaylaştırır (Sullivan ve ark 1995). Bu çalışmada da öğrencilerin farklı öğretim teknikleri kullanılarak sunulan ders ile diğer derslerin sunum biçimini karşılaştırmaları istenmiş ve farklı tekniklerin kullanıldığı bu çalışma (x=8.35±1.42); diğer derslere göre (x=4.76±1.64) daha başarılı olarak değerlendirilmiştir. Buna göre öğrencilerin farklı öğretim teknikleri ile sunulan dersi diğerlerine göre belirgin fark ile başarılı bulmaları, sunulan dersin özenle planlanması ve uygulanmasına bağlanabilir. Bu sonucun; "dersi sunan öğretim elemanının sağlık eğitimi bölümü mezunu olması, istekli olması, uygun öğrenme ortamını oluşturması, öğrencinin aktif katılımını desteklemesi, ayrıntılı bir ders ve staj planı hazırlaması, öğretim yöntemlerini destekleyen araç-gereçlerin ve uzmanların katkısı" ile olduğu düşünülebilir.

Öğrencilerin % 68'i iç hastalıkları hemşireliği ve %72'i cerrahi hastalıkları hemşireliği dersi stajında sağlık eğitimi yaptıklarını belirtmişlerdir. Sağlık eğitimi ile ilgili geçmiş bilgi ve deneyimlerin bilgi puanına etkisi vardır (Davis 1996). Her gruptan sunu yapan öğrenciler, eğitimci tarafından değerlendirilmiş ve başarı ortalamaları x=25.81±2.83 gibi yüksek bir sonuç bulunmuştur (Tablo 4). Sunum sırasında öğrenciler ders öğretim elemanının desteğiyle philip chart, afiş, broşür, slayt, karikatür, rol-play, demonstrasyon gibi bir çok yöntem ve araç-gereç de kullanmışlardır.

Tablo 4: Öğrencilerin Grup Çalışması ve Öğrenci-Eğitici İlişkisi

Etkileşim Puanları	X	± SD	Min-Max
Grup çalışması değerlendirme	15.83	2.47	0-20
Öğrenci sunum becerisi			
Klinik eğitmenin performansı	25.82	2.84	0-31
	12.00	14.00	0-15

Bu araştırma, sağlık eğitiminin etkili yöntemlerle ve araçlarla sunulmasının ötesinde, öğrencilere diğer sağlık elemanlarıyla çeşitli sektörlerle iş birliği kurma fırsatı vererek okulda öğrendikleri konular ile ilgili deneyimlerini zenginleştirmelerini sağlamıştır. Öğrencilerin katılımcı, araştırıcı, istekli, yaratıcı güçleri ortaya çıkarılmıştır. Öğrencilerin, sınırlı olanaklarla hazırladıkları araçlar, kendi düzenledikleri broşürler, konu ile ilgili maketler, slaytlar, rol-play çalışmaları, aynı zamanda okula ilgilerinin arttığının, daha önemlisi mesleklerine saygılarının arttığının da bir göstergesidir.

SONUÇ VE ÖNERİLER

Sonuç olarak öğrenci merkezli, aktif katılımı destekleyen bu uygulamanın, genel olarak öğrenciler açısından kazanımlar getirdiği, düşünme, kritik etme, problem çözme, ekip çalışması yapma, kendini ifade etme becerilerini ortaya koymalarına fırsat verdiği, eğitici yönünden de doyum verdiği, geliştirici olduğu söylenebilir.

Bu çalışma doğrultusunda;

-Özellikle beceri geliştirmeye yönelik mesleki branşlarda başarıyı artırmak için, farklı öğretim yöntemleri ve öğretim araçları kullanılmalı;

-Eğiticilerin katılmasına olanak sağlayacak farklı öğretim yöntemleri ve öğretim araç-gereçleri kurs programları yaygınlaştırılmalı,

-Müfredatın, kaynakların bu yöntemlere uygun olarak hazırlanmalı

-Bu yöntem denemeleri geliştirilerek sürdürülmelidir.

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FEN BİLGİSİ ÖĞRETMENLİĞİ ÖĞRENCİLERİNİN EĞİTİM TEKNOLOJİLERİNE YÖNELİK TUTUMLARI

ATTITUDES OF THE STUDENTS FROM THE DEPARTMENT OF SCIENCE TEACHING TOWARDS EDUCATIONAL TECHNOLOGIES

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Özet
Eğitimde, eğitim teknolojilerine karşı öğrenci tutumlarının ortaya konulması, eğitimde yeni teknolojilerin daha verimli kullanımı için gerekli şartların sağlanması açısından önemli ve gerekli görülmektedir. Bu bağlamda çalışmanın amacı, ilköğretim fen bilgisi öğretmenliği öğrencilerinin eğitim teknolojilerine yönelik tutumlarını belirlemek ve bu tutumlarına öğretim türü, cinsiyet ve mezun olunan okul türü değişkenlerinin etkisini araştırmaktır.

Araştırma, 2009-2010 eğitim - öğretim yılı bahar döneminde muğla üniversitesi, eğitim fakültesi, fen bilgisi öğretmenliği programına devam eden 101 birinci sınıf öğrencisi üzerinde yürütülmüştür. Tarama modelinde yürütülen araştırmanın verileri, araştırmacı tarafından oluşturulan, öğrencilerin demografik özelliklerinin yer aldığı bilgi formu ve pala (2006) tarafından geliştirilen 43 maddelik eğitim teknolojilerine yönelik tutum ölçeği ile sağlanmıştır. Verilerin analizinde aritmetik ortalama, frekans, yüzde dağılım, t testi ve tek yönlü varyans analizi (one-way anova) kullanılmıştır. Araştırmanın sonucunda, öğrencilerin eğitim teknolojilerine yönelik tutumlarının olumlu olduğu ve tutumlarının öğretim türü, cinsiyet ve mezun olunan okul türüne göre değişmediği tespit edilmiştir.
Anahtar kelimeler: eğitim teknolojisi, tutum, fen bilgisi öğretmenliği, öğrenci, tutum ölçeği

Abstract
In education, finding out students' attitudes towards educational technologies seems to be important and necessary to provide the required conditions for the more effective use of new technologies. In this respect, the purpose of the present study is to determine the attitudes of the students from the department of science teaching towards educational technologies and investigate the effects of the variables; whether they attend the day or evening classes, gender, and the type of the high school graduated from, on these attitudes.

the study was carried out among 101 first year students attending science teaching department in the faculty of education of muğla university in 2009-2010 academic year. The data in this study which was carried out through a survey model were collected via a questionnaire including a personal information form developed by the researcher to solicit the demographic properties of the participants and a 43-item scale of attitude towards educational technologies developed by pala (2006). In the analysis of the data, arithmetic means, frequencies, percentages, t-test and one-way anova were used. At the end of the study, it was found that the students have positive attitudes towards educational technologies and their attitudes do not vary depending on the variables of gender, whether they attend day time or evening classes and the type of the school graduated from.
Key words: educational technologies, attidue, department of science teaching, student, scala of attidue

GİRİŞ

Günümüzde, bütün dünyada iletişim teknolojisinin ilerlemesine paralel olarak, eğitim alanında da yeni arayışlar içine girilmiştir. Öğrencilerin eğitim teknolojilerine yönelik tutumlarını belirlemek amacıyla, çeşitli çalışmalar yapılarak, yatırımların daha akılcı kullanılmasına ilişkin gerekli eğitim politika ve stratejilerin oluşturulmasına önem verilmektedir. Bütün bu sonuçlar, eğitim teknolojilerine yönelik tutumların ve fikirlerin bilinmesi gerektiğini göstermektedir.

Alper ve Gülbahar (2009), 2003 ve 2007 yılları arasında eğitim teknolojileri üzerine yapılan çalışmaları inceledikleri araştırmalarında; makalelerde çoğunlukla "çoklu ortam destekli bilgisayarın etkileri, internet eğitimi ve teknolojinin eğitime entegrasyonu" konu başlıklarında yoğunlaşıldığını tespit etmişlerdir.

Tsai, Lin & Tsai (2001) lise öğrencilerinin internete karşı tutumlarına yönelik bir ölçek geliştirdikleri çalışmalarında, öğrencilerin farklı cinsiyete ve farklı internet deneyimine sahip olmalarına rağmen, kullanışlılığa karşı öğrenci fikirleri arasında istatistiksel olarak anlamlı bir fark bulamamışlardır.

İşman (2003), yapılan bir araştırmada, öğretmenlerimizin eğitim teknolojilerini öğrenme-öğretme ortamlarında yeterince kullanmadıklarının ortaya çıktığını belirtmektedir. Eğitim teknolojilerine yönelik tutumu olumlu olan öğretmenlerden, öğrenci ihtiyacına göre hedef belirlemesi, derslerde içeriğe göre değişik yöntemler uygulayarak motivasyonu yükseltmeye çalışması, görsel-işitsel materyalleri kullanarak derslere olan ilgiyi artırması, araç-gereç kullanımının öğretimde önemli unsur olarak görmesi ve sınavların öğrenmeye yönelttiğini düşünmesi beklenmektedir(Akt: Pala, 2006).

Mc Coy ve arkadaşları (2001), aynı kampüsteki öğrencilerin bilgisayar kullanımı ve tutumu üzerinde cinsiyet farklılığının etkisini inceledikleri bir çalışmalarında, bütün öğrencilere dizüstü bilgisayar vererek bir teknoloji programı gerçekleştirmiştir. Tutumlar incelendiğinde, %73'ünün bilgisayarı sevdiği, %23'ünün hoşlandığı, %4'ünün sevmediği ve %1'inin nefret ettiği, %83'ünün ise bilgisayarın kampüs yaşamına bir etkisi olduğunu, %75'inin eğitim yaşamına yardımcı olduğunu ve %48'inin ise sosyal yaşamlarına yardımcı olduğunu düşündüklerini bulmuşlardır.

Tanguma, Martin & Crawford (2002), ders kapsamında teknolojiyi kullanma modellerini incelenmişlerdir. Sonuçta, öğretmenlerin konu alanında paket programları kullandıklarını, tarayıcı, dijital kamera ve ses kayıt cihazları gibi yardımcı teknolojilerle etkileyici uygulamalar yaptıklarını, derslerinde teknolojiyi ve interneti kullandıklarını saptamışlardır.

Woodrow (1992) bir araştırmasında, teknolojiye yönelik tutumlar ile bilgisayar deneyimi arasında ilişki olduğunu tespit etmiştir. Chou da (1997) araştırmasında, bilgisayar deneyimini, bilgisayara yönelik öğretmen tutumlarının etkilediğini belirtmiştir. Ropp'un (1999) araştırmasına göre, bilgisayar erişimi ile bilgisayara yönelik tutumlar ve haftada bir saat bilgisayar kullanımı arasında anlamlı bir ilişki olduğu sonucuna ulaşılmıştır.

Bu araştırmada, fen bilgisi öğretmenliği öğrencilerinin, eğitim teknolojilerine yönelik tutumları ve bu tutumlarına öğretim türü, cinsiyet ve mezun olunan okul türü değişkenlerinin etkisi belirlenmeye çalışılmıştır. Araştırmanın amacına yönelik şu alt problemlere yanıt aranmıştır:

- Öğrencilerin eğitim teknolojilerine yönelik tutumları hangi düzeydedir?
- Öğrencilerin eğitim teknolojilerine yönelik tutumları, öğretim türüne göre anlamlı bir farklılık göstermekte midir?
- Kız ve erkek öğrencilerin, eğitim teknolojilerine yönelik tutumları arasında anlamlı bir farklılık var mıdır?
- Öğrencilerin eğitim teknolojilerine yönelik tutumları ile mezun olunan okul türü arasında anlamlı bir ilişki var mıdır?

YÖNTEM

Tarama modelinde yürütülen bu araştırmanın örneklemini, 2009-2010 eğitim - öğretim yılı bahar döneminde Muğla Üniversitesi, Eğitim Fakültesi, Fen Bilgisi Öğretmenliği programına devam eden 101 birinci sınıf öğrencisi oluşturmaktadır.

Verilerin Toplanması

Veri toplama aracı olarak; fen bilgisi öğretmenliği öğrencilerinin eğitim teknolojilerine yönelik tutumlarını belirlemek amacıyla, araştırmacı tarafından oluşturulan, öğrencilerin demografik özelliklerinin yer aldığı Bilgi Formu ve Pala (2006) tarafından geliştirilen 43 maddelik Eğitim Teknolojilerine Yönelik Tutum Ölçeği kullanılmıştır. Ölçeğin güvenirliği SPSS 14 paket programında Cronbach Alpha katsayısı formülü ile hesaplanmış ve 0.78 olarak bulunmuştur. Bu katsayı ölçeğin güvenilir olduğunu göstermekte ve uygulanması için yeterli olarak kabul edilmektedir. Ölçeğin geçerliğini sağlamak üzere, ölçekte yer alan maddelerin istenen tutumu ölçüp ölçmediği konusunda uzman görüşleri alınmıştır. Ölçekte "Kesinlikle katılıyorum", "Katılıyorum", "Kararsızım", "Katılmıyorum", "Kesinlikle katılmıyorum" şeklinde 5 cevap seçeneği yer almıştır. Puanlama, olumlu ifadeler için, sırasıyla 5'ten 1'e doğru; olumsuz ifadeler için ise, tersi yönde yapılmıştır. Tutum ölçeğinden elde edilecek en düşük puan 43, en yüksek puan 215'tir. Tutum ölçeğinden elde edilen puan 43-77 ise "kesinlikle katılmıyorum", 78-111 ise "katılmıyorum", 112-145 ise "kararsızım", 146-179 ise "katılıyorum", 180-215 ise "kesinlikle katılıyorum" kategorisine karşılık gelmektedir.

Verilerin Analizi

Ölçekten elde edilen veriler, SPSS 14 paket programı kullanılarak çözümlenmiştir. Öğrencilerin eğitim teknolojilerine yönelik tutumları ile öğretim türü ve cinsiyet arasında anlamlı bir farklılık olup olmadığı bağımsız gruplar t-testi ile mezun olunan okul türüne göre farklılık gösterip göstermediği ise, tek faktörlü varyans analizi (One-Way Anova) ile tespit edilmiştir.

BULGULAR VE YORUM

Birinci Alt Probleme İlişkin Bulgular

Araştırmanın ilk alt problemi "Öğrencilerin eğitim teknolojilerine yönelik tutumları hangi düzeydedir?" şeklinde ifade edilmiştir. Bu alt problemin yanıtı için elde edilen bilgiler Tablo 1'de verilmiştir.

Tablo1: Fen Bilgisi Öğretmenliği Öğrencilerinin Eğitim Teknolojilerine Yönelik Tutum Puanlarının Dağılımı

Program	N	En düşük puan	En yüksek puan	Ortalama	S
Fen Bilgisi Öğrt.	101	125	207	169.66	14.19

Tablo 1'de görüldüğü gibi Fen Bilgisi öğretmenliği öğrencilerinin eğitim teknolojilerine yönelik genel tutum puan ortalaması 169.66, standart sapması 14.19'dur. Bu değerlere göre öğrencilerinin eğitim teknolojilerine yönelik genel tutumları "katılıyorum" kategorisine karşılık gelmektedir. Bu bulgu, genel olarak öğrencilerin eğitim teknolojilerine yönelik tutumlarının olumlu olduğunu göstermektedir.

İkinci Alt Probleme İlişkin Bulgular

Araştırmanın ikinci alt problemi "Öğrencilerin eğitim teknolojilerine yönelik tutumları, öğretim türüne göre anlamlı bir farklılık göstermekte midir?" şeklinde ifade edilmiştir. Bu alt problemin yanıtı için, öğrencilerin eğitim teknolojilerine yönelik tutumları ile öğretim türü arasındaki ilişki için t testi uygulanmış ve sonuçlar Tablo 2'de verilmiştir.

Tablo 2: Öğrencilerin Tutum Ölçeği Puanlarının Öğretim Türüne Göre T-testi Sonuçları

Öğretim türü	N	$\overline{X}$	S	sd	t	p
Normal öğretim	51	172.06	12.63	99	1.73	.87
İkinci öğretim	50	167.22	15.37			

Tablo 2'de görüldüğü gibi, toplam öğrenci sayısının 51'ini normal öğretim öğrencileri; 50'sini ikinci öğretim öğrencileri oluşturmaktadır. Elde edilen t-testi sonuçlarına göre, öğrencilerin, eğitim teknolojilerine yönelik tutumları öğretim türüne göre anlamlı bir farklılık göstermemektedir [$t_{(99)} = 1.73$, $p>.05$]. Bu bulgu, öğrencilerin sergiledikleri tutumlar ile öğretim türü arasında anlamlı bir ilişkinin olmadığı şeklinde yorumlanabilir. Normal öğretim öğrencilerinin ($\overline{X} = 172.06$) eğitim teknolojilerine yönelik tutumlarının, ikinci öğretim öğrencilerine göre ($\overline{X} = 167.22$) daha olumlu olduğu görülmektedir.

Üçüncü Alt Probleme İlişkin Bulgular

Araştırmanın üçüncü alt problemi "Kız ve erkek öğrencilerin, eğitim teknolojilerine yönelik tutumları arasında anlamlı bir farklılık var mıdır?" şeklinde ifade edilmiştir. Kız ve erkek öğrencilerin, eğitim teknolojilerine yönelik tutumları arasındaki ilişki t testi ile belirlenerek bulgular Tablo 3'te verilmiştir.

