

EFFECT OF CONSTRUCTED WEB-SUPPORTED INSTRUCTION ON
ACHIEVEMENT RELATED TO RESEARCH METHODS

A THESIS SUBMITTED TO
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BY
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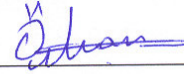
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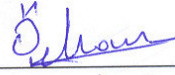
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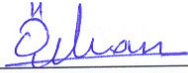


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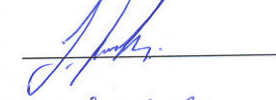
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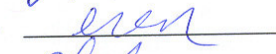
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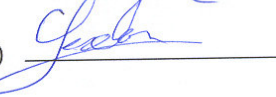
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ABSTRACT

EFFECT OF CONSTRUCTED WEB-SUPPORTED INSTRUCTION ON ACHIEVEMENT RELATED TO RESEARCH METHODS

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This study examined the effect of constructed web-supported instruction on students' achievement related to research methods. Also, in this study, constructed web site was tracking the activities of students, namely entrance and exit time, logs of each entrance to the tests as well as the results of each entrance, and posts to the forum.

Another intention of the study was to construct a web support system for traditionally offered courses in order to decrease both instructor and students efforts to communicate and reach for sources. In addition, the web site was prepared as a dynamic web site to decrease the instructor's construct and update time of the web site to the minimum level.

The subjects of the study were 24 graduate students of SSME 520 Research Methods in Education course offered by the SSME Department of METU. None of the subjects was offered an on-line course before.

The study used both quantitative and qualitative measurements to analyze the effectiveness of the site and. The results of the study showed that students had an average achievement value of 68%. There was significant correlation between the summary section usage

of web site and research methods achievement, and test section usage of web site and research methods achievement. But there was no significant correlation between forum section usage of web site and research methods achievement. Another result showed that supportive web site should provide asynchronous communication for more effective usage. It can also be concluded that the speed and the visual design of the web site is very important for the students.

During the development process, properties of web-based course management systems were taken as the models. Preferences of those systems were tried to accomplish. Unlike those systems, the developed site was not created for stand-alone course management systems but for an aid to the traditionally delivered courses. The framework was prepared not only for graduate courses, but also for other courses, because the study has intended to end up with a framework which would be easily adapted for all courses.

Keywords: Web Supported Learning Environment, Web Aided Instruction, Evaluation of Internet in Turkey, Educational Web Sites, Course support system

ÖZ

İNTERNET DESTEKLİ ÖĞRETİM ORTAMININ EĞİTİMDE ARAŞTIRMA TEKNİKLERİ KONUSUNDA ÖĞRENCİLERİN BAŞARILARI ÜZERİNDEKİ ETKİSİ

Emmungil, Levent

Yüksek Lisans, Ortaöğretim Fen ve Matematik Alanları Eğitimi Bölümü
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Bu çalışma internet destekli öğretimin eğitimde araştırma teknikleri konusunda öğrenci başarısı üzerindeki etkisini incelemek için yapılmıştır. Bu çalışma için hazırlanmış olan internet sitesi öğrencilerin sayfaya giriş ve çıkış zamanı, test bölümüne giriş zamanları ve sonuçları, ayrıca foruma gönderilen mesajları kaydetmektedir.

Çalışmanın amaçlarından biri de geleneksel yöntemle işlenen derslere internet destek sistemi oluşturup, hem öğretmenin hem de öğrencilerin iletişim ve bilgi kaynaklarına ulaşmak için harcadıkları çabayı azaltmaktır. Bunun yanında internet sitesinin dinamik içerikli olarak tasarlanmış olması sayesinde, öğretmenin site oluşturma ve güncel tutma için harcaması gereken zamanın en az düzeyde tutulması için çalışılmıştır.

Araştırmada örneklem olarak "Orta Öğretim Fen ve Matematik Alanları Eğitimi Bölümünde" "SSME 520 Eğitimde Araştırma Teknikleri" dersine katılan 24 lisansüstü öğrenci seçilmiştir. Örneklemdeki öğrencilerden hiçbiri daha önce internet tabanlı bir derse katılmamışlardır.

İnternet sitesinin etkinliğini belirlemek için hem nitel hem de nicel ölçümler kullanılmıştır. Çalışmanın sonucunda öğrencilerin ortalama başarısı %68 olarak bulunmuştur. Öğrencilerin internet sitesinin konu

özetleri bölümü ve test bölümü kullanımı ile araştırma teknikleri konusundaki başarıları arasında istatistiksel olarak anlamlı bir ilişki bulunmuştur. Fakat internet sitesinin forum bölümü kullanımı ile araştırma teknikleri konusundaki başarı arasında anlamlı bir ilişki bulunamamıştır. Araştırmanın bir diğer sonucu ise internet destekli öğretim ortamının daha etkili bir kullanım için eş zamanlı olmayan iletişimi desteklemesi gerektiğidir. Ayrıca öğrencilerin internet sitesinin görsel tasarımı ve hızının çok önemli faktörler olarak gördükleri bulunmuştur.

Hazırlanan internet sitesinin geliştirme sürecinde internet tabanlı ders yönetim sistemlerinin özellikleri model olarak alınmıştır ve bu özellikler siteye kazandırılmaya çalışılmıştır. Fakat bu sistemlerin tersine geliştirilen site yalnız başına kullanılacak bir sistem olarak değil, geleneksel olarak yürütülen derslere destek sistemi olarak hazırlanmıştır. Bu çalışma tüm derslerde kullanılacak bir altyapı hazırlama ortaya çıkarma amacıyla olduğu için bu altyapı sadece lisansüstü dersleri için değil tüm seviyedeki dersler için kullanılacak şekilde tasarlanmıştır.

Anahtar kelimeler: İnternet destekli öğretim ortamı, İnternet destekli öğretim, Türkiye’de internet, eğitim ile ilgili internet siteleri, Ders destek sistemi

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ABBREVIATIONS

ADSL: Asymmetric Digital Subscriber Line

CMS: Course management System

GPRS: General Packet Radio Service

IP: Internet Protocol

ISDN: Integrated Services Digital Network

Kbps: Kilo bit per second

METU: Middle East Technical University

MNE: Ministry of National Education

RMAT: Research Methods Achievement Test

SSME: Department of Secondary Science and Mathematic Education

TCP/IP: Transmission Control Protocol/Internet Protocol

USA: United States of America

WAP: Wireless Application Protocol

WEPS: Web Supported Environment Perception Survey

CHAPTER 1

INTRODUCTION

“No age for learning” is not an appropriate phrase for defining the situation for the education any more. “No age; No place; No time for learning” is more appropriate than the aforementioned phrase for defining the current approach.

The above-mentioned situation is a summary for the situation that delivery of knowledge must be changed. Education must be time and place independent. To overcome time and place dependent properties of education, technology started to be considered as an aid. In this study the researcher tried to explain a framework for the use of technology in education.

Technology is improving our life standards day by day. When a new technological device is introduced to the market, people intend to possess it. People want to renew their technological devices in order to use new technological features offered. The technological features of computers are also being improved frequently. The term multimedia computer is often associated with the computer that has rich technological features, which are being able to process sound and graphical information. There is a technology that uses computer, the Internet, which is defined below by the Federal Networking Council:

Internet refers to the global information system that --

1. Is logically linked together by a globally unique address space based on the IP its subsequent extensions/follow-on;
2. Is able to support communications using the TCP/IP suite or its subsequent extensions/follow-on, and/or other IP-compatible protocols; and

3. Provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein. (ITR, 2003)

The current era can be defined as the age of information if the technological developments of the recent years are considered. These developments can be listed as radios, televisions, newspapers and so on. Internet differs from all of them in terms of:

- *Individualization*: People can use the Internet according to their own needs. They can use it for many purposes.
- *Capabilities*: Internet is not only for listening to music, or reading a newspaper. Internet is able to meet many more needs.
- *Time Independence*: Internet is not usable only in working hours. It can be used 24 hours every day.
- *Place Independence*: Internet is accessible all over the world: at schools, at homes, even on the roads.
- *Amount of Information*: Internet has a huge amount of information, much more than any library.

All the above listed advantages of Internet cause it to be an invaluable medium both for improving education standards and for conveying information from one generation to another.

Although Internet presents many useful properties, there may be some disadvantages in case of careless use of it. Although Internet can be used by means of many technological devices such as television, cellular phone, pocket pc, Internet is mostly used by means of computers because of current standards. For instance, using computers for a long time may be harmful for eyes. Also being exposed to the radiation revealed by the standard monitors of personal computers may cause harmful effects. Besides, there may be problems for content of the Internet. Web sites may present wrong or illegal

information. Moreover viruses are common problems for the Internet users. Although Internet may cause these problems, people are able to overcome these difficulties with careful usage.

With proper precautions Internet can easily be used to improve the standards of education, which can easily be succeeded, via Internet. If the traditional education system is considered, it requires inflexible, strict, time and place dependent education but through Internet we can come over all these necessities since Internet has the potential to cover all the previously mentioned needs.

“SSME 520 Research Methods in Education” course is one of the two compulsory courses of graduate level at the Faculty of Education at the Middle East Technical University. Students prefer the graduate study at the education faculty because of improving themselves in their subject area. Some of the students are working for the Turkish Ministry of Education, while some others are at the private education institutions. Teachers at the primary and secondary levels, who do graduate study, need to work in the city where their university is located. However, this rule is not being applied for the pre-service teachers. In fact, it is the same for some experienced teachers. From this perspective we may conclude that most graduate students at the Education Faculty are practicing teaching. As most of them are in their first year of graduate study when they take this compulsory course, it is possible that they will have difficulties of attending the course. Although they may be able to attend regularly to the classes they can have difficulties of communicating with instructor and classmates. These problems lead to a decrease in the students’ achievement of ‘Research Methods’ concept. Because ‘Research Methods’ is one of the most important subject areas that the researchers have to use throughout their life, lack of knowledge in this subject leads them to struggle for difficulties.

SSME 520 course is one of the most important courses of the graduate study and unfortunately technology is not adequately used to help students' achievement in the institution that the research had been conducted. Thus, using web as a supporting medium to increase the students' understanding will help students to get used to technology for their studies. They will also be accustomed to Internet and technology as a research medium. Moreover, the graduate students who are in-service teachers may intend to use Internet and technology as an aid for their own students. They will also gain time by not going to university for consulting to their instructor, as they are able to do it by means of Internet. This may not seem to be an advantage for students living on campus, but the students living in different cities must have this opportunity as they have troubles even attending to the lectures.

Another fact of universities in Turkey is that many universities, especially the private universities, employ part-time instructors and pay for the lecture hours. In this case the instructor is present at university only for lectures and not for office hours. For this reason, in some cases although the students are not far from campus, the instructor may be. Then the communication problems begin. So using web will help not only students but also instructor.

The intention of this study was to construct a web site framework, which would be used by the instructor according to his/her students', needs. Not a static site but dynamic one, which would enable the instructor not to struggle with the programming, technical information but only with preparing more qualitative information for the students.

CHAPTER 2

REVIEW OF LITERATURE

Technological improvements present many opportunities to the educators in means of educational media. Technology is altering the time and place dependent properties of education. In addition, latest technologies offer more features such as interactivity or individualization and also extra alternatives in order to have the best support to the education.

Some reasons of using technology by institutions explained by Bates as cited in Gülbahar (2002) stating several factors, which lead educational institutions to experiment with new instructional technologies. These are;

- To improve the quality of learning
- To provide students with the everyday information technology skills they will need in their work and life
- To widen access to education and training
- To respond to the “technological imperative”
- To reduce the costs of education
- To improve the cost-effectiveness of education (p. 18).

With the improvements of technology Internet gives the opportunity of using graphical data as well as text-based data. Not only the hardware

but also the software used for Internet is improving. Therefore programmers are able to handle the educational media more easily for Internet usage. Internet will be an important medium with these advantages. Besides of having multimedia features, Internet can provide interaction for the students. Interaction provides motivation for students, as the books cannot be used interactively

2.1. Interaction in Education

Unlike television or radio, Internet offers interaction for users. Several authors i.e. Laurillard (2000), Garrison and Shale (1990), Palloff and Pratt (1999) and Patsula (2002) stated the importance of interaction in education. They are defining education including distance education as an interactive process (Garrison & Anderson, 2003).

In addition Patsula (2002) divided interaction into four groups:

- Learner-Content Interaction
- Learner-Teacher Interaction
- Learner-Learner Interaction
- Learner-Technology Interaction

Another study made by Brannan (2002), as cited in Ersoy (2003) found that learner-learner, learner-teacher, learner-content and learner-technology interactions impacted favorably by the use of technology (p.27). İnan (2003) cited the idea of Pan (2001) who stated that hypermedia-based applications could provide a highly interactive learning environment where students build up their own knowledge.

As an important part of processing knowledge, interaction must be integrated into education as much as possible. Especially for the

supportive materials to the instruction that are used outside of the classroom, the importance of the interaction increases. Internet may be the medium that provides the interaction that the supportive materials need.

2.2. Use of Internet for Education in Turkey

As computers improve, Internet improves as well because all devices needed to access the Internet are also being improved. For example in Turkey it was only a dream to have 256 KB/s or 1 MB/s Internet connection at home. So Internet usage proportion was very low. It was 6% in 2003 according to the research of Turkey Technology Foundation while it was 18% for Greece and 37% for France. (NTVMSNBC, 2004a) Although Turkey has not reached to the Internet usage level of developed countries yet, by the end of 2003 Turkish people can have a better connection up to 2 MB/s at a reasonable price at home with the ADSL technology.

Internet connection was expensive before with the other technologies such as dial-up, ISDN or frame-relay. Dial-up connection was relatively slow (56 Kbps at most) and expensive (telephone fee + service provider fee). Other high-speed connections were requiring high initial and monthly costs.

Table 2.1: ADSL Connection Rate (For each port) (TT, 2004)

Download/Upload Speed (Kbps)	Connection Fee	Monthly Fee
128/32	49.000.000	49.000.000
256/64	69.000.000	69.000.000
512/128	109.000.000	109.000.000
1024/256	249.000.000	249.000.000
2048/512	465.000.000	465.000.000

Nowadays Internet connections are rising in both public and private institutions in terms of speed and quality. Internet users do not need to care about telephone bills, low connection speeds and line cuts any more. As soon as the Internet usage improves, Internet usage in education will be put on the agenda.

