THE TURKISH ONLINE JOURNAL OF EDUCATIONAL TECHNOLOGY

JULY 2007

Volume 6 - Issue 3

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ISSN: 1303 - 6521

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Message from the Editor-in-Chief

TOJET welcomes you. It is a great honor for us that you are reader of this journal. Educational technology research, innovation and diffusion in teaching and learning are most important topics for the Turkish Online Journal of Educational Technology.

This journal was initiated in October 2002 to share knowledge with researchers, innovators, practitioners and administrators of education. We are delighted that more than 30000 researchers, practitioners, administrators, educators, teachers, parents, and students from around the world had visited the eighteenth issue between April 01 and June 30 2007. It means that TOJET has diffused successfully new developments on educational technology around the world. We hope that this volume six issue three will also successfully accomplish our global educational goal.

I am always honored to be the editor in chief of TOJET. Many persons gave their valuable contributions for this issue. I would like to thank the guest editor and the editorial board of this issue.

The guest editor of this issue is Prof. Dr. Zeki KAYA. TOJET thanks the guest editor and the editorial board of this issue.

Prof. Dr. Aytekin İŞMAN
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AN ASSESSMENT OF SECONDARY SCHOOL TEACHERS USES OF ICT'S: IMPLICATIONS FOR FURTHER DEVELOPMENT OF ICT'S USE IN NIGERIAN SECONDARY SCHOOLS.

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ABSTRACT
The use of ICTs in Nigeria and African countries generally is increasing and dramatically growing. However, while there is a great deal of knowledge about how ICTs are being used in developed countries, there is not much information on how ICTs are being used by teachers in developing countries. This study examined Nigeria secondary school teachers' uses of ICTs and its implications for further development of ICTs use in Nigerian secondary schools. The study through census drawn on 700 teachers from twenty five purposefully selected private secondary schools in Ibadan, Oyo state, Nigeria. This comprised 430 males and 270 females. Their age ranged from 25 – 45 years with a mean age of 35 years. A modified instrument tagged Teachers ICT use survey adapted from ICT survey indicator for teachers and staff by UNESCO (2004) and ICT Teachers Survey by New Zealand Ministry of Education MINEDU (1999) were used for the collection of data. The results showed that teachers generally have access to ICTs in their various schools except e-mail and Internet because their schools are not connected. Technical support are lacking in the schools and teachers lack of expertise in using ICT was indicated as being the prominent factors hindering teachers readiness and confidence of using ICTs during lesson. Furthermore, the results show that teachers perceived ICT as being easier and very useful in teaching and learning. For continuous uses of ICTs by teachers, it was recommended among others that teacher training and professional development oriented policies should support ICT-related teaching models that encourage both students and teachers to play an active role in teaching/learning activities. And that emphasis must be placed on the pedagogy behind the use of ICTs for teaching/learning.

Key words- Information communication technologies, Teachers, Teaching and Learning, Secondary schools, Nigeria.

INTRODUCTION

Africa have witness the development of ICTs in various sectors over the last decade including education. The change from teacher-centred education system to learner centred education the world over in the past view years

contributes to the use of ICTs in education. Borrowing from the word "Knowledge –Driven world" as conceived by (Hawkins, 2004; Inwent, 2004), it means that education reform practices should focus on equal access and quality of education which should highlight the importance of change in the education sector through use of ICTs and equipping new generations with enhanced skills to operate in the 21st century.

The use of ICTs in Nigeria and African countries generally is increasing and dramatically growing. However, while there is a great deal of knowledge about how ICTs are being used in developed countries, there is not much information on how ICTs are being introduced into schools in developing countries (Beukes-Amiss and Chiware, 2006). Looking at the developing countries according to these authors, there is generally limited access time per month using ICTs by both the teachers and students, and even less time spent with reliable Internet access. It should be noted that availability of ICTs vis-à-vis access in term of ratio of teachers and students differs significantly. Despite this, the new and emerging technologies challenges the traditional process of teaching and learning, and the way education is managed. While information communication technology is an important area of study in its own right, it is having a major impact across all curriculum areas. Easy worldwide communication provides instant access to vast array of data, challenging assimilation and assessment skills (Fowowe, 2006). Rapid communication plus increased access to ICTs in the home, at work, and in educational establishment, could mean that learning becomes a truly lifelong activity- an activity in which the pace of technological change forces constant evaluation of teaching process itself.

Formerly, the term IT was used to mean ICT, the term which was synonymous with computer but as the passage of time, it covered other equipment created to enhance acquisition, storage and dissemination of information materials. Most of these equipments were initially confine to the vicinity of offices. Libraries in the course of time embraced the use of these equipments to carry out their day-to-day activities as usage was adapted to carry out some routine activities. It functions does not end there. The current issue is the use of ICTs in the classroom by the teachers. This includes specifically the use of computers, Internet, telephone, digital camera, data projector, etc. As the world continues to revolve around technology, teachers need to continue incorporating these new technologies into their teaching.

Meanwhile, it is observed that some studies have been conducted on uses of ICTs by teachers particularly on the issue of their professional development. Most of these studies were carried out in developed countries where the use of ICTs has come of age, and where there are resources and material to maintain them. However, the use of ICTs by teachers in Nigeria is just beginning to gain popularity and researches in the area have just started emerging. Emphatically, the use of ICTs by teachers to teach the students is highly advantageous. This is because its enable them to demonstrate understanding of the opportunities and implications of the uses for learning and teaching in the curriculum context; plan, implement, and manage learning and teaching in open and flexible learning environment (UNESCO, 2004). In the light of these therefore, more research is needed to showcase further development of ICTs use by secondary school teachers in Nigeria.

INFORMATION COMMUNICATION TECHNOLOGIES/ TECHNOLOGY

Information communication technologies (ICTs) are information handling tools that are used to produce, store, and process, distribute and exchange information. These different tools are now able to work together, and combine to form networked world- which reaches into every corner of the globe (UNDP Evaluation Office, 2001). It is an increasingly powerful tool for participating in global markets, promoting political accountability; improving the delivery of basic services; and enhancing local development opportunities (UNDP, 2006). To Ogunsola (2005:3) ICT "is an electronic based system of information transmission, reception, processing and retrieval, which has drastically changed the way we think, the way we live and the environment in which we live". It can be used to access global knowledge and communication with other people (Ogunsola, 2005:3). Students who use ICTs gain deeper understanding of complex topics and concepts and are more likely to recall information and use it to solve problems outside the classroom (Apple Computer, 2002). In addition, through ICT, students extend and deepen their knowledge, investigation, and inquiry according to their needs and interest when access to information is available on multiple levels (CEO Forum on Education and Technology, 2001:8).

ICTS IN EDUCATION AND FOR EDUCATION

The idea that teaching and learning can successfully take place through the application of electronic communication facilities between teachers and students is one which had generated, sometimes, hope and dismay and at other times, excitement and fear. Hope that many more learners can be reached at a more convenient pace that had erstwhile been the case, dismay that the infrastructures necessary for deploying an effective ICT platform is lacking in low-income countries like Nigeria (Olakulehin, 2007).

However, the use of information and communication technologies in the education process has been divided into two broad categories: ICTs for Education and ICTs in Education. ICTs for education connote the development of information and communications technology specifically for teaching/learning purposes, while the ICTs in Education involves the adoption of general components of information and communication technologies in the teaching learning process (Olakulehin, 2007).

Generally, however, the educational relevance of computers and other components of information technology cannot be overemphasized. Reference can be made to the period when skinner applied programmed instructions to teaching machines, through Brunner's experiment with computers in instruction, to the current wave of information transmission and exchange via the worldwide web; we have seen different applications of ICTs in enhancing cognitive development. Thomas and Ranga in UNESCO (2004) in their classification divided the application of computers and other communication technologies in education into three broad categories. These are: Pedagogy, Training and Continuing Education. The pedagogical applicability of the ICTs is concerned essentially with the more effective learning and with the support of the various components of ICTs. Almost all subjects ranging from mathematics (the most structured) to music (the least structured) can be learnt with the help of computers. Olakulehin (2007) emphasized that pedagogic application of ICTs, involves effective learning with the aide of computers and other information technologies, serving the purpose of learning aids, which plays complementary roles in teaching/learning situations, rather than supplements to the teacher/instructor/facilitator. Computer is regarded as add-on rather than a replacing device. The pedagogic uses of the computer necessitate the development, among teachers as well as students, of skills and attitude related to effective use of information and communications technologies. Aside of literacy, ICTs also facilitates learning to programme, learning in subject areas and learning at home on one's own, and these necessitate the use of new methods like modeling, simulation, use of data bases, guided discovery, closed-word exploration etc. The implications in terms of changes in the teaching strategy, instructional content, role of the teachers and context of the curricula are obvious as well as inevitable. Pedagogy through the application of information and communications technologies has the advantage of heightening the motivation; helping recall previous learning; providing new instructional stimuli; activating the learner's response; providing systematic and steady feedback; facilitating appropriate practice; sequencing learning appropriately; and providing a viable source of information for enhanced learning. Teachers who use this system of instructional strategy would be able to kindle in the hearts of the learners a desirable attitude towards information technology tools in their entire way of life.

TEACHERS AND INSTRUCTIONAL APPLICATIONS OF ICTS

Many different types of technology can be used to support and enhance learning. Everything from video content and digital moviemaking to laptop computing and handheld technologies has been used in classrooms. Similarly, new uses of technology such as pod casting are constantly emerging (Marshall, 2002). To Marshal, various technologies deliver different kinds of content and serve different purposes in the classroom. Word processing and e-mail promote communication skills; database and spreadsheet programmes promote organizational skills; and modelling software promotes the understanding of Science and Mathematics concepts. It is important to consider how these electronic technologies differ and what characteristics make them important as vehicles for education (Berker, 1994).

Technologies available in classrooms today ranges from simple tool-based applications (such as word processors), to online repositories of scientific data. Others are primary historical documents, handheld computers, closed-circuit television channels, and two-way distance learning classrooms. Prensky (2005) asserts that even the cell phones that many now carry with them can be used to learn. According to Lei and Zhao (2006) each technology is likely to play a different role in students learning. Rather than trying to describe the impact of all technologies as if they were the same, researchers need to think about what kind of technologies are being used in the classroom and for what purposes. Two general distinctions could then be observed from the literature. Students can learn from computers where technology are used essentially as tutors and serve to increase student's basic skills and knowledge. Moreover, they can learn with computers where technology is used as tool that can be applied to a variety of goals in the learning process and can serve as a resource to help develop higher order thinking, creativity and research skills (Reeves, 1998; Ringstaff and Kelley, 2002).

According to Murphy, et al., (2001), the primary form of student learning from computers is described as Discrete Educational Software (DES), Integrated learning system (ILS), Computer-assisted Instruction (CAI), and Computer-based instruction (CBI). These software applications are also the most widely available applications of educational technology in schools today, along with word-processing software, and have assisted in classroom for more than 20 years (Becker, Ravity and Wong, 1999). Murphy et al., (2001) explains that teachers use DES not only to supplement instruction, as in the past, but to introduce topics, provide means for self study, and offer opportunities to learn concepts otherwise inaccessible to students. The software also

manifests two key assumptions about how computers can assist learning. First, the users' ability to interact with the software is narrowly defined in ways designed specifically to promote learning with the tools. Second, computers are viewed as a medium for learning, rather than as tools that could support further learning.

As DES is recognised as the commonly used approach to computer use in student learning, in more recent years, use of computers in schools has grown more diversified as educators recognize the potential of learning with technology as a means for enhancing students reasoning and problem solving abilities. Zhang (2005) notes that "this shift which has been driven by the plethora of new information and communication devices now increasingly available to students in school and at home, each of which offers new affordances to teachers and students alike for improving student achievement and for meeting the demand for 21st century skills." It should be noted at this juncture that there appear to be three main approaches to ICT taken by teachers according to (UNESCO, 2004). These are:

Integrated approach: planning the use of ICT within the subject to enhance particular concepts and skills and improve students' attainment. This involves a careful and considered review of the curriculum area, selecting the appropriate ICT resource which will contribute to the aims and objectives of the curriculum and scheme of work, and then integrating that use in relevant lessons.

Enhancement approach: planning the use of an ICT resource which will enhance the existing topic through some aspect of the lessons and tasks. For example, using an electronic whiteboard for presenting theory about a topic. In this approach, the teacher plans to complement the lesson with an innovative presentation method to promote class discussion and the visualisation of problems.