Tablo 3: Öğrencilerin Tutum Ölçeği Puanlarının Cinsiyete Göre T-testi Sonuçları

Cinsiyet	N	$\overline{X}$	S	sd	t	p
Kız	57	171.74	12.86	99	1.69	.09
Erkek	44	167.00	15.49			

Tablo 3'e göre, örneklemi oluşturan öğrencilerin 57'si kız; 44'ü erkektir. Öğrencilerin eğitim teknolojilerine yönelik tutum puanları, cinsiyete göre anlamlı bir farklılık göstermemektedir [$t_{(99)} = 1.69$, $p>.05$]. Kız öğrencilerin tutumları ($\overline{X} = 171.74$), erkek öğrencilere ($\overline{X} = 167.00$) göre daha olumlu bulunmuştur. Bu bulgular Yuen and Ma (2002), Shapka and Ferrari (2003), İspir vd. (2007), Yavuz ve Coşkun'un (2008) yaptığı araştırma bulguları ile örtüşmektedir.

Dördüncü Alt Probleme İlişkin Bulgular

Araştırmanın üçüncü alt problemi "Öğrencilerin eğitim teknolojilerine yönelik tutumları ile mezun olunan okul türü arasında anlamlı bir ilişki var mıdır?" şeklinde ifade edilmiştir. Öğrencilerin eğitim teknolojilerine yönelik tutumları ile mezun olunan okul türü arasındaki ilişki için varyans analizi (Anova) uygulanmış ve bulgular Tablo 4 ve Tablo 5'te gösterilmiştir.

Tablo 4: Öğrencilerin Mezun Olunan Okul Türüne Göre Tutum Ölçeğine İlişkin Aritmetik Ortalama ve Standart Sapmaları

Mezun olunan okul türü	N	$\overline{X}$	S
Fen/Anadololu/Anadolu Öğretmen Lisesi	43	3.97	.28
Düz Lise	56	3.94	.37
Meslek Lisesi	2	3.74	.13
Toplam	101	3.95	.33

Tablo 4'e göre, öğrencilerin yarısı düz lise (56) mezunu, kalan kısmın büyük bir bölümü de fen/ anadolu/ anadolu öğretmen lisesi (43) mezunudur. Meslek lisesi mezunu olan öğrenci sayısı ise, 2'dir. Aritmetik ortalamalar arasında görülen farklılığın istatistiksel olarak anlamlı olup olmadığına dair yapılan varyans analizi sonuçları Tablo 5'te verilmiştir.

Tablo 5: Öğrencilerin Tutum Ölçeği Puanlarının Mezun Olunan Okul Türüne Göre Anova Sonuçları

Varyansın Kaynağı	Kareler Toplamı	sd	Kareler Ortalaması	F	p	Anlamlı Fark
Gruplar arası	.11	2	.05	.48	.62	-
Gruplar içi	10.79	98	.11			
Toplam	10.89	100				

Tablo 5'te verilen Anova sonuçları, öğrencilerin eğitim teknolojilerine yönelik tutumları ile mezun olunan okul türü arasında anlamlı bir fark olmadığını göstermektedir [$F_{(2-98)} = .48$, $p>.05$]. Başka bir deyişle öğrencilerin sergiledikleri tutumlar ile mezun oldukları okul türü arasında anlamlı bir ilişki yoktur. Bu durum öğrencilerin farklı liselerden mezun olmasının, eğitim teknolojilerine yönelik tutumları üzerinde fark yaratacak bir etkiye sahip olmadığı şeklinde yorumlanabilir. Bu bulgu, Günhan ve ark.'nın (2008) araştırma sonuçları ile uyumludur.

SONUÇ VE ÖNERİLER

Bilgi çağı olarak adlandırılan bu çağda teknoloji, eğitim alanında önemli etkilere sahiptir. Teknolojinin derslerle bütünleştirilmesi etkili öğretim için kaçınılmaz hale gelmektedir. Geleceğin öğretmenleri olan öğrencilerimizin, gelişen teknolojiyi sınıfta kullanabilmeleri öncelikle teknolojiyi benimsemesine ve teknolojiye karşı olumlu tutum göstermesine bağlı olacaktır. Eğitim-öğretim faaliyetlerinin merkezini oluşturan öğrencilerimizin, eğitim teknolojilerine yönelik tutumlarının belirlemesinin ve bu konunun öneminin vurgulanmasının eğitime katkı sağlayacağı düşünülmektedir. Eğitim teknolojileri etkin olarak eğitime yansıdıkça eğitimin başarısını arttırdığı her zaman açıkça görülmektedir. Yapılan araştırmada, fen bilgisi öğretmenliği öğrencilerinin, eğitim teknolojilerine yönelik tutumları ve bu tutumlarına öğretim türü, cinsiyet ve mezun olunan okul türü değişkenlerinin etkisi belirlenmeye çalışılmıştır.

Çalışmada, fen bilgisi öğretmenliği öğrencilerinin eğitim teknolojilerine yönelik genel tutumlarının "katılıyorum" kategorisinde yer aldığı ve olumlu tutum sergiledikleri ortaya çıkmıştır.

Araştırmaya katılan öğrencilerin eğitim teknolojilerine yönelik tutumları ile öğretim türü arasında anlamlı bir ilişki bulunmazken, normal öğretim öğrencilerinin eğitim teknolojilerine yönelik tutumlarının, ikinci öğretim öğrencilerine göre daha olumlu olduğu sonucuna ulaşılmıştır.

Araştırmada fen bilgisi öğretmenliği öğrencilerinin, eğitim teknolojilerine yönelik tutumlarının cinsiyete göre anlamlı bir farklılık göstermediği tespit edilmiştir. Ancak kız öğrencilerin tutumlarının erkek öğrencilere göre daha olumlu olduğu bulunmuştur.

Fen Bilgisi öğretmenliği öğrencilerinin eğitim teknolojilerine yönelik tutumları arasında, mezun oldukları okul türü bakımından anlamlı bir farklılık olmadığı belirlenmiştir. Ayrıca, öğrencilerin büyük çoğunluğunun Düz lise ve Fen/Anadolu/Anadolu Lisesi mezunu olduğu ortaya çıkmıştır.

Mevcut çalışmalar, doğru ve yerinde kullanıldığı takdirde, teknolojinin öğrenme ortamını zenginleştirebileceğine ve öğrencilerin motivasyonu ile akılda tutma, problem çözme ve eleştirel düşünme becerilerini geliştirmede etkin bir araç olduğuna işaret etmektedir (Yıldırım, 2000). Fakat elde edilen bulgular ışığında genelleme yapmadan önce bazı sınırlılıklara da dikkat çekmek gereklidir. Öncelikle, bu araştırma yapıldığı çalışma grubu ile sınırlıdır. Dolayısıyla araştırmanın, farklı fakültelerde öğrenim gören öğrencilerle de yapılacak olması, araştırma konusuna farklı boyutlar getirecektir.

Eğitim teknolojilerinin eğitime entegrasyonu ile eğitim-öğretimde başarıyı arttırdığı bir gerçektir. Lisans programlarında, teknolojinin eğitimle bütünleştirilmesi için eğitim teknolojilerine yönelik gerekli bilgi ve becerilerin kazandırılacağı derslere ağırlık ve önem verilmelidir. Böylece öğrencilerin eğitim teknolojilerine yönelik olumlu tutum geliştirmeleri sağlanabilir.

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FEN EĞİTİMİNDE ARGÜMANTASYONA DAYALI BİR WEB TABANLI ÖĞRETİM MATERYALİ TASARIMI

DESIGN OF A WEB-BASED INSTRUCTIONAL TOOL THAT FOCUS ON ARGUMENTATION IN SCIENCE EDUCATION

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Özet

Yeniden yapılandırılan fen öğretim programlarında, temel fen kavramlarının öğrenilmesinin yanında, öğrencilerin tahmin etme, gözlemleme, analiz etme, çıkarım yapma gibi bilimsel süreç becerilerinin de geliştirilmesi programın temel amaçları arasında yer almaktadır. Bu amaçlara ulaşabilmek için bilimin ve fen eğitiminin temelini oluşturan argümantasyona dayalı etkinliklerin önemi literatürde vurgulanmıştır. Bu çalışmada bilgi ve iletişim teknolojilerindeki yeniliklerden faydalanılarak tasarlanan, argümantasyon yöntemine dayalı, etkileşimli, işbirlikli ve yapılandırıcı öğrenmeyi destekleyen bir öğretim materyalinin (webfen) tasarım süreci ele alınmıştır. Bu materyal daha önce "maddenin tanecikli yapısı" örnek ünitesi ile geliştirilen ve pilot uygulaması sonucunda kavramsal öğrenmede olumlu sonuçlar veren bir öğrenme aracı temel alınarak tasarlanmıştır. Bu sistemde öğrenciler ele alınan konular ile ilgili iddialara sistem içerisinde yer alan etkinlikleri tamamlayarak kanıtlar oluşturur, bu kanıtları ve oluşturdukları bilimsel argümanları akranları ile müzakere ederek bir sonuca bağlarlar. Sistemde yer alan etkinlikler milli eğitim bakanlığı'nın 6. 7. Ve 8. Sınıf fen ve teknoloji dersi "madde ve değişim" öğrenme alanına ait beş üniteyi kapsamakta ve bu ünitelerde yer alan kazanımlara uygun olarak tasarlanmıştır.

Abstract

In reformed science curriculum, beside conceptual learning, development of students' scientific process skills such as predicting, observing, analising, reasoning are accepted as main goals of the new curriculum. In order to achieve these goal, the literature highlights the importance of learning activities that focus on argumentation which is the base of science and science education. This study explains the design process of an instructional material (webfen) that takes the advantages of information and communication technologies and focuses on argumentation method in science education while supporting interaction, collaboration and constructivist approach of learning. This material is derived from a previously developed learning tool that is created with a sample unit on "particulate nature of matter" and provided positive outcomes in terms of conceptual learning in the pilot study. In the current system, students create evidences for arguments related with the science topics under consideration by carrying out activities in the system and discuss these evidences and their scientific arguments with peers to bring a conclusion. The activities in the system includes five units under the "matter and change" learning area in 6,7 and 8th grade science and technology course of ministry of national education and compatible with learning objectives of those lesson units.

GİRİŞ

Modern toplumda bilimsel bilginin günlük yaşamda daha çok kullanılıyor olması, bireyler için eleştirel düşünme yeteneğinin öne çıkmasına sebep olmaktadır. Nussbaum 'a göre (2008), eleştirel düşünme, farklı konulardaki (küresel ısınma, hormonlu gıdalar, bağımlılık gibi) çıkarım (argumentation) ve karşı çıkarımları değerlendirme yeteneği gerektirmektedir. Toplumda var olan yanlış bilimsel kavramların giderilmesi için bir tür düşünme becerisi öğesi olarak, çıkarım yapma öğretilmesi gereken bir olgudur.

Sosyal Bir Süreç Olarak Çıkarım Yapma (Argümantasyon) ve İşbirlikli Öğrenme

Öğrencilerin aynı etkinlik üzerinde birlikte çalışarak öğrenmelerine ilişkin kuramsal analizler yeni değildir. Örneğin, Dewey (1916) öğrencilerin bir grubun aktif üyesi olarak öğrenme etkinliklerine katılmasını önermiştir. Benzer olarak, Piaget (1932) öğrencilerin birlikte çalışmasının sosyal bir bağlam oluşturacağını ve bu bağlamda öğrencilerin varolan bilgilerini alternatif bilgilerle karşılaştırma ve değiştirme fırsatı yaratacağını ifade etmiştir.

Değişik teknolojik araçlar ve ortamlarda öğrencileri bir araya getirmek ya da bir öğrenciyi bir grubun içine koymak ne öğrenciler arasındaki işbirliğini (Fischer ve diğ, 2002); ne de öğrencinin çıkarımlar yapmasını garanti etmektedir (Ohlsson, 1996). Grup üyeleri arasındaki sosyal etkileşimi artırarak ve aynı anda birden fazla yaklaşım/aracı birbirini pekiştiren ve tamamlayan şekilde kullanarak öğrencilerin işbirliği içinde öğrenmesi sağlanmalıdır (Kirschner ve Kreijns, 2005; s. 172). Grup üyelerinin bilişsel etkinliklerde bulunmalarını sağlamak için verilecek görevler öğrencilere açıklama, tanımlama, yorumlama, kestirme, eleştirme, tartışma, alternatif fikir söyleme ve değerlendirme yaptırmalıdır (Ohlsson, 1996; s. 51).

Düşüncelerin paylaşımı, tartışma ve sonuç çıkarmada öğrenci grubu içindeki etkileşimi sağlamak ve artırmak gerekmektedir. Söz konusu etkileşim sürecinde, öğrenciler onlara sunulan görevler dahilindeki bilişsel çelişkilerini çözmek için çıkarımlarda bulunmalı, çıkarımlarını paylaşmalı ve çıkarımlarını biraraya getirerek bir sonuca bağlamalıdırlar. (Driver ve diğ, 2000; Johnson ve Johnson, 1994; Kirschner ve Kreijns, 2005; Roazzi ve Bryant, 1998). Öğrencilerin söz konusu çıkarımlarına temel teşkil edecek öğrenme malzemeleri öğrenme nesneleri olarak düzenlenerek fen öğrenim ortamının parçası olabilir. Öğrenme nesneleri içine konulacak içerik, görev ve deney araçları öğrenci grupları için sosyal ve bilgisel işbirliği araçları olacaktır. Bu tür araçlar öğrenci etkinliklerine bir çerçeve sağlayarak (Weinberger ve diğ., 2005), yeni bilginin öncekilerle ilişkilendirilmesine de (Suthers ve Hundhausen, 2001) yardımcı olur.

Fen Öğreniminde Çıkarımlar ve Görselleştirme

Öğrenciler fen bilgisi çalışmaya başladıklarında sıklıkla kabul edilen bilimsel düşünmelerin aksi yönde düşüncelere sahip olarak gelirler. Bu tür rasyonelize edilmemiş bireysel düşünceler (geniş kabul görmüş de olabilir) bireyin yanlış kavramlar geliştirmesine sebep olabilir, hatta kavramların kabul edilen anlamlarının öğrenilmesini zorlaştırabilir (Welmar, 1996). Söz konusu yanlış kavramlaştırmalar hem öğrenci hem de öğretmenler için problem oluştururlar. Bu problemler özellikle fen bilgisi ve soyutlamaların yoğun olduğu alanlarda daha sık görülür. Öğrencilerin fen bilgisi ile ilgili

iki farklı perspektife sahip olduğu kabul edilir (Cadmus, 1990; Tsai ve Chou, 2002): bunlardan biri sınıftaki formal öğrenme ortamında kullanılırken diğeri sınıf dışındaki günlük yaşamda kullanılır. Etkin fen öğrenme ortamı: (1) öğrencilerin hata ile yanlış kavramlaştırma arasındaki farkı belirlemelerine yardımcı olur, (2) öğrencilerin günlük yaşamdaki açıklamalarının yetersiz olduğunun farkına varmaları için onlara sınıf içi tartışma ve bilgisayar temelli görselleştirmeler sunar, (3) fen bilgisinin diliyle olayların açıklanması için fırsatlar yaratır.

Fen bilgisi kavramlarının anlaşılması ve pekiştirilmesi için fen bilimsel olguların görselleştirilmesi ve laboratuar deneyleri önemli araçlardır: Olguların sunular, benzeşimler, modeller, olay eş zamanlı grafikler ve videolar ile görselleştirilmesi öğrencilerin öğrenmekte oldukları kavramları zihinsel görsellerle ilişkilendirerek anlamalarına yardımcı olur (Escalade ve diğ., 1996). Görselleştirme teknikleri hem öğrencilerin nesnelerin nasıl davrandığını ve etkileştiğini gözlemelerine, hem de öğrencilerin bilimsel olguların kolay anlaşılır temsillerle ifadesini sağlar ki bu olguların metinsel ya da sözel ifadelerle açıklaması öğrenciler için anlaşılması zordur (Cadmus, 1990). Örneğin, bilgisayar benzeşimleri çıplak gözle görünmeyen bilimin kavramsal dünyasını öğrencilerin canlandırmalarla anlamasına yardımcı olur. Nicel veriler işlenerek ve görselleştirilerek öğrencinin nitel zihinsel resimler inşa etmelerine yardımcı olunabilir. Bu karmaşık deneyimler öğrencilerin benzeşimlerdeki örüntüleri belirlemelerine, model ve teorilerdeki olgular için açıklamalar oluşturmalarına yardımcı olabilir.

WEBFEN'İN TASARIMI

Eğitsel yazılım geliştirme konusunda ülkemizde az sayıda firma kendi ürününü geliştirmektedir: Firmaların bazıları ya yurtdışından edindikleri eğitsel yazılımları Türkçeye çevirme yoluna gitmektedir ya da farklı öğrenci gereksinimlerini dikkate almayan yazılımlar geliştirmektedirler. Türkçe içerikli olarak ülkemizde hazırlanmış ve öğrenmeye katkısına dönük deneysel kanıtlara sahip Fen Bilgisi 6., 7. ve 8. sınıf ünite yazılımları mevcut değildir. MEB bünyesinde yaklaşık 16 milyon öğrenci bulunmaktadır (MEB, 2006). Bu sayılar göz önüne alındığında eğitsel amaçla kullanılacak yazılım ve/veya platform alanında yapılacak çalışmaların önemi, ölçeği ve ekonomik yatırıma değer bir alan olduğu daha iyi anlaşılabilir. Milli Eğitim Bakanlığının yeni müfredatı yapısalcılık öğrenme kuramını etkinliklerde dikkate almayı önermektedir. Bu yeni yaklaşımla İlköğretim Fen Bilgisi dersleri, öğrencilerin öğrenme sürecinde etkin katılımcı olmasını esas almaktadır. Bu yaş grubundaki öğrenciler çevreleriyle, somut nesnelerle ve akranlarıyla etkileşimlerinden kendi düşüncelerini oluştururlar. Fen Bilgisi öğrenme etkin bir süreç olarak ele alınmıştır. Programda; öğrencilerin araştırma yapabilecekleri, keşfedebilecekleri, problem çözebilecekleri, çözüm ve yaklaşımlarını paylaşıp tartışabilecekleri ortamların sağlanmasının önemi vurgulanmıştır.