2.2.1. Internet in Primary and Secondary Education

Ministry of National Education (M.N.E.) started to provide ADSL Internet connection for the entire primary and secondary schools in Turkey by the end of 2003, which means that within a few years almost all of our students at the level of primary and secondary education will have Internet literacy. According to this project by the October 31, 2004, 20000 institutions of M.N.E. will have ADSL Internet connection. By the December 31, 2004, additional 22534 will be connected to the Internet. This service will be provided for 3 years plus optional 2 years. According to the 2003-2004 education data there are 36117 schools at primary level and 6512 schools at secondary level.

According to this numbers it can be concluded that most of our students will have met with Internet in a few years. (MNE, 2004)

The Figure 2.1 represents the current situation of kindergarten, primary and secondary schools better. It shows the number of registered domain names with "k12.tr" extensions. ".k12" is used for kindergarten, primary and secondary schools. Because of the fact that using the Internet requires literacy, it is difficult to mention about using the Internet for education purposes of preschool children. For this reason kindergarten schools were eliminated from the target group of this research. 2004 number stands for the registrations until the end of June 2004. The gradual increase can be seen in Figure 2.1, which means that the primary and secondary schools are getting online. They firstly provide general information in terms of introducing the school, staff, and applications on the web site. It will be possible to see web-supported courses of these institutions in the near future.

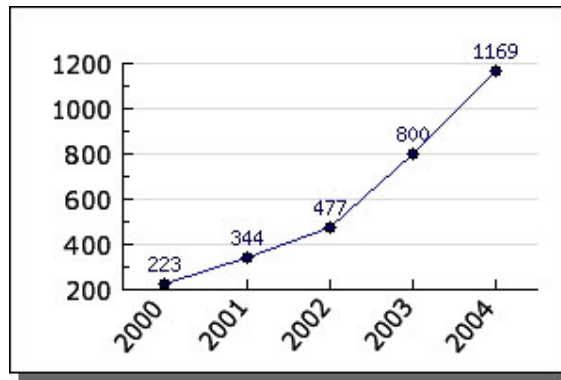


Figure 2.1: The distribution of the ".k12.tr" domain names according to years. (.tr Domain Name Registration)

2.2.2. Internet in Higher Education

From the perspective of universities in Turkey, it can be seen that all of the universities have their own high-speed Internet connection. UlakBim (a foundation of Turkish government inside Higher Education Institution) is the Internet service provider for all of the universities in Turkey. UlakBim is covering all expenses for public universities and service expenses for private universities. Table 2.2 shows the Internet connection speed of some universities.

Table 2.2: Internet connection speed of some universities (UlakBim, 2004)

Institution	Line Capacity (Kbps)
Kafkas University	2048
Yüzüncü Yıl University (Hakkari MYO)	1024
Trakya University	8192
Muğla University	8192
19 Mayıs University	8192
Mustafa Kemal University	8192

When the connection speed is compared to the speed of 56Kbps speed of an ordinary modem, it can be seen that each student has a usable connection rate at university. Also all students are able to obtain an e-mail address from their universities. Although these improvements have started a long time ago in developed countries, Turkey started to reach that level just before a few years. Under these circumstances, technology usage in education has just started in Turkey.

2.2.3. Internet in Online Education

Turkey used to have technology in education by means of Anadolu University Open Education Faculty. Teaching at a distance, which means no obligation at a limited place and in a limited time was considered at first in 1927 to increase the literacy rate but could not put into action. Then the Anadolu University has officially started its distance education by means of mails in 1982. Today it is one of the largest universities in the world and has invaluable contribution on Turkey's educational system. Although studies about new technologies are being taken into consideration, usage of new technologies in a faster way will lead us to a better place in terms of online education. Turkey may continue to have the largest university in the world by means of adaptation to the technological changes and the respect of the world will continue. In fact, in order to decrease the number of people who thinks as McWilliams, B. (2000) does, we have to take precautions. McWilliams was considered Open Education Faculty as an "old-fashioned" distance education because of usage of mail, TV and radio as the means of instruction.

The Turkish Higher Education Institution has stated the regulations of distance education in Turkey for undergraduate and graduate courses. According to the rules 80% of the grades must be consisted of in-class examinations for the undergraduate level, and it is 50% for the graduate level. And students must get minimum 70% achievement of these examinations. As these conditions are provided, any university is able to offer online courses. (C.H.E., 2004)

2.3. Internet Usage in Education

2.3.1. Online (Web-Based) Education

There is a big trend for online education around the world. A study about the perceptions of online learning consists of 16 organizations such as BBC, Xerox Europe. 86% of the directors of the organizations considered the online learning as an effective tool for education (New era for corporate e-learning, 2004). The result shows that not only educational but also commercial institutions are aware of the advantages of the online learning.

Ward and Newlands (1998) identified six perceived advantages of online courses as cited by Taylor (1999):

- Better learning resources
- A more flexible pace of learning
- Greater choice of when to study
- Increased self reliance
- More tutorials/seminars
- Improved computer literacy

The most important of these are better learning resources and greater choice of when to study. They also identified eight perceived disadvantages:

- Poorer learning resources
- An alienating learning experience
- Technical frustrations
- Inadequate access to computers
- Unfairness

- Loss of contact with staff
- Loss of contact with other students
- Reduced motivation

Simonson, Smaldino, Albright and Zvacek, (2003) considered the people in the below groups as high-risk distance education student;

- 25 years or older
- Divorced
- Less than 30 credits completed
- GPA less than 3.0-2.9
- Internal locus of control
- Abstract learner

People in these groups make a high proportion of learners. This shows that most of the learners are not ready for distance education enough. As time passes the available population for online instruction will probably increase.

The companies had seen the commercial scene in distance education some years ago and they started to get into the educational market. Some software packages were developed for commercial use. These programs intend to ease the administrators' and instructors' efforts to prepare online courses. Some of them are listed below:

1. Blackboard
2. Convene
3. Embanet
4. eCollege.com
5. IntraLearn
6. Symposium
7. TopClass

8. WebCT
9. The Learning Manager
10. WebMentor
11. Integrated Virtual Learning Environment (IVLE)
12. LUVIT
13. Asymetrix Librarian
14. Virtual-U
15. eduprise.com

Marshall University (1999) provides a comparison page about the above course management software. This page shows the features of software comparatively. Features are categorized under the nine headings:

- Developmental Features
- Instructor Tools
- Instructional Features
- Student Tools
- Technical Support
- Administrator Tools
- Administrative Features
- Software Costs
- Hardware Requirements.

As there are many software and features it was preferred to compare some features of WebCT and Blackboard, which are the mostly used packages in the market.

Table 2.3: Comparison of number of provided features of two mostly used courseware; Blackboard and WebCT.

	Blackboard	WebCT
Developmental Features (29 Criteria)	29	29
Instructor Tools (23 Criteria)	20	21
Instructional Features (12 Criteria)	12	10
Student Tools (25 Criteria)	17	24
Technical Support (9 Criteria)	8	6
Administrator Tools (20 Criteria)	18	16
Administrative Features (10 Criteria)	7	8
Software Costs* (3 Criteria)	3	3
Hardware Requirements (7 Criteria)	5	5

*Software costs are negative features, i.e. both systems have site pricing, start-up and on-going costs.

Although there are many useful features, institutions and instructors avoid purchasing these systems when considered the expenses. The costs must be especially considered in Turkey. It is the fact that institutions need to find feasible solutions. As long as hardware is expensive in Turkey, it must be searched for economic software solutions because it is not so easy to decrease the hardware costs, as they are not produced in Turkey.

Another aspect of view about purchasing is not only a problem of Turkey but also all countries. As cited by Palloff & Pratt (2001, p10), Andrew Feenberg (2000) states:

Instead of professors, politicians, university administrations, and computer and telecommunications companies have taken the lead, because they see money in electronic ventures (p.26). In educational computing, the choice of infrastructure largely determines how a program can be applied. If administrations consult corporations instead of faculty about this choice, the outcome is not likely to foster the kind of educational community that faculty culture and traditions encourage (p.28).

Although there are some deficiencies of current commercial course management software, there is an increasing demand for learning at a distance as it provides flexibility for students. In order to meet this demand many institutions started to offer online courses which means learners get a course totally online without attending to a class.

Salem-Kaizer Online is one step further. It is a virtual high school. With the idea of students having different learning styles should not need to attend to a class, which is organized for one learning style. Another problem is stated as having to attend a lesson in a community. As the school is relatively new, its effectiveness has not been examined but the students attending to the school have positive attitudes towards the online education (White, 2004).

Although Reeves and Hedberg (2003) consider that online education is preferred by not only remote learners but also the people nearly placed at education institutions because of its flexibility and convenience. A case study in Turkey by Yükseltürk (2003) showed that the learners of the online certification program at METU decided to participate mostly because the program was offered by METU. 24,1% of the 1st certificate program students, 20,4% of the 2nd certificate program students, and 19,4% of the 3rd certificate program students participated because the program was offered online. The perceptions of learners in terms of cost were; 61,5% as high, 38,5% as normal and 0% as low for the 1st program; 59,3% as high, 39,5% as normal

and 1,2% as low for the 2nd program; and 43,1% as high, 56,9% as normal and 0% as low for the 3rd program. The results showed that the online education has not been implemented effectively in Turkey yet.

2.3.2. Internet as a Personal Research Medium

Anybody is able to search what he/she is looking for within the web pages with using search engines. Web pages offer a great source of knowledge. In fact they sometimes offer more than needed. It is easy to get lost while searching on the Internet.

Block (2003) discussed the availability of information on the Internet. She considered the Internet with over 3 billion indexed pages as fourth largest publicly available information source. It includes some—but only a small fraction—of the preceding media. Because of the prohibitive cost of digitizing, lack of interest, and copyright issues, most of the world's information will never be on the Internet, or at least not for free. She demonstrated the knowledge sources graphically as in Figure 2.2.

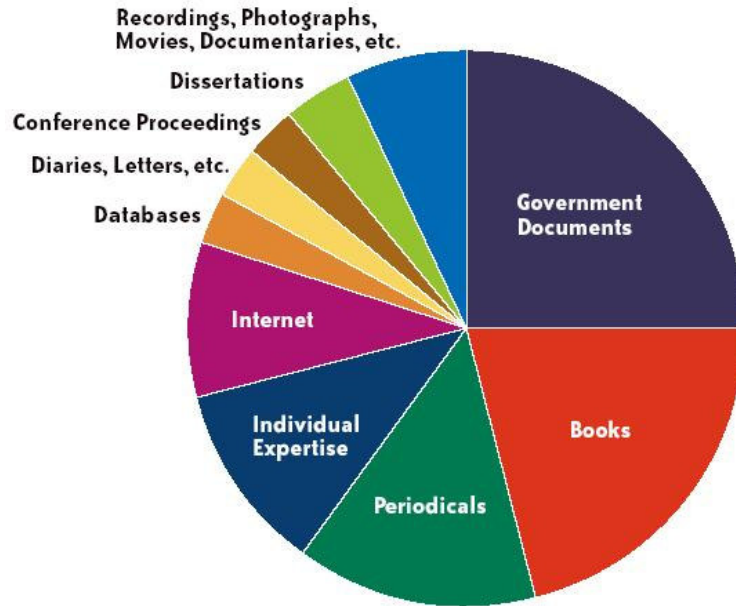


Figure 2.2: Information Sources (Block, 2003)

Chief of the Turkish Information and Communication Sector Association states that, most of the web sites in Turkey presented the same knowledge by using the same unique source. This causes information pollution on the Internet. He also considers about the sites that are not updated. These sites increase the pollution. The most important effects are the unintended results of searches, increased time to reach the related information and extra time spent on searching (NTVMSNBC, 2004b). It can be concluded that it is not so valuable that having the students search and get the knowledge from the Internet.

2.3.3. Internet as a Support for Education (Web-Supported Instruction)

People are not used to deal with the emerging technology genetically. It is a process of learning. It does not seem to be possible for people to get new knowledge by means of technology that they do not know. Being used to the new technology is a process. As stated before in Turkey Internet technology is not new but it started to be used by a larger population by means of ADSL technology in the late of 2003. Online courses may be offered but in case of reaching to a reasonable portion of community it seems to use Internet as one of the media of education.

Witt (2003), who studied the effectiveness of web sites associated with traditional courses involving regular student attendance at university, concluded that most instructors are largely achieved their expectation from their prepared web sites for their course. Additionally, he examined the time spent by the instructor to create and maintain their sites. Results showed 13,6 hours as the mean of spent time to construct the site and 10,6 hours as to maintain the site. Time to construct the site was as long as 100 hours for some instructor and it was 50 hours to maintain the site.

Sanders & Morrison-Shetlar (2001) have supported the traditional instruction by web technologies and tried to find out the attitudes of the learners towards this new system. For the web component, the goal was to allow asynchronous learning outside the classroom and increase learner-to-learner interaction. Learners also used the web site to access chapter outlines, quizzes, and questions leading to improve critical-thinking and problem-solving skills, grades and the course syllabus. Reporting the web components' highly positive effect on

student learning, critical-thinking and problem-solving skills, and the researchers suggested the following:

... Instructors should use the Web for the posting of course syllabi, grades, quizzes, questions, and materials that encourage student-to-student and student-to-faculty interaction.

Gillham, Buckner and Butt (1999) studied the usage and attitudes of 38 arts course students who were not enthusiastic to computers towards the Narrative and Genre (NAR) communication module at Queen Margaret University in UK. The module was tracking the students' usage time. 34 students used the site whereas 4 students did not. The average times of short, typical and long visits were 11, 21 and 43 minutes respectively. Time is quite high for the students who are not familiar with computers. 55% of students thought that the site had assisted a lot to their study while 45% thought a little. 52% perceived the site as useful, whereas 39% as essential and 9% as of limited use. 90% of students liked lectures and seminars supported by online materials, while 10% were not sure. None of the students disliked the idea of online support materials. The authors concluded that if the site was being updated more it would be used even more. But they considered the site highly successful in introducing students to Web-based educational material.

Vogel & Klassen (2001) examined the FaBWeb at the City University of Hong Kong which is an educational environment that combines three individual software packages; Learning Resource, Meeting Space and Plat to Learn. Learning Resource part includes documentations, videos, presentations and links. Meeting space was used for communication among students and instructor based on scheduled programs and events. Play to Learn part contains interactive business games and simulations. But they consider the currently available web applications

as tending to be very fragmented i.e. they include a number of non-integrated pieces and not interacting with other pieces.