Complementary approach: using an ICT resource to empower the pupils' learning, for example by enabling them to improve their class work by taking notes on the computer, or by sending homework by email to the teacher from home, or by word processing their homework. All three approaches can enhance attainment, but the effects may be different. In the integrated approach, students' learning is enhanced because they are confronted with challenges to their existing knowledge and given deeper insights into the subject being studied. The enhancement approach could improve students' learning through presenting knowledge in new ways, promoting debates among students, and encouraging them to formulate their own explanations. The complementary approach draws on the approach that suggests that learning can be enhanced by reducing the mundane and repetitive aspects of tasks such as writing essays and homework by hand, freeing the learner to focus on more challenging and subject-focused tasks (Kemmis et al., 1977 in UNESCO, 2004). These different types of use require the teacher to have an extensive knowledge of ICT and to be able to fit its use either into their existing pedagogy or to extend their pedagogical knowledge so they can accommodate ICT effectively in their teaching

FACTORS CONTRIBUTING TO USING ICT IN THE CLASSROOM

According to Cox, Preston and Cox (1999), there are a number of factors which have been identified which might influence and support teachers in using ICT in the classroom. In order to investigate these factors further in relation to teachers' ICT use, the study make use of the technology acceptance model TAM developed by Davis, Bagozzi and Warshaw (1989) which was an adaptation of theory of reason action by Ajzen and Fisbein (1980) to investigate the reasons why teachers use ICTs. Their model, shown in Figure 1, links the perceived usefulness and ease of use with attitude towards using ICT and actual use (system use). They tested this model with 107 adult users, who had been using a managerial system for 14 weeks. They found that people's computer use was predicted by their intentions to use it and that perceived usefulness was also strongly linked to these intentions.

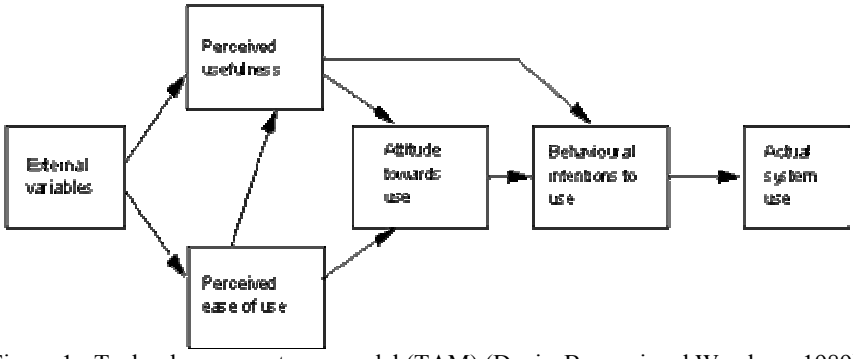

Figure 1 - Technology acceptance model (TAM) (Davis, Bagozzi and Warshaw, 1989)

External variables

In TAM, the external variables represent the many influences on teachers which come from outside their sphere of control. These will include:

the requirements of a national curriculum or national guidelines; the changes in society with the rapid growth in the uses of the Internet and ICT in general; school policies on using ICT; opinions of colleagues; responsibilities of the teacher; pressure from parents and students; the influence of the local education authority. Although these have been identified as very important by a number of research studies, in leading teachers to understand the need for change and to question their professional practice, discussed earlier, only a few could be investigated within the scope of this project. The main focus of this research is how teachers perceive ICT's contribution to teaching and learning. These factors come within Davis et al's perceived usefulness and perceived ease of use components.

PERCEIVED EASE OF USE

From previous studies there are a number of factors which have been identified which relate to the perceived ease of use of ICT, which in our case is for experienced practicing ICT/IT users. The Impact project (Watson, 1993) and other studies identified a wide range of skills and competencies which teachers felt they needed in order to find ICT easy to use. Some of these are given in Table 1 below.

Table 1 - Positive and negative factors influencing perceived ease of use

Positive factors	**Negative factors**
regular use and experience of ICT outside the classroom	difficulties in using software/hardware
ownership of a computer	need more technical support
confidence in using ICT	not enough time to use ICT
easy to control the class	is too expensive to use regularly
easy to think of new lesson ideas	insufficient access to the resources
can get help and advice from colleagues	restricts the content of the lessons

Source: Cox, Preston & Cox, (1999).

PERCEIVED USEFULNESS

If teachers see no need to question or change their professional practice according to TAM then they are unlikely to adopt the use of ICT. However, if they perceive ICT to be useful to them, their teaching and their students' learning, then according to the empirical evidence of previous studies (Cox, Preston and Cox, 1999) they are more likely to have a positive attitude to the use of ICT in the classroom. In the review of literature a number of factors which will contribute to teachers' perceived usefulness of ICT were identified. Some of these factors are given in Table 2 below.

Table 2 - Positive and negative factors influencing perceived usefulness

Positive factors	**Negative factors**
makes my lessons more interesting	makes my lessons more difficult
makes my lessons more diverse	makes my lessons less fun
has improved the presentation of materials for my lessons	reduces pupils' motivation
Gives me more prestige	impairs pupils' learning
makes my administration more efficient	restricts the content of the lessons
Gives me more confidence	is not enjoyable

makes the lessons more fun	takes up too much time
enhances my career prospects	is counter-productive due to insufficient technical resources
help[s me to discuss teaching ideas	

Source: Cox, Preston & Cox (1999).

Teachers' attitudes to many of these factors will depend upon how easy they perceive using ICT to be on a personal level as well as for teaching in the classroom. According to Davis et al's technology acceptance model shown in Figure 1, the more positive the responses to the above factors of perceived usefulness and perceived ease of use, then the more positive the attitudes of teachers will be to the use of ICT and the more likely they will be to use ICT in their teaching.

STUDIES ON TEACHERS USES OF ICTS

Previous studies into teacher use of ICTs have identified staff development as one of the contributing factors in using ICT effectively in the classroom. McCarney (2004) gave a report on an investigation into effective staff development in ICT for teachers. A sample of Scottish primary school teachers have been surveyed to investigate the impact of different models of staff development in ICT on the teacher and to explore the knowledge and skills gained by teachers from staff development: technical; academic/content-related; pedagogy. The results indicate the need for a much greater emphasis to be placed on the pedagogy of ICT. This should be of interest to all involved in teacher education and the continuing professional development of teachers.

Moseley et al. (1999 in UNESCO, 2004), in a study of primary school teachers known to be achieving either average or above average gains on measures of relative attainment by pupils, that focused on pedagogy using ICT. Observations showed that the most successful teachers were those who used examples and counter-examples and involved students in explaining and modelling in the class. Teachers who favoured ICT were likely to have well-developed ICT skills and to see ICT as an important tool for learning and instruction. They were also likely to value collaborative working, enquiry and decision making by students. Teachers' pedagogical approaches are in turn affected by a number of key factors. First, they are affected by knowledge about their own subject. There is a clear distinction between teachers who choose ICT resources to fit within a particular topic and those who choose resources merely to present pupils' work in a new way, without any direct application to the topic. The evidence shows that when teachers use their knowledge both the subject and also how students understand the subject with their use of ICT have more direct effect on students' attainment.

Cox et al., (1999) report findings of a small project funded by the Teacher Training Agency and Oracle through the MirandaNet project, set up to investigate the factors which have contributed to the continuing use of ICT by experienced ICT and ICT teachers in their teaching. Evidence has been collected through a literature search, teacher questionnaires, teachers' reports and interviews. The factors which were found to be most important to these teachers in their teaching were: making the lessons more interesting, easier, more fun for them and their pupils, more diverse, more motivating for the pupils and more enjoyable. Additionally, more personal factors were improving presentation of materials, allowing greater access to computers for personal use, giving more power to the teacher in the school, giving the teacher more prestige, making the teachers' administration more efficient and providing professional support through the Internet.

Gray and Souter (2004) in a study of secondary science teachers use of ICT conducted in America focuses on the data from one aspect of the use of ICT in secondary subject areas, and the perceptions of teachers in these areas. A comparison of science teachers' perceptions is made with teachers from other disciplines. Although the responses of biology teachers could be analysed the numbers in the study were quite small overall so a general view is taken across the three science disciplines of biology, chemistry and physics. Examination of the data indicated that, relative to other subject teachers, science teachers came out positively with regard to use of and confidence in ICT. However, in absolute terms although the availability of computing facilities was reportedly quite high, actual level of use was quite low. In addition, where level of use was higher, it was with regard to a rather narrow range of applications, particularly word-processing. In addition, little was reported in the way of pupil use of ICT in science classes. Although there appeared to be an awareness of the potential for ICT in science, teachers indicated that they did not see the introduction of ICT radically changing the way in which teaching took place, nor changing the teacher-student relationship. Science teachers were reasonably confident in their use of ICT but felt that they needed much more in the way of support and professional development to maximise their use of ICT in the classroom.

The Gordon University Aberdeen (2004) in a study conducted in Scotland on teachers' ICT skills and knowledge need reported that the use of ICT is relatively low and is focused on a fairly narrow range of ICT. Word processing is the predominant use made of ICT in primary and secondary schools. There is some use of externally produced educational software in both sectors and secondary teachers tend to use a broader range of generic packages such as spreadsheets and DTP than do primary teachers. There is very little use of the Internet and WWW or e-mail by either primary or secondary teachers, despite the fact that the majority of secondary schools have access to the Internet. Resources such as video conferencing and network computer conferencing are rarely used. The study further revealed that primary teachers use ICT primarily to support classroom practice; secondary teachers use it as much or more for professional development and personal use as in the classroom. Teachers are using ICT throughout the curriculum but use and attitude varies in secondary schools between subject areas. Mathematics and science teachers use ICT relatively little while, amongst non-computing teachers, ICT is used most by teachers of business and management subjects.

Having review relevant literature on this study, the focus still remain to examine the teachers use of ICT from a population of Nigeria secondary school teachers where study of this nature has just begin to emerge. To achieve the stated objective of the study, the following research questions were developed to guide the study.

1. Which ICTs do teachers have access to in their schools and what is the frequency of their access per week?
2. What is the adequacy level of the various aspects of ICT availability/ access in respondents' schools?
3. What are the factors hindering teachers' readiness and confidence in using ICT?
4. What is the teachers' perception about the perceived ease of using ICT?
5. What is the teachers perception about the perceive usefulness of ICT?

METHODOLOGY

Design

This study employed a descriptive survey method. This method was used to allow the researcher a vivid description of how Nigeria secondary school teachers are making use of ICTs.

Population and Sample

The population of this study comprised all private secondary school teachers in Ibadan, the capital of Oyo state Nigeria where the study was conducted. Twenty five private secondary schools were purposefully selected. From the selection, a census of teachers in each of the school was taken. These gave a total of 700 teachers which consists of 430 males and 270 females. Their age ranged between 25 – 45 years with a mean age of 35 years.

Instrument

A modified instrument tagged Teachers ICT use survey adapted from ICT survey indicator for teachers and staff by UNESCO (2004) and ICT Teachers Survey by New Zealand Ministry of Education MINEDU (1999) was used to gather data on the study. The instrument consists of two sections. The section 1 request the respondents' demographic information like age, sex, name of school, the class taught etc. The second section contains the items. These are 10 in number. Respondents were required to respond to items 1-8 by ticking as applicable. While item 9 and 10 are likert type response format in which the respondents were to choose from strongly agree, agree, neutral, disagree, and strongly disagree. To ascertain the reliability of the instrument after modification, it was administered on 50 respondents which were not part of the sample using test- retest method. The reliability co-efficient trough a cronbach alpha yielded an $r = 0.82$.

Procedure

All the 700 censured teachers were administered the Teachers ICT use survey in their respective schools with the permission granted by the various authorities of the schools. The administration took place after the school hour in each of the school. The entire respondents were informed about the date of the exercise in advance. A day was allocated for a school. This mean 25 days was used to cover all the schools where the respondents were selected. Out of the 700 instrument administered, only 620 were valid for the analysis.

Method of data Analysis

Data collected on the study were analyzed using frequency count and percentages.

Results

The results of the analysis are presented in the tables below:

Research Question 1: Which ICTs do teachers have access to in their schools and what is the frequency of their access per week? To answer this question teacher were asked to identify the type of ICTs and their frequency of

access to them. This was to determine the type of ICTs teachers have access to in their various schools and the frequency of their access to these ICTs per week. The result is presented in Table 1a and 1b.

Table 1a: Teachers Access to ICTs

ICTS	No of response	%
Computers	378	61.0
E-mail	-	-
Internet	-	-
Digital camera	62	10.0
Scanner	48	7.7
Video equipment	74	11.9
Data projector	58	9.4
Total	**620**	**100.0**

Table 1a above shows that 378 (61%) of the teachers who took part in the study indicate computer is the type of ICTs they have access to in their schools. The table also shows that 74 teachers (11.9%) indicate they have access to video equipment and 62 teachers (10%) indicate they have access to digital cameras. No teacher indicate having access to the Internet and e-mail. The result indicates that respondents have access to ICTs except that they do not have access to e-mail and the Internet this may be because their schools are not connected.

Table 1b: Teachers frequency of access to ICTs

Hours of Access/ week	No of response	%
0 – 5 Hours	184	29.7
6 – 10 Hours	102	16.7
11 – 15 Hours	188	30.3
16 – 20 Hours	84	13.5
21 Hours above	62	10.0
Total	**620**	**100.0**

Table 1b above shows that the majority of the teachers 188 (30.3) access ICTs in their schools between 11 – 15 hours per week. The table also reveals that 184 teachers (29.7%) access ICTs between 0 – 5 hours per week. Only 10% of the teachers access ICTs 21 hours and above per week. This indicates that teachers have access to ICT I their various schools only that variation exist in the frequency to which they access them.