Bu projenin amacı yapılandırıcı yaklaşımın temel ilkelerini ve bilimsel düşünmeyi destekleyen argümantasyon yönteminin temel öğelerini esas alan web-tabanlı fen öğrenme ortamları (WebFen) geliştirmektir. WebFen öğrenme ortamının tasarımında "Madde ve Değişim" öğrenme alanı esas alınmıştır. Bu çerçevede öğrenme ortamında kapsanan içerik "Fen ve Teknoloji Dersi" programında 6., 7. ve 8. sınıflar için "Madde ve Değişim" öğrenme alanında yer alan 5 uniteden oluşmaktadır. Çalışmada "Madde ve Değişim" öğrenme alanındaki ünitelerin tümü müfredatta yer alan hedef, öneri ve örnekler esas alarak tasarlanmıştır. Bu çerçevede WebFen'in kullanıcılar (öğretmenler-öğrenciler) için sınıf-içi ve/veya sınıf-dışı bir kaynak oluşturmasının yanında yapılandırıcı yaklaşımın ve bilimsel düşünme becerilerinin fen öğrenme sürecindeki rolü ve kullanımına yönelik de bir model oluşturması hedeflenmiştir. Geliştirilecek bu sistemin temel özelliklerini yansıtan, web tabanlı, "maddenin tanecikli doğası" örnek ünitesini içeren bir öğretim materyali daha önce gelitirilerek (Er, 2008) pilot çalışması yapılmış ve sonuçları web-tabanlı çalışma ünitesini kullanan öğrencilerin tanecikli yapıya ilişkin anlama düzeylerinin arttığını göstermiştir.

Sistem içerisinde yer alacak öğrenme etkinliklerinde öğrenciler ele alınan fen konuları ile ilgili sunulan karşıt görüşleri (iddiaları) inceleyerek bu iddiaları destekleyecek/çürütecek kanıtlara sistemde yer alan canlandırma, benzeşim, video ve benzeri etkinlikleri tamamlayarak ulaşmaya, konu ile ilgili argümanlarını oluşturmaya ve buldukları kanıtlar ile argümanlarını diğer öğrencilerle tartışarak sonuca ulaşmaya çalışırlar.

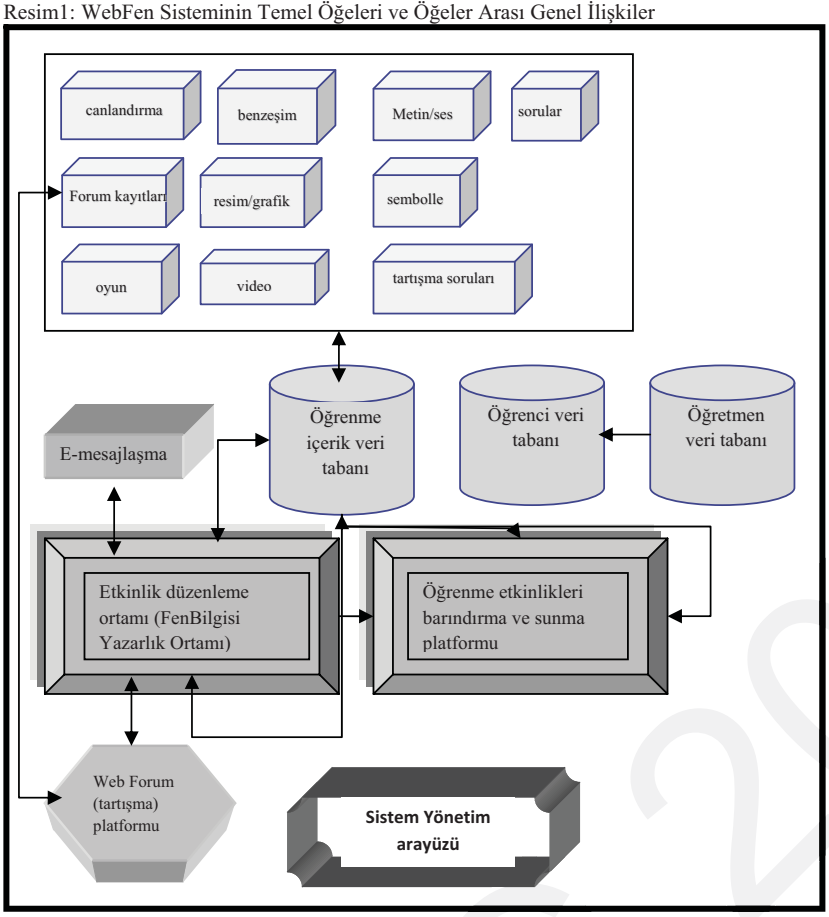
Bu çalışma sonunda ortaya çıkarılacak öğrenme malzemelerinin bağımsız birer "öğrenme nesnesi" olarak paketlenmesi de kolay ve muhtemel olup, isteyen öğretmenlerin bu nesneleri kendi öğrenme ortamlarında kendi tercih ettikleri (ve uygun olan) öğrenme yöntemiyle kullanmaları mümkün olacaktır. Böylece geliştirilecek ürünler sadece argümantasyon geliştirme sürecinde değil, diğer tür öğrenme yöntemlerine de hizmet edebilme özelliğindedir.

Sistemin Özellikleri

Webfen sisteminin yaygın olarak kullanılabilmesini sağlayacak özelliklerinden bazıları şunlardır:

1. Ölçeklenebilirlik: Sistem tek bir grup öğrenci tarafından ya da bir sınıfca kullanılabileceği gibi, bir okuldaki örneğin tüm 6. sınıf Fen Bilgisi öğrencilerince kullanılabilir. Hazırlanacak teknoloji tabanlı sistem ve onun veritabanlarına ait öğeler ölçeklenebilirliğe izin vermektedir.
2. *Platform bağımsız çalışan öğrenme malzemeleri:* Öğrenci ve öğretmenlerin tipik ya da temel kabul edilen donanım özelliklerine sahip Internet bağlantısı mevcut bilgisayarlarla WebFen sistemini kullanmaları mümkün olacaktır. WebFen sistemi genel kullanım amaçlı (işletim sistemi, web tarayıcı, flash player ve Windows Media Player gibi bir video oynatıcı) yazılımlar dışında yazılım gerektirmeyeceğinden platform bağımsız özelliğe sahip olacaktır.
3. *Hızla güncellenen ve sınanmış ve onaylanmış içerikler:* öğrenci ve öğretmenlerden alınacak sürekli dönütlerle sisteme yeni eklenecek öğelerle birlikte, öğrenme etkinliklerinin sayılarının ve çeşitliliklerinin artırılması sağlanabilecektir. Öğrenme malzemelerinin değişik senaryolarla kullandırılması, öğretmenlerin bunların sonuçlarını diğer öğretmenlerle sistem üzerinde paylaşmaları ve tüm bunların sonucu olarak sistem üzerindeki öğrenme malzemelerinin kullanım sırası, görev türlerinin hangi tip öğrencilere hangi tür etkinliklerle daha faydalı olduğu şeklindeki bilgilerle sistem kullanım bilgileri de güncel tutulacaktır. Sisteme öğretmenlerin sağlayacağı canlandırma ve benzeşimlerle ve ünitelere ait diğer tür içeriklerle de sistem gelişecektir. Sisteme alan uzmanlarının enazından sistemde bulunacak öğrenme düzeneklerine onay vermek amacıyla dahil olması da sistemin güvenirliğini artıracaktır. WebFen sistemindeki öğrenci-öğrenci, öğrenci-öğrenme malzemesi, öğrenci-öğretmen, öğretmen-öğrenme malzemesi arasındaki etkileşim sistemi işleten akademik elemanlarca gözlenebilir ve öğretmen-akademisyen kullanıcı grupları derlenen bu etkileşim örüntülerini sistem üzerinde tartışarak, sistemin gelişimine katkı sağlayabilir. İçerikler üzerindeki geliştirmelerle güncellenen sistemin yaygın kabul görmesi artacaktır.
4. *Bilimsel kanıtlara dayalı sistem:* Öğrenci ve öğretmenlere açık olan bir çok öğrenme materyallerinin öğrenmeye katkısına dair bilimsel kanıt bulunmamaktadır. WebFen sistemi bilimsel kanıtlara dayalı olarak kurulması ve bilimsel süreçlerle test edilerek ürünlerin öğrenmeye katkısının uygulamacılarla paylaşımı sonucu, uygulamacıların etkililiği denenmiş öğrenme materyallerini benimsemelerine yardımcı olacaktır.
5. *Genişleyebilir bir sistem:* WebFen sistemi öncelikle diğer ilköğretim Fen Bilgisi ünitelerinde de benzer yaklaşımlarla kurgulanarak hazırlanacak ürünlerin üretimini mümkün kılacak ve sistemin genişlemesine olanak sağlayacaktır.

Resim1: WebFen Sisteminin Temel Öğeleri ve Öğeler Arası Genel İlişkiler



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FEN VE TEKNOLOJİ DERSİ ÖĞRETİM PROGRAMI İÇİN HAZIRLANAN VİTAMİN İLKÖĞRETİM EĞİTİM YAZILIMININ İNCELENMESİ

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Özet

Eğitim yazılımları bilgisayar destekli öğretimi gerçekleştirme amacıyla hazırlanmış eğitim materyalleridir. Fen ve teknoloji derslerinde öğrencilerin verilen bilgileri kalıcı olarak öğrenmelerini sağlamak ve derse karşı ilgilerini sürekli canlı tutmak için çeşitli eğitim yazılımlarından yararlanılmaktadır. Bu çalışmanın amacı fen ve teknoloji öğretim programını desteklemek için hazırlanmış ve milli eğitim bakanlığı web sayfasına konularak bütün öğretmen ve öğrencilerin ücretsiz kullanımına sunulan vitamin ilköğretim'in eğitim yazılımlarının taşıması gereken niteliklere ne kadar uygun olarak hazırlandığını ve öğretim boyutuna katkılarını incelemektir. Eğitim yazılımları incelenirken; içeriğin eğitim programlarına uygunluğu, bilginin güncelliği, fen ve teknoloji dersi kazanımlarına uygunluğu, yazılımın görsel özellikleri, kullanışlılığı, tasarımı, interaktif öğrenmeye katkıları, öğretimsel açıdan program geliştirme mantığına uygun olarak hazırlanıp hazırlanmadığı ve yapılandırmacı yaklaşıma uygunluğu dikkate alınmıştır. Yapılan değerlendirme sonunda vitamin ilköğretim eğitim yazılımı kazanım, içerik, teknik yeterlilik ve kullanım kolaylığı boyutlarında "orta" düzeyde, yapılandırmacı yaklaşımın değerlendirme boyutunda ise "zayıf" düzeyde bulunmuştur.
Anahtar kelimeler:vitamin ilköğretim, eğitim yazilimlari, fen ve teknoloji eğitim programi

Abstract

This research examines vitamin elementary instructional software developed for science and technology classes in 6th , 7th and 8th grades. The study mainly focuses on the software's convenience to educational objectives, content, learning experiences and evaluation measures of the new curriculum and its technical aspects and educational usage. An evaluation form which included 89 items in five major categories was developed by the researchers and vitamin elemantary was evaluated on each category according to the scale of 1 to 5 points ranking from excellent to poor . At the end of the evaluation, vitamin elementary instructional software was found "acceptable" in terms of its convenience to educational objectives, content, technical aspects and educational usage and "poor" in measurement and evaluation.
Keywords: vitamin elementary , ınstructional software, science and technology curriculum

GİRİŞ

Teknoloji alanında meydana gelen hızlı gelişmeler, bu gelişmelere paralel olarak eğitim alanında teknolojik olanaklardan en üst seviyede faydalanmayı kaçınılmaz kılmaktadır. Çağımızın en etkili iletişim araçlarından biri olan bilgisayar, bireylere kurumlara ve toplumlara sundukları olanaklardan dolayı her alanda kullanılabilir duruma gelmiştir. Teknoloji bir olgu olarak çağdaş yaşamın ve toplumun kültürünün çok önemli bir öğesi olma niteliğini kazanmıştır. Eğitim anlayışındaki, bilgisayar teknolojisindeki ve iş yaşamındaki gelişmeler ise bilgisayarın eğitimde kullanılması zorunluluğunu ortaya çıkarmıştır (Odabaşı, 2002). Bilgisayarın son yıllarda hızlı bir şekilde gelişimi eğitim sistemimizi de etkileyerek sistemde bir takım değişikliklerin yapılması mecburiyetini doğurmuştur. Eğitimde yeni teknolojileri kullanmak geleneksel yönteme göre daha fazla duyu organına hitap etmeyi beraberinde getirir. Bu da öğrenci ilgisini arttırdığı gibi öğretimi kolaylaştırıp, zevkli hale getirerek öğrenmenin hızlanmasını sağlar (Yalın, 2003).

Bilgisayar destekli öğretim (BDÖ), bilgisayarların öğrenme ortamı olarak kullanıldığı bir öğretim yöntemi olarak ortaya çıkmıştır. Ayrıca geleneksel yaklaşımların yerine bireysel farklılıkları öne çıkaran, öğrencinin kendi hızına göre yararlanabileceği uygulamaların önem kazanması bu yöntemin kabul görmesinde etkili olmuştur (Uşun 2000; Yiğit ve Akdeniz, 2003; Şahin ve Yıldırım, 1999). Ayrıca BDÖ, grup çalışmalarını ve işbirliğine dayalı öğrenmeyi de destekler (Yager, 1991; Öztekin, 2001; Kutluca ve Birgin, 2007).

Eğitim yazılımları bilgisayar destekli öğretimi gerçekleştirmek amacıyla hazırlanmış, öğretim materyalleridir. Eğitim yazılımları belli bir konunun öğretilmesinde ya da öğrenilmesinde, bilgisayar ortamından faydalanılarak konuyu daha görsel ve işitsel hale getirerek daha etkin öğrenme-öğretme olanağı sağlayan bilgisayar ortamında hazırlanmış yazılımlardır. Bilgisayar destekli öğretimde, eğitim yazılımları öğrencilerin başarısını doğrudan etkileyen en önemli faktörlerden biridir .Eğitim yazılımları önceden belirlenmiş konular için öğrenme kaynağı olarak düzenlenebildikleri gibi, diğer öğrenme ortamlarını destekleyici bir araç olarak da kullanılabilirler. Bayram (2004) eğitim yazılımlarının öğrenmeye olan katkılarını aşağıdaki gibi özetlemektedir:

- Öğrencilerin öğrenme esnasında bir bölümü tekrar etmelerine olanak tanıyarak bireysel ihtiyaçlarını karşılar.
- Öğrencilerin dikkatlerini çeker, motive eder ve hatırlamalarını kolaylaştırır.
- Soyut nesneleri çocuklar için somutlaştırarak öğrenmelerini kolaylaştırır.
- Çoklu eğitim-öğretim ortamları hazırlamaya yardımcı olur.
- Öğretim zamanından tasarruf sağlar. Öğretim zamanını öğrenci belirleyebilir.
- Tehlikeli olabilecek ortamlar simülasyon sayesinde güvenli olarak gözlemlenebilir.
- Tekrar ve uygulamalar sayesinde kalıcılık sağlanır.

Belirtilen bu özellikler çerçevesinde eğitim yazılımları öğrencilerin eğitim-öğretim ortamlarını zenginleştirmekte, öğrenmeye karşı motive etmekte ve kalıcı ve etkili öğrenme sağlamaktadır. İyi bir ders yazılımı, konu işlendikten sonra, öğrenciye yönelttiği sorularla konunun öğrenci tarafından iyi öğrenilip, öğrenilmediğini araştırır. Konuyu öğrenen öğrencileri daha ileri basamaklara gönderir, iyi öğrenmeyen öğrenciler için sorularda uygun ipuçları vererek onları düşünmeye ve doğru cevabı keşfetmeye yöneltir. Gerekirse dersi tekrarlar, hatta öğrenciyi önceki konulara göndererek daha iyi öğrenmesini sağlar (Kazu ve Yavuzalp,2008).

Eğitim yazılımları, bilgisayar destekli öğretim materyallerinin genel niteliklerini taşır. Öğretim yazılımlarının sahip olması gereken nitelikler aşağıdaki gibidir (Şeniş, 1991);

- İçerik, eğitim programlarına uygun hazırlanmalıdır.
- İçerik, basılı materyal hazırlama anlayışı ile oluşturulmamalıdır.
- Yazılımlar hazırlanırken mevcut sistemler göz önünde bulundurularak ileri yazılım teknolojilerinden yararlanılmalıdır.
- Yazılım, programlı öğretime uygun yapıda olmalıdır.
- Yazılım, öğrencinin ilgisini çekecek görsel özelliklere sahip olmalıdır.
- Yazılımda öğrencilerin rahatlıkla ulaşabilecekleri ve kullanımlarına rehberlik edecek yardım öğeleri bulunmalıdır.
- Öğrencilerin bireysel farklılıklarının dikkate alınabilmesi için yazılım dallara ayrılan programlama yapısına göre hazırlanmalıdır. Böylece öğrencinin bireysel hızına bağlı olarak bölümler atlanabilir.
- Öğrenci başarısını ölçerek sonuçları daha sonra istatistiksel bilgi olarak vermek amacıyla depo eder.
- Yazılımlar herhangi bir dersin parçası veya özeti değil, tümünü kapsamalıdır.
- Yazılım içerisindeki bölümler ve küçük birimler arasındaki geçişler kolaylıkla yapılabilmelidir.
- Animasyon, simülasyon, örnek, deney, soru, problem çözümü gibi öğeleri içermelidir.