Hsu and Thomas (2002) used an instructional simulation called MtnSim on science learning. MtnSim is a simulation, which is defined in text as "a concept related to that of microworld, as a model or simplified example of complex natural phenomena". It records the usage of students to give feedback to both instructor and student. Intention of this qualitative study was defined as trying to address the aspects of simulation design and the impacts on students' actions and problem-solving strategies when they explore the simulation. Based on the positive results of the study, authors make two recommendations. First, the simulation should be demonstrated and its features should be explained. Second, the recordings of students' work with the simulation should serve as the instructor's guide in structuring these activities.

Barab, MaKinster and Scheckler (2002) conducted a study involving the design and evaluation of an electronic knowledge network, the Inquiry Learning Forum (ILF) for grade 5-12 mathematics and science pre-service teachers. Authors stated some offers of creating learning community and importance of usage. The important factor that needs to be taken into consideration is the importance of caring inside dynamics instead of using external design principles i.e. the need of users is more important than the pre-configured principles. One more important result can be shown in Figure 2.3. This figure tells that the patience is very important while using a new medium for the students. While comparing each month in 2000 and 2001, for each case we can see a gradual increase in number of posts. It can be resulted that after the period of getting used to the new technology the real usage and effect can be seen.

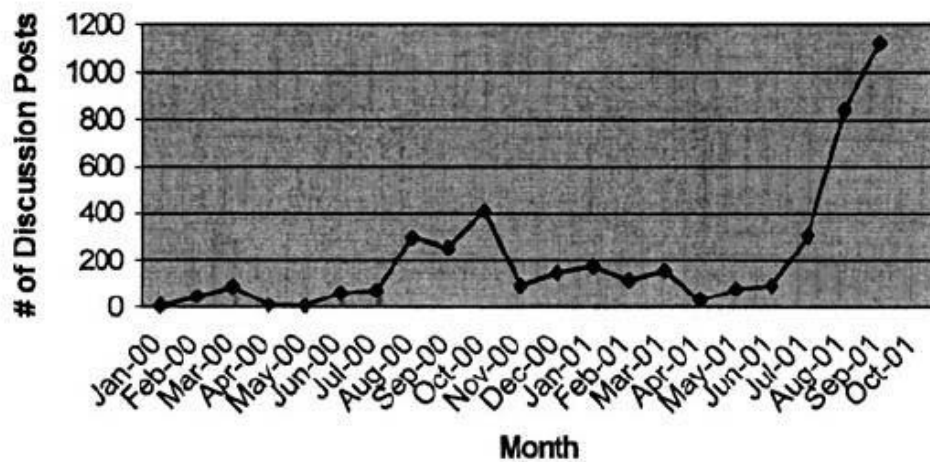


FIG 2.3: ILF Discussion postings per month since the beginning of the project (Barab, MaKinster and Scheckler, 2002)

McClelland's (2001) study on 163 students taking Market Research Methods course at Liverpool John Moores University. In the study an online source for lecture notes, presentations, individual learning resources, workshop questions, revision materials and links to other related sites were used. The results showed that there is a significant difference between web site usage and gender of user, age of user and computing skills of user. But for undergraduate students (102 of 163) there is no significant difference between web site usage and their computing skills. Another result shows that there is no correlation between different learning styles and perception of the web page. The most important result of this study is saving £4000 on printed material by using the site for one semester. Author also states that students perceived an increase in quality of teaching and availability of learning materials.

Horton (2000) stated that the most effective way is combining the conventional and on-line education. As cited by Gouveia (2001), Walkden and Sharp (2000) proposed the parallel ideas with Horton in terms of advantages of hybrid learning systems.

Taking all these information into consideration, it can be said that systematical usage of Internet can improve the quality of education without much investment. Traditional instruction can be supported with presenting the summaries on the web page. In addition, discussion list or forum usage may improve the achievement of students. Besides, supportive information on the web may lead to a decrease on the usage of printed material.

Internet is a new medium for the instructors in Turkey. Maybe it is not for searching and using web pages but it is for preparing web sites. To construct a site requires at least some HTML knowledge, which is the basic programming language of Internet. It requires even more programming knowledge if the instructor needs more advanced sites such as database usage, tracking students' activities, file upload or forum preparation.

In this study, the constructed web site was used to investigate its effect on achievement. The prepared site of this research prevents the instructor to spend time for learning programming languages. In this case instructor spends his/her time to improve the content of the site instead of its infrastructure.

CHAPTER 3

RESEARCH PROBLEMS

3.1. The Main Problem and the Research Questions

The main purpose of this study was to find the effectiveness of the constructed web-supported instruction on achievement related to research methods.

In order to reach the main purpose of the study some research questions were defined. The research questions were defined to analyze the effectiveness of the.

3.1.1. Question 1:

What is the average correct response of students of Research Method Achievement Test?

3.1.2. Question 2:

Is there any relationship between supportive web site usage and achievement of the students related to research methods?

Sub Question 1

Is there any relationship between number of entrance to the site and achievement related to research methods?

Sub Question 2

Is there any relationship between number of entrance to the test section of the site and achievement related to research methods?

Sub Question 3

Is there any relationship between forum usage and achievement related to research methods?

3.1.3. Question 3:

What are the perceptions of students about web supported instruction?

Sub Question 1

What are the students' perceptions about reaching resources from everywhere?

Sub Question 2

What are the students' perceptions about using course web page as a support to the instruction?

Sub Question 3

What are the students' perceptions about using search engines instead of Web Site?

Sub Question 4

What are the students' perceptions about providing username and password to use the Web Site?

Sub Question 5

What are the students' perceptions about communicating by means of the Web Site?

Sub Question 6

What are the students' perceptions about examining the classmates' works?

Sub Question 7

What are the students' perceptions about practicing by means of quizzes and getting immediate feedback?

Sub Question 8

What are the students' perceptions about the speeds of educational web sites?

Sub Question 9

What are the students' perceptions about the importance of visual design of the educational web sites?

CHAPTER 4

DESIGN OF THE STUDY

4.1. Research Model

Table 4.1 Research Design of the Study

Group	Pre-Test	Treatment	Post-Test
24 Students of Research Method Course	None	Web-Supported Learning Environment	RMAT

One-shot case study was selected as the model for this research. This model includes one treatment and one post-test. There is no control to the validity threats for this model if it is purely applied. In this study post-test results variable was not the only variable used. In fact, the researcher's observations were mostly taken into consideration, as he was participant as observer in this study. This study included both quantitative and qualitative measures in order to analyze the effectiveness of the web-supported instruction and students' perceptions.

4.2. Subjects of the Study

Target population of this study was the graduate students of education faculties in Ankara. But accessible population was graduate students in faculty of education at METU. The sample was selected by convenient sampling from the department where the researcher was about to

complete his master degree. Subjects of the research were the 24 Secondary Science and Mathematic Education department's graduate students who attended the Research Methods in Education course at the Middle East Technical University. Mentioning about students by assigning Student1, Student2 etc. instead of their names provided confidentiality. These assignments were used throughout the study. Number assignment was made randomly to the students.

4.3. Variables

Variables of this study are:

- *Students' Chapter Summary Usage:* Students' entrance number to the chapter summary section of the web site.
- *Students' Test Usage:* Students' entrance numbers to the test section of the web site.
- *Students' Forum Usage:* Students' posts numbers to the forum section of the web site.
- *Students' Research Methods Achievement Test Grades:* Students' grades of Research Method Achievement Test.
- *Students' perceptions about course web supported environment:* The results of the course web page usage survey that students are requested to fill.

4.4. Instruments

The following instruments were used during the study to obtain relevant data for the variables of the study.

4.4.1. Research Methods Achievement Test (RMAT)

Research Method Achievement Test was prepared according to the instructor's emphasizes about the subject matters. Researcher developed the test using related literature (Fraenkel & Wallen, 2003, Gay & Airasian, 2000). The subject matter experts controlled the content validity of the test. The test is provided in the Appendix B.

4.4.2. Web-Supported Environment Perceptions Survey (WSEPS)

In order to have quantitative data about the perceptions of the students, a survey was conducted throughout the study by means of the Internet. As the survey had been conducted while the study was implementing, the questions were selected to provide general opinions instead of specific for the site. The content and construct validity of the test were controlled by the subject matter expert who was studying at the same university and department with the researcher. The reliability of the test was 64%. To raise the reliability each item must be asked three times ideally. The researcher asked each item for once, because he was trying to verify the answers of the students in class meetings. It was possible that the students think that it is boring to answer a question over and over again and also talk about the item in class. Reliability of the test was tried to increase by comparing the test results with in class opinions of the students. The Survey is provided in

the Appendix C. Because the survey was conducted over the Internet the provided format is not the format that students saw.

4.5. Procedure

Because there was not any previous course offered having the same content it was supposed that the students had no previous knowledge about the subject matter. So it was decided that it is unnecessary to have pretest for this research. Researcher's observations showed that none of the students had previous knowledge about course content. The students were thought with web-supported instruction by using the developed web site.

Although the site was debugged during its preparation, most of the editing was done while it was in service. The web site evaluated and changed throughout the study according to the obstacles and students' suggestions. Researcher attended to the lectures during the semester, he was the participant as observer. At the first lecture of the semester, the instructor introduced the researcher to the class and the researcher explained the intention of the study as "find and improve the prepared web site according to their usage results." It was stated that the site was prepared to store all activities made by the user after they enter their username and password. It was said that at the first usage they have to state a user name and password providing their e-mail address in order to use the web site.

It was also stated that their course grade would NOT be affected by their usage of site to obtain more reliable result i.e. not manipulated by the purpose of getting better grades. The intention of the researcher was that; students must use the site when they need it, not because it is compulsory. However, some research results were presented to the students as having the opportunity of studying at

anytime and reaching the resources of the course, provide better learning environments. Also the students were told that the site would include chapter summaries, quizzes, and forum and also the researcher would always be ready to answer the questions, and sending the homework over the Internet would be appreciated.

During every lecture of the semester, the researcher took notes about subjects and examples in order to provide different approaches to subjects, examples and questions at the web site. To accomplish this objective, the questions and examples were used from different books. Researcher also looked for the misunderstood points by the students. Until the lecture was started and during the two 10-minutes break researcher tried to cooperate with students and instructor in order to evaluate and improve the web site formatively.

4.6. Analysis of Data

The quantitative data was obtained by the result of achievement test, perception survey, and the statistics of usage obtained by the background codes of the web site and survey results analyzed through descriptive methods including frequencies, percentages, and means. Moreover, simple correlation and multiple regression analysis were used in order to analyze the correlation among the variables of the study. SPSS 10 Statistical Analysis Software was used to analyze data. To present graphical information also SPSS 10 software was used. There was 1 missing value of one of the questions of attitude survey and it was used as it is for frequency analysis. It was changed to Neutral by the researcher for the reliability analysis. Out of 24, 5 students did not reply to the survey. Assigning each student with a random number from 1 to 24 provided confidentiality.

4.7. Assumptions and Limitations

4.7.1. Assumptions

Although the study was tried to be implemented perfectly, there may be some mistakes of the researcher that he was not aware of. To minimize the mistakes, the researcher was always in touch with the instructor and the assistant of the course. Researcher tried to communicate well with the students. As he did not want to rely on one survey or one examination, he tried to get the students' perceptions during the conversations. Also he wanted to overcome the difficulties of the students immediately so he continued to ask for possible problems that the students might face with.

4.7.2. Limitations

There were some limitations of this study. Most of the limitations were revealed because of being used a software. When software are taken into consideration, no matter how perfectly prepared it is, but when it is started to be used there is always something to improve. After a long period of preparation and test phase, the web site started to be used. Some problems occurred after the study has begun. Below there is a list of the problems and actions taken for those problems:

- The server of the web site became out of order for two days before the examination because of serving for many other sites as well. This was effected the usage of the web site.
- The researcher was not the administrator of the server, so he had difficulties of using the server and debugging. Researcher tried to use the server remotely.

- The online test part was prepared for 5 alternatives multiple-choice questions. After the implementation has started the need for two, three and four alternative questions wanted to use. In that case the program displayed the empty alternatives also. Controlling the number of alternatives and displaying only the existing alternatives solved the problem.
- The researcher needed to erase and change some questions but there was no graphical interface for that action. The graphical interface was prepared for the solution and researcher started to use the form of the web page instead of using the database directly.
- The main points of the chapters were added by changing the path from the database. In order to ease this action the addition of the main points of the chapters started to be made from an internal form.
- The server of the web site was serving also for the web pages of other faculty members and this was caused some accessibility problems. To overcome this obstacle a commercial server was hired for better use of the site.
- The passwords of the students were being controlled from the database and they were not encrypted. Because some people use the same password for most sites, being able to seen may cause some problems. Not to let the passwords were seen by anybody including the researcher; encryption was used i.e. instead of "a" database includes an encrypted string like "c6au7sdvq".
- It could not be possible to assign a simple domain name to be remembered easily. Then it was decided to buy and use the domain names "www.egitim.name" and "www.egitim.name.tr".

Although there were some obstacles during the implementation, with immediate interfering the obstacles tried to overcome.

CHAPTER 5

FINDINGS AND DISCUSSION

5.1. Quantitative Data Analysis

5.1.1. Analysis of Average Correct Responses to RMAAT

In order to analyze the question "What is the average correct response of students of Research Method Achievement Test?", average correct response to RMAAT was calculated to find the average achievement of the students. Average correct response to RMAAT was 34,5 out of 52. The average percentage was 66%. This is a low percentage for graduate studies. The satisfactory grade is BB, 80 out of 100 for graduate study.

5.1.2. Simple Correlation Analysis of Variables

A simple correlation analysis was conducted to find the correlation coefficient for question "Is there any relationship between supportive web site usage and achievement of the students related to research methods?" The analysis output was presented in Table 5.1.

Table 5.1: Simple Correlations Analysis

		Summary Usage	Test Usage	Forum Usage	RMAT Results
Summary Usage	Pearson Correlation	1,000	,517**	,048	,432*
	Sign (2-tailed)	,	,010	,823	,035
	N	24	24	24	24
Test Usage	Pearson Correlation	,517**	1,000	,314	,605**
	Sign (2-tailed)	,010	,	,135	,002
	N	24	24	24	24
Forum Usage	Pearson Correlation	,048	,314	1,000	,184
	Sign (2-tailed)	,823	,135	,	,391
	N	24	24	24	24
RMAT Results	Pearson Correlation	,432*	,605**	,184	1,000
	Sign (2-tailed)	,035	,002	,391	,
	N	24	24	24	24

** . Correlation is significant at the 0,01 level (2-tailed)

* . Correlation is significant at the 0,05 level (2-tailed)

In terms of chapters' summary usage, it was found that;

- There is significant relationship between the summary usage and the results of RMAT results ($r=.432$, $p<.05$).