Research Question 2: What is the adequacy level of the various aspects of ICT availability/ access in respondents' schools? To answer this question respondents were asked to rate the adequacy of various aspect of ICTs availability in their schools on a five point scale. The result is presented in Table 2.

Table 2: ICTs adequacy and availability/ access

Ratings	Computer hardware	Software	Computer consumable	ICT technical Support	Internet Access	Others e.g. Data projector,Digital camera etc
Very good	34	29	31	12	0	27
Good	30	26	29	14	0	29
Satisfactory	28	25	28	20	0	30
Poor	5	12	8	35	44	10
V.poor/ Non existence	3	8	4	29	58	4

Table 2 shows that computer hardware, software, consumable and others received higher rating of very good, good and satisfactory than ICT technical support and Internet access.
This indicates that technical support and Internet access are lacking. This may be due to non existence of the Internet and non availability of ICT technician in the country generally.

Research Question 3: What are the factors hindering teachers' readiness and confidence in using ICT? Teachers were asked to identify factors hindering their readiness and confidence of using ICTs. The purpose was to know the factors hindering their readiness in using ICTs in their teaching. The result is presented in Table 3.

Table 3: Factors hindering teacher's readiness and confidence of using ICTs

Problems	No of respondents	%
Teachers lack of expertise with ICT	210	33.8
Lack of confidence in using ICT	47	7.6
Insufficient knowledge of appropriate software	133	21.5
Insufficient knowledge of how to use ICT equipment	70	11.3
Lack of knowledge of how to evaluate the use and the role play by ICT in teaching and learning.	160	25.8
Total	**620**	**100**

Table 3 shows that the most prominent factor hindering teacher's readiness and confidence in using ICT is lack of expertise. This is indicated by 210 teachers (33.8%). Furthermore, lack of knowledge on how to evaluate the use and role play by ICT in the teaching and learning at the secondary school level was identify as another factor by 160 teachers (25.8%). The result also reveals that 133 teachers (21.5%) indicated insufficient knowledge of appropriate software as factor hindering the readiness of using ICT.

Research Question 4: What is the teachers' perception about the perceived ease of using ICT? Respondents were asked to rate themselves on the items provided on the perceived ease of using ICT. The purpose was to determine how easier teachers perceive the use of ICT during their lesson. The result is presented in Table 4.

Table 4: Teachers perceived ease of using ICT

S/N	Perceived ease of use items	SA	A	N	D	SD	Total
1	Using ICT makes it more difficult to control the class.	15	24	32	189	360	620
2	ICT makes the lesson more difficult.	9	6	40	248	317	620
3	ICT makes preparing the lesson more difficult.	2	6	8	291	313	620
4	Hardware and software problems often disrupt the lesson.	8	12	19	284	297	620
5	Using ICT in teaching is expensive.	7	12	17	271	312	620

Result in table 4 shows that more teachers strongly disagree and disagree than those strongly agree and agree with the perception that using ICT makes it more difficult to control the class. In other words, the number of teachers who strongly disagree and disagree on all other items on perceived ease of using ICT is more than the numbers of those strongly agree and agree on the items. This means that the reverse is the case. That is to say that the teachers perceived ICT as very easier to use in teaching their lesson.

Research Question 5: What is the teachers perception about the perceive usefulness of ICT? Teachers were asked to rate themselves on the perceived usefulness items of ICT during their lesson. This is to determine how useful teachers perceived the use of ICT during their lesson. The result is presented in Table 5.

Table 5: Teachers perceived usefulness of ICT

S/N	Perceived usefulness items	SA	A	N	D	SD	Total
1	Using ICT makes lesson more interesting.	323	201	62	20	14	620
2	Using ICT in my teaching is not enjoyable.	6	14	10	287	302	620
3	Using ICT makes lesson more fun.	295	286	11	17	11	620
4	Using ICT makes lesson more diverse.	264	246	52	36	22	620
5	Using ICT improves presentation of materials.	306	212	54	38	10	620
6	Using ICT makes lesson more difficult.	22	38	100	187	283	620
7	Using ICT reduces pupils' motivation.	8	20	68	213	311	620
8	Using ICT impairs pupils' learning.	7	14	47	256	296	620

The result in table 5 shows that 323 and 201 teachers strongly agree and agree that using ICT makes lesson more interesting. This is greater than the number of those strongly disagree 14 and disagree 20. Furthermore, the result shows that 295 teachers strongly agree and 286 agree that using ICT makes lesson more fun. This is more than the number of teacher who strongly disagree 11 and disagree 17. It is also shown from the table that 264 teachers and 246 strongly agree and agree that using ICT makes lesson more diverse. This is more than the numbers of those strongly disagree and disagree. Additionally, 306 and 212 teachers indicate that using ICT

improves presentation of materials during their lesson. This also is greater than 10 and 38 teachers who strongly agree and agree with this statement.

On the other hand, 6 teachers indicate strongly agree to the statement that using ICT in their teaching is not enjoyable with another 14 indicate agree respectively. Contrarily, 302 and 287 teachers indicate they strongly disagree and disagree with the statement. The results on the table further indicate that more teachers strongly disagree and disagree that using ICT makes lesson more difficult, reduces students' motivation and impairs students' learning than the numbers of those strongly agree and agree with the statements. The results in table 5 generally indicate that teachers perceived the use of ICT as been very useful in n their teaching and similarly contributing a lot to the performances of the students.

DISCUSSION OF FINDINGS

On the issue of access to ICT in the respondents various schools, the result generally showed that aside of other identified ICTs, it's only the Internet and e-mail facilities that respondents didn't have access to. This is in agreement with the report by Gordon University Aberdeen, Scotland that teachers reported less use of the Internet and e-mail. This result may be due to the fact these facilities are not available for access or perhaps the teachers lack the skills to access them. Moreover, some government considers providing Internet connectivity in schools as being expensive and difficult to maintain. However, providing Internet connectivity should not be seen in this way considering the plethora of information that can be accessed by the teachers and how this could be of immense help to facilitate knowledge delivery and students learning.

On frequency of access, the result generally shown that a considerable number of teachers access ICT between 11- 15 hours per week. This is an indication that using ICT by the Nigeria secondary school teachers is relatively high. This corroborates the report by (Gray and Souter, 2004) that teachers came out positively with regards to the use of ICTs. It also confirms the assertion that availability usually determines access. If the ICTs are available, this will motivate the teachers to access them than when they are not available or available but not in sufficient quantity and quality. Similarly, Cox et al, (1999) identified factors which were found to be most important to teachers in their teaching which include: making the lessons more interesting, easier, more fun for them and their pupils, more diverse, more motivating for the pupils and more enjoyable. Additionally, more personal factors were improving presentation of materials, allowing greater access to computers for personal use, giving more power to the teacher in the school, giving the teacher more prestige, making the teachers' administration more efficient and providing professional support through the Internet. All these may be responsible for the relatively high use of ICT by Nigeria teachers.

The study also shows that ICT technical support and Internet facility are lacking in all the respondents schools, while other facilities like hardware, software, computer consumables and other ICT equipment like digital camera and data projector are adequate and available. The report by Gordon University Aberdeen (2004) that teachers were reasonably confident in their use of ICT but felt that they needed much more in the way of support and professional development to maximise their use of ICT in the classroom support the present findings. The lack of ICT technical support therefore may be attributed to limited number of people who are professional in the use of ICT equipments, couple with the fact that integration of ICT in the school curriculum in Nigeria and Africa generally has just begin. People just begin to develop interest in the area and take it as chosen field of study. It is assumed that at the passage of time more expert and ICT technician will begin to emerge. It should be noted that when planning introduction of new technology or when it is being used and implementing technical support or support services generally are very important. It is important to bear it in mind that it is not every user or every member of the social system where new technology is being used that have good knowledge of using the new technology. This is the more reason why support services need to be provided particularly for those who have less or no knowledge of the technology and how it works. Not this alone, the people with lesser knowledge or no knowledge at all will have the opportunity of being trained by the technical support staffs. This argument is line with the step taken by the University of Botswana where e-learning has been introduced to complement teaching and learning. The e-learning support staffs are charged with the responsibilities of providing assistance to the tutors on how to teach their students through this medium and how to train those who do not have the knowledge of teaching through electronic medium. Courses were developed in categories and certificates are awarded based on the completion of each stage (Gachago and Mafote, 2007).

The finding that teacher's expertise and lack of knowledge to evaluate the use and role of ICT in teaching as the two prominent factors hindering teacher's readiness and confidence in using ICT support. Similarly, (JISC, 2004) in their study on developing maturity in learning technology revealed that the most significant barriers identified are linked to staff attitude and training staff in the use of ICT, access and ICT skill in general. Moreover (Marshall, Elgort & Mitchell, 2003) reported similarly that staff continues to identify a lack of time as

a barrier to the use of technology. While this has been interpreted to mean that staff have not have had the time to acquire the necessary skills in the use of technology in teaching, it now seems more likely that it reflects a sense of priority conveyed by the institution and a desire by academics to see a return on the investment of their time in developing their teaching delivery with technology. Previous surveys of academic staff attitudes to the use of technology have also repeatedly identified time and an absence of such examples (e.g. skills and knowledge) as significant barriers to technology adoption (Marshall, 2000).

The perception of ICT as been easier to use by teachers in this study is also relevant to the findings by Cox et al. (1999). This is due to the fact that all factors teachers consider as making it easier to use ICTs was considered by Cox et al. as contributing to the continuous use of ICT by teachers in their study, and which were also found to be most important to these teachers in their teaching. The factors are: making the lessons more interesting, easier, more fun for them and their pupils, more diverse, more motivating for the pupils and more enjoyable among others. Additionally, it should be noted that in Technology Acceptance Model by (Davis et al., 1989), one of the basic theme examined was perceived ease of use. This according to Davis usually influence people acceptance to use a particular technology. Hence, the result of this study actually agrees with TAM position. This is to say that the easier teachers in this study perceived the use of ICT the in their teaching the more they increase its use.

Teachers also perceived ICT as being very useful on this study. This may be connected to the fact that it is perceived as improving learner's performance; and more so that teachers are affected by knowledge about their own subject. There is a clear distinction between teachers who choose ICT resources to fit within a particular topic and those who choose resources merely to present pupils' work in a new way, without any direct application to the topic. The evidence shows that when teachers use their knowledge both the subject and also how pupils understand the subject with their use of ICT has a more direct effect on pupils' attainment (Moseley's et al., 1999). This lends a good credence to the present finding on this study. This is also in agreement with the second position of TAM by (Davis et al., 1989) that the useful user perceives a particular technology the better they engaged in its use.

CONCLUSIONS AND IMPLICATIONS

The use of information communication tools such as e-mail, fax, computer and video conferencing have made it possible to overcomes barriers of space and time, and opens new possibilities for learning. The use of such technology is increasing, and it is now possible to deliver training and teaching to a widely disperse audience by means of on-demand two-way video over terrestrial broadband networks. There is now an increasing awareness regarding the potentials of ICTs in learning. Many private and public secondary schools in the country are now infusing ICT into their teaching activities. The race has become rather dramatic because the students seem to be leading the teachers in e-capabilities. The computers and Internet facilities in the homes of the affluent students complemented by the cybercafé proliferating the entire country have provided hundred of thousands of Nigerian secondary school students an unprecedented opportunity to join millions of their colleagues around the globe to surf and navigate.

Meanwhile, this study has shown generally that ICT now have far reaching implications in teaching and learning at the secondary school level in Nigeria. This is because teachers themselves have now perceived it usefulness. However, we should not forget the fact that it's not every teacher in the country today that is now applying the use of ICTs during the lesson. The need for further development and use among teachers particularly at this level is highly necessary. In the light of this therefore, it is recommended that: employers of teachers and teachers themselves should take advantage of the several on-going in-service training on ICT by participating with enthusiasm and partnering with organizers to expand the tenure of such training or workshops. It is shown in this study that all the respondents were selected from private schools. This indicates that proprietors of these schools are really putting up effort in providing ICT equipment in their schools. It wont be out of place however, if the ministries of education and local government education authorities provide computers, Internet and other ICT infrastructure in all the government own schools so as to encourage teachers to use them. Teacher training and professional development oriented policies should support ICT-related teaching models that encourage both students and teachers to play an active role in teaching/learning activities. Emphasis must be placed on the pedagogy behind the use of ICTs for teaching/learning. Teachers need to adopt, develop and support a pedagogic culture that develops supportive practices for students' and encourages own theories in teaching/learning activities. It should be linked to the development of life-long learning and professional practices that enable teachers to keep in touch with ICT developments, new knowledge and research on teaching/learning.

It is worthy to note some of the limitations of this study. First, it is limited to secondary schools in Nigeria. This is because its drew sample from among private secondary school teachers. This means that findings of the study

are expected to be applied to only similar environment. Secondly, the sample used in the study was drawn from a state out of the 36 states of Nigeria. In the light of these, future research should try and build on the limitations of this study by expanding its scope to cover more states. Effort should as well be made to compare ICT availability and use among teachers in private and government own secondary schools in the country.