Bayram (2004)'e göre; etkili bir öğretimsel yazılımın aşağıdaki niteliklere sahip olması beklenir:

- İçerdiği dersin hedefleri üzerine kurulmalıdır.
- Öğrencinin özellikleriyle uyumlu olmalıdır. Öğrencilerin fiziksel, bilişsel, duyuşsal, sosyo-kültürel ve pedagojik hazır bulunuşluk düzeyleriyle uyumlu olmalıdır.
- Öğrenci katılımını ve etkileşimini artırıcı olmalıdır.
- Öğrenmeyi bireyselleştirebilmelidir.
- Öğrenciyi güdüleyebilmeli ve bunu ders boyunca koruyabilmelidir.
- Öğrenciye dönüt sağlamada etkin olmalıdır.
- Ortamına uygun ve öğretmeni destekleyici olmalıdır.
- Öğrenci performansını doğru ve uygun şekilde değerlendirir.
- Öğretim tasarımı ilkeleri göz önüne alınarak geliştirilmelidir.

Bir öğretim yazılımının bu nitelikleri gerçekleştirip gerçekleştiremeyeceği sınanabilir. Eğitim yazılımı değerlendirilmesi aşamasında dört ana unsur göz önünde bulundurulur. Bunlar; öğretimsel uygunluk, öğretim programlarıyla olan uygunluk, biçimsel uygunluk ve programlama uygunluğu. Bu aşamalar söyle tanımlanabilir:

a) Öğretimsel uygunluk: Yazılımın kullanımı için gerekli açıklamaların açık ve doğru bir şekilde verilmiş olması gerekir. Yazılım hedeflerde belirtilen beklendik çıktılarla tutarlı olmalıdır. Dersin akış sırası kolaylıkla takip edilebilir ve mantıklı olmalıdır. Dersin içeriği doğru ve anlaşılabilir olmalıdır. Derste kullanılan öğretimsel faaliyetler ve öğretimsel süreç etkin olmalıdır.(Şahin ve Yıldırım, 1999).Etkin bir yazılım, kullanıcı öğrenci ve öğretmene uygun ve eğitim programıyla kolayca bütünleşebilecek özellikte olmalıdır. Ders yazılımları, bilgisayar destekli öğretim kapsamında ise koşulduğunda birincil hedefi öğrenme yaşantılarını zenginleştirmektir (Hofman, 2001).

b) Eğitim programlarıyla olan uygunluk: Yazılım diğer ilgili derslerle tutarlı olmalıdır. Öğretim süreci ve etkinlikleri kullanıcının beklentileri ile tutarlı olmalıdır. Yazılım ile diğer bir yazılımın geliştirilmesinde temel alınabilmelidir. Yazılım kısa süre içinde eskiyecek bilgiler içermemelidir. Yazılımdaki ders ya da dersler önerilen sürede tamamlanabilmelidir. Yazılım kullanımda öğrenciye esneklik tanımalıdır.

c) Biçimsel *(Kozmetik)* uygunluk: Ekran alanı etkili kullanılmalıdır. Dersin farklı ekranları arasında bir uyum ve tutarlılık olmalıdır. Ekranda sunulan bilgilerin kargaşalıktan uzak olması gerekir. Kullanılan renkler ve ses öğrenmeyi destekleyici olmalıdır. Kullanılan görsel özellikler öğretimi destekleyici nitelikte olmalıdır.

d) Programlama uygunluğu: Yazılım istendiği gibi çalışmalıdır. Yazılım programlama ve kavramsal hatalardan arındırılmış olmalıdır. Yazılım kullanıcının müdahalesini en aza indirmelidir. Yazılım öğrenci ve öğretmen için kayıt tutmada gerekli güvenliği sağlamalıdır (Şahin ve Yildirim,1999;Nişancı,2000).

VİTAMİN İLKÖĞRETİM NEDİR?

VİTAMİN İlköğretim öğretmen ve öğrenciler için hazırlanmış, internet üzerinden ulaşılan okul eğitimine destek bir eğitim yazılımıdır. Türk Telekom'un iştiraki olan Sebit tarafından Türkiye'de üretilen ve geliştirilen VİTAMİN İlköğretim ilköğretim 4, 5, 6, 7 ve 8. sınıf matematik, fen ve teknoloji, Türkçe ve sosyal bilgiler derslerini kapsar. Bu öğrenme ortamının, öğrencinin bireysel farklılıkları ve değişik öğrenme stilleri göz önünde bulundurularak tasarlandığı, içeriğinin Millî Eğitim Bakanlığı'nın yeni öğretim programıyla uyumlu olduğu, derslerin yeni öğretim programının öngördüğü şekilde sarmal yapıda olduğu iddia edilmiştir. Vitamin İlköğretim'de 3600'ü aşkın interaktif etkinlik, canlandırma ve deney hareketli ve görsel uygulamalarla sunulmaktadır. Gerek evde gerekse okulda kullanılabilir. İstenilen an istenilen yerde kullanım kolaylığı sunmaktadır. Sesli ve görsel konu anlatımlarından oluşan, üç boyutlu eğitsel nesneler ile öğrencinin öğrenmesine yardım etmektedir. Sunduğu çözümlü örnekler, tarama testleri, değerlendirme soruları, Seviye Belirleme Sınavları gibi ölçme ve değerlendirme araçları, öğrencinin seviyesini tespit etmesinde ve eksiklerini gidermesinde yardımcı olur. Oyunlar, ek kaynaklar ve haritalar gibi pek çok eğitsel araçlar ile desteklenmiştir. VİTAMİN İlköğretimin tanıtıldığı internet sayfasında; öğrencilerin bireysel farklılıklarının ve değişik öğrenme düzeylerinin göz önünde bulundurulduğu varsayılmıştır. Yine, çoklu zekâ kuramı uygulanarak öğrencinin baskın zekasının yanı sıra çok baskın olmayan zekasının da geliştirilmeye çalışıldığına vurgu yapılmıştır. Ayrıca VİTAMİN İlköğretim'in öğrenci odaklı olduğu, öğrencinin artılarını güçlendirirken zayıf yönlerinin giderilmesi için olanaklar sunduğu savunulmuştur. Vitamin İlköğretim'de her kullanıcı tüm sınıfların ders içeriğine ulaşabilir. VİTAMİN yazılımcıları VİTAMİN İlköğretimin online bir ürün olduğu için içeriği devamlı güncelleştirildiğini ve zenginleştirildiğini söylemektedirler (TTNET vitamin,2009).

ARAŞTIRMANIN AMACI

Bu araştırmanın amacı, 6. 7. ve 8. sınıf Fen ve teknoloji öğretim programını desteklemek amacıyla hazırlanan VİTAMİN İlköğretim eğitim yazılımını kazanımlar, içerik ve eğitim durumları, ölçme ve değerlendirme, teknik yeterlilik ve kullanım kolaylığı açılarından değerlendirmektir.

YÖNTEM

Araştırmaya konu olan VİTAMİN İlköğretim eğitim yazılımlarını değerlendirmek amacıyla araştırmacılar tarafından Eğitim Yazılımı Değerlendirme Formu geliştirilmiştir. Bu form 5 ana başlıktan oluşmaktadır. Yeni İlköğretim Programıyla Uygunluk (Kazanımlar) başlığı altında 25, Yeni İlköğretim Programıyla Öğretimsel Uygunluk (İçerik / Eğitim Durumları) başlığı altında 26, Yeni İlköğretim Programının Ölçme Değerlendirme Boyutuyla Uygunluk başlığı altında 18, Teknik Yeterlilik ve Kullanım Kolaylığı başlıkları altında 20 şer sorudan oluşan eğitim yazılımı değerlendirme formu, toplam 89 maddeden oluşmaktadır. Çalışmada Vitamin eğitim yazılımı internetten araştırmacılar tarafından detaylı olarak incelenmiş ve her bir araştırmacı bu amaç için geliştirilen Eğitim Yazılımı Değerlendirme Formunu doldurmuştur. Vitamin ders yazılımının yeterlik düzeyini açıklayabilecek puan aralıkları aşağıdaki gibi belirlenmiştir:

1.00-1.79 Çok Zayıf
1.80-2.59 Zayıf
2.60-3.39 Orta (5-1 = 4 / 5 = 0.80)
3.40-4.19 İyi
4.20-5.00 Çok iyi

Araştırmanın bulgular ve yorumlar bölümünde her bir madde bu ölçütler dikkate alınarak değerlendirilmiştir. Veri toplama aracı ile toplanan veriler üzerinde aritmetik ortalama ve standart sapma değerleri hesaplanarak elde edilen sonuçlar yorumlanmıştır.

BULGULAR VE YORUMLAR

Bu bölümde Eğitim Yazılımları Değerlendirme Formunda elde edilen puanlarının ortalamaları ve standart sapması ilköğretim 6. 7. ve 8. sınıf Fen ve teknoloji dersi için tablolaştırılmış ve yorumlanmıştır.

Tablo1: Vitamin eğitim yazılımının Fen ve Teknoloji Öğretim Programının Kazanım Boyutuna Uygunluğuna İlişkin Bulgular

Yeni İlköğretim Programıyla Uygunluk (KAZANIMLAR)	$\overline{X}$	SS
Yeni öğretim programının gerektirdiği biçimde yapılandırmacı yaklaşım esaslarına göre düzenlenmiştir.	3,66	0,57
Öğrencilerin psikolojik ve bilişsel öğrenme düzeyleri ve evreleri göz önünde tutulur.	2,33	0,57
Konu anlatımlarının ve sınıf etkinliklerinin yeni öğretim programına uygun bir sırayla ve işlenişle kullanılabilir	3,66	0,57
Tam öğrenme modelini ve çoklu zekâ kuramını destekler, uygulamalarında yer verir.	2,66	1,15
Öğrencilerinize aktif bir öğrenme ortamı sunarak, öğrencilerinizin özgürce keşfetmelerini ve öğrenmenin de daha kalıcı gerçekleşmesi sağlar.	4,00	0,00
Sesli ve üç boyutlu canlandırmalar, zengin deneyler, etkileşimli konu anlatımları, alıştırmalar ve eğitici oyunlar öğrencinin ilgi ve motivasyonu artırarak derse aktif katılımı gerçekleştirir.	3,33	1,52
Sarmal yapısı sayesinde, kullanıcılar tüm sınıf içeriklerine erişebilir	3,33	0,57
Canlandırmalar ve animasyonlar ile ders konuları daha kolay anlaşılır	4,33	0,57
Doğal dünyayı öğrenmeleri ve anlamalarını sağlar	4,33	0,57
Bilimsel ve teknolojik gelişme ile olaylara merak duygusu geliştirmelerini teşvik eder.	3,33	0,57
Fen, teknoloji, toplum ve çevre arasındaki karşılıklı etkileşimleri anlamalarını sağlar	3,00	1,00
Yeni bilgileri yapılandırma becerileri kazanmalarını sağlar	3,33	0,57
Fen ve teknolojiye dayalı meslekler hakkında bilgi, deneyim, ilgi geliştirmelerini sağlayabilecek alt yapıyı oluşturur	2,33	0,57
Karşılaşabileceği alışılmadık durumlarda, yeni bilgi elde etme ile problem çözmede fen ve teknolojiyi kullanmalarını sağlar.	2,33	0,57
Kişisel kararlar verirken uygun bilimsel süreç ve ilkeleri kullanmalarını sağlar	3,00	0,00
Fen ve teknolojiyle ilgili sosyal, ekonomik ve etik değerleri, kişisel sağlık ve çevre sorunlarını fark etmelerini sağlar.	2,33	0,57
Bilmeye ve anlamaya istekli olma, sorgulama, mantığa değer verme, eylemlerin sonuçlarını düşünme gibi bilimsel değerlere sahip olmalarını sağlar.	2,66	1,15
Kazanımlar ve etkinlikler seçilirken öğrencilerin zihinsel ve fiziksel gelişim düzeyleri gözetilmiştir	2,66	0,57
Bireysel farklılıkları hesaba katılarak farklı etkinliklerin seçimi yapılmıştır.	2,00	0,00
İşlenen konunun katkıda bulunduğu ara disiplin kazanımlara gönderme yapılmıştır	2,66	1,52
Öğrenci merkezli olması gerektiği genel kabul görmüş bir gerçekle hazırlanmıştır.	3,66	0,57
Okulda öğrendiği veya geliştirdiği düşünceleri pekiştirmeyi sağlar.	4,00	0,00
Yardım almadan çalışma becerilerini ve özgüvenlerini geliştirmeyi sağlar.	3,33	0,57
Sosyal ve kültürel şartlara uygun hazırlanmıştır	2,66	0,57
Neyi ne kadar öğrendikleri hakkında düşünme fırsatı sağlar.	3,33	1,15

Araştırmacıların vitamin yazılımlarının fen ve teknoloji programının kazanım boyutuna uygunluğuna ilişkin görüşleri incelendiğinde; canlandırmalar, animasyonlarla öğrenme ve doğal dünyayı öğrenme ölçütleri bakımından 4.20 – 5.00 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi acısından "ÇOK İYİ" düzeyde bulunmuştur. Araştırmacı görüşlerinin programın içeriğinin yapılandırmacı yaklaşımlara göre düzenlenmesi, konuların yeni programa uygun sırayla işlenmesi, aktif öğrenme ortamı sunması, öğrenci merkezli olması, öğrenilen bilgileri pekiştirmesi ölçütleri bakımından 3.40 – 4.19 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi acısından "İYİ" düzeyde değerlendirilmiştir. Araştırmacı görüşlerinin tam öğrenme ve çoklu zeka yaklaşımına uygunluk, zengin deneyler, sarmal yapı, bilimsel ve teknolojik gelişmeler, fen teknoloji ve toplum etkileşimi, yeni bilgilerin yapılandırılması, bilimsel süreç ve ilkeleri kullanma, sorgulama, mantığa yer verme, kazanım seçiminde öğrencinin gelişim düzeyine yer verme, ara disiplinlere göndermeler yapma, özgüven geliştirme, sosyal – kültürel şartlara uygunluk ve öğrenilenler hakkında düşünme fırsatı sağlama ölçütleri bakımından 2.60 – 3.39 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi acısından "ORTA" düzeyde değerlendirilmiştir Araştırmacı görüşlerinin öğrencilerin psikolojik ve bilişsel öğrenme evrelerinin göz önünde bulundurulması, fen ve teknolojiyi bağlı mesleklerle ilgili alt yapıyı oluşturması problem çözmede fen ve teknolojiyi kullanabilme becerisi sağlama, sosyal ve etik değerleri, sağlık ve çevresel sorunları fark etmeyi sağlama, bireysel farklılıkları hesaba katma ölçütleri bakımından 1.80 – 2.59 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi açısından "ZAYIF" düzeyde bulunmuştur.

Tablo 2: Vitamin eğitim yazılımının Fen ve Teknoloji Öğretim Programının İçerik Boyutuna Uygunluğuna İlişkin Bulgular

Yeni İlköğretim Programıyla Öğretimsel Uygunluk(İÇERİK / EĞİTİM DURUMLARI)	$\overline{X}$	SS
1.Yazılım, önemli bilgileri öğretmek için değişik metotlar içerir	2,66	1,15
2.Destekleyici materyal uygunluğu sağlar.	3,33	0,57
3.Yazılım, gereksiz bilgiler içermez.	3,66	0,57
4.Diğer konularla yakınlık kurar.	3,33	1,15
5. Yazılım acık ve anlaşılır bir dille yazılmıştır	3,66	0,57
6.Öğretimsel içerik hedef kitlenin düzeyine uygundur	3,33	0,57
7.Öğretimsel içerik günceldir	4,00	0,00
8.Öğretimsel içerik bilimseldir	3,33	1,15
9.Yazılım içerisinde uygun zamanlarda dönüt verilir	3,33	1,15
10.Kullanıcıya alıştırma ve uygulama olanağı sağlamaktadır	3,00	1,00
11.Yazılım konu bitimlerinde "özet" sunar	2,66	1,52
12.Yazılımdaki animasyonların uzunluğu uygundur	3,33	1,15
13.Öğrencilerin dikkatini çekme ve merak uyandırır	4,00	0,00
14.Konularda akıcılık, mantık dokusu ve fikir bütünlüğü sağlar	3,33	0,57
15.Yazılımın içeriği, modüler (küçük bölümler) seklinde düzenlenmiştir.	3,66	0,57
16.Yazılım daha fazla bilgi edinmek isteyen öğrenciler için ilerleme olanağı (veya açıklayıcı bilgiler) verir	3,33	0,57
17.Yeterli ve nitelikli örnek verir	2,66	1,15
18.Yazılım öğrencilerin dikkatini çekme ve devam ettirme özelliklerini taşır	3,00	0,00
19.Yazılım içerisindeki pekiştireçler öğrencilerin öğrenme isteklerini arttırır.	2,00	0,00
20.Yazılım kalıcı ve anlamlı öğrenmeler oluşturabilir	3,33	0,57
21.Yazılım; öğrencileri yönlendirici özellikler taşır	3,33	0,57
22.Öğrencinin verdiği cevaplara dönüt sağlar	2,66	0,57
23.İçerik, yeni programın kazanımlarına uygundur	3,66	0,57
24.Yazılımda islenen konunun içeriği müfredata uygundur	4,00	0,00
25.Öğrencinin sınırlarını zorlayıcı ve geliştirici alternatif öğrenme etkinliklerine katılarak bilgi ve becerilerini kendi hızlarında geliştirmesine olanak sağlar	2,66	0,57
26.Analiz, sentez, değerlendirme gibi üst düzey düşünme becerilerini teşvik eden öğrenme etkinliklerine yer verir.	2,33	0,57

VİTAMİN ilköğretim yazılımlarının fen ve teknoloji programının içerik boyutuna uygunluğuna ilişkin araştırmacı görüşleri incelendiğinde; yazılımın gereksiz bilgileri içermemesi, açık ve anlaşılır olması, güncel olması, dikkat çekme ve merak uyandırması, modüler şeklinde düzenlenmesi, kazanımlara ve müfredata uygun olması ölçütleri bakımından 3.40 – 4.19 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi açısından "İYİ" düzeyde değerlendirilmiştir. Araştırmacı görüşlerinin, değişik metotlar içermesi, materyal uygunluğu sağlama, diğer konulara yakınlık kurma, hedef kitlenin düzeyine uygun olma, bilimsellik, dönüt verme, uygulama olanağı sağlama, özet sunma, uygun animasyon süresi, konularda akıcılık ve bütünlük sağlama, ilerleme sağlama, nitelikli örnek verme, dikkat çekme, anlamlı öğrenme oluşturma, yönlendirici özellik taşıma, alternatif öğrenme etkinlikleri sunma ölçütleri bakımından 2.60 – 3.39 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi acısından "ORTA" düzeyde bulunmuştur. Araştırmacı görüşlerinin, pekiştireç verme, üst düzey düşünme becerilerini teşvik eden öğrenme etkinliklerine yer verme ölçütleri bakımından 1.80 – 2.59 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi acısından "ZAYIF" bulunmuştur.