In terms of test section usage, it was found that;

- There is significant correlation between the test usage and the results of RMAT results ($r=.605$, $p<.05$).

In terms of forum usage, it was found that;

- There is no significant correlation between the forum usage and the RMAT results of the students ($r=.184$, $p>.05$).

5.1.3. Multiple Regression Analysis of Variables

A multiple regression analysis was conducted to determine proportion that the RMAT results explained by the independent variables (summary usage, test usage, and forum usage). The multiple regression result of the RMAT results as dependent variable, summary usage, test usage, and forum usage as independent variables resulted with ,621 multiple R value. The R square value was equal to ,386.

Table 5.2: Multiple regression analysis

R	R Square	Adjusted R Square	Std. Error of the Estimate	Significance
,621 ^a	,386	,294	4,5700	0,019

a: Predictors: (Constant), FRMUSG, SMMRYUSG, TESTUSG

Table 5.2 indicates the multiple regression measures. There was a statistically significant contribution of summary section usage, test section usage and forum section usage of web site together to the variation in achievement. These three predictors accounted for 38,6% of the variation in achievement.

5.1.4. Quantitative Analysis of Web Site Usage in terms of Communication

The constructed web site provided both synchronous and asynchronous communications between teacher and students. Frequencies of entrance hours were analyzed in order to decide the communication type. It was decided to use asynchronous communication for the site because there was no dedicated time for

students to use the computer laboratory in order to use the web site. The result shows the difference between usage hours of the site. The figure of usage hours showed that asynchronous communication was more proper use for communication.

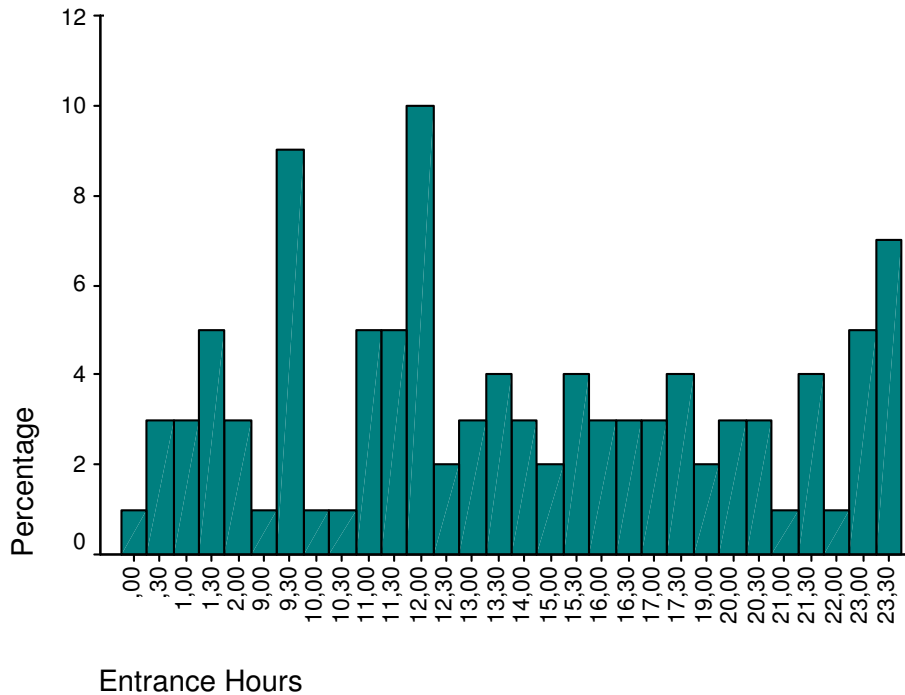


Figure 5.1 Entrance Hours to the Web Site

The Figure 5.1 shows the percentages of web site entrances by 30 minutes time intervals. It shows that synchronous communication software (i.e. chats) is not feasible because students used the site almost every hours of the day. To provide synchronous communication, the instructor needs to be online 16 hours a day. Besides, the instructor would have to use communication service with only one or two students for some of these hours.

5.2. Qualitative Data Analysis

Quantitative and qualitative data analyses were combined in order to analyze students' perceptions. The answers to the survey were coded from 1 to 5 in order to analyze the answers more easily. 5 was represented for "strongly agree" when it was the most expected statement. If the most expected statement was "strongly disagree" then 5 represented for "strongly disagree". After the data were gathered the answers were summed up for each subject. The average of total score was 35,8 out of 52, with standard deviation 3,38. When the average total score was divided into 9; the number of questions, the average for each question was found 3,97. 3,97 represents "agree" statement.

5.2.1. Reaching Resources from Everywhere

Table 5.3 Frequencies of question "Being able to reach the course resources anytime from anywhere improves my academic achievement"

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0	0	0
Disagree	0	0	0	0
Neutral	1	5,3	5,3	5,3
Agree	9	47,4	47,4	52,6
Strongly Agree	9	47,4	47,4	100,0
Total	19	100,0	100,0	

In Table 5.3 the answers of the statement "Being able to reach the course resources anytime from anywhere improves my academic achievement" can be seen. This statement includes the usage of portable and easy to reach educational materials such as handouts, educational SMS for cellular phones, materials in CD-ROMs. The statement asks for not only the Internet but also the other portable media usage for educational purposes. Student11 was the neutral person. It can be seen that, none of the students has the negative idea of this statement. In the class meetings the students were considering the necessity of reaching the course materials more easily. The usage of libraries was one of the subjects that were discussed on. As the all students have been working for the institutions except Student20 who was looking after her child, they complained about the limitations of usage of libraries.

After the working hours, it is difficult to come to the library to work for only one or two hours. At the weekends libraries close earlier. It takes more time to travel between home and the library than to study in the library.

This was the idea of Student4. The other students agreed with this idea. In the break of one meeting, Student1 shared the idea of using cellular phone to practice. She said;

I spend much time on the way, is it possible to practice using my phone for some courses?

The researcher told the possibility, if the learner accepts to cover high cost because the WAP and GPRS services were expensive. Considering this idea, palmtops and cellular phones decided to support for the future researches.

5.2.2. Using Web Site of the course

Table 5.4 Frequencies of question "I like using web page of a course in order to easily reach information about course"

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0	0	0
Disagree	0	0	0	0
Neutral	2	10,5	10,5	10,5
Agree	10	52,6	52,6	63,2
Strongly Agree	7	36,8	36,8	100,0
Total	19	100,0	100,0	

The phrase is "I like using web page of a course in order to reach information about course easily." There was no negative opinion about this phrase. But it must be carefully examined that the number of people "agreed" increased whereas "strongly agreed" people decreased. This might show the expectation level from the web. Some people might prefer mobile library to mobile Internet, because some students had more willing for the former statement. This was the result of not having so successful web support materials

5.2.3. Using Search Engines instead of Web Site

Table 5.5 Frequencies of question “It would be more useful to find and use related information from search engines than a course web page”

	Frequency	Percent	Valid Percent	Cumulative Percent
Empty	1	5,3	5,3	5,3
Strongly Disagree	0	0	0	0
Disagree	3	15,8	15,8	21,1
Neutral	5	26,3	26,3	47,4
Agree	9	47,4	47,4	94,7
Strongly Agree	1	5,3	5,3	100,0
Total	19	100,0	100,0	

Opinions about “It would be more useful to find and use related information from search engines than a course web page” are important, because learners may want to find the related information by themselves. As can be seen in the Table 4.5, 16 percent of the students agreed with this statement. This can be perceived as high proportion but Student18 (Agree), Student23 (Agree), Student16 (Neutral), and Student16 (Neutral) might have replied wrong to this question because, these four students stated the usefulness of the site other than searching the web in a conversation with the researcher. Other six students (namely Student2, Student3, Student9, Student11, and Student22) who used the site but did not reply the survey

presented the positive opinions about using the site instead of search engines.

5.2.4. Providing Username and Password to use the Web Site

One of the important rules for the Internet usage was avoiding usage of Turkish characters (ç, Ç, ğ, Ğ, ı, İ, ö, Ö, ş, Ş, ü, Ü). No domain name or e-mail address may include these characters and also none of the user names and passwords should contain these. In the second meeting of the course, there were some complaints about having difficulties of visiting to the web site. Having listened to the complaints it was realized that the problem was Turkish characters. During that meeting the students were informed that these characters must not be selected as username or password in order to use the web site. Also the students were informed about selecting secure and appropriate passwords.

24 students have taken 40 username and password because of wrong character usage. Some incorrect selection of username and passwords are provided at Table 5.6. 'x' is represent for the right character whereas '?' is the one that must not be used.

Table 5.6: Examples for Mistakes in Username or Passwords.

Student	Username or Password	Number of tries
Student10	x?x?x xxxxxxx?xx?xxx xx?xxx	5
Student22	X?xx	1
Student4	xxxxx??xx?xx? X?xx?xx?	5

One of the ideas of that conversation came from Student20 as;

Turkey has population of 70 million, but any of these people cannot use our own character. Mustafa Kemal ATATÜRK did not do Turkish Letter Revolution because Turkish people will use 'g' instead of 'ğ' or 'u' for 'ü' etc.

The rest of the class was all in the agreement with her. After that discussion, the usage of Turkish characters was searched. Hürriyet newspaper started a survey about Turkish character and F keyboard usage in its web site and Table 5.7 shows the results of 121,530 participants by the July 18, 2004.

Table 5.7 "Bilgisayar Türkçesi İstemiyoruz" survey results (Hürriyetim, 2004)

Phrase	Accepted Participants
The Ministry of Industry should define compulsory Turkish support for the products that will be sold in Turkey.	74,028
It should be compulsory to sold computers with keyboard and it should be consumer's option to buy with Q keyboard.	F 68,383
Turkish government should define a standard for Turkish character set and it must be compulsory to use these set for all software.	73,688

The survey shows the sensitivity about this subject. The researcher thinks in the same way for this subject, too. So it was decided to add extra Turkish Character support to the web site. Turkish character support was provided within the content of the site but after the discussion, the support was broadened for the username and password. Although until the support was added, most of the students had completed the sign up process, it was prepared for the future researches.

Table 5.8 Frequencies of question "If I have to enter 'username' and 'password' to use the educational web page, it decreases my motivation"

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	5,3	5,3	5,3
Disagree	3	15,8	15,8	21,1
Neutral	7	36,8	36,8	57,9
Agree	8	42,1	42,1	100,0
Strongly Agree	1	5,3	5,3	100,0
Total	19	100,0	100,0	

The answers of the question "If I have to enter 'username' and 'password' to use the educational web page, it decreases my motivation" presented in Table 5.8. It can be seen that less than half of the students disagreed the phrase. This can be the result of having difficulties while trying to sign up because of Turkish characters. But any of the students except of Student10 who is the owner of Strongly Disagree answer, considered about not liking the authentication. Instead after the need for authentication was explained as tracking the students' achievement progress for both instructor and themselves, positive feedback was gotten from some of the students.

5.2.5. Communication by means of Web Site

Table 5.9 Frequencies of question "An educational web page needs to provide opportunity of communication among students and instructor"

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0	0	0
Disagree	0	0	0	0
Neutral	0	0	0	0
Agree	13	68,4	68,4	68,4
Strongly Agree	6	31,6	31,6	100,0
Total	19	100,0	100,0	

Table 5.9 shows the students' confirmation to the idea of usage of educational web page for communication purposes. Out of 19, there were no students, who have the opposite idea to the "An educational web page needs to provide opportunity of communication among students and instructor" sentence. In classroom meetings all students showed parallel perceptions to the above result. Student10 was living in a different city from the city that university is placed. She was using web site especially for communication purposes. As she was living in a different city, she stated that she was having difficulties in case of communication with classmates and the instructor. She could not risk a day for a meeting with instructor because it was taking one complete day to come and return for a meeting. Conversations among the students and the researcher showed that most of the students were

having difficulties about communicating with each other and the instructor. As they are attending the course from different institutions, it was not easy to reach one of the classmates or come to see the instructor.

To overcome these difficulties, forum has been started to use for communication purposes. Researcher himself participated to discussion lists for all seven course of the graduate study he took. The cause of need of discussion list usage was that, the students were not present at the campus and difficulties of getting permission for extra time from the institution. Most of the students that practice teaching at the private educational institutions were not able to leave the institutions in addition to the lecture hours. But discussion lists had a disadvantage of having to use the e-mail addresses of students. Any problem of e-mail addresses causes the messages not to reach to that student or students. These problems may be identified as:

- Spam-mails that leads student not to use his/her mail account effectively
- Overused inbox size which blocks the new mails
- Wrong e-mail addresses
- An inactive moderator, lack of control for delivery of e-mails

As a result of these problems, ineffective usage of discussion list may be observed. To overcome these difficulties, discussion forums may be used. Discussion forums do not use the e-mail addresses of the users. Instead there is a message pool integrated with the web page of the forum that authenticated users can read or send messages to this pool. As it does not use e-mail system, the difficulties of discussion lists can be overcome.

5.2.6. Examining the Classmates' Works

Table 5.10 Frequencies of question "I like to examine my classmates' works and their feedbacks"

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0	0	0
Disagree	3	15,8	15,8	15,8
Neutral	1	5,3	5,3	21,1
Agree	13	68,4	68,4	89,5
Strongly Agree	2	10,5	10,5	100,0
Total	19	100,0	100,0	

The most different perceptions were obtained from the "I like to examine my classmates' works and their feedbacks" statement. The web site was having the opportunity of checking the classmates' works because the students posted the homeworks to the forum. Although 79% of the students had positive feelings can be resulted from the frequency of answers, in class conversations resulted confusion of the researcher about this subject. In class, most of the students liked the idea of checking others' works and not to repeat the mistakes most parallel to the above frequencies. On the contrary some of the students, who believed the benefits of this opportunity, stated that they are unwilling to post their works to the forum. They did not want their works to be seen by the others (Students 4, 7, 8, 11, 15, 16, 17, 26, and 28). They were afraid of having many mistakes and did not want their names appeared.