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ATTITUDES OF EFL LEARNERS TOWARDS THE INTERNET

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ABSTRACT
Related literature indicates that the Internet has an important role and great potential in foreign language learning. It is also obvious that attitudes of learners affect learning process significantly. This study aimed to investigate the attitudes of foreign language learners and to find the relationship between attitudes and subject variables. A background questionnaire, a test on Internet information and a survey were administered to 115 foreign language learners. Data gathered were analyzed statistically. The results showed that EFL learners had positive attitudes towards the Internet except some items such as addiction, socialization and shopping. It was implicated that positive attitudes would contribute to foreign language learning via the Internet after overcoming some potential problems and disadvantages.

Key Words: Attitude, English as Foreign Language, the Internet

INTRODUCTION

Learning a foreign language depends on some reasons such as school curricula, need of advancement in professional life, living in a target community permanently or temporarily, interest in different cultures and some specific purposes (Harmer, 1991). Depending on the goals of language teaching, students are expected to be proficient in pronunciation, grammar, vocabulary, discourse and language skills in target language. However, it is not possible to say that language learning environment always provides learners real and natural settings. For example, EFL learners in Turkey, except the ones at schools that apply intensive language classes, try to learn English in teacher-centered, examination-oriented and textbook-based environments in crowded classrooms. Consequently, decontextualized language knowledge that they acquire not only prevents learning and using language but also causes negative attitudes towards language learning. As a final point, it is clear that one of the ways to overcome the difficulties in EFL learning is to teach them language in real and natural environments.

The Internet, today, has an important role and great potential in foreign language learning and teaching. Yang and Chen (2007) summarize the advantages of Internet use in EFL learning in a general sense:

> "The Internet enables English learners to access useful language resources and communicate directly with native English speakers. … Learners can practice applying information and overcome the decontextualized predicament of English learning. Students can learn listening, speaking, reading and writing English integratively via real-world situations."

In addition to the statements given above, some more specific aspects of Internet use in EFL learning can be mentioned. First, the Internet increases language use (Kasanga, 1996), enhances synchronous and asynchronous communication of language learners (Kern, 1995; Warschauer and Healey 1998), and helps them to use language in real communication situations (Wiburg and Butker Pasceo, 2002). In sum, communication via the Internet allows learners practice and use their language skills. Second, the Internet changes the interaction between language learners and teachers (Kern, 1995). That is, it changes teacher and students' roles (Peterson, 1997), makes learning more student-centered (Means and Olson, 1997), and increases participation (Warschauer, Turbee, and Roberts, 1996) as there is less teacher and more learner talk in computer classes. Third, the Internet is a potential source authentic materials. It is useful and easy to retrieve, access and use information in the context of foreign second language learning. Fourth, in addition to the benefits of Internet use in EFL learning, these concerns are also significant: The Internet gives the opportunity to learn about target culture, improves higher thinking (Mike, 1996) and computer skills (Means and Olson, 1997), makes learners have a great variety of speech discourse (Sullivan and Pratt, 1996), makes learners use more complex language (Warschauer, 1996). Consequently, it can be said that the Internet has brought new dimensions and opportunities to foreign language learners in the aspects of communication, classroom interaction and authentic materials. In other words, the Internet has been a chance for EFL learners to improve their discourse, grammar, vocabulary and language skills in a real and natural environment. However, efficient use of the Internet as a real environment in EFL learning is

closely and directly related to the attitudes of EFL learners towards it. To be brief, achievement in EFL learning via the Internet depends on the positive attitudes of learners.

Related literature indicates that foreign language learners usually have positive attitudes towards the Internet. In an analysis (Slate, Manuel and Brinson, 2002) of learners' views on Internet use for educational purposes, it was found that language used was a significant variable that affected their attitudes towards Internet use. In the same study, gender was also a significant subject variable that affected attitudes towards the Internet. In Usun's survey study (2003) that aimed to investigate the attitudes towards educational uses of the Internet, 207 undergraduate students who had must EFL courses were used as sample group. The participants mostly had positive attitudes towards Internet use. In another study (Ministry of Education and Science of Ukraine, 2003), it was noted that 71% of the ESP learners had positive attitudes towards the Internet while only 43% of teachers admitted its usefulness. In one of the studies conducted in Turkey (Isman and Dabaj, 2004), the results indicated students at graduate and postgraduate levels had positive attitudes towards the Internet. This study was significant since EFL was a must course for undergraduate students in the sample group. In a study conducted by Asan and Koca (2006), it was found that the majority of the students have positive attitudes. However, it should be noted that 77 of the 667 students in the sample group of the study were Language Center students. Since there was no significant difference between institutions based on the students responses, it could be said that foreign language learners had positive attitudes towards the Internet. In another study (Yang and Chen, 2007) that focused on the integration of Internet tools in language learning activities, it was found that the Internet increased learning possibilities. 44 male students liked and approved EFL learning using the Internet but had different opinions about its benefits. With respect to the attitudes of EFL learners towards the Internet, the findings indicated that learners were positive about the potential of the Internet. To sum up, though the studies show that learners have positive attitudes toward the Internet, it is necessary to emphasize that there is not a study in which only EFL learners were used as sample group.

This study was guided by two reasons: First, it seems significant to investigate attitudes of EFL learners towards the Internet that can be used as a real environment in EFL learning and teaching. That is, though the Internet has certain advantages in foreign language learning and teaching, it is clear that attitudes may affect learning level positively or negatively. Additionally, increase in achievement and proficiency in foreign language via the Internet is closely and directly related to attitudes of learners. Second, the studies on the issue in Turkey consisted of sample groups in which some part are foreign language learners. In other words, there has not been a study that investigated attitudes of students as only EFL learners yet. Depending on these concerns, the study has two research questions: What are the attitudes of EFL learners toward the Internet? Is there a relationship between the attitudes towards the Internet and some subject variables?

METHOD

Sample group of the study consisted of 115 students at English Language Department of Balikesir University. Mean of the participants' age, with the range between 17 and 24, was 19.8. In Table 1, distribution of the students according to age, gender, grade, places they live and the types of high schools they graduated from were given in number and percent.

Table 1. Distribution of participants according to some variables

Variables		N	%
Age	17	3	2.6
	18	22	19.2
	19	20	17.4
	20	32	27.8
	21	30	26.1
	22	6	5.2
	23	2	1.7
Gender	Male	25	21.7
	Female	90	78.3
Grade	1	31	27.0
	2	27	23.5
	3	30	26.1

	4	27	23.5
Place where they live	Dormitory	44	38.3
	Home with mates	40	34.8
	Home with parents	31	27.0
High school they graduated	Super	44	38.3
	Anatolian	71	61.7

Mean score of the Foreign Language Examination, an official selection and placement test that is administered once a year was 360.6. The participants stated that they spent 286 YTL (158 Euro) a month. They have been using the Internet 1.88 hour a day while they have been familiar with it for 4 years. Lastly, more than half of the students' fathers were public employees while their mothers were mostly housewives, as seen in Table 2.

Table 2. Sectors of participants' parents

Sectors	Father		Mother	
	n	%	N	%
Public	61	53.0	17	14.8
Industry	18	15.7	1	0.9
Education	11	9.6	2	1.7
Trade	14	12.2	-	-
Agriculture	10	8.7	1	0.9
Engineering	1	0.9	-	-
None	-	-	93	80.9
Health	-	-	1	0.9

The instruments used to gather data consisted of a test, a background questionnaire and a survey. The test with 20 items aimed to measure information level of the students on the Internet. The background questionnaire asked students' age, gender, grade, where they live, which high school they graduated from, score of Foreign Language Examination, how much money they spend a month, how long they use Internet a day, how many years they are familiar with it, and the sectors in which their parents were employed. In addition, it asked if they have computers, Internet connection, Internet instruction and how often and where they used the Internet. The survey (Alpha=0.77), adapted from *Tendency towards Internet* designed by Kilincoglu and Altun (in Isman, 2004), contained 21 items in Likert type (*strongly agree=5, agree=4, undecided=3, disagree=2, strongly disagree=1*) and aimed to measure the degree of the attitudes of the subjects toward the Internet (See Appendix 1).

The author administered the test during the second week of the semester. The background questionnaire and survey were administered in the following week. Next, the data were analyzed with the aid of SPPS in two steps. First, the frequencies were found for the survey questions. Then, the values of ANOVA and independent samples tests were computed in order to see the correlations between the dependent and independent variables. In the study, the dependant variables were 21 items in the survey while the independent variables were age, gender, grade, places they live, types of the high schools they graduated from, Foreign Language Exam scores, amount of money they spend in a month, the duration of Internet use a day, Internet familiarity in years, sectors of the participants' parents, information level on the Internet, computer ownership, Internet connection, Internet instruction, the frequency of Internet use in hours, and the places they use it.

FINDINGS

Statistical findings in the study can be divided into three sections. The first section gives the findings on computer availability, Internet connection and instruction, the frequency of Internet use, place used Internet and Internet test results. In the second section, the findings on the attitudes of the subjects towards the Internet are presented. The third section presents the relationship between their attitudes and the independent variables.

According to the findings given in Table 3, more than half of the participants have their own computers while only 27% of them have Internet connection. The values also indicate that 67.8% of the students have not had any

Internet instruction. Most of the learners say they used the Internet today or a few days ago. However, 67% of the students state that they use the Internet at Internet cafes. Additionally, the mean of the test used to measure their information level on Internet use is 51.5 in the scale of 100. The range of the test is between 0 and 90 while standard deviation was 17.9.

Table 3. Computer availability, Internet connection and instruction

Variables		n	%
Computer availability	Yes	49	42.6
	No	66	56.4
Internet connection	Yes	31	27.0
	No	84	73.0
Internet instruction	Yes	37	32.2
	No	78	67.8
Frequency of Internet use	Today	36	31.3
	A few day ago	59	51.3
	Last week	10	8.7
	Last month	3	2.6
	More than one month	7	6.0
Place	Home	27	23.5
	School	2	1.7
	Internet Café	77	67.0
	Dormitory	6	6.1

As seen in Table 4, findings show that the participants' attitudes vary in the statements in the survey. The students believe mostly that the Internet is a universal library, the fastest way to teach knowledge, a place that creates close relationship among societies, an effective training tool and a way to provide learning for people in order to search. Most of them think that it is exciting to get information about the Internet and vital to enhance exchanging cultures. For them, the Internet provides an easy life while they do not believe that it includes unnecessary, non-useful information, causes destroyed societies, and creates cultural dilemma. On the other hand, the values indicates that the subjects believe that it causes to be far away from real life, creates addiction, and forces people to be alone. They do not think the Internet can provide stable friendship by chatting and endless freedom to people. The participants also believe that chatting prevents to be socialized. Lastly, they do not find safe shopping at the Internet.

Table 4. Attitudes towards the Internet

Statements	Strongly agree and agree		Undecided, disagree and strongly disagree	
	N	%	N	%
Internet is a universal digital library.	112	97.4	3	2.6
Internet provides easy life.	111	96.5	4	3.5
Internet is a fastest way to reach knowledge.	111	96.5	4	3.5
Internet is a digital place that creates close relationship among societies.	100	87.0	15	13.0
Internet provides endless freedom to people.	47	40.9	68	59.1
Internet is vital to enhancing exchanging cultures.	80	69.6	35	30.4
Internet has a potential to be an effective training tool.	88	76.5	37	23.5

Internet is a way to provide learning for people in order to search.	113	98.3	2	1.7
It is exciting to get information about Internet.	86	74.8	29	25.2
It is enjoyable to chat at Internet.	71	61.7	44	38.3
Having friends in Internet is temporary.	79	68.7	36	31.3
Internet causes to be far away from real life.	71	61.7	44	38.3
Chatting in Internet prevent to be socialized.	81	70.4	34	29.6
Internet can provide stable friendship by doing chatting.	29	25.2	86	74.8
Internet creates tendency to people for getting prepared knowledge.	99	86.1	16	13.9
Internet includes unnecessary, non-useful knowledge.	30	26.1	85	73.9
Internet causes destroyed societies.	31	27.0	84	73.0
Internet creates addiction.	94	81.7	21	18.3
Internet creates cultural dilemma.	44	38.3	71	61.7
Internet forces people to be alone.	56	48.7	59	51.3
It is not safety to make shopping at Internet.	76	66.1	39	33.9

In the research, it was found that some of the variables and some statements in the survey are correlated. The findings show that age is correlated with one statement while there is a correlation between age and three statements. As seen in Table 5, the older the students are, the less they feel excited about getting information about the Internet. Similarly, first and second grade students feel less excited about having information about the Internet than third and fourth grade learners (Table 6). However, this result may depend on the parallelism between grade and age.