Tablo 3: Vitamin Eğitim Yazılımının Fen Ve Teknoloji Öğretim Programının Ölçme Değerlendirme Boyutuna Uygunluğuna İlişkin Bulgular

Yeni İlköğretim Programının Ölçme Değerlendirme Boyutuyla uygunluk	$\overline{X}$	SS
Yazılımın eğitimsel hedefleri program içinde açık bir şekilde yazılmıştır	2,00	1,00
Konu içerisinde sorulan sorular eğitici özelliktedir	2,66	1,52
Yazılımın sonunda öğrencinin sunulan konuyu öğrenmedeki başarısını ölçmek için bir basarı testi bulunmaktadır	3,00	1,73
Öğrenciler için birden fazla soru formu (çoktan seçmeli, doğru, yanlış gibi) geliştirilmiştir.	2,00	0,00
Alternatif ölçme ve değerlendirme yaklaşımlarına uygundur	2,33	0,57
SBS'de çıkan soru formatına uygundur	3,66	0,57
Üst düzey bilişsel basamağı ölçen sorulara yer verilmiştir	1,33	0,57
Soruların çözümüyle ilgili açıklamalar yeterlidir	2,66	0,57
Öğrenme sürecini değerlendirme anlayışına ağırlık verilmiştir.	2,66	1,52
Öğrencilerin fen konularındaki öğrenme durumlarını teşhis ederek öğretim programında belirtilen kazanımların edinim düzeyini belirlemeyi sağlar	2,66	1,15
Öğrenmeyi daha anlamlı ve derin hâle getirebilmek amacı ile dönüt sağlar	2,66	0,57
Öğrencilerin gelecekteki öğrenme ihtiyaçlarını belirler	2,66	0,57
Öğretme stratejilerinin ve program içeriğinin dengeli ve etkili olup olmadığını izlemeyi sağlar	2,00	0,00
Anlamlı ve derin öğrenilen bilgileri değerlendirir	3,33	0,00
Birbirine bağlı, iyi yapılanmış bir bilgi ağını değerlendirir	2,33	0,57
Bilimsel anlamayı ve bilimsel mantığı değerlendirir	2,66	1,15
Öğrencinin ne anladığını öğrenmek amacı ile değerlendirme sağlar.	3,33	0,57
Dönem boyunca devam eden değerlendirme etkinlikleri sağlar	3,00	1,00

VİTAMİN ilköğretim yazılımının fen ve teknoloji programının ölçme değerlendirme boyutuna uygunluğu incelendiğinde; SBS soru formatına uygunluk ölçütü bakımından $\overline{X}$ = 3,66 olduğu görülmektedir. Bu özelliğe ilişkin ortalama puanlar yeterlik düzeyi açısından "İYİ"

düzeyde değerlendirilmiştir. Araştırmacı görüşlerinin, soruların eğitici olması, başarı testinin olması, soru çözümlerinin yeterli olması, değerlendirmenin ağırlıklı olması, kazanımların edinim düzeyini belirleyici olması, dönüt sağlaması, öğrenme ihtiyaçlarını belirleyici olması, anlamlı ve derin bilgileri değerlendirmesi, bilimsel mantığı değerlendirmesi, öğrencinin ne anladığını belirleme, dönem boyunca devam etkinlikleri değerlendirme ölçütleri bakımından 2.60 – 3.39 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi acısından "ORTA" düzeyde bulunmuştur. Eğitimsel hedeflerin açık şekilde yazılması, birden fazla soru formatı içermesi, alternatif ölçme değerlendirme yaklaşımlarını içermesi, üst düzey bilişsel basamak sorularına yer vermesi, program içeriğinin dengeli ve etkili olup olmadığını izleme, iyi yapılanmış bilgi ağını değerlendirme ölçütleri bakımından 1.80 – 2.59 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi acısından "ZAYIF" olarak değerlendirilmiştir.

Tablo 4: Vitamin Eğitim Yazılımının Teknik Yeterlilik Boyutuna İlişkin Bulgular

Teknik Yeterlilik (Nitelik)	$\overline{X}$	**SS**
Yazılımın değişik işletim sitemlerini desteklemektedir	2,00	0,00
Yazılım bilgisayarı her açtığımızda doğru bir şekilde çalışmaktadır	4,33	0,57
Yazılımda farklı ekran gösterimleri kullanılmıştır	3,00	1,00
Program durduğu zaman kolayca yeniden çalıştırılmaktadır	3,00	1,00
Yazılımda kullanılan renkler kullanıcının dikkatini dağıtmamaktadır	3,33	0,57
Kullanılan ekran görüntüsü kullanıcının dikkatini dağıtmamaktadır.	4,00	0,00
Yazılımın içerisinde bulunan yönergeler doğru çalışmaktadır.	3,66	0,57
Yazılımın sayfaları ekranda en kısa surede görüntülenebilmektedir	3,00	1,00
Kullanılan sesler dinleme becerisini geliştirecek niteliktedir	4,00	0,00
Kullanıcı yazlımın ses düzeyini ayarlayabilmelidir	2,66	2,08

VİTAMİN ilköğretim yazılımlarının teknik yeterliliği boyutuna ilişkin görüşleri incelendiğinde; araştırmacı görüşlerinin, yazılım bilgisayarı her açtığımızda doğru bir şekilde çalışması ölçütü bakımından $\overline{X}$ = 4,33 olduğu görülmektedir. Bu özelliğe ilişkin ortalama puanlar yeterlik düzeyi acısından " ÇOK İYİ" olarak değerlendirilmiştir. Araştırmacı görüşlerinin ekran görüntüsü, yönergelerin doğru çalışması ve seslerin dinleme becerisini geliştirecek nitelikte olması ölçütleri bakımından 3.40 – 4.19 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi acısından "İYİ" bulunmuştur. Araştırmacı görüşlerinin farklı ekran gösterimi, kolayca yeniden çalıştırılması, renklerin dikkat dağıtıcı olmaması, sayfanın kısa sürede görüntülenebilmesi, ses düzeyinin ayarlanabilmesi ölçütleri bakımından 2.60 – 3.39 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi acısından "ORTA" düzeyde olduğu tespit edilmiştir. Araştırmacı görüşlerinin değişik işletim sistemlerini desteklemesi ölçütü bakımından $\overline{X}$ = 2,00 olduğu görülmektedir. Bu özelliğe ilişkin ortalama puanlar yeterlik düzeyi acısından " ZAYIF" bulunmuştur.

Tablo 5: Vitamin Eğitim Yazılımının Kullanım Kolaylığı Boyutuna İlişkin Bulgular

Kullanım kolaylığı (Nitelik)	$\overline{X}$	**SS**
Yazılım bilgisayara kolayca kurulabilmektedir	4,00	1,00
Bilgisayar deneyimi olmayan öğrenciler tarafından da kullanılabilmektedir.	2,66	1,15
Yazılımda sözlük ve hesap makinesi gibi yardımcı materyaller bulunmaktadır	1,66	1,15
Yazılım öğrencilerin yaptıkları yanlışları düzeltmelerine olanak tanımaktadır	2,00	1,73
Öğrencinin takıldığı noktalarda yapılması gerekenler belirtilmektedir	1,66	0,57
Yazılımın kullanımına ait açıklamaları içeren ve kolayca ulaşılabilen yardım ve çıkış menüleri bulunmalıdır.	2,66	0,57
Kullanımla ilgili yönergeler kısa, basit, acık, tutarlı bir şekilde hazırlanmıştır.	2,66	1,52
Öğrencinin ekranı istediğinde atlayarak geçebilmesine olanak tanınmaktadır	2,66	1,15
Kullanıcı istediği zaman yazılıma kaldığı yerden devam edebilmektedir.	3,33	2,08
Kullanıcı istediği zaman yazılımdan kolayca çıkabilmektedir	3,66	0,57

VİTAMİN ilköğretim yazılımlarının kullanım kolaylığı boyutu göz önüne alındığında, yazılımın bilgisayara kolayca kurulabilmesi ve kullanıcının istediğinde yazılımdan kolayca çıkabilmesi ölçütleri bakımından 3.40 – 4.19 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi açısından "İYİ" düzeyde değerlendirilmiştir. Bilgisayar deneyimi olmayan öğrenciler tarafından da kullanılabilirliği, kolayca ulaşılan yardım ve çıkış menülerinin olması, yönergelerin kısa, basit, açık tutarlı olması, istendiğinde atlayarak geçilmesi, istendiği zaman yazılıma kalındığı yerden devam edilmesi ölçütleri bakımından 2.60 – 3.39 puan aralığında değiştiği görülmektedir. Bu özelliklere ilişkin ortalama puanlar yeterlik düzeyi açısından "ORTA" düzeyde değerlendirilmiştir. Yazılımlarda sözlük ve hesap makinesi bulunması ve öğrencinin takıldığı noktalarda yapılması gerektiğini belirtmesi ölçütleri bakımından 1.00 – 1.79 puan aralığında değiştiği görülmektedir. Bu özelliğe ilişkin ortalama puanlar yeterlik düzeyi açısından " ÇOK ZAYIF" düzeyde değerlendirilmiştir.

Tablo 6 Ders Yazılımı Değerlendirme Formu Bütünüyle İlgili Bulgular

	Madde sayısı	**ss**	**ortalama**
Yeni İlköğretim Programıyla Uygunluk (Kazanımlar)	25	0.34	3.13
Yeni İlköğretim Programıyla Öğretimsel Uygunluk (İçerik / Eğitim Durumları)	26	0.05	3.21
Yeni İlköğretim Programının Ölçme Değerlendirme Boyutuyla Uygunluk	18	0.17	2.59
Teknik yeterlilik	10	0.17	3.3
Kullanım kolaylığı	10	0.51	2.7

SONUÇ

Bu çalışmada VİTAMİN ilköğretim eğitim yazılımı araştırmacılar tarafından geliştirilen Eğitim Yazılımı Değerlendirme Formu kullanılarak değerlendirilmiştir. Yapılan değerlendirme sonucunda ders yazılımının genel olarak "ORTA" düzeyde yeterliliğe sahip bir yazılım olduğu belirlenmiştir

1. Vitamin İlköğretim eğitim yazılımının Yeni İlköğretim Programıyla Uygunluk (Kazanımlar) boyutu açısından "ORTA" düzeyde bulunmuştur
2. Vitamin İlköğretim eğitim yazılımının Yeni İlköğretim Programıyla Öğretimsel Uygunluk (İçerik / Eğitim Durumları) boyutu açısından "ORTA" düzeyde bulunmuştur
3. Vitamin İlköğretim eğitim yazılımının Yeni İlköğretim Programının Ölçme Değerlendirme Boyutuyla Uygunluğu açısından "ZAYIF" düzeyde bulunmuştur.
4. Vitamin İlköğretim eğitim yazılımının Teknik yeterlilik boyutu açısından "ORTA" düzeyde bulunmuştur
5. Vitamin İlköğretim eğitim yazılımının Kullanım kolaylığı boyutu açısından "ORTA" düzeyde bulunmuştur

ÖNERİLER

1-Vitamin ilköğretimi öncelikle okullar da sürekli kullanılır hale getirilmesi ve öğretmenlerin bu eğitim yazılımını fark etmeleri sağlanarak, kullanmaları teşvik edilmelidir

2-Yeni ilköğretim programının felsefesini oluşturan ezbersiz eğitimin ruhuna uygun olarak ,öğretmen kılavuz kitaplarında da vurgulandığı gibi bazı videolarda konu anlatımlarının formüllerle birlikte verilmesi (örneğin;7.sınıf basit makineler çıkrık videosu) öğrencinin bu bilgiyi fark edememesine ve eksik öğrendiğini düşünmesine yol açabilir.Bunun için formüllerin konu anlatımında yer almaması daha uygun olacaktır.

3- İnternet erişimi sıkıntısı çeken okullar olduğu için, MEB vitamin videoları cd halinde öğretmenlere gönderilebilir.

4- Videoların sonunda konulara ait testlerin olması dersin verimliliğini arttıracağı gibi tarama testlerinden ziyade videolarla birlikte alternatif ölçme ve değerlendirme tekniklerine de yer verilmelidir .

5-Son olarak da videonun başında dersin konusuyla ilgili önbilgi verilebilir.Ya da video sonunda hangi kazanıma ait olduğu vurgulanabilir.Öğrenci bu sayede ne öğrendiğini hangi amaçla bu konu öğretildiğini daha iyi kavrayabilir.

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FEN ve TEKNOLOJİ ÖĞRETMEN ADAYLARININ TEKNOLOJİ ENTEGRASYONUNU ETKİLEYEN FAKTÖRLERE İLİŞKİN GÖRÜŞLERİ

SCIENCE AND TECHNOLOGY TEACHER CANDIDATES' VIEWS ON FACTORS AFFECTING TECHNOLOGY INTEGRATION

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Özet

İçinde bulunduğumuz 21. Yüzyılda teknolojinin hızlı gelişimi tüm alanları etkilediği gibi eğitimde sürekli bir değişim oluşturmaktadır. Bu değişim süreciyle birlikte eğitim sisteminde öğretmenlerin farklı nitelik ve becerilerle donanık olması beklenmektedir. Öğretmenlerden beklenen bu becerilerden birisi de günlük yaşamlarının yanı sıra öğretme süreçlerinde de teknolojiden etkin bir biçimde yararlanmalarıdır. Bu nedenle teknoloji kullanımı ile etkili öğretimin temellerini atacak olan öğretmen adaylarının teknoloji entegrasyonu ve bu süreci etkileyen faktörlere ilişkin görüşleri önem taşımaktadır. Bu bağlamda bu çalışmanın amacı, fen ve teknoloji öğretmen adaylarının teknoloji entegrasyonunu etkileyen faktörlere ilişkin görüşlerinin belirlenmesidir. Araştırmanın çalışma grubunu eskişehir osmangazi üniversitesi ve selçuk üniversitesi'nde öğrenim gören fen ve teknoloji öğretmenliği bölümündeki 154 öğretmen adayı oluşturmaktadır. Araştırmada veri toplama aracı olarak çakır ve yıldırım (2009) tarafından geliştirilen "okulda teknoloji entegrasyonunu etkileyen faktörler anketi" kullanılmıştır. Verilerin analizinde betimsel istatistiklerden ve t-testinden yararlanılmıştır.

Anahtar kelimeler: teknoloji entegrasyonu, teknoloji entegrasyonunu etkileyen faktörler, fen ve teknoloji öğretmenliği

Abstract

The rapid development of technology in 21st century has affected all fields and it has led to many changes in the field of education as well. Along with that period of change, teachers are expected to be equipped with different qualities and skills. One of those expected skills is to make use of technology effectively in teaching process as well as in their daily lives. Therefore, the views of teacher candidates, who will lay the foundations of effective teaching with technology, regarding technology integration and factors which affects this process are crucial. In this context, the aim of this study is to determine the views of science and technology teacher candidates regarding the factors which affect technology integration. Study group of the research is constituted by 154 teacher candidates studying at eskişehir osmangazi university and selçuk university. The survey "factors affecting technology integration at school", which was developed by çakir and yildirim (2009) used in the research. Descriptive statistics and t-test are used in data analyzing.

Keywords: technology integration, factors affecting technology integration, science and technology teaching

GİRİŞ

İçinde bulunduğumuz 21. yüzyılda bilgi ve iletişim teknolojilerinde (BİT) yaşanan hızlı gelişim günlük yaşamın hemen hemen her alanında değişim ve dönüşümü de beraberinde getirmektedir. BİTlerin bireylerin günlük yaşamlarında karşılaştıkları birçok olayda karar verme aşamasında önemli rol oynamalarının yanı sıra iş alanlarındaki mekanizmalardan, otomobillerin motor sistemlerine ve ev aletlerinin çalışmasına kadar hemen her şeyi kontrol etmektedirler. Böyle bir gelişimin eşiğinde, teknolojinin eğitim alanında kullanılmasının, bireylerin gelecekteki hayatlarına hazırlanmaları ve adapte olmaları açısından faydalı olacağı söylenebilir. Bu nedenle yaşanan değişim ve dönüşümün en çok etkilendiği sistemlerin başında gelen eğitime teknolojinin entegre edilmesi kaçınılmaz hale gelmiştir. Alkan (1991), bireylere kaliteli eğitim hizmeti sağlamak için, toplumun farklı ihtiyaç ve taleplerini karşılamanın, insan kaynaklarını etkili bir biçimde kullanmanın ve eğitimde fırsat eşitliğini sağlamanın yanı sıra eğitim teknolojilerinin sınıfta kullanılmasının gerekliliğini savunarak teknolojinin eğitime entegrasyonunun gerekliliğini vurgulamaktadır. Alanyazında farklı bakış açılarına dayalı olarak teknoloji entegrasyonuna ilişkin farklı tanımlamaların yapıldığı bazı çalışmalarda ise teknoloji entegrasyonun BİT entegrasyonu olarak ele alındığı görülmektedir.