But the idea of researcher was improving the quality of homeworks with the idea of checked by classmates. If the names do not appear, students may not care much about the quality of their works. There is an important point; appearing the names or not may not mean anything if each student have different homework. In this case confidentiality cannot be established because every students may know who did the provided homework even it does not include a name. For this reason the researcher decided to leave the decision of posting homeworks to the forum to the instructor.

5.2.7. Quizzes and Immediate Feedback

Table 5.11 Frequencies of question “An educational web page needs to include quizzes and immediate feedback for the answers”

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0	0	0
Disagree	0	0	0	0
Neutral	1	5,3	5,3	5,3
Agree	6	31,6	31,6	36,8
Strongly Agree	12	63,2	63,2	100,0
Total	19	100,0	100,0	

Teachers may observe students’ performance by examinations and students may be able to realize their knowledge level by practicing. But instructor needs time for measurement. Even the easiest to grade measurement item multiple-choice quizzes need time to evaluate. Because it is advisable to return the examinations to the students back as soon as possible, using computers can be helpful for evaluation of

students. This can be helpful in two ways; first instructor gains time by using computer to measure the students' performances, second the students may be able to see their own performances. With this idea the usage of quizzes with immediate feedback can be resulted with improvements in achievements.

Students' perceptions were not different from this idea. Except for Student15 (although he used the test section of the web site 3 times), showed positive perceptions about the "An educational web site needs to include quizzes and immediate feedback for the answers" statement. In fact this statement is the one that has the most "strongly agree" answer among the other statements. Classroom conversations with the students showed that they liked being able to;

- See their own performance
- Have immediate feedback
- Practice whenever they want
- Sample questions that informs about examination.

One more advantage of having quizzes on the web stated by the assistant of the course who said that:

The online quizzes and immediate feedback prevents students from asking such questions;

- May I ask you to recheck my quiz in case of your mistake?
- Is it possible to see the quiz papers?
- How the examination will be?
- Where do we have to study?
- How will be the questions like?
- What are the important points etc.?

5.2.8. Speed of the Web Sites

Table 5.12 Frequencies of question “The most important criteria is the speed of the web page”

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	5,3	5,3	5,3
Disagree	2	10,5	10,5	15,8
Neutral	6	31,6	31,6	47,4
Agree	4	21,1	21,1	68,4
Strongly Agree	6	31,6	31,6	100,0
Total	19	100,0	100,0	

It can be thought that the content of a web site is more important than its speed. People may wait if they will get useful information. This is not right. People are not waiting for anything although the person may get benefit. For the Internet usage 30 seconds is the deadline, which is decreasing everyday. If the user would not see it in few seconds, it is better not to prepare that page. Out of 19, 10 students agreed with the “The most important criteria is the speed of the web page” statement. This can show that the speed of the site must be taken into consideration seriously.

During the classroom meetings, students made no complaints about the speed of the site. This may be resulted from the efforts made to maximize the speed of the web site. The size of each page was tried to minimize.

5.2.9. Visual Design of the Web Sites

Table 5.13 Frequencies of question "The visual design of the web page is very important for its usage"

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	5,3	5,3	5,3
Disagree	0	0	0	0
Neutral	1	5,3	5,3	10,5
Agree	9	47,4	47,4	57,9
Strongly Agree	8	42,1	42,1	100,0
Total	19	100,0	100,0	

As capabilities of computers improves, user interfaces improves as well. Visual design has become a separate profession area. As the most web pages are visually attractive, the visual design of the site might be important for its usage. "The visual design of the web page is very important for its usage" statement replied mostly with agreement.

Only Student4 was different from other students. He stated that;

Visualization must not be very important criteria because some sites may look good but contains nothing whereas some sites that are not visually interactive may contain the exact information that I want.

CHAPTER 6

DISCUSSION AND RECOMMENDATIONS

Some examples of Europe countries' expenditure on education as a percentage of GDP (Gross Domestic Product) are listed in Table 6.1.

Table 6.1 Expenditure on education as a percentage of GDP: EU comparison, (UK Government Statistics, 2001)

Country	Percentages
Denmark	6,7
Sweden	6,5
France	6,1
Austria	5,7
Portugal	5,7
Finland	5,6
Belgium	5,5
Germany	5,3
Spain	4,9
Italy	4,9
Netherlands	4,7
Ireland	4,6
Greece	4,0

When compared the expenditure of Turkey which was 2,86 even at 2002 (MNE booklet, 2003), it can be seen that Turkey need to allocate more funds for education in order to reach the level of developed

countries. But considering the economical situation of Turkey it must be admitted that it is difficult to allocate more funds for education. So Turkish government need to do the best with current opportunities. The researcher believes that improving education can be achieved without much investment by means of effective integration of technology to the education. The aim of this research was to prepare a medium that would improve the education without changing the whole system

Internet usage is increasing rapidly in Turkey. In fact, the use of internet increased mostly in Turkey over the world (NTVMSNBC, 2004c). This can be used for educational purposes. As it is increasingly becoming popular, its power and flexibility features can be used to improve the quality of education. The result of the study also shows the need for improvement in quality in education.

The result of this study shows 66% achievement for the Research Methods concept. As a graduate course this achievement is insufficient. This result shows the need for improving the achievement for research methods subject. Also the study showed a significant correlation between summary section usage of the web site and RMAAT results as well as test section usage of the web site and RMAAT results. The findings of this study show the need for better approaches to the education especially for graduate studies. This may be possible if the needs of students can be met.

The researcher as an instructional technologist believes that; no one is able to fulfill all of the requirements of students in order to provide the best education. There are many educational software in the market, but all those software offers a complete solution for the educational problems. Those programs created with the idea of creating a "magic wand" to overcome the difficulties of Turkey's educational problems.

But it can be easily seen that the "era of heroes" was over a long time ago.

If it is accepted that it is not possible to prepare a pill for all people in Turkey, it will be the biggest improvement for the educational system. It is obvious that the needs of the students in one classroom differ from each other. With this fact it must be focused on providing individualized solutions instead of general ones. The researcher believes that the instructors have the most information about their students. So the teachers are the authority to decide the best way of instruction for the students. The researcher decided to provide a framework for the instructors. The instructor will be able to shape the framework according to the needs of his/her students.

The results of this study are mentioned below.

Providing chance for the learners to reach the resources of the course anytime and anywhere may improve their achievement. The students will not have to spend much time to find the relevant information. Instead they will spend that time for learning the provided information. Besides, it is important to gain learners' respect by creating more qualified web support materials. Ersoy (2003), Gillham et al. (1999), Gülbahar (2002), McClelland (2001), Sanders & Morrison-Shetlar (2001), Witt (2003), are some of the researchers who stated the importance of the Internet usage as a support material for education.

Using a web site to support the instruction for a course may increase the motivation of students. The easiest and the most feasible way to provide the resources of the course for students anytime and anywhere are using the Internet. A prepared web site with relevant information may lead to an increase in the achievement of the students. The result of the study showed the 3,97 average score for

the survey. With the average score of 3,97, it is concluded that the students had positive perceptions about web-supported environment.

Providing self-paced learning for students is one of the advantages of the supportive course web sites. Students are able to practice on any of the subjects they want. In addition, students may spend more time on the subjects they are interested in. Moreover the students may be able to improve themselves on any subject area of the course that they feel that they are suffering with the lack of knowledge.

Another advantage of supportive web sites is being able to include summaries of subject matter. Chapter summaries in the educational web sites help students to prepare for examinations more effectively. Students will be able to see the important points more easily. They will be able to focus on the more important subject while they are studying. However long chapters on the computer screen may bore the students and get tired of their eyes.

One of the most important parts of supportive web sites is test section. Test section provided in the course web sites, decreases instructors' effort for measurement and evaluation. It will be more useful to have different kind of questions on the site such as matching or short answer questions as well as multiple-choice ones. But the instructor must be careful about providing the all-possible answers for the short answer questions. As the evaluation will be made automatically, providing all possible answers will prevent student from having misconceptions. Having to record the all test results of the students will help both the instructor and the students see the process of learning. Also having the records of answers for each question will help the instructor realize the misconceptions. It can be seen that one of the most important part of an educational web site is the quizzes section. It is important to give immediate feedback to students in order to maximize their retention rate. It will be also helpful to

increase the achievement of the students because they will be able to practice, remember important points more easily.

Moreover, educational web sites help students with providing communication features, especially the students living apart from the institution. In addition, part time instructors will have the opportunity of easier communication by means of the course web site.

Forum section is another essential part of the supportive learning environment. In case of posting homeworks to the forum, most of the students did not want their works to be examined by their classmates. So the instructor needs to analyze the students carefully. As suggestion, if the subjects of the homeworks will be the same for all students, the instructor may post the best homeworks to the forum. So the students would be able to see a model for their homeworks. It would be better that the instructor decides to provide or not the identities of the students who prepared the homeworks while posting them to the forum. In other cases, if the homeworks of the students are personalized, there may be a problem of revealing the identities of the student if they do not wish to have their names provided.

One more aspect is communication type. If there is not a dedicated time for computer usage for a course, it will be more feasible to have asynchronous communication. When there is not a dedicated time for computer usage, the students will probably use the communication features in various times. Synchronized communication in this case may lead to a decrease in motivation as it may include few students. Koç (2002) cited the advantages of asynchronous communication from McIsaac & Gunawardena (1996) as desirable access time, being able to think more and read every message, being able to search about concepts, and being more cost-effective according to the synchronous communication. One more advantage of asynchronous communication

was the distribution of the load on the server. The server did not need to respond to 24 users in a moment and then did nothing for the rest of the day. Instead it served for one or two students at a time, which is more feasible according to the synchronous alternative.

For the future studies, the features of the site may be improved. During the preparation period, worldwide commercial educational software's features were taken into consideration. Software development process has not an end, it always can be continued to develop. As implementation of this site increases, the usability, effectiveness and feasibility of the site increases as well.

The test section of the site can be used for testing part of many studies. Forum section may improve the communication among the students and teachers. With providing some additions to the system, site can be used also for online education. To use the site for online education purposes, the chapter summary section of the site need to be improved. It is necessary to improve the summary section because that part was designed to provide summary information for traditionally delivered courses and need some editing for online education purpose.

For the future researches mobile device support can be added to the system. Although it is not difficult to add the support, the use of mobile devices for Internet is not so common. The trend shows the mobility will be an important criterion in the near future as it is possible to use Internet in public areas.

The study also showed that the speed and visual design were the usability criteria for web site usage. This showed that the design needs to be done by experts. Design and speed are related concepts for web sites and they must be carefully balanced for efficient use.

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APPENDIX A

DEFINITION OF TERMS

TECHNICAL TERMS

ADSL: ADSL line provides continuous connection to the Internet over existing 2-wire copper telephone wiring and does not tie up your phone line. ADSL digital service can be used to deliver bandwidth-intensive applications like videoconference and distance learning. (D-Link, 2003)

Database: A formally structured collection of data in order to find and use the intended data easier. (ATIS, 2001a)

Dial-up: A temporary Internet service, as opposed to dedicated, connection between machines established over a telephone line using modems. Internet Service Provider provides this service, which is usually a company that charges users for this service. In addition users have to pay for the telephone bill for the duration they are on-line. (Dictionary of Computing, 2002)

Domain Name: A name that identifies one or more IP addresses. For example, the domain name *www.egitim.name.tr* represents about a dozen IP addresses like 144.122.58.145. (Webopedia, nd.a)

Frame-Relay: A packet-switching for connecting devices on a Wide Area Network (WAN). (Webopedia, nd.b)

GPRS: A packet-linked technology that may enable up to 115 kilobit per second access to wireless Internet in a GSM network. (T-Mobile, nd.a)

ISDN: Is a set of standards for digital transmission over ordinary telephone copper wire as well as over other media. Up to 128 Kbps (SouthEast University, 2000)

Server: A network device that provides service to the network users by managing shared resources. (ATIS, 2001b)

WAP: Is a family of protocols allowing mobile devices to access wireless services. (T-Mobile, nd.b)

EDUCATIONAL TERMS

Asynchronous Communication: Students and the instructor can get onto the system at any time they want, post their discussion, comments or opinion for others to view later. (Xiaoshi, 2000a)

Interactive Learning: Specifically defined as a process of involving some form of digital mediation between a teacher or designer and a learner. (Reeves & Hedberg, 2003)

Course management System: CMS is a flexible, integrated environment where students can use the latest technology to foster inquiry, encourage discourse and inspire collaboration. Meanwhile, CMS allows instructors automatically to control the progression of an online class through the course material delivery and evaluation, interactivities with their students as well as online student information system application. (Xiaoshi, 2000b)

Synchronous Communication: The communication system that both students and the instructor are logged into a system and communicate with each other at the same time. (Xiaoshi, 2000c)

Web-Supported Instruction (Also called as Web-based Instruction or Web-aided instruction): Web support to a traditionally delivered course with a web site, which includes resources of the course (LeJeune and

Karen, 1998). In this research the supportive web site is represent for the site that was used throughout the study.

APPENDIX B

SUPPORTIVE WEB SITE

In order to use during this research a supportive web site is prepared by the researcher with the help of a programmer. The last programming technologies are used for this web site. The last versions of PHP as the programming language, MySQL as database, Dreamweaver MX as the programming interface, Fireworks MX as the graphical program (Studio MX software used, licensed to the University which researcher used to work and the other programs does not need to have a license to use). The site is designed for the low Internet connection and minimum system configuration possible to be widely used without any restriction for users. Both the server side and client side are considered during the design phase. The Linux platform is decided to use at the server side to construct a cost effective project. Linux based system offered faster and cheaper platform for the research. Linux, MySQL, PHP are the freely distributed software. Considering the relatively low budget of educational projects according to commercial ones it is decided to hold setup and maintaining cost at a minimum rate. For the client side the site is programmed to be system-friendly for most platforms possible in case of hardware and software requirements.

The aim is to construct a course web site that will be used as an aid for the lectures. The difference of this site from the others is the background codes. Codes enable to keep the logs of usage as well as dynamic content. The former gives the chance of evaluating the usage of the site and compare with the achievement of user by logging the entrance time and exit time of the learner. Besides the logs of the

tests in the site, would enable to observe the ongoing performance of learner for both learner and instructor. The logs show the number of usage of that test, the duration that spends on the test and number of true and false answer for each try of the test. As well as the past test data got by the learner, program gives the immediate feedback for the taken test at that time. This will improve the attention of the learner and will cause higher retention rate. For the instructor this will decrease the time used for paper evaluation.