Table 5. Age and attitude (ANOVA)

Statement	Age	Mean	St. D.	F	Sig.
It is exciting to get information about Internet.	18	4.4	0.7	2.3	0.04
	19	3.9	1.1		
	20	3.6	1.0		
	21	3.6	1.0		

Table 6. Grade and attitude (ANOVA)

Statement	Grade	Mean	St. D.	F	Sig.
It is exciting to get information about Internet.	1	4.3	0.7	3.5	0.02
	2	3.8	1.1		
	3	3.6	1.0		
	4	3.5	1.0		

According to the findings on the correlation between gender and attitudes, males have more positive attitudes about finding the Internet vital for cultural exchange and feeling excited to have information about the Internet than females do. Additionally, females agree more that the Internet causes tendency to people for prepared knowledge, as indicated in Table 7.

Table 7. Gender and attitudes (Independent Samples Test)

Statements	Gender	Mean	St. D.	F	Sig.
Internet is vital to enhance exchanging cultures.	Male	3.9	0.6	4.9	0.03
	Female	3.7	0.9		
It is exciting to get information about Internet.	Male	4.0	0.7	6.0	0.02
	Female	3.8	1.1		
Internet creates tendency to people for getting prepared knowledge.	Male	3.6	1.1	9.0	0.003
	Female	4.2	0.7		

Findings show that there is no significant correlation between attitudes towards Internet and some independent variables such as where the students live, their parents' jobs, amount of money they spend in one month, and Foreign Language Exam scores. On the other hand, three statements are correlated significantly with the types of high schools they graduated from. According to the values shown in Table 8, the subjects graduated from Anatolian High Schools agree more that the Internet is a fastest way to reach knowledge. Additionally, participants in the same group believe more that friendship in the Internet is temporary. Lastly, the same students think more that the Internet creates cultural dilemma.

Table 8. Educational background and attitudes (Independent Samples Test)

Statements	School	Mean	St. D.	F	Sig.
Internet is a fastest way to reach knowledge.	Super	4.5	0.8	8.5	.002
	Anatolian	4.7	0.5		
Having friends in Internet is temporary.	Super	3.8	1.1	7.4	.01
	Anatolian	4.0	0.9		
Internet creates cultural dilemma.	Super	3.0	1.1	5.2	.02
	Anatolian	3.2	1.1		

Values indicated in Table 9 show that there is a significant correlation between computer ownership and six items in the survey. According to the findings, the students who have their own computers have more positive attitudes towards the Internet as a universal library, an important tool for cultural exchange and training than the ones who do not. They also think that it makes life easy and feel more excited about getting information about the Internet than the participants who do not have computers.

Table 9. Computer Availability and attitudes (Independent Samples Test)

Statements	Computer Availability	Mean	St. D.	F	Sig.
Internet is a universal digital library.	Yes	4.7	.5	4.7	.03
	No	4.6	.6		
Internet provides easy life.	Yes	4.6	.5	3.9	.05
	No	4.5	.8		
Internet is vital to enhancing exchanging cultures.	Yes	4.0	.8	5.6	.02
	No	3.7	.9		
Internet has a potential to be an effective training tool.	Yes	3.9	.9	5.5	.02
	No	3.8	1.1		
It is exciting to get information about Internet.	Yes	3.9	1.0	4.4	.04
	No	3.8	1.1		
Internet creates addiction.	Yes	4.1	.8	5.2	.02
	No	3.9	1.1		

The learners who have Internet connections believe more that the Internet is a universal digital library than the ones who do not, when the significance level, presented in Table 10, is considered. The frequency of Internet use is correlated significantly with that friendship in the Internet is not stable. Mean scores in Table 11 show that the students who use the Internet more frequently believe less that having friends in the Internet is temporary.

Table 10. Internet connection and attitudes (Independent Samples Test)

Statement	Internet connection	Mean	St. D.	F	Sig.
Internet is a universal digital library.	Yes	4.8	0.4	20.2	.00

	No	4.5	0.6		

Table 11. Internet instruction and attitudes (ANOVA)

Statements	Internet use	Mean	St. D.	F	Sig.
Having friends in Internet is temporary.	Today	3.6	1.1	3.1	.01
	A few days ago	4.1	.9		
	Last week	4.2	.6		
	Last month	4.3	.6		

According to the ANOVA results, places where the participants use the Internet, duration of Internet use in a day and Internet familiarity in years are not correlated with their attitudes towards the Internet. However, the information level of the participants on the Internet is correlated significantly with two statements. Mean scores in Table 12 show that the ones who have high level information think that it is safety to make shopping at the Internet. They also believe more that the Internet is a universal digital library than the students who have low level information on the Internet.

Table 12. Internet test and attitudes (ANOVA)

Statements	Scores	Mean	St. D.	F	Sig.
Internet is a universal digital library.	2 (21 – 40)	4.3	.8	5.2	.001
	3 (41 – 60)	4.7	.5		
	4 (61 – 80)	4.9	.3		
It is not safety to make shopping at Internet.	2 (21 – 40)	4.0	1.0	3.0	.02
	3 (41 – 60)	3.9	.9		
	4 (61 – 80)	3.3	1.3		

CONCLUSIONS AND DISCUSSION

The results found in the study can be summarized in three topics: *Positive* and *negative attitudes of ELF learners towards the Internet* and *correlations between attitudes and independent variable*s. First, EFL learners have positive attitudes towards the Internet as a universal library, the fastest way to teach knowledge, a place that creates close relationship among societies, an effective training tool, and a way to provide learning for people in order to search. They find the Internet exciting to get information about the Internet and vital to enhance exchanging cultures, and think that it makes life easy. Additionally, they do not agree that it includes unnecessary, non-useful information, causes destroyed societies, and creates cultural dilemma. Second, they believe that the Internet causes to be far away from real life, creates addiction, and forces people to be alone. They also think that it cannot provide stable friendship by chatting and endless freedom to people and socialization. Interestingly, they do not find safe shopping at the Internet. Third, some of the independent variables are correlated significantly with some statements in the survey. Younger learners feel more excited about getting information about the Internet. Male students have more positive attitudes about finding the Internet vital for cultural exchange and feeling excited to have information about the Internet than females do. Females also agree more that the Internet causes tendency to people for prepared knowledge. Anatolian High School graduates agree more that the Internet is a fastest way to reach knowledge. They also think more that the Internet creates cultural dilemma and friendships in the Internet is not stable. Computer ownership has a positive effect on the point of that it is a universal library, makes life easy and an important tool for cultural exchange and training. Computer owners also feel more excited about getting information about the Internet. Having Internet connection is a significant variable that affect positively on that the Internet is a universal digital library. Students who rarely use the Internet think that having friends in the Internet is temporary. Learners who have the Internet instruction have more positive attitudes towards the Internet as a universal digital library, while they do not think shopping at the Internet is safe. On the other hand, places where students live, their parents' jobs, amount of money they spend, foreign language proficiency level, places they use the Internet, duration of Internet use a day and computer familiarity in years do not have effect on their attitudes towards the Internet.

As mentioned before, this reach differs from the studies presented above since the sample group consisted of only EFL learners. Thus, it seems useful to discuss the similarities and differences. In Slate, Manuel and Brinson's study (2002); gender was a significant variable that affected attitudes towards the Internet. However, in this research, it was found that gender had a significant effect on only three statements among 21 items. The findings in this study seemed similar to the results found in Usun's (2003) research. Results in other related research (Ministry of Education and Science of Ukraine, 2003; Isman and Dabaj, 2004; Asan and Koca, 2006, Yang and Chen, 2007) also indicated that learners have positive attitudes as found in this study.

Depending on the conclusions, some implications can be noted. First, though learners generally have positive attitudes towards the Internet, some potential problems should be mentioned. Two most significant problems are inaccessibility and inequity issues. As found in the study, more than half of the students do not have computers. In addition, language learners mostly do not have Internet connection and instruction, and have to use the Internet at Internet cafes. Consequently, the problem is that the Internet is not always accessible by all learners though EFL learners have positive attitudes. Statistics indicate that Internet accessibility in Turkey is 14.2% for overall population while the values are 75.6% in Sweden, 61.4% in Holland, 68.7% in Japan, 50% in Germany, 17.7% in Greece (The World Bank, 2004). In other words, even though accessibility rate of the sample group is higher than the average rate of Turkey, inaccessibility and inequity issues are discouraging for both language teachers and students in educational settings (Mike, 1996) in our country. Other problems about Internet use are Internet unfamiliarity and lack of training. These problems are also an anxiety source for language learners. Internet training is one of the ways to decrease not only the level of negative attitudes and but also anxiety. Doubtless, positive attitudes of learners are not enough to solve these potential problems. Educational and economic policy makers have important roles for solving them. Second, there are some disadvantages of Internet use in foreign language learning. Though it is a fact that the Internet improves the communicational and language skills, the significant point is that learners are not sometimes aware of why, how and where they learn. Additionally, although a mass of materials in the Internet can be found, the integration of the materials into foreign language curriculum is another disadvantage. Thus, Internet use in language learning may be the waste of time if it does not depend on a language curriculum. In order to overcome these drawbacks learners should be instructed, and have the chance of the Internet accessibility, experience and familiarity with its all functions in educational life. As a final point, positive attitudes can contribute to create a real-life language learning environment via the Internet after solving the problems and overcoming difficulties mentioned above without forgetting that the Internet is not a purpose but only a tool for all learning necessities.

Some limitations of the research can be noted. The study is limited to 115 EFL learners at ELT Department of Education Faculty at Balikesir University, Turkey. It is limited to the scale and the variables given above. Considering that the study is limited to the attitudes of EFL learners towards the Internet, further research should be focused on the attitudes of foreign language teachers. In addition to attitudes, why, where and how learners use the Internet are other areas to investigate.

ACKNOWLEDGEMENTS

I would like to thank to Emrah Ozdemir for his help with data processing. I also thank to the students at ELT Department of Balikesir University for their kind participation.

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APPENDIX 1

The scale of attitudes towards the Internet

Statements	Strongly agree	agree	Undecided	disagree	strongly disagree
Internet is a universal digital library.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet provides easy life.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet is a fastest way to reach knowledge.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet is a digital place that creates close relationship among societies.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet provides endless freedom to people.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet is vital to enhancing exchanging cultures.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet has a potential to be an effective training tool.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet is a way to provide learning for people in order to search.	[ ]	[ ]	[ ]	[ ]	[ ]
It is exciting to get information about Internet.	[ ]	[ ]	[ ]	[ ]	[ ]
It is enjoyable to chat at Internet.	[ ]	[ ]	[ ]	[ ]	[ ]
Having friends in Internet is temporary.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet causes to be far away from real life.	[ ]	[ ]	[ ]	[ ]	[ ]
Chatting in Internet prevent to be socialized.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet can provide stable friendship by doing chatting.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet creates tendency to people for getting prepared knowledge.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet includes unnecessary, non-useful knowledge.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet causes destroyed societies.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet creates addiction.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet creates cultural dilemma.	[ ]	[ ]	[ ]	[ ]	[ ]
Internet forces people to be alone.	[ ]	[ ]	[ ]	[ ]	[ ]
It is not safety to make shopping at Internet.	[ ]	[ ]	[ ]	[ ]	[ ]

DETERMINATION OF MISCONCEPTIONS THAT ARE ENCOUNTERED BY TEACHER CANDIDATES AND SOLUTION PROPOSITIONS FOR RELIEVING OF THESE MISCONCEPTIONS

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INTRODUCTION

In order to think, to interpret and judge correctly, the humans have to comprehend what they have learned. Concepts are the abstract representatives of the classifications that are formed by objects, events, ideas and behaviors which have common specifications. (Fidan, N., 1985).

Concepts reduce the complexity by simplifying the environment that people live. They help us in defining and explaining the objects in our environment. Learning concepts cannot be determined only by classifying objects or by telling the name or definition of a class of objects. Learning concepts has three steps; interpreting, translating and transition. For an individual to overcome these three steps, he has to have the ability to percept common elements objects, events, ideas and behaviors by abstracting them and has to distinguish the common and uncommon sides of these. Glover, Ronning and Bruning (Glover,A.Roning,R.R.,Bruning, R. H., 1990) have divided the database needed in problem solving process into three parts as subject knowledge, general and specific strategic knowledge. The conceptual knowledge that is related to the subject of the problem constitutes the first type of knowledge. Remembering a knowledge signifies that it is known. However, this remembrance can both be by memorizing and comprehending. It is the comprehension step, which is formed by the behaviors that distinguishes a person who has comprehended, from a person who has memorized. (Alkan, H., Altun, M., 1998). As knowledge and skill is not transferred genetically and cannot be controlled by instinct, the behaviors that will be necessary in life should be designated to the person. This can be achieved by learning. The people agree that without learning life cannot be successful. While teaching new knowledge to individuals, it should be made sure that the concepts are formed correctly. In recent years, students' understanding of the scientific concepts is one of the subjects that researchers and teachers give importance to. The reason is that students have difficulties in understanding scientific concepts. Learning concepts in a non-meaningful way leads to the formation and increasing of misconceptions. Misconception is the perception of concepts by students in a different way than their scientifically accepted definitions.

The difficulties for students that can occur in learning concepts can also be related to; time, memory, strategies, concentration, culture, development and insufficiency of teachers. (Ülgen,G.,1988).