BİT entegrasyonu öğretme-öğrenme ortamlarını, öğretim programını ve alt yapıyı içine alacak biçimde öğretme-öğrenme sürecinin tüm boyutlarında teknolojinin etkili ve verimli biçimde kullanılmasıdır (Yalın, Karadeniz ve Şahin, 2007). Bir başka deyişle BİT entegrasyonu öğretmenlerin sınıflarda öğrencinin başarısını artırmak için her türlü teknolojiyi kullanmasıdır. Ancak BİTlerin entegrasyon sürecinde öğretmenlerin teknolojiye yönelik temel beceri eksiklikleri, tutumları (Hew ve Brush, 2007), öğretmenlerin teknoloji kullanımına yönelik mesleki gelişime ihtiyaç duymaları (Göktaş, Yıldırım ve Yıldırım, 2009) gibi nedenlerle sorunlar yaşanmaktadır.

Jonassen, Peck ve Wilson (1999) tarafından etkili bir teknoloji entegrasyonunun, sadece bilgisayar becerilerini kazanmak değil, öğrencilerin araştırma yaptıkları, veri analiz ettikleri, bilgi ürettikleri ve işledikleri, kişisel ve toplumsal olarak paylaşılan anlamlar geliştirdiği, iletişim ve işbirlikçi görevler içeren bir süreç olduğu vurgulanmıştır. Koç'un (2005) yaptığı çalışmada ise, teknolojinin öğrenme aracı olarak etkili ve verimli bir şekilde kullanılmasının öğrencilerin başarılarında, tutumlarında, öğretmen ve arkadaşlarıyla olan iletişimlerinde gözle görünür bir değişim

yapabileceği; etkileşimli, bireysel öğrenme ve üst düzey düşünme becerilerini geliştirebileceği sonucuna varılmıştır. Prevenzo, Brett ve McCloskey (1999) tarafından teknolojinin öğretmenler için başa çıkılması gereken bir olgu olduğu belirtilmiş ve mevcut eğitim sisteminde öğretmenin başarılı olabilmesi için teknoloji okuryazarlığının olması gerektiği vurgulanmıştır.

0'Donnell (1996) tarafından yapılan çalışmada teknolojinin sınıflara entegre edilmesi sürecinde öğretmenlerin teknolojiyi eğitim ortamlarında kullanmalarında sorunlar yaşadıkları ve başarısız oldukları, öğretmenlerin yeni teknolojileri öğretme sürecinde nasıl kullanacaklarını dersleriyle nasıl bütünleştireceklerini bilmedikleri belirlenmiştir. Charp (1996) yönetim desteğinin olmaması, eğitim eksikliği, teknolojinin yeterince desteklenmeyişi ve yeterince ödenek ayrılmamasından kaynaklanan sorunların öğretmenlerin eğitimde teknoloji yapısına sahip olarak yetiştirilememesine neden olduğunu belirtmektedir. Çağıltay, Çakıroğlu, Çağıltay ve Çakıroğlu (2001) tarafından yapılan araştırmada öğretmenler, sınıflarında bilgisayar kullanımı konusundaki endişelerini, yeterli bilgisayar olmaması, öğretim programının buna uygun olmaması ve öğretmenlerin bu konuda yeterince eğitilmemiş olması olarak belirtmişlerdir. Araştırmada ortaya çıkan bulgulardan bir diğeri ise gelişmekte olan ülkelerdeki gibi, malzeme yetersizliğinin ve öğretmen eğitiminin Türkiye'de de en önemli problemlerden birisi olarak görüldüğüdür. Bu bağlamda teknolojinin sağladığı olanakların verimli kullanabilmesi için öğretmenlerin hizmet öncesi eğitimlerinin teknolojik gelişmeler doğrultusunda değişmesi ve gelişmesi gerekmektedir (Karal ve Berigel, 2006). Bu nedenle öğretmen yetiştiren kurumlarda ders içeriklerine uygun teknoloji ürünlerinin eğitimde yaygın kullanılması ve adayların bu dönemde daha nitelikli yetiştirilmesi önem kazanmaktadır (Akkoyulu ve Kurbanoğlu, 2003). Etkili bir teknoloji entegrasyonunun eğitim ve öğretim sisteminde köklü değişiklikler gerektirdiği, bu süreçte en önemli görevin öğretmen ve onları yetiştiren eğitim kurumlarına düştüğü söylenebilir. Bunun yanı sıra geleceğin öğretmenleri olan öğretmen adaylarının teknolojinin öğretime entegre edilmesi konusundaki problemleri ve endişeleri hakkında bilgi sahibi olunması sürecin sağlıklı işleyişine katkı sağlayacaktır. Buna bağlı olarak bu çalışmanın amacı ilköğretim okullarında görev yapacak olan Fen ve Teknoloji öğretmen adaylarının teknolojinin eğitime entegrasyonunu etkileyen faktörler hakkındaki görüşlerini belirlemektir.

YÖNTEM

Tarama modelinde desenlenen araştırmanın çalışma grubunu Eskişehir Osmangazi Üniversitesi ve Selçuk Üniversitesi'nde öğrenim gören Fen ve Teknoloji Öğretmenliği bölümündeki 154 öğretmen adayı oluşturmuştur. Araştırmada veri toplama aracı olarak Çakır ve Yıldırım (2009) tarafından geliştirilen "Okullarda Teknoloji Entegrasyonunu Etkileyen Faktörler Anketi" kullanılmıştır. Anket, katılımcıların teknoloji entegrasyonunu etkileyen faktörleri en azdan en çok etkili olana doğru sıralayacak şekilde 5'li likert olarak düzenlenmiş 27 ifadeden oluşmaktadır.

Fen ve Teknoloji öğretmen adaylarının teknolojinin eğitime entegrasyonunu etkileyen faktörler hakkındaki görüşlerinin belirlenmeye çalışıldığı araştırmada aşağıdaki sorulara cevap aranmıştır:

1. Fen ve Teknoloji öğretmen adaylarının teknolojinin eğitime entegrasyonunu etkileyen faktörler hakkındaki görüşleri nelerdir?
2. Fen ve Teknoloji öğretmen adaylarının teknolojinin eğitime entegrasyonunu etkileyen faktörler hakkındaki görüşleri
   - cinsiyetlerine
   - kendilerine ait bilgisayarlarının olup olmamasına

   göre değişmekte midir?

BULGULAR

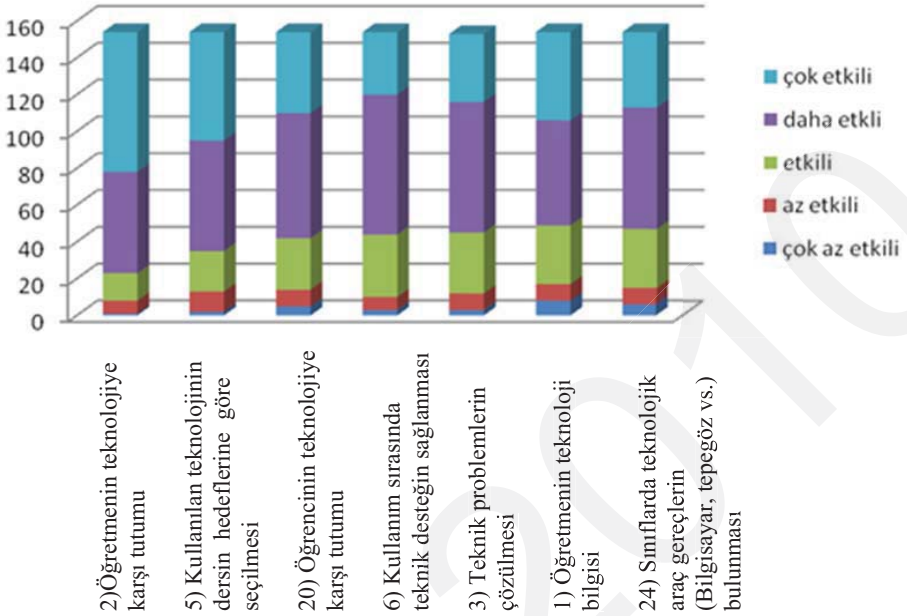
Fen ve Teknoloji öğretmeni adaylarının teknoloji entegrasyonu etkileyen faktörlere ilişkin görüşlerinin aritmetik ortalamaları ve standart sapmaları Tablo 1'de yer almaktadır.

Tablo 1. Öğretmen adaylarının her bir madde için verdikleri cevapların aritmetik ortalama ve standart sapma değerleri

Maddeler	$\overline{X}$	ss
2) Öğretmenin teknolojiye karşı tutumu	4.25	.90
1) Öğretmenin teknoloji bilgisi	4.05	.96
5) Kullanılan teknolojinin dersin hedeflerine göre seçilmesi	3.88	.99
20) Öğrencinin teknolojiye karşı tutumu	3.85	.88
6) Kullanım sırasında teknik desteğin sağlanması	3.83	.94
3) Teknik problemlerin çözülmesi	3.83	1.09
24) Sınıflarda teknolojik araç gereçlerin(Bilgisayar, tepegöz vs.) bulunması	3.82	1.01
18) Öğretmenin teknolojiyi kullanma becerisi	3.81	.98
27) Teknolojik araç gereçlerin yeni ve kullanılabilir olması	3.78	.96
10) Kullanılan öğretim metotlarının öğrenci merkezli hale getirilmesi	3.78	.97
16) Bilgisayar laboratuvarlarına ve diğer teknoloji araç gereçlere erişim	3.77	.95
19) Derste kullanılacak teknolojinin çeşitliliği	3.77	.99
9) Öğretmenin hangi konuda hangi teknolojik hangi teknolojik araç gereci kullanılacağına dair yeterli bilgiye sahip olması	3.77	1.01
21) Öğrencinin teknoloji kullanma becerisi	3.72	.80
17) Teknoloji tabanlı dersi uygularken yeterli zamanın sağlanması	3.72	1.01
4) Öğretilecek konu-içerik	3.71	.88
7) Okul idarecilerinin teknolojiye karşı tutumu	3.70	.92
8) Öğrenme hedeflerinin belirlenmesi	3.67	.88
23) Okuldaki bilgisayar laboratuvarı ve bilgisayar sayısı	3.65	1.02
22) Öğrencilerin seviyeleri (1.sınıf, 2. sınıf, 3.sınıf vs.)	3.64	.98
15) Sınıftaki öğrenci sayısı	3.64	1.03
13) Teknolojik araç gereçlerin kullanılmasına ilişkin öğretmenlere verilen hizmet içi eğitim	3.63	1.00
14) Öğretmenin teknoloji entegrasyonuna uygun ders planı hazırlaması	3.57	.94
12) Teknolojik araç-gereçlerin kullanılmasına ilişkin öğretmenin aldığı hizmet öncesi dersler	3.55	1.04
11) Teknoloji uyarlanmış bir dersin sunumunda bir yardımcının olması	3.51	.99
26) Velilerin teknoloji kullanımını desteklemesi	3.55	1.02

25) Okullarda kullanılan yazılımların çeşitliliği	*3.46*	*.95*

Öğretmen adaylarının görüşlerine göre "Öğretmenin teknolojiye karşı tutumu" teknoloji entegrasyonunda en önemli faktör ($\overline{X}$ =4.25, ss=.90) olarak belirlenmiştir. Diğer önemli faktör ise "Öğretmenin teknoloji bilgisi"dir ($\overline{X}$ =4.05, ss=.96). Öğretmen adaylarının görüşlerine göre "Okullarda kullanılan yazılımların çeşitliliği" ($\overline{X}$ =3.46, ss=.95) teknoloji entegrasyonu için en az etkili olan faktördür. Öğretmen adaylarına göre teknoloji entegrasyonunda en az etkili olan ikinci faktör ise "Velilerin teknoloji kullanımını desteklemesi"dir ($\overline{X}$ =3.55, ss=1.02). Öğretmen adaylarının görüşlerine göre teknoloji entegrasyonunda etkiliği en fazla olan maddeler Grafik 1'de gösterilmiştir.



Grafik 1. Öğretmen adaylarının görüşlerine göre teknoloji entegrasyonunda etkililiği en fazla olan maddeler

Araştırmanın ikinci alt problemine cevap aramak amacıyla bağımsız örneklemler t-testinden yararlanılmıştır. Öğretmen adaylarının cinsiyetlerine göre teknolojinin eğitime entegrasyonunu etkileyen faktörler hakkındaki görüşlerine ilişkin t-testi sonuçları Tablo 2'de yer almaktadır.

Tablo2. Öğretmen adaylarının cinsiyetlerine göre teknolojinin eğitime entegrasyonunu etkileyen faktörler hakkındaki görüşlerine ilişkin t-testi sonuçları

Madde	Grup	N	$\overline{X}$	ss	sd	t	p
Sınıflarda teknolojik araç gereçlerin (Bilgisayar, tepegöz vs.) bulunması	Kız Erkek	86 68	4.01 3.58	.97 1.02	152	2.614	.01*

*p< .05

Öğretmen adaylarının cinsiyetlerine göre "Sınıflarda teknolojik araç gereçlerin (Bilgisayar, tepegöz vs.) bulunması" maddesinde kız öğretmen adayları lehine anlamlı bir farklılık ortaya çıkmıştır. Bu farklılığın ortaya çıkmasında kız öğretmen adaylarının derslerinde görselliğe daha çok önem vermeleri dolayısı ile bu tür araç gereçleri eğitimde teknolojiyi entegre ederken daha sıklıkla kullanmalarının etkili olduğu söylenebilir.

Öğretmen adaylarının kendilerine ait bilgisayarlarının olup olmama durumlarına göre teknoloji entegrasyonunu etkileyen faktörlere ilişkin görüşleri arasında anlamlı farklılık bulunmamıştır (p>.05).
Bir başka deyişle kendisine ait bilgisayarı olan ve olmayan öğretmen adaylarının teknolojinin eğitime entegrasyonunu etkileyen faktörlere ilişkin görüşleri benzerdir.

SONUÇ ve TARTIŞMA

Fen ve Teknoloji öğretmeni adaylarının teknolojiyi fen ve teknoloji dersine entegre edilmesi hakkındaki görüşlerinin belirlenmesi, teknolojinin etkili ve verimli bir şekilde kullanılması okullarda etkili teknoloji entegrasyonunu sağlamak için önemlidir. Bu çalışmada Fen ve Teknoloji öğretmeni adaylarının teknolojinin eğitime entegrasyonu etkileyen faktörler hakkındaki görüşleri belirlenmeye çalışılmıştır. Araştırma sonucunda öğretmen adaylarının, okullarda teknoloji entegrasyonu etkileyen en önemli faktörleri aşağıdaki gibi sıraladıkları görülmüştür.

- Öğretmenin teknolojiye karşı tutumu
- Öğretmenin teknoloji bilgisi
- Kullanılan teknolojinin dersin hedeflerine göre seçilmesi
- Öğrencinin teknolojiye karşı tutumu
- Kullanım sırasında teknik desteğin sağlanması
- Teknik problemlerin çözülmesi
- Sınıflarda teknolojik araç gereçlerin (Bilgisayar, tepegöz vs.) bulunması

- Öğretmenin teknolojiyi kullanma becerisi
- Teknolojik araç gereçlerin yeni ve kullanılabilir olması
- Kullanılan öğretim metotlarının öğrenci merkezli hale getirilmesi
- Öğretmenin hangi konuda hangi teknolojik araç gereci kullanılacağına dair yeterli bilgiye sahip olması

Araştırmada öğretmen adaylarının görüşlerine göre öğretmenin teknolojiye karşı tutumu teknoloji entegrasyonundaki en önemli faktördür. Bu bulgu Çakır ve Yıldırım (2007) tarafından gerçekleştirilen çalışmanın bulgusuyla tutarlıdır. Öğretme-öğrenme sürecinde teknoloji entegrasyonunun sağlanmasında öğretmenlerin rolleri önemlidir. Teknoloji entegrasyonunun başarısı ve öğrencilerin okulda teknolojiyi etkili olarak kullanması, öğretmenlerin davranışlarına ve teknolojiyi benimseme isteklerine bağlıdır (Yıldırım, 2007). Araştırmada elde edilen sonuçlar teknoloji entegrasyonu ile alanyazında yapılan birçok çalışma ile tutarlılık göstermektedir. Çağıltay, Çakıroğlu, Çağıltay ve Çakıroğlu (2001) tarafından yapılan çalışmada, öğretmenlerin okullardaki bilgisayar teknolojisi kullanımının öğretim ve öğrenim etkinliklerinde yararlı olduğuna inanmalarına rağmen, teknoloji entegrasyonu ile ilgili yeterli seviyede bilgilerinin olmadığı sonucuna ulaşılmıştır. Yıldırım (2007) tarafından yapılan çalışmada ise teknik ve pedagojik destek eksikliği ile öğretmenin yetersizliğinin okullardaki başarılı teknoloji entegrasyonunu etkileyen etkenler olduğu sonucuna ulaşılmıştır. BİTlerin okullarda uygulanabilmesi konusunda yapılan çalışmaların ortak noktasını BİTlerin öğretme-öğrenme sürecine etkili entegrasyonu için öğretmenlerin bilgi ve becerilere sahip olma koşulu oluşturmaktadır (Demirarslan ve Koçak-Usluel, 2005; Galanolule, Murphy ve Gardner, 2004). Bu çalışmada da öğretmenin yeterli bilgiye sahip olmamasının teknoloji entegrasyonunda önemli bir engel oluşturduğu sonucuna ulaşılmıştır.