Students had to register in order to use the site. In order to tracking the students, it is needed to sign them in by asking for a username and password. The student was able to select any username and password unless it was not selected before. In case of forgetting the username or password program sends a new password to the e-mail address of the user.

In the test page on the right section of the page user and time information was provided. After the student finishes the test he/she presses the Submit button in order to have the immediate feedback. Before the student starts to use the test, the earlier results of those tests were provided to the students in order to show the process. Students got immediate feedback after answering the tests. In addition, each result has written to the database to inform both instructor and student later.

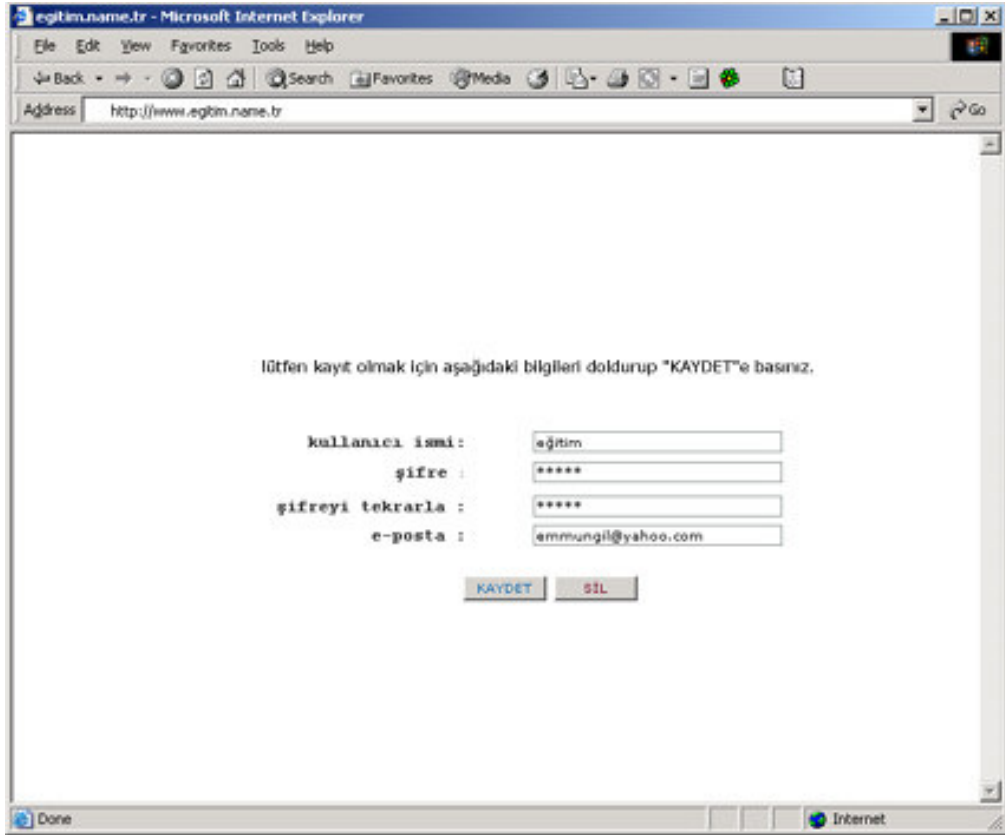


Figure B.1 Register Screen

Students had to register in order to use the site. In order to tracking the students, it is needed to sign them in by asking for a username and password. The student was able to select any username and password unless it was not selected before. In addition, users are able to select user names or passwords that contain Turkish characters. E-mail address is required in order to provide new password for user and for communication purposes when it is needed.

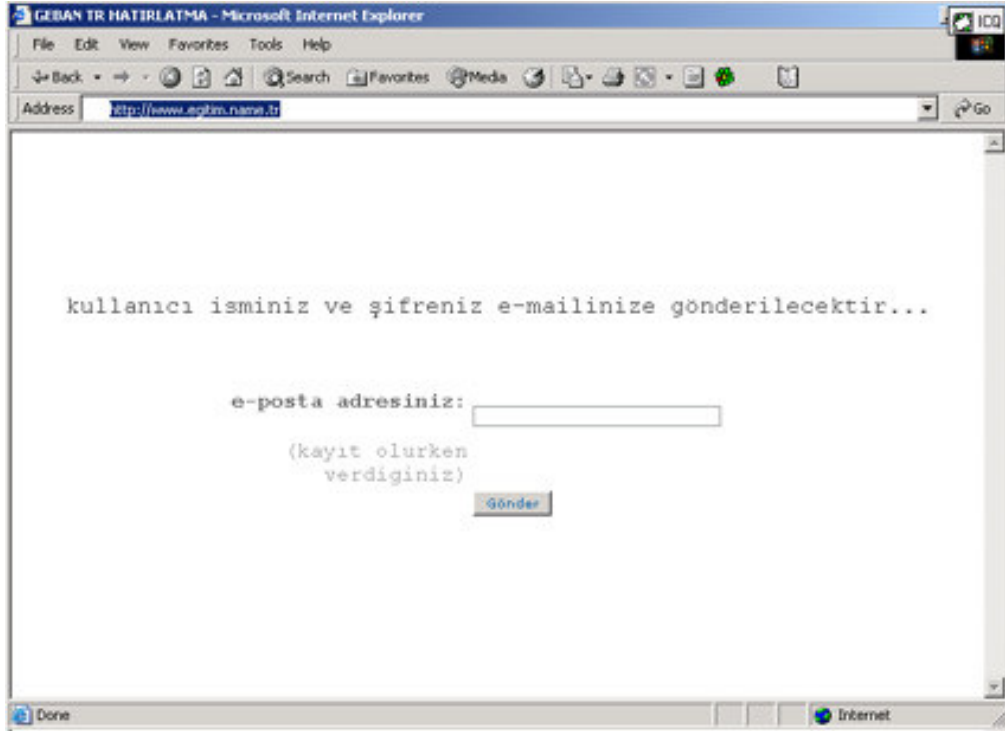


Figure B.2 Username and password reminder screen

In case of forgetting the username or password program sends a new password to the e-mail address of the user. The user has to provide the correct e-mail address in order to get the new password.

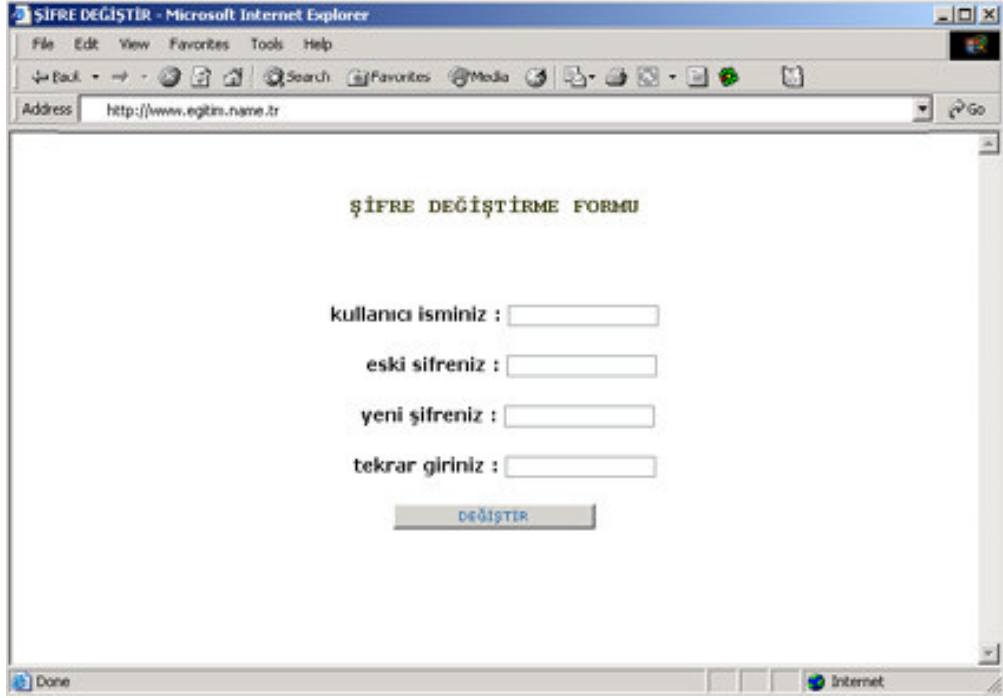


Figure B.3 Password change screen

Students are able to change their passwords whenever they want. They have to enter the new password twice in order to eliminate mistakes as the characters appears as "*" for passwords.

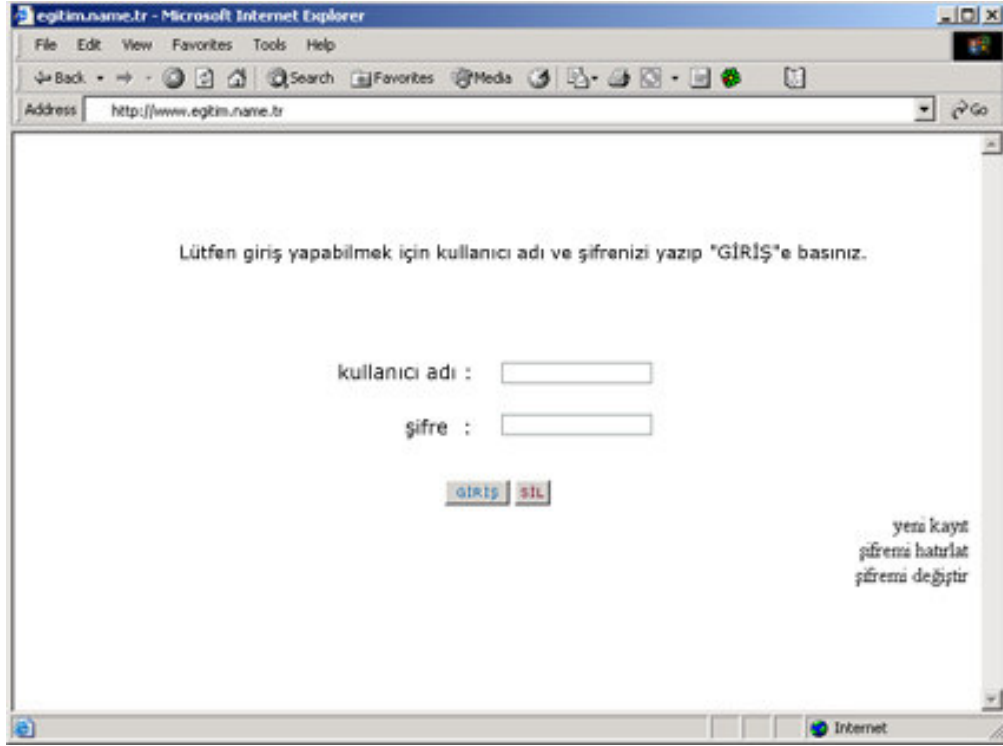


Figure B.4 Entrance screen

After completing the registration process students are able to use the system. Instructor also uses this screen in order to use the administration page. The system automatically forwards the administrator user name and password provider to the administrator page.

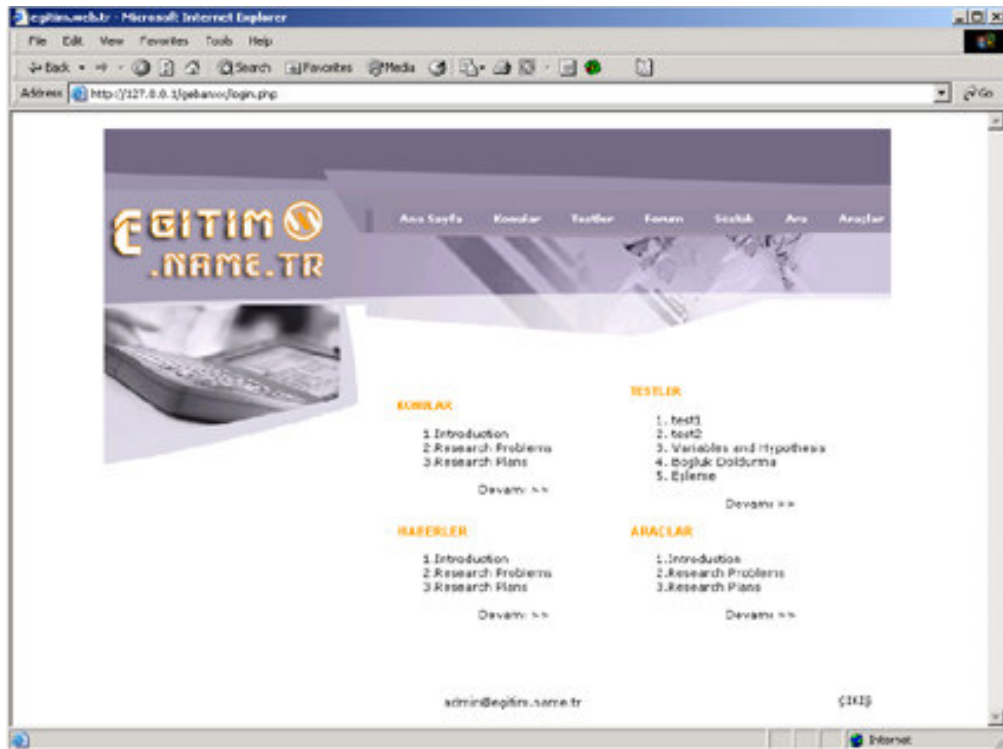
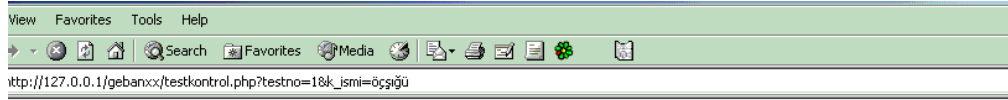
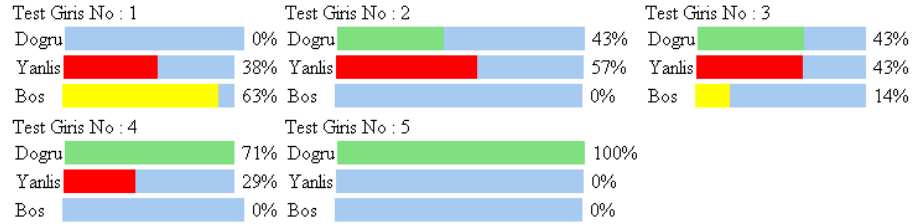


Figure B.5 Main user screen

The user page provides to the users all functions assigned for students. Chapter summaries, tests, news, tools, forum, glossary, and search functions are supported for the users.