Misconceptions are a big impediment in meaningful learning. Especially, the permanent mistakes creates great difficulties for the math education to reach its goals if they aren't avoided on time. Traditional teaching techniques seem to be the major reason in the occurrence of mistakes. (Lawson, A. E., Thompson, L. D. 1988 & Ubuz, B., 1999 & Marek, E. A., Cowan, C. C., 1994).

Studies have showed that, as misconceptions are permanent and continuous, and at the same time they are not sufficient to make the student develop the right concepts, it is hard to relieve misconceptions by traditional teaching techniques. (Lawson, A. E., Thompson, L. D. 1988). The definition of misconceptions and distinguish these from insufficient knowledge is a very important area in educational research(Teaching Physics, 1999). The reasons for misconceptions can be explained as; lesson books, teacher factor and not having information of the students' past knowledge, not preparing the appropriate environment, wrong usage of technological tools, not making the necessary concept exchanging in lessons.

Seeing the missing part of the knowledge should be taught to the students. Error-correction operation should take place.

The questionnaires which were made with different teachers working in private schools, government colleges, government high-schools showed that even teachers have serious misconceptions concerning high-school mathematics. For this reason, it is necessary to determine teachers' misconceptions and to search ways for relieving these. (Alkan, H. ve arkadaşları, 1996 & Köroğlu, H. ve arkadaşları, 1996 & Alkan, H. ve arkadaşları, 1995).

While their studies in educational faculties, by learning the necessary knowledge, teories, basic principles and concepts, teacher candidates will be able make relations with their knowledge and practices in their working areas. (YOK/Dünya Bankası, 1997). This study is made under the light of these thoughts and is based on the results of the questions which were designed for testing field knowledge. These questions were applied to the teacher candidates which were attending Applied Seminar classes held in the final class of University of Dokuz Eylul (DEU) Educational Faculty of Buca (EFB) Main Division of Secondary Science and Mathematical Fields Education (DSSMFE) in the educational term of 2000-2001 and the attendees of certification program who were graduated DEU Faculty of Science and Literature (FSL)in the educational term of 2000-2001.

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THE OBJECT AND LIMITATIONS OF THE RESEARCH

The object of this research is, to evaluate the knowledge of the teacher candidates which will graduate from Educational Faculty of Buca (DSSMFE) 2000-2001 educational term and certification program attendees which were graduated from University of Dokuz Eylul (DEU) Faculty of Literature Divison of Mathematics and to make contribution to the studies that have been made to determine the different misconceptions that these groups separately experienced, and the misconceptions that they commonly experienced.

To achieve this object, answers searched for the sub-problems below.

1- What are lack of knowledge and misconceptions of the graduates of EFB – DSSMFE Main Division of Mathematics and FSL Division of Mathematics related to sequence concept?
2- What are lack of knowledge and misconceptions of the graduates of EFB – DSSMFE Main Division of Mathematics and FSL Division of Mathematics related to permutation and combination which are one of the basic subjects of secondary level possibility concept?
3- What are lack of knowledge and misconceptions related to logarithm?
4- What are lack of knowledge and misconceptions related to complex numbers ?
5- What are lack of knowledge and misconceptions related to trigonometry, geometry and application of these to second degree equations.
6- What are lack of knowledge and misconceptions related to relation and function?
7- What are lack of knowledge and misconceptions related to modular arithmetic and sets?

The data of the research is limited to the field knowledge of the teacher candidates which will graduate from Educational Faculty of Buca (DSSMFE) 2000-2001 educational term and certification program attendees which were graduated from University of Dokuz Eylul (DEU) Faculty of Literature Divison of Mathematics that has been tried to be determined by a test. In the applied test a target and a behavior has been determined for each question's right alternative and misleadings.

Statistics

In this research, inside the teacher candidates which will graduate from Educational Faculty of Buca (DSSMFE) 2000-2001 educational term and certification program attendees which were graduated from University of Dokuz Eylul (DEU) Faculty of Literature Divison of Mathematics, it is decided that a group of 104 individuals has the quality to represent the other mathematics teachers.

Limitation

Limitations are given as below.

a) The data of the research is limited to test answers given by the teacher candidates which will graduate from Educational Faculty of Buca (DSSMFE) 2000-2001 educational term and certification program attendees which were graduated from University of Dokuz Eylul (DEU) Faculty of Science and Literature Divison of Mathematics.
b) Distribution of the test questions with respect to the subjects has been based upon quizzes and the test has been limited to 25 questions.
c) The validity of the evaluation tool is limited to the time section.

METHOD

The research is directed towards revealing misconceptions of the teacher candidates that are graduated from Educational Faculties and teacher candidates who had attended certification program and graduated from Faculty of Science and Literature, and to present suggestions that could prevent these mistakes.

Population

The sampling of the research is formed by the teacher candidates which will graduate from Educational Faculty of Buca (DSSMFE) 2000-2001 educational term and certification program attendees which were graduated from University of Dokuz Eylul (DEU) Faculty of Science and Literature.

In the sampling there are 49 teacher candidates of Educational Faculty of Buca (DSSMFE) Division of Mathematics and 55 certification program attendees graduated from Faculty of Science and Literature.

Data Collection Tool and Analysis

In the research, data collection tool consists of a test that is applied to 104 teacher candidates. Five alternatives have been determined for each question, in each alternative different behavior and mistakes have been searched. It is given as a fore condition that four wrong answers will disvalue one right answer. This condition prevented the ones who answered this test to answer randomly because of inefficient knowledge. In the applied test there were 25 questions related to field knowledge. In the evaluation of the data, SPSS 8.0 pack software was used. Average, standard deviation, frequency and percentage display results were evaluated.

The Object of Asking the Questions of the Data Collection Tool and the Target and Behaviors That are Wanted to be Measured.

1) In alternative A, this knowledge was searched. Does he/she know that infinity isn't included in R ? If he/she isn't aware that infinity isn't included in R, he/she will think that the result that was obtained for $n \to \infty$ belongs to the sequence. For alternatives B and C, this knowledge was searched. If $\forall \, n \in N \text{ için}, 0 < a_n < b_n$ condition is provided in the $\left(\frac{a_n}{b_n}\right)$ division sequence, the division sequence is limited, a_n and b_n .are convergent, then division sequence is also convergent. Otherwise it is not proved. For alternative D, are they aware that limit may not belong to the sequence? For alternative E, there shouldn't be any $n \in N$ that causes indefinicy for the rule that will be attained to the sequence.

2) For A and B, to confirm **" Each convergent sequence is limited but opposite is not right."** the alternatives C,D and E were asked to measure the basic concepts that determines the relation between convergent sequences and monotony.

3) It is asked to confirm that a common multiplier can be negative in a geometric sequence and the sequence will be convergent for $|r| < 1$

4) It is asked with the idea if a teacher candidate could distinguish the theory: " For a serial to be convergent, it is necessary but not enough to make the general term's limit go to zero."

5) It is searched if the teacher candidates know that ; "R is the Cauchy sequence of every convergent sequence"

6) It is searched how the sub-sequence of a sequence is obtained, given that there is sub-sequence.

7) It is searched that, if a teacher candidate will express a behavior of solving the problem of a total of a serial that can state convergence by moving from the Sn total of pieces.

8) It is asked to measure if it is known that in a binomial expansion, the coefficients of the terms that are in the equal distance from the starting point and the end, also if they use the knowledge that the possibility of the complementary of an event is obtained by subtracting the event's possibility from 1.

9) To solve a question, problem, a research it is necessary to understand the question completely. To provide this, the teacher candidate should catch the lighting words in the question. Is he/she is able to reach another type of question by leaving the type of question that he/she decided before? It is asked to search how much he/she reflects the mistakes to the combination.

10) It is asked to measure if they are aware of a serious relation between the set and the possibility.

11) It is asked to measure if the teacher candidates could exactly percept the difference between the arranging and grouping.

12) It is asked to measure, if the teacher candidates keep in mind that a number which is possible to take the logarithm of, cannot have a negative mantis (decimal fraction).

13) It is asked to measure, their capacity to solve the logarithmic equality system and if they know that the base of the logarithm should be different than 1.

14) It is asked to measure, that the absolute of the difference between the two complex numbers is equal to the distance between the two points that are equivalent to these complex numbers, and if they are aware that when one is variable then there is a geometrical area problem or not.

15) It is asked to measure, that the product of two complex numbers' argument is equal to its' arguments' total separately, and if they could use their knowledge of second degree equality together with the knowledge of complex number.
16) It is asked to measure, if they know that instead of Cartesian coordinates the polar coordinates can be used to designate the point on a plane and if they are aware of the dense relation between trigonometry and complex numbers.
17) It is asked to measure, if they know that the relation between the roots of a second grade equality can also be used in trigonometry.
18) and 19) It is asked to measure if they are of the dense relation between geometry and trigonometry.
20) It is asked to measure the knowledge level of teacher candidates that it is possible to obtain special results by the help of total, difference and radius formulas in trigonometry, and when one of the trigonometric rates is known then the other can be calculated.
21) It is asked to measure the how successfully they can use these knowledge on an example: Why equality relation? Why equality classification? What are the conditions of being an equality relation?
22) It is asked to measure, if they can produce alternative solution steps for the ability of obtaining a function's opposite.
23) It is asked to see, how these knowledge are applied on an example: What is mode? When solving a problem in modular arithmetic, how do you search its relation with the number concept?
24) and 25) It is asked to find out, how much they are aware of the basic specifications of a set. How frequently they can use these knowledge on the examples?

EXAM QUESTIONS

1-Which one of the below is wrong ?

A) $\left(5+\frac{2}{\mathbf{n}}\right)$ sequence doesn't have the lowest element i) 15,53 ii) 13-83

B) The division of two limited sequences is also limited i) 30,53 ii)30,83

C) The division of two divergent sequences can be convergent I)20,53 ii)24-83

D)The limit of a positive termed sequence may not be positive I) 20,53 ii) 19-83

E) $\left(\frac{\mathbf{n}+3}{\mathbf{n}-2}\right)$.expression cannot be general term of a sequence I)15,53 ii)14-83

2-Which one of the below expressions is wrong ?

A) A convergent sequence may not be limited i)44,28-ii)61-76

B) A limited sequence may not be convergent i)14,28-ii)23-76

C) A convergent sequence may not be monotonous i)28,28-ii)08-76

D) A monotonous sequence may not be convergent i)00,28-ii)00-76

E) In a monotonous increasing upper limited sequence, the limit is the LUB i)14,28-ii)08-76

3- What is the limit of the Sn sequence with a general term of :Sn= 1-(0,4)+(0,4)2-(0,4)3+....+(-1)n-1 .(0,4)n-1 ?

A)7/3 *i)00,40-ii)08,45* B) 0,64 *i)05,40-ii)08,45* **C) 5/7 i)40,40-ii)32,45** D) 0 *i)30,40-ii)32,45* E) 1 *i)25,40-ii)20,45*

4 – Which one of the below is divergent ?

A) $\sum_{\mathbf{n}=1}^{\infty}\frac{2^{\mathbf{n}}+3^{\mathbf{n}}}{5^{\mathbf{n}}}$ *i)38,53-ii)27-85* B) $\sum_{\mathbf{n}=1}^{\infty}\frac{1}{3^{\mathbf{n}}}$ *i)11,53-ii)17-85* C) $\sum_{\mathbf{n}=1}^{\infty}\frac{1}{\mathbf{n}(\mathbf{n}+1)}$ *i)03,53-ii)04-85* **D)** $\sum_{\mathbf{n}=1}^{\infty}\frac{5\mathbf{n}+2}{\mathbf{n}+3}$ **i)35,53-ii)36-85**

E) $\sum_{\mathbf{n}=1}^{\infty}\frac{1}{(2\mathbf{n}-1)(2\mathbf{n}+1)}$ *i)11,53-ii)14-85*

5 – Which one of the below is not a basic (CAUCHY) progression ?

A) $\left(\sqrt{\frac{2}{\mathbf{n}}}+1\right)$ *i)20,20-ii)00,43* B) $\left(\frac{4\mathbf{n}^3+1}{\mathbf{n}^3+2}\right)$ *i)00,20-ii)16,43* C) $\left(2^{\frac{1}{\mathbf{n}(\mathbf{n}+1)}}\right)$ *i)10,20-ii)16,43* D) $\left(\frac{\cos\mathbf{n}}{3^{\mathbf{n}}}\right)$ *i)10,20-ii)29,43*

E) $\left(\sqrt{\mathbf{n}+1}\right)$ **i) 60,20-37,43**

6- Which one of the below is (a_{2n}) for the (a_n) progression that has a general term of; $a_n=1+\frac{1}{2}+\frac{1}{2^2}+...+\frac{1}{2^{\mathbf{n}}}$

A) $\left(\frac{2^{2\mathbf{n}+1}-1}{2^{\mathbf{n}}}\right)$ *i)18,34-ii)13,56* **B)** $\left(\frac{2^{2\mathbf{n}+1}-1}{2^{2\mathbf{n}}}\right)$ **i)35,34-ii) 51,56** C) $\left(\frac{1}{2^{\mathbf{n}}}\right)$ *i)05,34-ii)03,56* D) $\left(\frac{1}{(2^{\mathbf{n}})^2}\right)$ *i)12,34-ii)10,56*

E) $\left(\frac{2^{2\mathbf{n}}-1}{2^{2\mathbf{n}}}\right)$ *i)30,34-ii)23,56*

7-What is the total for $x=1+2x+3x^2+4x^3+....$?