Teknolojinin eğitime entegrasyonunda en önemli faktörlerden birisinin de öğrencilerin teknolojiye karşı tutumları olduğu araştırma sonucunda ortaya çıkmıştır. Çoklar ve Kuzu (2006) tarafından da belirtildiği gibi teknolojinin eğitimde kullanılması konusunda en önemli faktörler arasında öğretmen adaylarının teknolojiye karşı olumlu tutumu gelmektedir. Ancak Brush ve arkadaşları (2003), öğretmen adaylarının teknolojiye karşı algılarının olumlu olmasına karşın teknolojiyi öğretim etkinliklerine entegre ederken sorunlarla karşılaştıklarını belirtmişlerdir. Teknolojinin okullara entegrasyonunu engelleyen en önemli alt yapı sorunları olarak, teknik destek eksikliği, kullanılan yazılımlar, öğretmenin teknoloji kullanma becerisi, fiziksel mekânın uygun olmaması, sınıftaki öğrenci sayısı, teknolojik araçların kullanılmasına ilişkin öğretmenin aldığı hizmet öncesi dersler ve eğitim araçlarındaki eksiklikler sıralanabilir (Tezer ve Aktunç, 2009; Tezer ve Karasel, 2009: Yıldırım, 2007; Karal ve Berigel, 2006; Granger, Morbey, Lotherington, Owston ve Wideman, 2002). Benzer bir durum bu çalışmada da ortaya çıkmıştır.

Araştırmadan elde edilen sonuçlar doğrultusunda öğretmenlere teknolojinin kullanılması ve kendi derslerinde nasıl işlevsellik kazandırılabileceği ile ilgili detaylı eğitimler verilmesi, öğretmenlere teknolojiyi derslerine entegre edebilecekleri altyapıların sağlanması gerektiği söylenebilir. Ayrıca teknolojinin eğitime entegrasyonu ile ilgili daha derinlemesine bilgi edinmek için durum çalışmaları desenlenebilir. Bunun yanı sıra benzer çalışmalar daha büyük örneklem grubu ve hizmet içindeki öğretmenlerle gerçekleştirilebilir.

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FINE ARTS DEPARTMENT STUDENTS' IDEAS ABOUT THE FUTURE'S TECHNOLOGY

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Abstract:
Nowadays technology changes and develops with a vertiginous speed. The innovations that technology brings, has been differentiated the daily life significantly, including the educational media. It is very important to predict future's technology from now for make ready the education for the future. It is an universally accepted reality that artists were some of the most prescient persons. The basic aim of this study was determine the ideas of fine arts department students' that are the future's art educators oriented towards the future's technology, discuss the obtained data about this issue and to propose oriented towards preparation for the future's education. For this purpose, has been applied to qualitative method and directed some open-ended questions to the art and music teaching candidates studying in fine arts education department. Obtained evidences have been analyzed by descriptive analyze method. In consequence of the research, obtained data has been interpreted and has been made some suggestions.

Key words: fine arts education, future's technology, technology

1. INTRODUCTION

Visual arts education is a necessary part of the educational process. Art education is not only for educate artists. More important of this, it aims to educate all people by way of art. Briefly art is a necessity of being a human. People have to be in communication with each other and visual arts are a communication form as well. This communication language is the communication language of civilization. Because we can reflect our fears, anxieties, curiosities, hopes or explorations more effectively with this language. The art is a universal language in our lives. Foundational lesson learnt from this language as can be understood by its name, is the 'basic art education'.

The general aim of visual arts education is to help every individual to gain a visual literacy. The alphabet of visual literacy consists of visual design principles and elements (Özsoy, 2006:10). From the beginning art has been integrated with technology and maintain its presence in parallel with technology. The people drew bison or mammoth pictures in the cavern period, also had used that period's technology. Even though they were unaware of the concept of technology at that period, they had used the technology born from the facilities of the time. Because artists have to use equipments and materials (Genç, 1988:100; Robinson, 2003:197).

Human beings preserve mind and emotions and from the beginning times they collected its presence under the daily life's experience and art's common grand. Making a weapon by sharpening a stone, drawing and painting animal's picture was intended for hunt on the cave walls; using the art as a magic tool and as a weapon or see it as an established trap for an animal, pursued a goal of continuation of presence. In anyway, the human directed to the aim of render more livable by dominate on nature, anticipate of complicated mystery of reality and reach to the true judgment by using his all abilities, thought, sensations and wills. The source that human nourished while was creating his own knowledge and technologic universe, had been art and he constantly turned to the art for understanding the problems of natural environment that was living in and maintain his presence (Altınkaş, 2008:253; Gençaydın, 1988:103).

The science interested in how the things are while the art interested in how the things must be (Özgültekin, 1988:156). Because the art produces the knowledge and the knowledge produces the technology; and the technology provides the maturates the produced knowledge and its proliferation (Atan, 2004:64). Creative processes in art and science are similar and attending to the art can raise the performance in science. In this respect, performances in visual arts is important in terms of putting shed light on psychological factors in scientific exploration and technologic inventions (Boydaş, 2004:6;Gürer, 1988:124; Tansuğ, 1988:45; Tepecik, 2002:13).

It is needed more than every time to the artist's genuine creativeness in our world that machinery and industry esthetic is dominant. Soon, it started to be understood that the public places that became uninhabitable, the streets and concrete heap structures need to humanization. The world of technology that is far from art sensitivity may become more helpful to the industry by more development but at the same time it may gradually become unlikable and could be away from the humanity (Gençaydın, 1988:109). Nonetheless, the creator of art and its subject directly will be human or concerned with human. Regardless the development of technology, because of the fact that the human will be unable to entitle as art without possession of his own, the art will be remain for human as a gorgeous way for expressing himself and communicate with others (Özel, 2000:148). The developments in technologic area gradually make people flagged and cause to lose their sensitivity. The developments in science and technique, bring along some defects that effect the human's psychological aspect too. Over here, the esthetic education must be included and bringing up the individuals know the beauty concept's meaning and importance and delicate to living environment must be aimed (Buyurgan, 1996:20; Ersoy, 2002:1124; Özel, 2000:144).

Art education essentially aims to operate on the human soul and to create a contemporary community consist of sensitive persons. Beginning by constitute creative and productive individuals with confidence to themselves and improved esthetical emotions; a community possessor to these qualities is aimed. Technology and manufacturing bring the deprivation of individual creativeness with themselves (Bayav, 2008:352). The basic arguments about educational targets and equipments, focused on nonaddiction to the latest technological inventions (Gardner, 1999:205). The two most important values that technology has offered to the education; are the computer and the internet. These two elements when thought together, makes many approaches more sensible that can be alternative to the education focused on physical environment like school and class (Taşpınar&Tuncer, 2008:133).

2. AIM

The main purpose of this study is; to determine of fine arts department students' (that are the future's art educators) ideas towards the future's technology.

3. METHOD

Study Groups

The 3rd grade students that study in the Art Education and Music Education programs of Fine Arts Education Department at Fatih Education Faculty, Karadeniz Technical University, constitutes the universe of the study. The study group that has been determined in the universe, consists of 81 fine arts students on total (24 music and 57 art education students) that study in the mentioned departments.

Collecting Data

The participating students have been asked to answer provided open ended questions on the purpose of expose their ideas about the issue prepared by the researchers. The documents that developed as interview forms, have been collected as written format from the participating students. The questions took place in the interview form are; *a) What do you think about how the future's art education would be like? b) How the technologic improvements will effect the art education in your opinion? And c) Write your ideas imagining the art education in the year of 2050.*

Analysis of Data

In the study it has been tried to obtain data by applying to the statistical methods based on qualitative research method for analyze of data collected from the interview. Obtained evidences have been interpreted by the researcher. For analysis of findings obtained from the answers of questions took place in the questionnaire, the *descriptive analysis* and *content analysis* approaches have been utilized. According to Yıldırım and Şimşek (2000:158-162); the purpose in the descriptive analysis is to offer obtained data in regulated and interpreted form to the reader. As to the content analysis, the main purpose is to reach to the concepts and relationships that can explain the obtained data. The summarized and interpreted data by the descriptive analysis, has been put to a process more deep than content analyze and incognizable concepts and themes by the descriptive approach, can be discovered in consequence of this analysis. Furthermore, evidences obtained from the answers took place in the interview form, after put to content analysis with regard to certain words, the data has been categorized and collected under some titles. Obtained data has been analyzed descriptively and interpreted after collected under suitable categories.

4. FINDINGS AND DISCUSSION

Ideas About How The Future's Art Education Will Be Like

By examining of the answers that fine arts department students gave to the question of "What do you think about how the future's art education would be like?" firstly can be said the ideas can be collected under two groups as *optimistic expectations* and *pessimistic expectations*.

Optimistic Expectations: I think Future's art education will be better. Because:

- There will be more liberal environments for people to exhibit their abilities.
- New art trends will emerge and the art scope will expand.
- Public will be more platonic with art and will give more importance to the art.
- Interaction between the cultures will develop and artistic variety will increase.
- The talented people will be detected more easily.
- Artistic improvement will be very fast because reach to the information will be easy.
- Artistic activities will rise with interest to the art.
- The art teacher's importance will rise by give valuation to the art.
- Visuality will stand in the forefront and the necessity to the art education will increase.
- More genuine artists will grow up because there will be more people interested in art.
- Every person will start to educate himself in art.
- Art will become prevalent and depressing life conditions will increase the interest in art.
- Education will be student- centered and the teacher's effect will decrease constantly.
- A common program will be carried out in the all countries of the world.
- Lesson periods in the program will increase because the importance of the lesson will be understood.
- More importance will be given to the artistic ideas and art education will be individual.
- Permanent creations will emerge by increasing the interest to the art.
- Reach to the information and dealings of information will be easier.
- Very different methods, techniques and equipments will be discovered.
- Much more entertaining art education environments will exist.

Pessimistic Expectations: I think that the future's art education will be worse than today. Because:

- There will be completely a technological education.
- It will cause to lose ancient values.
- It will be a more memorizer art education.
- The new creation production will slow down.
- Art lessons can be removed because of the lessons.
- The art will remain as a hobby and won't be given as a lesson.
- Different endeavors can replacement with art.
- There won't be something as handcraft.
- Art creations will be cheap and worthless.

As it is understood from the expectations sorted above, ideas of the participating students towards the future's technology mostly consist of optimistic expectations. The impression that students with optimistic expectations have been exposed towards the future, can be said that is especially about the understanding of art and art education importance. For example one participant has stated his idea as below: "*I think that art education in the future will be more extensive and masses form every region will meet the art. Public platonic with art will be more productive and consequently the country will develop culturally"*. Correspondingly another participant says: "*I think that art education will improve in the future by developing technology and by increasing the importance that people give to the education".*

The students with pessimistic expectations have stated fairly opposite ideas. They also expressed that in forming these pessimistic ideas, the technology has been effective. For instance one idea is: "*I think that art and artist's value will gradually decrease and almost every thing about*

the art will be exposed by virtual and technologic devices like computers". And another opinion with a qualification of completing that is: "*Art education completely will improve under control and effect of the technology or today's art will give its place completely to the technology and will lost today's meaning".* One participant that wanted to attract attention to the art's emotional dimension, has stated his opinion with these words: *"Humans may can't transfer their emotions anymore. Like touching a metal object and feel the coldness of the winter. Touching something alive and nonliving can be the same? The art will get like a metal in time and the human won't enjoy of that".*

Ideas About How The Technologic Improvements Will Effect The Art Education

By examining of the answers that fine arts department students gave to the question of "*How the technologic improvements will effect the art education in your opinion*?", firstly is observed that the ideas can be collected under two groups as *optimistic approaches* and *pessimistic approaches.* Positive and negative ideas have been put in a chart as frequency and percent.

Technology Will Effect The Art Education Positively		**f**	**%**
Because	It will facilitate teaching art and art	17	20,4
	It will facilitate to follow the artistic events and new techniques	10	12
	It will facilitate to learn and researches	8	9,6
	It will cause the art reach to every segment and interest to the art will increase	6	7,2
	Artistic diversity will increase and new artistic areas and new trends will be born.	6	7,2
	It will cause to save up time and will decrease the endeavor and effort.	5	6
	It will cause to improve new materials and equipments	4	4,8
	It will facilitate to reach to the information and different products	4	4,8
	Visuality will increase and instruction will gain speed	3	3,6
	It will increase the subjectivity and will cause to emerge genuine products	2	2,4
	The art education will come to be enjoyable	2	2,4
	Qualified materials will emerge and computer will displace with colors	2	2,4
	It will support learning in art to be permanent	1	1,2
	Sharing will increase in art and instruction	1	1,2
	It will ease keeping the information for the future	1	1,2
	Computers and technological machines will help for educate artists	1	1,2
	Will change the aspect to the environment	1	1,2
	Will provide more extensive educational environment	1	1,2
	Will cause individual recognize himself more better	1	1,2
	Other…..	4	4,8

Table 1: Positive Ideas About How The Technological Improvements Will Effect The Art Education

As it is understood from the frequencies and percentages, the students that have ideas as technology will affect art education positively, especially can be said that they have emphasized on the facilities that technology will bring to the art education. For example one participant expresses his opinion with these words: *"By using of technology in the art history lesson, we will find the chance of seeing art creations like Egypt pyramids or ones that Mayas in the South America created, one-to-one in front of our eyes. Or we will be able to criticize the students' works in an art workshop in the Paris as if we are there."*

Technology Will Effect The Art Education Negatively		**f**	**%**
Because	Technology accustoms people to the laziness	13	16,0
	The importance of handcraft, hand labor and talent will be lost	8	9,6
	It accustoms to imitating and cheating	7	8,4
	The art will get mechanical and emotions will become blunt	4	4,8
	The liberty will lost its importance and will guide people to the simple things	4	4,8
	It leads to the uniformity and monotony	3	3,6
	Will make practical and the subjectivity will be lost	2	2,4
	Will remove the mystery and fascination of art	1	1,2
	Dry up the power of imagination	1	1,2
	Esthetic will be degrade	1	1,2
	Will bring universality	1	1,2
	Art education will be regarded unnecessary	1	1,2
	Artistic production will decrease	1	1,2
	Other….	3	3,6

Table 2: Negative Ideas About How The Technological Improvements Will Effect The Art Education

As it is understood from the frequencies and percentages, most of the students that think technology will effect the art education negatively; expressed that technology will accustom people to the laziness, will cause to loosing the importance of handcraft, hand labor and talent, will accustom to imitating and cheating. For example one participate has summarized this idea with these words: *"In my opinion, the technologic development will reduce the art's value. Hand Labor will replace with technological labor. And every thing will get more worthless. On one hand while every thing is under our hands, on the other hand every one accustoms to laziness. I wish we could carry out the technology and the art without mixing with each other."* Another participant having a parallel idea, explained his view with these words: *"People will hang on their walls computer made paintings instead of oil paintings. Children will lose their manual skills. They will do some things with computer mousses instead."* Another participant emphasized on technology's negative effect on the human psychology and said: *"Individuals with psychological disorders and generations unaware of themselves are some of the creations of technology."*

Ideas About The Art Education In The Year of 2050

By examining of the answers that fine arts department students gave to the question of "*Write your ideas imagining the art education in the year of 2050*", the described version of art education in the year of 2050 can be seen. The students with positive expectations, describe a positive year in the name of art education; while the students with negative expectations from the future have described a year with negative improvements.

By examining of the answers of all participants, the year of 2050 can be described as below with the imagination of students that have positive expectations: very many new art types that nowadays are nonexistent have been emerged; more dominant universality in the art; much interest in technology; families emphasize importantly on the art education; art education turns to master-pupil relationship again; the tangible value of art work is very high; given importance to the design factors more than the painting; given importance to the art educator more than artist; community always consists of individuals that want to do the best; art education is done in modern physical environments; public are deliberately interested in art and artist; canvases replaced with computers; the art has been learnt from computers instead of teachers; art works are very different and original from today's; art education is individual and is given with respect to the person; art education is given in the three-mentioned visual environments; there is no class and school environment and distance education is being applied in education of art; art branches like music, painting and dance are being taught all together; art education is being done for take pleasure; teleportation method is being used in the art education and art works can be seen in their own location; the student determines duration of the lesson and can stop the lesson whenever he wants; the painting can be done by radiated colors without using brushes; the art education is compulsory and it is placed among important lessons; three-mentioned paintings are being done; telephones are being used in art lessons as a tool for design; painting and music is being done with computer, nowadays' equipments as canvas and brushes and musical instruments will be removed.

From the examining of the ideas above, it is seen that participant students described the year of 2050 as a year bringing very many innovations. Also it is understood that technological improvements will be very effective on these innovations in their opinion. One of the students that exhibit his ideas with an optimistic description says: *"there will be canvases that have backspace button and stock effects. Techniques like oil color, water color and pastel, will occur just with one clicking. There will be no need to class environment for art education and a practical art understanding will exist like done at home and mail or write the name of the lesson and leave a space and send to 2233. You'll find your mark on your mobile"*. Another student indicates his idea with these words: *"2050's art education may be by flying. We can see the art works that we want to see by being irradiated"*.

Imaginations of the students with negative expectations from the 2050 can be described as below: The art lost its existence and became a slave of the technology; art education has been given completely from the computer and various technological devices and no need to the teachers; art education has been removed from the schools; people are depressed and not interested in art; every thing has being copied, the concepts of art and artist have been removed; The world got full of technology addicted people; art is being regarded only as a financial value; today's art works regarded as ridiculous and have been ridiculed; electronic and arabesque is fairly prevalent; the art work has lost its fascination because it is easily reachable.