[Bu Testi daha önce 5 kez çözmüşsünüz bir daha girmek için \(Teste Gir\)](#)



[Test Sayfasına geri dön](#)

Figure B.6 Test entrance screen

Before the student starts to use the test, the earlier results of those tests were provided to the students in order to show the process. Instructor also is able to see the results of each student.

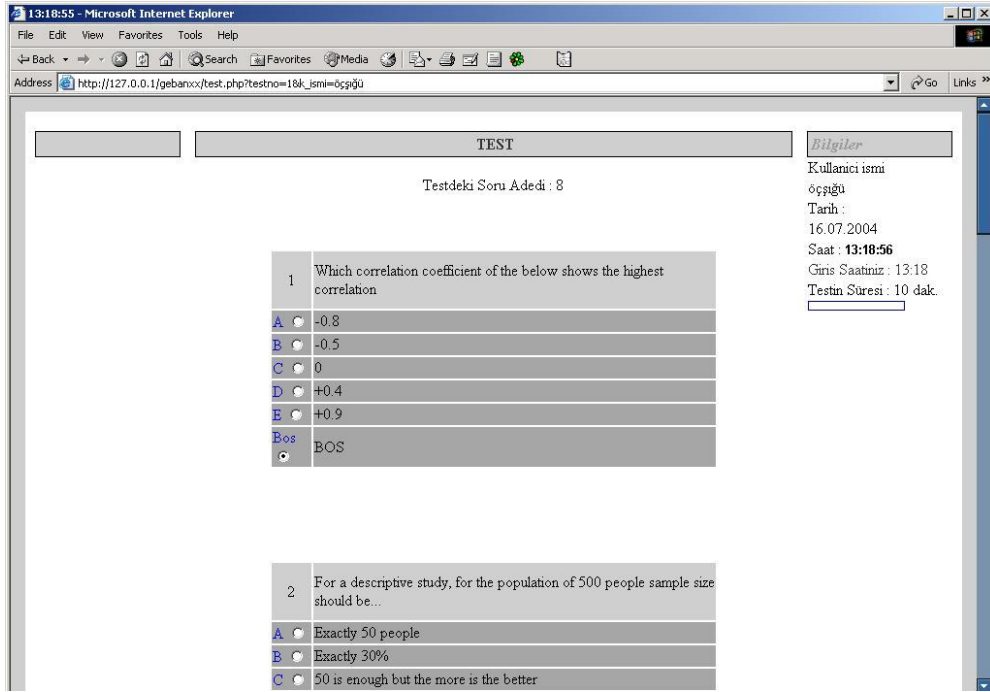


Figure B.7 Test screen

In the test page on the right section of the page user and time information was provided. After the student finishes the test he/she presses the Submit button in order to have the immediate feedback. Figure B.8 shows the post screen.

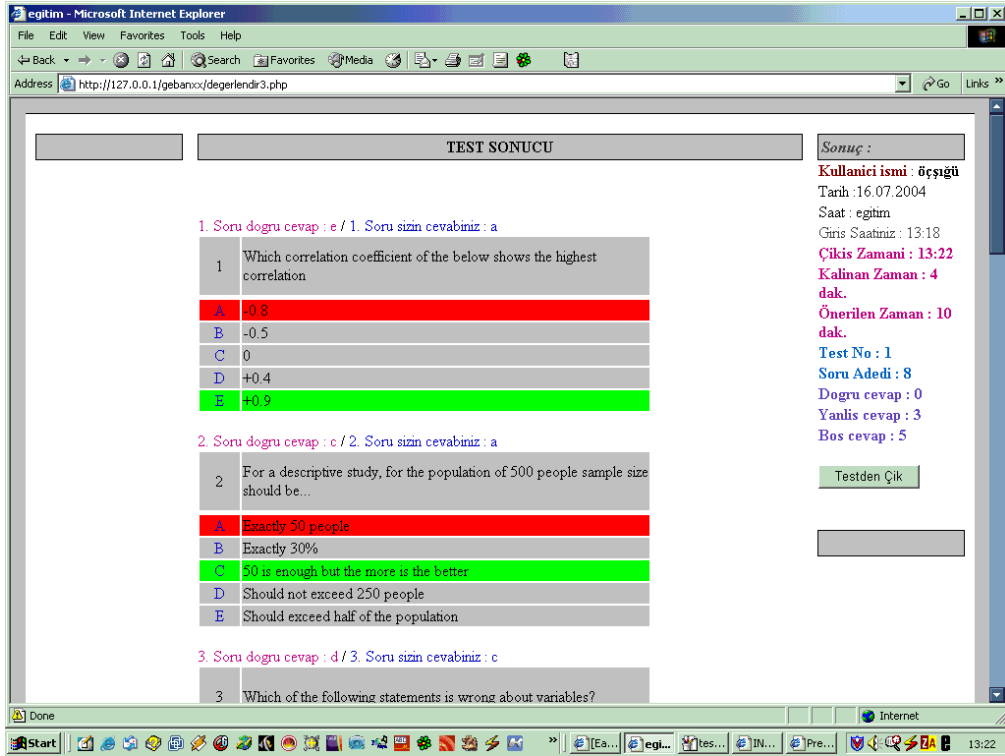


Figure B.8 Test feedback screen

Students got immediate feedback after answering the tests. In addition, each result has written to the database to inform both instructor and student later.

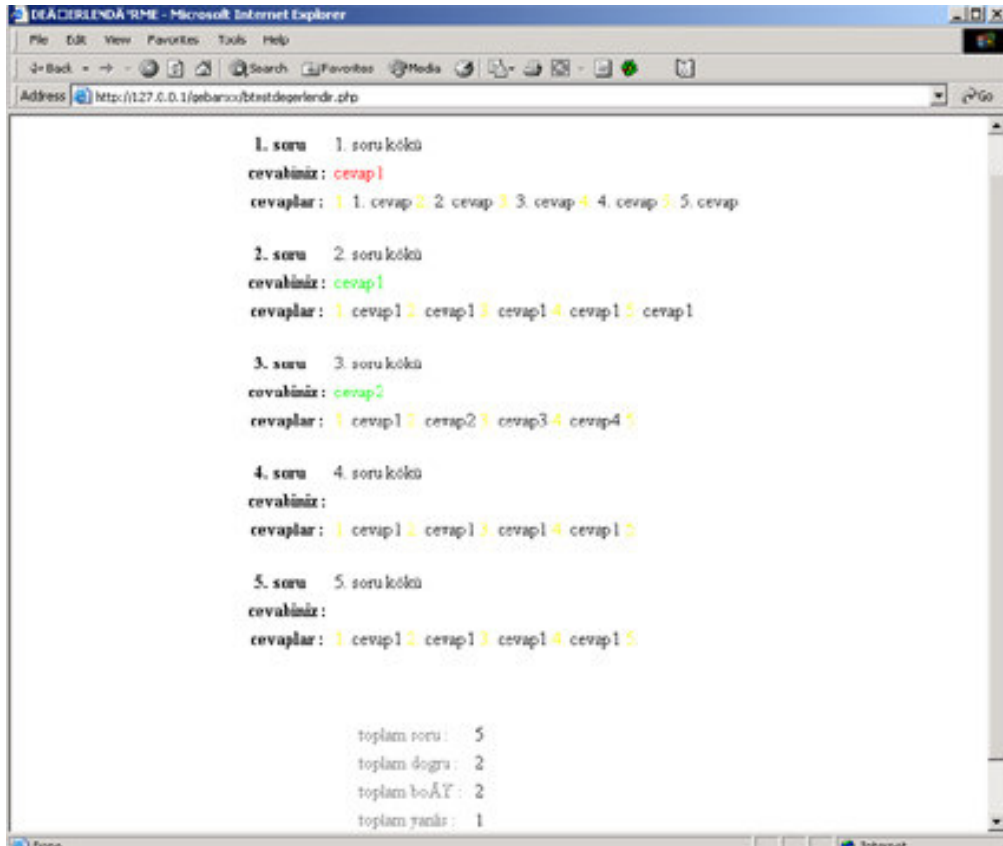


Figure B.9 Short answer questions feedback screen

The feedback page of the short answer questions is different from the multiple choice test feedback pages. The instructor is able to provide five different answers for one short answer question. This option was added because some questions may have more than one correct answer. For example CPU, Central Processing Unit, or C.P.U. are all represents the same thing. The system fills the rest of the options if are not provided. Then the system accepts the provided as correct and the others incorrect.

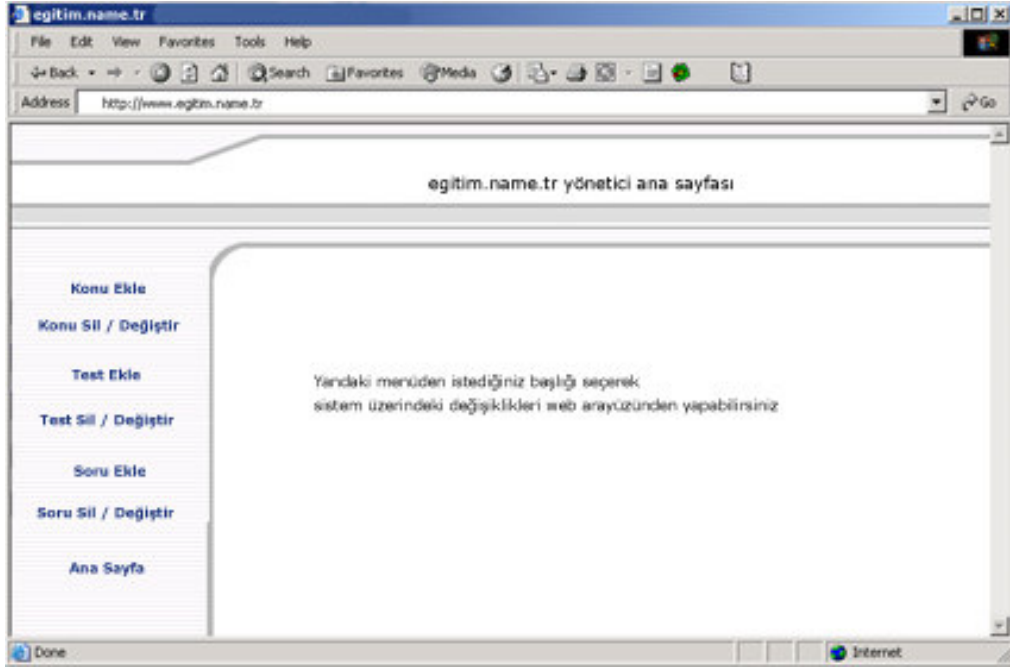


Figure B.10 Administrator screen

Figure B.10 shows the administrator screen. Instructor is able to add, edit or delete chapter summaries, tests, and questions in this page.



Figure B.11 User statistics page

In the user statistics page, instructor can see the students' activities. Each entrance to the chapter summary section and also each test result of student can be analyzed in this page.

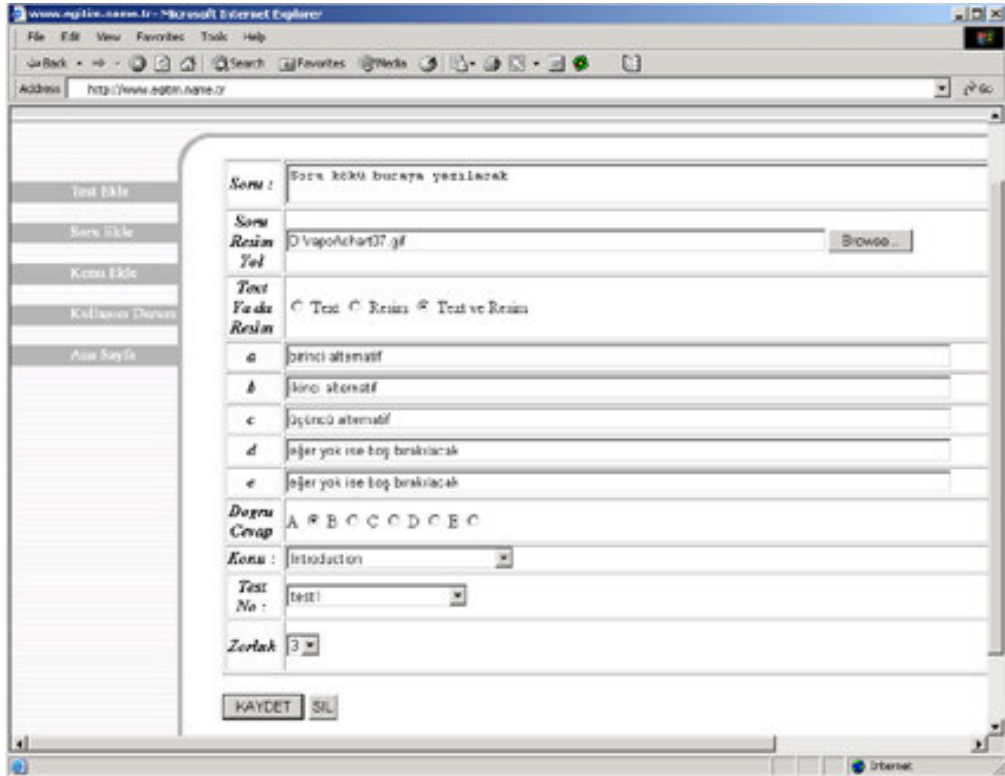


Figure B.12 Add question screen

In the add question screen, the instructor is able to provide questions via web interface. Alternatives also are provided by the instructor as well as correct one. The instructor needs to select the difficulty level and belonging chapter of the question.