A) 9/4 i)79,27-ii) 52,41 B) 2/3 i)00,27-ii)00,41 C) 3/2 i)07,27-ii)26,41 D) 4/9 i)07,27-ii)14,41 E)1/3 i)07,27-ii)08,41

8- In the expansion of (x+y)12 expression the different coefficients formed are written on different cards and put inside a hen a card is randomly picked, what is the possibility of number on the card to be higher that 12 ?
A) 2/7 i)00,47-ii)04,45 B) 3/4 i)00,47-ii)00,45 C)9/13 i)70,47-ii)72,45 **D) 5/7 i)30,47-ii)20,45** E)7/8 i)00,47-ii)04,45

9 – 32 teams are playing in a league, in each match one is eliminated and always winning teams are playing. In this league, ny matches can be played at most?
A) $\binom{32}{2}$ *i)12,51-ii)06,56* B) $\binom{16}{2}$ *i)05,51-ii)09,56* C) 962 *i)00,51-ii)06,56* D) 62 *i)00,51-ii)00,56* **E) 31 i)84,51-ii)77,56**

10 - In a class of 40 students, the number of students who passed Deutsch is 26, the number of students who passed atics is 22 and the number of students who passed both is 18.
When you randomly call a student from this class, if it is known that he/she is failed mathematics, what is the possibility for him/her to be also failed from Deutsch ?
A) 7/10 i)13,44-ii)00,36 B) 2/5 i)00,44-ii)10,36 **C) 5/9 i)69,44-ii)55,36** D) 4/9 i)18,44-ii)35,36 E) 1/3 i)00,44-ii)00,36

11- 3 girl and 4 boy students had gone to a theatre. If the girls cannot sit side by side, how many different sitting combinations can be ?

A) 2880 i)10,38-ii)18,29 **B) 1440 i)21,38-ii)37,29** C)4320 i)53,38-ii)31,29 D) 2160 i)06,38-ii)00,29 E) 5040 i)11,38-ii)12,29

12- If log3=0,48 then what is $\log\sqrt[3]{0,03}$?

A) 2,48 *i)04,51-ii)00,35* B) $\bar{2}$,493 *i)00,51-ii)05,35* C) $\bar{1}$,506 *i)48,51-ii)47,35* D) $\bar{2}$,506 *i)04,51-ii)15,35*
E) $\bar{1}$,493 i)44,51-ii)31,35

13– If logx + logy = logx . logy and $\log_x y = 2$ then what is (x,y) ?

A) (1,1) *i)10,96-ii)09,78* B) ($\sqrt{2}$, $\sqrt{2}$) *i)02,96-ii)00,78* C) ($\sqrt[3]{10}$,10) *i)00,96-ii)06,78* **D) (10 $\sqrt{10}$,1000) i)80,96-ii)67,78**
E) (10,100) *i)06,96-ii)16,78*

14- What can be the highest base argument of z numbers which proves the equality of $|\mathbf{z}-4\mathbf{i}|=2$?

A) $\frac{\pi}{3}$ *i)06,32-ii)00,14* B) $\frac{5\pi}{12}$ *i)06,32-ii)12,14* C) $\frac{\pi}{2}$ *i)56,32-ii)26,14* **D)** $\frac{2\pi}{3}$ **i)18,32-ii)62,14** E) $\frac{5\pi}{6}$ *i)06,32-ii)00,14*

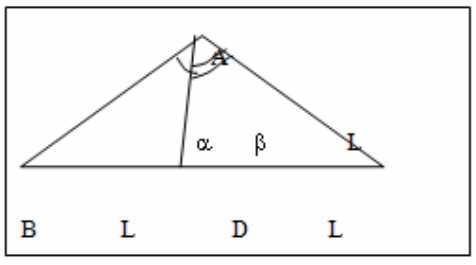
15- What are the total degree of base arguments of the equivalency of $\mathbf{z}^2-(6-\mathbf{i})\mathbf{z}+5-5\mathbf{i}=0$?
A) 45^0 *i)00,12-ii)33,05* B) 120^0 *i)16,12-ii)00,05* C) 210^0 *i)00,12-ii)00,05* D) 240^0 *i)00,12-ii)00,05* **E) 315^0 i)84,12-ii)67,05**

16- What is the distance between the complex numbers given with their polar coordinates of z1 = (2,780) and z2=(5,180) ?
A) $3\sqrt{2}$ *i)00,26-ii)00,09* **B)** $\sqrt{19}$ **i)92,26-ii)60,09** C) $\sqrt{20}$ *i)00,26-ii)00,09* D) $\sqrt{22}$ *i)00,26-ii)00,09*
E)$3\sqrt{3}$ *i)07,26-ii)40,09*

17- In an ABC triangle, if mA<90^0 and tanB and tanC are the roots of 2x2+3x-1=0 equality,

then what is the measure of **A** ?
A) 45^0 **i)100,20-ii)41,30** B) 15^0 *i)00,20-ii)00,30* C) 30^0 *i)00,20-ii)05,30* D) 60^0 *i)00,20-ii)36,30* E) 75^0 *i)00,20-ii)18,30*

18- In an ABC triangle, if $|\mathbf{AC}|=|\mathbf{BD}|=|\mathbf{DC}|=\mathbf{L}$ dir tanα=m then what is tanβ?



A) $\frac{\mathbf{m}}{2}$ *i)50,04-ii)00,11*

B) $\frac{\mathbf{m}-1}{2}$ *i)00,04-ii)33,11*

C) $\frac{\mathbf{m}}{3}$ i)00,04-ii)50,11

D) $\frac{\mathbf{m}-1}{3}$ *i)50,04-ii)16,11*

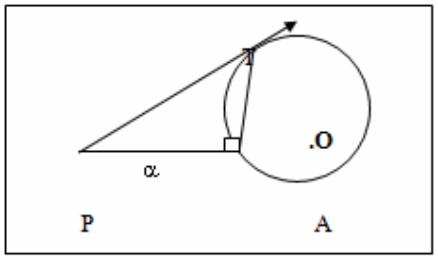
E) $\frac{2\mathbf{m}}{3}$ *i)00,04-ii)00,11*

19- If $\tan\frac{\alpha}{2} = 2-\sqrt{3}$ then what is Cosα?

A) $\frac{\sqrt{3}}{2}$ **i)86,30-ii)90,36** B) $1-\sqrt{3}$ *i)00,30-ii)00,36* C) $\frac{1}{2}$ *i)06,30-ii)00,36* D) $\frac{\sqrt{3}-2}{2}$ *i)06,30-ii)05,36*

E) $\frac{1-\sqrt{3}}{2}$ *i)00,30-ii)05,36*

20-



In an O centered circle with 6 cm. radius , [PT is tangent to the circle and $|\mathbf{PT}| = 8$ .cm. If $[\mathbf{PA}] \perp [\mathbf{AT}]$ then what is the value of tanα ?

A) $\frac{1}{2}$ *i)00,18-ii)11,16* *B)* $\frac{2}{3}$ *i)00,18-ii)22,16*

C) $\frac{3}{4}$ *i)11,18-ii)00,16* *D)* $\frac{4}{3}$ *i)11,18-ii)11,16*

E) $\frac{3}{2}$ **i)77,18-ii)55,16**

21-According to β=$\{$(x,y):4, divides x-y $\}$. relation defined in the set of A=$\{0,1,2,3,4,5,6,7,8,9,10,11,12\}$, which one of the below is not in the equivalency class of $\bar{0}$?

A) 0 *i)00,33-ii)03,55* B) 4 *i)06,33-ii)03,55* **C) 6 i)94,33-ii)90,55** D) 8 *i)00,33-ii)00,55* E) 12 *i)00,33-ii)03,55*

22-f:1-1 and is a onto function. What is $f^{-1}(x)$ for the value of f(x) that provides the condition of $\frac{[\mathbf{f}(\mathbf{x})]^2}{\mathbf{x}} - 2\mathbf{f}(\mathbf{x}) + \frac{1}{\mathbf{x}} = 0$?

A) $\frac{\mathbf{x}}{\mathbf{x}^2+2}$ *i)00,45-ii)00,27* **B)** $\frac{\mathbf{x}^2+1}{2\mathbf{x}}$ **i)77,45-ii)60,27** C) $\frac{2\mathbf{x}}{\mathbf{x}^2+1}$ *i)09,45-ii)20,27* D) $\frac{1-\mathbf{x}^2}{2\mathbf{x}}$ *i)09,45-ii)20,27*

E) $\frac{-\mathbf{x}}{\mathbf{x}^2+1}$ *i)04,45-ii)00,27*

23- How many whole numbers are there, that provides the equivalency of $\mathbf{x}-3 \equiv 4[\mathrm{mod}(\mathbf{x}-2)]$?

A) 1 i)76,27-ii)48,42 B)2 *i)00,27-ii)13,42* C) 3 *i)15,27-ii)27,42* D) 4 *i)07,27-ii)08,42* E) 5 *i)00,27-ii)04,42*

24- If s(A)=5, s(B)=6, s(C)= 9 and if the highest value of s(A∪B∪C) is a , the lowest value is b and the highest value of s(A∩B∩C) is c, the lowest value is d, then what is the rate of $\frac{\mathbf{a}-\mathbf{b}}{\mathbf{c}+\mathbf{d}}$?

A) $\frac{17}{5}$ *i)04,43-ii)02,62* B) $\frac{21}{5}$ *i)04,43-ii)02,62* C) $\frac{9}{5}$ *i)04,43-ii)08,62* **D)** $\frac{11}{5}$ **i)86,43-ii)88,62** E) $\frac{7}{5}$ i)00,43-ii)00,62

25- For A,B,C sets, which one of the propositions below is precisely right ?

A) $(\mathbf{A} \cap \mathbf{B} = \phi \text{ ve } \mathbf{B} \cap \mathbf{C} = \phi) \Rightarrow \mathbf{A} \cap \mathbf{C} = \phi$ dir *i)07,80-ii)16,65*

B) $\mathbf{A} \cap \mathbf{B} = \mathbf{A} \cap \mathbf{C} \Rightarrow \mathbf{B} = \mathbf{C}$ dir *i)07,80-ii)08,65*

C) $\mathbf{A} \cup \mathbf{B} = \mathbf{A} \cup \mathbf{C} \Rightarrow \mathbf{B} = \mathbf{C}$ dir *i)33,80-ii)32,65*

D) $\mathbf{A}' \cup \mathbf{B}' \subset \mathbf{C} \Rightarrow \mathbf{C}' \subset (\mathbf{A} \cap \mathbf{B})$dir **i)49,80-ii)44,65**

E) $\mathbf{A} \cup (\mathbf{A} \cap \mathbf{B}) = \mathbf{B}$ dir *i)02,80-ii)00,65*

Note: The i) aa,bb-ii)aa,bb symbols given in tables above signifies these;
The numbers coming after symbol i) are the percentages that are related to the answers given by the final class teacher candidates at Educational Faculty of Buca, Division of Mathematics Teaching.

The numbers coming after symbol ii) are the percentages that are related to the answers given by the teacher candidates attending Faculty of Science and Literature, Division of Mathematics.

aa symbol is the marking percentage of the related alternatives by teacher candidates that answered the related question,
bb symbol is the percentage of students that answered the related question. The expressions written in bold signifies the correct answers.

FINDINGS

For teacher candidates attending Educational Faculty of Buca, the rate of answering the question that measures the concepts related with sequences was lower comparing to the graduates of the Faculty of Science and Literature. For this reason, it is determined that there is a real lack of knowledge considering sequence subject.

Despite this, it was noticed that the misconceptions were same considering the defined values of the Sequence and that its value was not at real numbers.

They couldn't comprehend that two divergent sequences' division can be convergent. The reason for this is thought that the teacher candidates couldn't achieve transition, which is one of the steps of comprehension.

To be able to determine that the positive termed sequence's limit may not be positive, it is needed to be able to interpret that zero is not positive. For the graduates of Faculty of Science and Literature, we feel that there is a serious lack of knowledge transition and misconception in determining the rightness of two divergent sequences division may be positive. Here, the transformation, which is one of the steps of comprehending in limitation subject, couldn't be achieved.

The teacher candidates of DSSMFE in the Educational Faculty of Buca by not agreeing that a limited sequence may not be convergent and that limit is LUB in a monotonous increasing upper limited sequence, showed that due to the lack of interpretation they have mistakes in the subjects of limitation and convergence, monotonous increasing and upper limited. As the number of teacher candidates who tended that a convergent sequence may not be monotonous was higher, it is clear that there is a misconception related to the subject of monotony.

The two of groups has answered the question related to calculating the limit of a sequence with its general term given almost in the same rate. Educational Faculty of Buca had a higher percentage of correct answers than the teacher candidates of Faculty of Science and Literature, had serious mistakes in the subject of partial total in determining general term.