From examining of the ideas above, it is seen that a part of participant students described the year of 2050 as a year that have been experienced negative improvements in respect to the art education. For example one participant has expressed his fairly pessimistic ideas as below: "*in the year of 2050 the art will be completely vanished or people will continue to being mad of vanity by aimlessness and exaggerating of the art. The art will be on top as a malicious tool"*. Another student with similar ideas for show his hopeless form the future says: *"I am worried about existence of art in the year of 2050. There won't be a concept as art. I think people won't have time for art because of the redundancy of exams"*. By examining the pessimistic ideas, it is considered that in comprising these ideas –like comprising the optimistic ones- technology is one of the most effective tools. For example one participant indicates to this view by these words: *"In my opinion every thing will get electronic. Infrastructures, instruments will change according to the conditions of those days and will become unlovely. As people won't respect each other, also won't respect to the art"*.

5. CONCLUSION

The ideas of fine arts department students about the technology of future have been examined and have been observed that they had drawn a chart connected to relationship between the technology and art education in the future. The students that put the future's art education in a chart, commonly answered the questions with optimistic or pessimistic approaches. But the majority declared that technology will effect the future's art education positively and art education will be improved and very different from today. However the students with pessimistic ideas maintained that technological improvements in the future may cause the art and art education to be removed. Also they depicted they are worried that this situation may alter the community as insensitive and machinelike individuals.

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FORUM BASED LEARNING: CONTENT ANALYSIS OF ASYNCHRONOUS DISCUSSION FORUMS FOR THE TEACHING OF COMPUTER PROGRAMMING LANGUAGES

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Abstract:
This study was conducted in order to analyze the use of asynchronous-online discussion forums (adf) of computer-mediated communication (cmc) and the learning activities that occur in these mediums. Adfs, in turkey, relating to computer programming languages were scanned by means of this research. Discussion dialogues in adfs and the programming languages on which the discussions had been held were analyzed. In addition to this, opinions of adf users were collected and evaluated so as to determine how individuals benefit from these mediums. We made a research about how the adfs are used while learning programming languages and what kind of contributions they had. We came to the conclusion that adfs are efficient tools in individual learning.

Keywords: asynchronous discussion forums, computer-mediated communication, online learning activities, learning programming languages

INTRODUCTION

Technology has become a part of daily life and Computer-Mediated Communication instruments such as e-mail, chat, instant messaging, blog, wiki and asynchronous discussion forums gained importance (Lee, Vogel & Limayem, 2003; Chiou & Lee, 2008). Communication through CMC instruments can be defined as a simultaneous and asynchronous communication model which is established and resumed either individually or between groups by means of computer networks (Naidu & Järvelä, 2006; Deryakulu & Olkun, 2007). People communicate by means of these instruments, exchange information with each other and create social environments. The use of CMC instruments in conducting education activities is increasing day by day. Thus, Asynchronous Discussion Forums of CMC instruments are widely used as a teaching tool nowadays (Dringus & Ellis, 2005; Chen & Chiu, 2008; Andresen, 2009).

ADFs may be considered as instruments which enable the individuals who share common interest areas to meet in virtual medium (Coppola, Hiltz & Rotter, 2002; Saade, Huang, 2009). ADFs are electronic mediums which enables its users to exchange information on specific subjects. It also enables the other users read or write their opinions (Brower, 2003, Murphy, 2004). Basic structure in these mediums is based on members' writing messages and answering of these messages by the other members asynchronously (Shafqat & Graeme, 2004; Lowes, Lin & Wang, 2007; Chiou & Lee, 2008). Individuals who have common interest areas widely use ADFs as specific information sharing mediums and social communication networks. This kind of ADF usage made them a frequently used learning tool today (Helic, Maurer, Scerbakov, 2004; Dennen, 2005; Dringus & Ellis, 2005; Dawson, 2006). The information technology's wide usage provided us with a healthy way to access the necessary information on internet. Therefore, ADFs are of importance in terms of forming student based learning strategies and activities (Bali & Ramadan, 2007; Mazzolini & Maddison, 2007; Chen & Chiu, 2008; Patriarcheas & Xenos, 2009). Individuals may learn from another individual or a material by means of ADFs (Thomas, 2002).

With respect to Barker's (1994) point of view, interaction within the learning process is both necessary and important so as to develop cognitive and physical skills. This interaction occurs within ADFs between learner-learner instead of face-to-face learning (Woo & Reeves, 2007; Hew & Cheung, 2008). This leads ADFs to be different from the conventional classroom environments structurally. Interaction mainly occurs between learner-instructors in conventional classroom environments. Learners-Learners interaction is not thoroughly possible within the conventional classroom environment. In this regard, social network is more sturdily created and all participants' interaction is easier in ADFs. Conducted studies proved that ADFs are of importance for social support and are successful instruments (Murphy, 2004; Eastin & LaRose, 2005; Zhu, 2006). ADFs can also promote student engagement, collaborative thinking, critical analysis, and social construction of knowledge during the discussion (Andresen, 2009).

METHOD

In this study, ADFs relating to computer programming language in Turkey were scanned using document analysis method. By means of Google, which is a widely used search engine, "programming forum" and "programming forums" keywords were searched and the found web sites were examined one by one.

Analyzed Web Sites

The number of web sites which were examined in this study is 96 in total. These sites are divided into two as the sites which were created with the aim of being only a forum and sites which were created with the aim of teaching programming languages and forums which were part of these sites. The number of the sites which were based on any programming language or languages is 59 and the number of sites which were created only to serve as forums is 37. How ADFs are used in teaching of programming languages and interaction also with communication between individuals in these mediums were both analyzed and commented by means of this study.

Details of Document Analysis

The sites which were examined in the study were divided into two. Of these, the first one is education portals whose aim is to teach programming languages and the second one is portals which were constructed as ADF.
While some of the education portals employed only one language, the others were designed in such a way that they cover many languages. ADF was created as a part in these sites. In addition to ADFs, source sharing, sample programme codes, articles and materials that teach programming languages are frequently encountered in these mediums. As for the mediums that were created only as ADF, they were constructed on forum based discussions and designed in a way to enable members to participate.

15 of the sites that can be an example to these kinds of mediums are listed in Table 1.

Table 1. Some of the ADFs which are used in teaching programming languages

http://www.programlama.com/sys/forum/
http://forum.ceviz.net/programlama/
http://www.hazirprogram.com/forum.html
http://www.frmtr.com/programlama/
http://www.vbturk.net/forum.asp
http://www.forumturkiye.com/forumdisplay.php?f=89
http://www.kodforum.com/
http://www.trlink.net/forum/programlama/
http://www.ceturk.com/forum
http://www.cmsturk.net/forum/forumdisplay.php?f=17
http://www.forumimaj.com/forumdisplay.php?f=173
http://forum.ogren.tv/programlama/
http://www.delphiturkiye.com/forum
http://www.bilgipasaji.com/forum/programlama-40/

While evaluating examined sites for content analysis, programming languages which were discussed and commented in these mediums were categorized. In this categorization process, all of the sites were analyzed. We paid attention to the programmes, under which title they were placed and what was discussed. This categorization process is given in Table 2. In each line main categories are given in bold and beneath them there are sub-categories in italic.

Within ADFs, there is structural difference between members and non-members in examining teaching activities. Member user can log in the forum by which he/she reaches to his/her account, selects the programming language he/she pleases and open a new subject. Thereby, he/she is able to ask for the opinions and views of other forum members. Another member can write his/her opinion on the subject which were opened by other members and participate in the discussion. Similarly, a member or non-member user who is in search of specific information can read these discussion dialogues in the forum.

Table 2. Categorization of the Programming Languages Which Are Discussed in ADFs

General Programming
Programming languages, Programming techniques, Programming tools, Algorithms, etc.
Dos Based Languages
C, C++, Java, Pascal, Basic, Cobol, Fortran, etc.
Visual Languages
Visual Basic/Visual Basic.Net, Delphi/Delphi.Net, Visual Studio.Net, C++ Builder, Visual C++, etc..
Script Based Languages
ActionScript, JavaScript, VBScript, AutoIt, Python, XML, HTML, Perl, etc.
Web Programming Instruments
Asp, Asp.net, PHP, JSP, CFML - ColdFusion, Silverlight / Moonlight, etc.
Artificial Intelligence Languages
Prolog, Lisp, SAIL vs.
Database and SQL
Database Designs, Systems, Instruments and SQL language, etc.
Other Languages
Game Programming Instruments, Assembly, Haskel, Matlab, etc.

A sample forum image is given in Figure 1. In this image, programming language, the last message relating to that language, and the number of the subjects and message which were opened for that language are given in the same line.

Alt-Forumlar : Programlama

Forum	En Son Mesaj	Konular	Mesaj
Genel Programlama Programlama dilleri, teknikleri, araçları üzerine...	Compiler veya Script dili... centauru Bugün 15:24	1,169	10,082
C# C# üzerine ...	c# da ile Mssql üzerindeki... feelil Bugün 15:02	1,755	8,007
C / C++ C, C++ dilleri üzerine...	c'de binary dosyalarına yeni... Revlis Bugün 14:34	2,284	16,416
Visual Basic .Net Visual Basic.NET üzerine...	MDI parebt formda printeri... esnamarak Bugün 16:11	459	2,833
Visual Basic VBA, VBScript, Visual Basic üzerine...	Chat otomasyonuna ihtiyacım... CodeMania Dün 08:30	1,138	5,989
Pascal / Delphi / Delphi.NET Pascal, Delphi ve Delphi.NET programlama üzerine...	iki dizinin ortak... eva_08 Bugün 14:35	1,613	8,146
Java / JSP / JSF Java platformu, teknolojiler ve programlama üzerine...	Netstat -e komutunun sonucunu... Mengu 27/10/2009 18:44	1,473	7,932
Javascript / DHTML / Ajax Javascript programlama dili, teknikleri, araçları üzerine...	setTimeout sorunu punky Bugün 16:18	4,219	21,369
PHP PHP ile programlama üzerine...	wordpress de neymis? turkkeylogger Bugün 16:49	16,566	118,586
Framework / MVC Frameworkler ve Model - View - Controller Üzerine	Codeigneter ve echo By Azrail, 17/10/2009 03:03	29	585
ASP ASP üzerine...	Basit bir html kod... stajeriz Bugün 16:22	5,448	31,627
ASP.NET / Silverlight / Moonlight ASP.NET , silverlight/moonlight, databinding, ajax, web parts, master pages, membership, ve üçüncü parti kütüphaneler üstüne...	ASP.NET ile Site Yapmak anov Bugün 01:32	1,979	9,820
Python / Zope Python/Zope/Django/Plone/CMF/ERP5 v.b. üzerine...	qt'de label widget üzerine... sedatayrn Dün 18:38	399	2,328
Diğer Diller Assembly, Perl, Cold Fusion, Lisp, Matlab, Haskel...	Matlab'te "perceptron"... xxyyxx Dün 22:30	260	1,663
Veritabanları & SQL Veritabanı Tasarımı, Sistemleri, Araçları ve SQL dili üzerine...	insert Triger da değer atama feelil Bugün 14:41	3,680	17,313

Figure 1. The main page of an ADF in which programming languages are discussed

Content analysis of ADF dialogues for the determination of learning extent

It is possible to encounter with thousands kinds of dialogues in ADF mediums. While some of these dialogues were conversed between 1-2 members, some of them were conversed between tens of members. The more participants in the dialogues means the more informing and informed individuals. In other words, information attainment will be better during that conversation and afterwards by more participant members and more information exchange. These dialogues may change according to programming language, the kind of information and the problem to which an answer is looking for.

In order to examine the extent of learning of scanned web sites and forum mediums, an in depth analysis should be made about the conversations that took place in these mediums. Within this context, dialogues in ADF medium were examined and subjected to content analysis. A sample dialogue is given in Table 3.

Table 3. A sample from ADF dialogues

Link **Subject** **Members** **Date**	**http://forum.ceviz.net/php/83754-db-teki-verileri-siralama.html** **Sequencing the data in Db** **Message**
GReeNN	Hello Friends, I need your help with sequencing the data from which I have drawn Db PHP Code: I record my videos by means of Select adi from bolum order by adi Video Titles are Episode 1, Episode 2, Episode 3…Episode 10, it goes on until 50… They are sequenced like this : 1 10 11 12 13 14 15 ... 2 20 21 21.....3 30 and it goes on. Is there any solution to this problem? Sincerely. I hope I managed to explain myself.
Zumsuk	I did not understand what do you want? Do you want them to be sequenced like this : 30-29-28
Turkoman	Did you try ORDER BY adi DESC ?
Zumsuk	If you use SELECT adi FROM bolum order by adi desc limit 10 They will sequence from the last added to the first in tenfolds.
Onderilze	Select adi from bolum ORDER BY LENGTH(adi), adi;

GReeNN	Friends, I think I was not successful in explaining myself, I am sorry. While sequencing according to id normally, I manage to sequence them directly or adversely. But, just because the value in Adi area is not int, I cannot sequence them properly. While it should be like this: 1, 2, 3, 4 etc. It turns out to be like this: 1,10,11,12,13,14,15....2,20
DeVKaN	You should make the value Int in the column it should be If you click on Structure Tab from the necessary Sql you can do it. It will work 100%.
sdemirkeser	Man, if there is text in value you cannot sequence it as numbers. You should either make them int and sequence them as you have said or they should remain varchar and be arranged as text.
Centauru	Now that episodes are like this, then make them integer and they will be 1, 2, 3, 4, 5
GReeNN	Man, not only int value exists in the determined space. I cannot explain myself, I think ☺ In the example you have given, both episode and video name are in separate spaces. However, I told that mine are in the same space. Thanks to the friends who have answered.
sdemirkeser	See, you have to choose one or another, master. You should either choose converting into int and sequence them normally or they will sequence wrongfully in the string. Another alternative choice is that you can estimate maximum length and put 0 in front of text values. Then you can solve the problem in the text for example if we assume that the length is 99999 in the maximum instead of 1 you will save them as 00001. And it is solved.
Centauru	Ah, I have already understood that there is not only int value in the determined space and told you to make that space integer and put the episode numbers and take the episode name from another space. I mean, the true method of this work is this... of course you can do it like episode1, episode2…etc. However you should use additional codes, sort out episode number and sequence them by means of php codes. This is really unnecessary and nonsense. Because you will prolong the work by doing the thing in php which is done by sql. You should either enter another space such as EpisodeNumber separately or make the existing space int number entry and take episode names from another space and print them in php. Can you write your structure of table here?

The conversation example in Table 3 is a dialogue with multi –participants, long content and has mutual interaction and sharing which can be an example to examined dialogues. In this dialogue, 7 members participated in discussion. Besides, the member who asked the question, GReeNN, participated in the dialogue three times apart from his/her question and showed his/her situation despite the given answers. This dialogue represents social network structure which constitutes the base of ADFs well.

In evaluating learning activities relating to teaching of computer programming languages in forums, opinions of forum members may be instructive. Therefore, messages were sent to forum members and questions in Table 4 were directed to them. We tried to have the opinions of members about the contribution of interaction in forum by means of this question. 3 opinions chosen from the answers of the members are listed in Table 4.

Table 4. Opinions of ADF users about the learning activities in these mediums

Question	***What do you think about, as a forum member, the discussions in forum mediums on computer programming and the effect of these discussions on your learning?***
Member name	*d3niz*
To which forum he/she is a member	*http://www.ceturk.com/forum*
Opinion	*The best way to comprehend the solution of a problem or learn information is brainstorming. ☺ The discussions in the forums serve in this area. I think this is one of the best ways to learn. It may be necessary to participate in discussions however sometimes it avails without participation. The dialogues conversed before may answer my purpose.*
Member name	*Karpuzoglu*
To which forum he/she is a member	*http://www.programlama.com*
Opinion	*It is the most beneficial site I've ever known. It consists examples of almost all the programming languages. While writing a software and I am against a wall, it is the first thing I look up. If I cannot find the information I search for here, I google it and try to find it in other forums. In this way, I achieve the information I search. Discussions in the forums are really productive for information sharing. I learn the solutions, opinions and viewpoints of others in this way.*
Member name	*hknkszk*
To which forum he/she is a member	*http://www.programlama.com*

Opinion	*I am generally in interaction with the ones who have pre-information about the Project I am working on. Thanks to forums, I can have information about the subjects in which I am deficient and hesitant from the experienced people. With the people in the same level as me who are informed, I execute more productive works. From this aspect, I abundantly utilize forums.*

When opinions of ADF users are examined, the notion that the discussion and interaction in these mediums contribute much to teaching of programming languages becomes prominent. At the same time, another thing which was determined from this fact is that the dialogues and the discussions which were conversed before are also beneficial. As a matter of the fact, "d3niz" nicknamed member stated this in his/her opinion. According to this member, the discussions and information sharing which were made before may be beneficial to the people who need similar information in the future.

CONCLUSION

We esteemed that ADFs are important instruments in teaching programming languages by means of the conducted study. The findings obtained from the study support the idea that these mediums are widely used as a learning tool (Dringus & Ellis, 2005; Dawson, 2006; Marra, 2006). The discussion and interaction which take place in these mediums provide the members with a chance to share their opinions and establish an information network in parallel to the viewpoints in literature (Murphy, 2004; Eastin & LaRose, 2005). The fact that not only participating in dialogues but also dialogues which were conversed before are of importance for information achievement and learning is a widespread opinion. This also proves the contribution of these mediums to learning. These opinions belong to members who use ADFs while learning programming languages. These informal learning tools -forum mediums- are widely used in learning of programming languages and finding a solution to problems. In addition to this, some of the ADF users employ the information they get from these mediums and state their opinions about information's being wrong or right or if they were effective or not again in these mediums. This prevents learners from losing their time with deceptive or unnecessary information. If we take all the characteristics of ADFs into consideration, we see that these mediums are rather useful, beneficial, available and interactive sources.

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