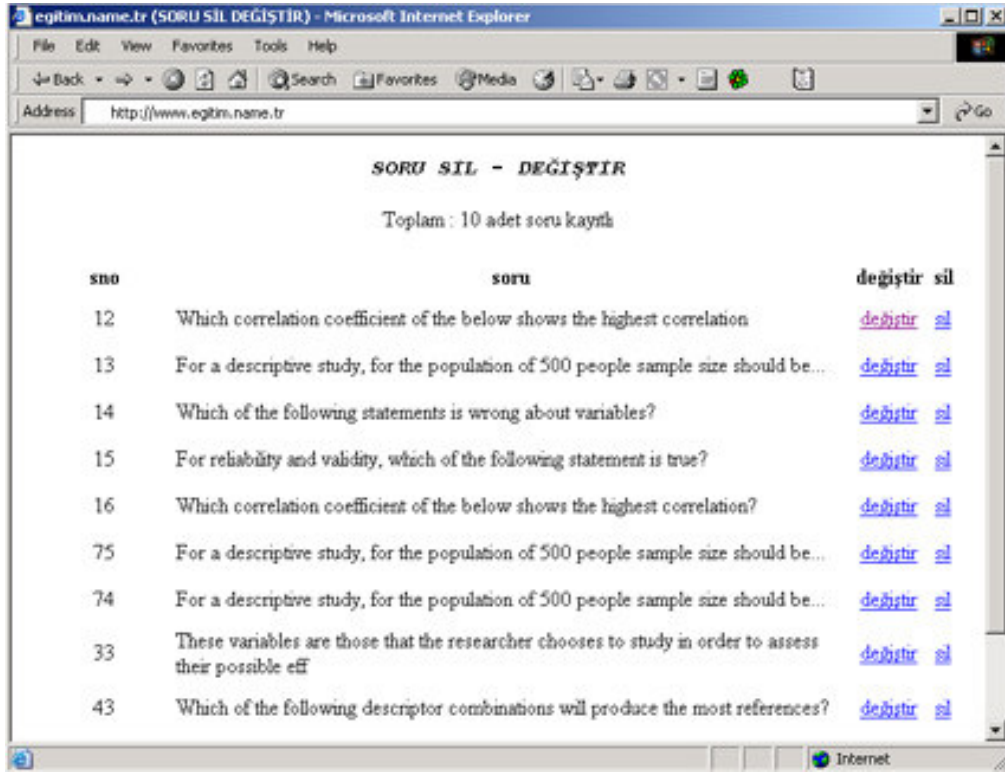


Figure B.13 Question edit or delete page

Figure B.13 shows the page that is used for deleting or editing questions.

APPENDIX C

RESEARCH METHODS IN EDUCATION FINAL EXAMINATION

SSME 520

Date: 15/01/04

Name and Surname:

.....

Student ID:

.....

Please choose and circle the best option for each question:

(All questions have the same point)

1. In order for a question to qualify as a research question the researcher must be able to

- Make observations and then analyze these to find an answer.
- Propose several answers to the question that are equally acceptable.
- Identify value statements in the question that reflect current societal norms.
- Develop metaphysical answers based on concise statements of belief.

2. Which of the following is a good research question?

- Is the "back to the basics" movement good for public schools?
- How would the current generation of young adults react if the military draft were reinstated?
- Are teachers underpaid?
- Does the phonics or the whole-language approach to reading lead to higher achievement?

3. Which of the following is not a good research question?

- Does the inclusion of metaphors in text increase reading comprehension?
- Is it good to include civics courses in the high school curriculum?
- To what factors do successful teachers attribute their success?
- Is the college retention rate greater for students who enroll in an academic skills program than for those who do not?

4. Which of the following questions meets the criteria of a well-formulated research question?

- Would long periods of isolation alter a child's emotional development?
- Should marijuana be legalized?
- Will the use of peer critiques improve college students' compositions?
- What are political leaders like after they leave office?

5. Good research questions are

- Clear, significant, and ethical.
- Feasible, clear, significant, and ethical.
- Feasible, clear, significant, and include an hypothesis.
- Feasible, clear, and ethical.

6. The variable manipulated by the researcher in an experiment is called the

- Response variable.
- Independent variable.
- Dependent variable.
- Extraneous variable.

7. An example of a quantitative variable is the

- Month of birth.
- Highest educational degree earned.
- Time taken to complete a spatial reasoning task.
- Telephone area code.

8. If a researcher studies fourth-grade students to determine the effects of rewarding good behavior on subsequent behavior, which of the following is least likely to be an extraneous variable?

- Student grade level
- Student attitude

- c) Teacher characteristics
 - d) Parent's parenting style
9. Which of the following statements best describes the relationship between a hypothesis and a theory?
- a) A theoretical prediction can be stated as a specific hypothesis.
 - b) When a hypothesis has been proven correct, it becomes a theory.
 - c) Weak theories are hypotheses and strong theories are scientific laws.
 - d) "Theory" is another name for hypothesis.
10. An example of a categorical variable is
- a) teacher hair color.
 - b) Time it takes a teacher to grade an essay.
 - c) The length a teacher has to walk from the office to her class.
 - d) The time it takes for a teacher to drive to work.
11. Which of the following is an advantage of stating hypotheses?
- a) It forces the researcher to think more deeply and specifically about the possible outcomes of a study.
 - b) It may lead to a bias.
 - c) It may be unnecessary or inappropriate.
 - d) It may prevent researchers from noticing other phenomena.
12. Which of the following is a disadvantage of stating hypotheses?
- a) A hypothesis involves a philosophy of science, thus enabling one to make specific predictions on prior evidence or theoretical argument.

- b) It may prevent researchers from noticing other phenomena.
- c) It forces the researcher to think more deeply and specifically about the possible outcomes of a study.
- d) It helps the researcher to see of he or she is investigating a relationship.

13. Which of the following is an example of a directional hypothesis?

- a) There will be a difference between the students' reading levels.
- b) There will be a difference between lecture and group instruction.
- c) Group instruction is more effective than lecture in the elementary classroom.
- d) There will be an increase in learning.

14. Which of the following is not a suggested method to ensure confidentiality of research data?

- a) Assure all participants that any data collected from them or about them will be held in confidence.
- b) The names of individual subjects should never be used in any publication that describes the research.
- c) All participants should have the right to withdraw from the study or to request that the data collected about them not be used.
- d) Share the names of the participants only with the researchers in your state.

15. Which of the following is least likely to be a primary source?

- a) An article in a professional journal
- b) A dissertation
- c) A textbook
- d) A paper presented at a professional conference

16. Which of the following best describes how research should usually be described in the body of a literature review report?

- a) The major findings of the study should be briefly reported.
- b) Most of the details of how the study was conducted should be carefully described.
- c) The abstract of the research should be paraphrased.
- d) Only the reference to the study should be provided.

17. Researchers need to be familiar with these three basic types of sources.

- a) General references, historical resources, and secondary resources
- b) General references, primary resources, and secondary resources
- c) Tertiary references, primary resources, and secondary resources
- d) General references, primary resources, and statistical resources

18. When every member of the accessible population has an equal chance of being selected to participate in the study, the researcher is using

- a) Simple random sampling.
- b) Stratified random sampling.
- c) Convenience sampling.

d) Purposive sampling.

19. If a researcher selected five schools at random and then interviewed each of the teachers in those five schools, the researcher used

- a) Simple random sampling.
- b) Stratified random sampling.
- c) Cluster random sampling.
- d) Systematic random sampling.

20. The best sample is one that is

- a) Selected at random.
- b) Convenient.
- c) Representative of the population.
- d) Purposefully selected.

21. Which of the following is not an example of a random sampling method?

- a) Systematic sampling
- b) Stratified random sampling.
- c) Simple random sampling
- d) Cluster random

22. The purpose of stratified random sampling is to make certain that

- a) Every member of the population has an equal chance of being selected for the sample.
- b) The sample proportionately represents individuals from different categories of the population.
- c) The participants chosen for the study are the ones most likely to react to the treatment.
- d) The sample is more representative of the target population than the accessible population.

23. Population generalizability refers to

- a) Conclusions researchers make about a random sample.
- b) Conclusions researchers make about information uncovered in research study.
- c) The degree to which a sample represents the population of interest.
- d) The degree to which results of a study can be extended to other settings or conditions.

24. "A student scored at the 75th percentile of fifth graders who took this exam" is an example of which type of evaluation statement?

- a) Criterion-referenced
- b) Norm-referenced

25. Which of the following is content-related evidence of validity?

- a) Test items are at an appropriate reading level.
- b) Observed participant characteristics are consistent with responses on a scale.
- c) Scores obtained on two administrations of the instrument are consistent.
- d) Scores are correlated with scores obtained on another instrument.

26. The best construct-related evidence of validity comes from

- a) A series of studies of the instrument.
- b) A validity coefficient that is near 0.
- c) Careful review of the instrument by experts.
- d) Data-based predictions that prove to be correct.

27. Which of the following statements accurately portrays the relationship of reliability to validity?

- a) Inferences must be valid before the scores can be reliable.
- b) Scores must be reliable before inferences can be valid.
- c) The more valid the inference is, the higher the reliability of the score must be.
- d) Score reliability is not related to inference validity.

28. What are the two forms of criterion-related validity?

- a) Correlation and content
- b) Predictive and correlational
- c) Predictive and concurrent
- d) Criterion and predictive

29. To obtain evidence of predictive validity a researcher will have to

- a) consult another researcher.
- b) Review all of the instruments.
- c) Gather instrument data and criterion data at nearly the same time.
- d) Allow a time interval to elapse between administration of the instrument and obtaining the criterion scores.

30. The threat of "subject characteristics" refers to differences among subjects on a(n)

- a) Treatment variable.
- b) Independent variable.
- c) Dependent variable.
- d) Extraneous variable.

31. When a pretest influences scores on a posttest, it is known as a(n)

- a) Instrumentation threat.
- b) Testing threat.
- c) Regression threat.
- d) Implementation threat.

32. No matter how careful a researcher is in selecting subjects it happens that some subjects leave as the study progresses. This loss is known as

- a) Mortality threat.
- b) History threat.
- c) Maturation threat.
- d) Subject attitude.

33. When a researcher's identity is not known to any of the individuals being observed and he/she interacts with members of the group as naturally as possible, he/she is a(n)

- a) complete participant.
- b) nonparticipant observation.
- c) observer-as-participant.
- d) participant-as-observer.

34. A limitation of all observational methods is

- a) inability to get acceptable observer agreement.
- b) Inability to observe everything.
- c) Inability to get necessary permissions.
- d) Inability to make sense out of the information.

35. Which of the following is most likely to be a secondary source?

- a) A book about educational theory in the early 1900s
- b) A soldier's letter home during the Korean War

- c) Minutes from a university faculty meeting held in 1892
- d) A frontier family photograph

36. The variable that is predicted in a prediction study is the

- a) Criterion variable.
- b) Predictor variable.
- c) Effect variable.
- d) Regression variable.

37. For which of the following correlations is the standard error of estimate the largest?

- a) .20
- b) .40
- c) .60
- d) .80

38. One major purpose of correlational research is

- a) to study the changes in behavior an individual exhibits after exposure to an intervention or treatment of some sort.
- b) To clarify our understanding of important phenomena through the identification of relationships.
- c) To make people aware of what has happened from past failures or accomplishments.
- d) To assess attitudes and opinions.

39. Which of the following research questions would almost certainly be studied with causal-comparative research?

- a) Do instructor-provided notes lead to higher achievement than student-constructed notes?
- b) Are three-year-old boys more likely to exhibit aggressive behaviors than three-year-old girls?

- c) Is mathematics achievement related to spatial reasoning aptitude?
- d) What proportion of school district superintendents support school choice?

40. Which of the following is a method for controlling the subject characteristics threat in causal-comparative research?

- a) Matching subjects in the groups
- b) Randomizing subjects to conditions
- c) Varying the baseline interval for each group
- d) Counterbalancing the groups

41. The primary threat to internal validity in causal-comparative studies is

- a) subject characteristics.
- b) Implementation.
- c) Testing.
- d) Mortality.

42. Which of the following is not a similarity between causal-comparative and correlational research?

- a) They are examples of associational research.
- b) They provide guidance for subsequent experimental studies.
- c) They permit the manipulation of variables by the researcher.
- d) They attempt to explain phenomena.

43. One strategy that can greatly reduce the threat to external validity in causal comparative research is

- a) statistical matching.
- b) Replicating the causal-comparative study.

- c) Matching subjects.
- d) Finding or creating homogeneous subgroups.

44. Is it important to follow up non-responders in mail and telephone surveys?

- a) No. Delayed returns would be less valid.
- b) No. This will not result in more responses.
- c) Yes. Lack of response is likely to bias results.
- d) Yes. A large sample is required.

45. Which of the following is not an advantage of closed-ended questions?

- a) They enhance the consistency of response across respondents
- b) They are easier and faster to tabulate
- c) They are more popular with respondents
- d) They allow more freedom in response

46. Experimental research differs from other types of research because in experimental research

- a) the dependent variable must be measured precisely.
- b) The independent variable must be manipulated.
- c) Groups are compared.
- d) There are no extraneous variables.

47. In matching designs, participants in two or more groups are matched using

- a) an extraneous variable.
- b) The dependent measure.
- c) The independent variable.
- d) The researcher's expertise.

48. Using the randomized Solomon four-group design, which of the following threats to internal validity is most likely to occur?

- a) History
- b) Testing
- c) Implementation
- d) Maturation

49. Using the static-group comparison design, which of the following threats to internal validity is most likely to occur?

- a) History
- b) Maturation
- c) Instrument decay
- d) Subject characteristics

50. Using the matching-only pre-posttest control group design, which of the following threats to internal validity is most likely to occur?

- a) Testing
- b) Maturation

- c) History
- d) Location

51. Using the time-series design, which of the following threats to internal validity is least likely to occur?

- a) Subject characteristics
- b) Testing
- c) History
- d) Attitudinal

52. Which type of hypothesis specifies that there is no relationship in the population?

- a) Research hypothesis
- b) Descriptive hypothesis
- c) Null hypothesis
- d) Inferential hypothesis

APPENDIX D

SSME 520 WEB-SUPPORTED COURSE ATTITUDE SURVEY

Dear,

We are conducting a survey about your perceptions about the web site of the SSME 520 course, and your response would be appreciated.

Here is the link to the survey:

<http://.....>

Please provide your opinions choosing the best alternative, which is the most suitable for you.

Thanks for your participation,

Levent EMMUNGİL

(SD: Strongly Disagree: D: Disagree N: Neutral A: Agree SA: Strongly Agree)

	S D	D	N	A	S A
1. Being able to reach the resources anytime from anywhere improves my achievement					
2. I like using web page of a course in order to easily reach information about course					
3. I like to examine my classmates' works and their feedbacks					
4. If I have to enter 'username' and 'password' to use the educational web page, it decreases my motivation					
5. An educational web page needs to provide opportunity of communication among students and					

instructor					
6. An educational web page needs to include quizzes and immediate feedback for the answers					
7. It would be more useful to find and use related information from search engines than a course web page					
8. The most important criteria is the speed of the web page					
9. The visual design of the web page is very important for its usage					

10. If you have any comments, please write below:

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