In determining divergent sequence the teacher candidates of Faculty of Science and Literature answered the questions at a higher rate than the teacher candidates of Educational Faculty of Buca. Both of the two groups had right answers in a lower rate. They had mistakes about convergence criteria. The number of the ones who couldn't achieve transition, which is a step of comprehension in the subject of convergence – divergence, was not low.

In determining the specifications of Cauchy sequence the groups of Faculty of Science and Literature and Educational Faculty of Buca had difficulties almost at the same rate. In both of the groups, there were ones who didn't use the expression;" Every convergent sequence is a Cauchy sequence", and fell into contradictive side.

They had mistakes in calculating the general term of sequence, which is given as partial total, and reaching to sub-sequence. Considering this, the teacher candidates of Educational Faculty of Buca had mistaken more than the teacher candidates of Faculty of Science and Literature.

In calculating a certain value of a serial expansion, the teacher candidates of Educational Faculty of Buca has answered in a lower rate than the teacher candidates of Faculty of Science and Literature. However, the teacher candidates of Educational Faculty of Buca had a higher rate in finding the correct answer. They couldn't achieve transition operation, which is a step of comprehension.

In Binomial expansion, the terms after certain terms may have same coefficients. The percentage of giving the right answer was at the same rate. However, by sticking the contradiction above or not reading the question carefully, the rate of persons giving wrong answer was high.

Even the rate of answering possibility question was low in both groups, it was lower for the graduates of Faculty of Science and Literature. The percentage of correct answering for the possibility question which included sets was higher for Educational Faculty of Buca than Faculty of Science and Literature. However, we cannot avoid the percentage of teacher candidates who mixed with the condition and had mistaken.

The percentage of correct answering for the question related to arranging was low for both two groups. A lack of interpretation was observed in subject of arranging.

The percentage of answering the logarithm question related to Mantis and Logarithm was higher for the group of Educational Faculty of Buca than the group of Faculty of Science and Literature. The percentage of correct answering was also higher for the group of Educational Faculty of Buca. They fell into contradictive side in the same and unavoidable rate. The mistakes related to the operations in logarithm was not high.

In both of two groups there was lack of knowledge related to the absolute value and argument of complex number. But the percentage of correct answering was higher for the group of Faculty of Science and Literature than the Educational Faculty of Buca. The percentage of the ones who fell into contradiction because of wrongly determining the complex numbers that supplied equality, cannot be avoided.

There is lack of knowledge in finding the roots of equivalencies with complex varieties. However, the percentage of correct answers was high.

There is a very high lack of knowledge in polar displaying of the complex numbers. However, the percentage of answering this question correctly was high. The group of Educational Faculty of Buca has given more correct answers than the group of Faculty of Science and Literature.

Considering a triangle, there is lack of knowledge in using trigonometric relations for solving equivalencies. The teacher candidates of Educational Faculty of Buca has answered 100% correctly but teacher candidates of Faculty of Science and Literature has answered correctly at a lower rate. The rate of the ones who answered the question related to length in a triangle was almost none, so there is a high lack of knowledge. The rate of answering this question correctly was 0% for the group of Educational Faculty of Buca. For the group of Faculty of Science and Literature, it is 50%. Here, we can see that there are serious misconceptions related to geometry; transition, transformation or interpretation was not made in these questions.

The rate of answering the question related to trigonometric identity was low and both of the two groups has given correct answers at a higher rate. About the question that demanded trigonometry and circle knowledge, a lack of knowledge was observed in both of the two groups. The teacher candidates of Educational Faculty of Buca (EFB) have given correct answers at higher rate than the teacher candidates of Faculty of Science and Literature (FSL).

The EFB candidates had a higher rate of answering the question that demanded the equivalency grade of a set according to relation, but the rate for the ones who answered correctly was high in both of the two groups.

As the rate for answering the question related to determine reverse function was low, there is a lack of knowledge considering this subject. The correct answering rate is high, but it is higher for the
the group of Educational Faculty of Buca. Considering the subject related to modular arithmetic, the group of Educational Faculty of Buca has more lack of knowledge than the group of Faculty of Science and Literature. However, the group of Educational Faculty of Buca has given more correct answers. Misconception is higher for FSL.

Gorup of EFB has more lack of knowledge considering the subject related to element number of a set. However, both of the groups have answered at the same and a higher rate. The question determining the propositions related to the operations in a set was answered by both of the two groups at a higher rate, but the group of Educational Faculty of Buca had a higher rate of correct answers. The correct answers' rate was low for the two groups almost at the same amount and there is misconception about this subject. When determining the unity of two sets, even one set is evident; it may not be expressed in a unique type. The mistaking rate is high at this point and there is misconception.

DISCUSSION

The teacher candidates which will graduate from Educational Faculty of Buca (DSSMFE) 2000-2001 educational term and certification program attendees which were graduated from University of Dokuz Eylul (DEU) Faculty of Science and Literature were tested in this research.

The research is oriented to determine the general knowledge levels related to the steps of interpretation, transformation and transition of high school mathematics which these teacher candidates will service in the future. It is evident that the evaluation tool, which was applied, was not enough to measure all the dimensions of

a subject. For each subject, the knowledge levels and lack of knowledge of the teacher candidates should be researched and the ways of relieving these should be determined.

Furthermore, these subjects should be researched and the solution steps should be determined for the teacher candidates of Educational Faculty and Faculty of Science and Literature which will soon gain to the army of education.

By the findings and results obtained from this study which the numerations and limitations are determined of, we think that it will make it necessary to reach the decisions below.

The available educational model is still based on straight expression method; the principle of explaining the lesson books and notes in a straight way. This means that, education which is made by a passive method, cannot achieve its duty (Gürol, M. 1997).

It is very important to make the teacher candidates comprehend the basic points while dealing with the sequences, which are one of the basic subjects of analysis. It is necessary to give a better definition of sequence and teach the concepts like limit of sequence, limitations in sequences, convergence, divergence, the lowest element, the highest element, in a careful way. Especially, in Educational Faculties and Science and Literature Faculties these concepts should be handled very carefully. In explanation of the subjects, active education should be preferred.

General mathematics is the beginning point of advanced mathematics and the basic for other advanced subjects. The last twenty years is the witness for the publications related to the understanding of general mathematics by teacher candidates (Monaghan, J.,1986).

In sequences, the relation between convergence and limitation, monotony and convergence, monotony and limitation and the theories related to determination of limit by utilizing these properties should be examined very well. Especially in analysis lessons, these concepts should be discussed in a better way. What are the necessary conditions of determining the limit of a sequence and how can we determine the limit of a sequence? These points should well be illuminated in lessons, homework should be given to the teacher candidates if necessary. These difficulties should be relieved by applying different teaching methods. The properties of the sequence given as a Cauchy sequence should be examined more carefully in analysis lessons at Educational Faculties and Science and Literature Faculties and conditions have to be determined very well. The theory of "Every convergent sequence in R is a Cauchy sequence, every Cauchy sequence is convergent" needed to be very well examined. Considering the determination of general term in sequences and how the sub- sequences are obtained, different exercises should be made at analysis lessons at EFB and FSL by consolidating with examples. This subject is needed to be insisted in lessons. Computer supported teaching, which includes and helps to understand these subjects, can be made. In computer supported teaching, the teacher candidates can overcome mistakes by obtaining the errors faster.

In a computer supported teaching environment, the students use the softwares interactively, solve the problems step by step, by receiving errors learn their mistakes. In this manner, computer plays a bridge role which brings students' knowledge and talents into foreground (Baki, A., Budak, İ., 1999). The basic properties in the subject of determining series total and sequence concept, which constitutes the base for integral subject, needed to be comprehended well. Otherwise, it is possible to encounter important problems in making students comprehend integral and other related subjects.

Understanding possibility concept entirely can only take place in the adolescence period (Piaget, J., Inhelder, B., 1975). In our country, possibility subject is both included in 8^{th} Class and 10^{th} Class programs (National Ministry of Education, 1988). Despite possibility subject is so important, as in most of the foreign countries, also in our country for various reasons these concepts aren't effectively educated. (Aksu,M., 1990 & Bar-On, E., Or-Bach, R., 1988 & Carpenter,T. P., Corbitt, M. K., Kepner, H. S., Linquıst, M. M.,Reys, E. R., 1981 & Fischein, E., Schnarch, D., 1997). Having misconceptions related to possibility subject, affects students success (Fischein,E., Schnarch, D.,1997).

One of the reasons for this, is that most of the mathematics teachers doesn't have the necessary talent and knowledge for teaching possibility subject effectively (Tobuk, Z., 1994).

Being one of the basic subjects of possibility concept, the Binomial expansion by insisting on its properties, we should make both two groups of teacher candidates comprehend that in the expansion the terms, which are in

same distance, have equal coefficients. It is delighted if they can apply combination in daily life. But this is not enough. In calculating conditional possibility, it should be insisted that conditions are needed to be determined well. The properties of the sets given in questions should be pointed out well. Distinguishing points should be brought into foreground.

Details about the subject of permutation's properties and its meaning should be put forward. The subject should be explained by many different examples. In logarithm subject, properties of characteristic and mantis are generally being forgotten. These properties should be insisted more.

A good level of success is observed on analyzing logarithmic equivalencies. However, Educational Faculties are more successful. Also, Science and Literature Faculties should attach importance to this subject.

Analogies that are formed by students not only support students to think, but also help the teachers to see the right or wrong concepts related to that concept, which students have in their mind (Wong, E. D., 1993). To understand a new event, analogy supplies the prior segmented knowledge to be used completely. Analogies not only play a productive role in students' self learning and education, but also have important duties in solution of wrong concepts and misconceptions (Şahin, F., Gürdal,A.,Berkem,M.L.,2000).

We think that, it is necessary to make the students comprehend the base argument in complex numbers, interpretation of what can it be at most or least. In complex numbered equivalencies, it is necessary to be insisted on determining the roots and calculating the base argument. It is necessary to attach importance to analogy. As with other subjects, analogy should also be practiced when studying other subjects.

It should be insisted on giving different expressions of complex numbers and operations that are necessary for determining the distance between two complex numbers. It is observed that this subject should be insisted carefully especially in Science and Literature Faculties.

The students need to have strategic knowledge on the subject. This knowledge should be transferred from teacher to the student before. Using sinus and cosine terms when writing all expressions related to tangent and cotangent, can be given as an example for a this type of knowledge (Wilson,J.W., Fernandez,M.L., Hadaway,N.,1999).

For learning root totals and root products of a second-degree equivalency and solving problems by combining trigonometric rates with these and likely properties, exercises should be made by both of the two groups.

Models, which are a tool of material education, play a key role in interpreting science and help in understanding complex concepts. Also supports students to produce new and creative thoughts (Gilbert, K. J., Boulter, C., 1998). According to Van Hiele the most important reason for the mistakes that students make (Van Hiele, P. M., Van Hiele-Geldof, D., 1958) is the vision which is one levels of geometric thinking levels.

To make them able to use distance and angle relations, geometry lessons which include plane geometry, should also be given. It should be insisted more on trigonometric properties and identities. The tangent and vertical properties in circle should be determined well and the synthetic examination of the circle should be made in a better way. While working on these subjects, there should be a tool laboratory for mathematics and as well as objects of plane geometry, objects of space geometry should be kept in there.

As Cornell also stated, " Math education should be entertaining and interesting. When students are pleased in a math lesson which is equipped with projects, concepts, shows and likely activities, learning and motivation increase in education(Cornell,C.,2000).

Both of the two groups have successfully achieved determining equivalency classes of a set according to a given relation. The operations for determining function and reverse function should be handled more detailed by Science and Literature Faculties. More students should comprehend the operations in modular arithmetic. More exercises should be made on this subject. The lack of preliminary and talent about sets subject effects possibility concept negatively (Bar-On, E., Or-Bach, R., 1988).

A good level of success was observed on sets subject. However, some basic properties related to the operations in sets wasn't determined completely by two groups. For this reason, operations in sets should be examined more carefully in lessons of Abstract Mathematics and Analysis.

Lesson books are another factor that causes misconceptions. Lesson books should be investigated by this point of view. It is agreed that "Lesson Books" and "Assistant Lesson Books" have an important part in education. This situation bears the obligation for arranging publications in a suitable way. Otherwise, one of the components of education remains missing (Alkan, H.ve arkadaşları, 1996).

Many different researches show that Elementary and Secondary Level students also have misconceptions. For this reason, misconceptions of the teachers working in Secondary Education Institutions should be relieved by inner service courses, seminars and publications. We think that it is necessary to conduct these kinds of studies in Educational Faculties for teacher candidates to be relieved from these misconceptions.

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DEVELOPMENT OF A NEW CURRICULUM FOR COMPUTER EDUCATION AND COMPARISON WITH THE CURRENT CURRICULUM OF THE TURKISH MINISTRY OF NATIONAL EDUCATION

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ABSTRACT
The aim of this study is to develop a new curriculum, which meets the standards of today's computer literacy and enables the students to apply the MS Excel program in their daily lives as a tool, for the spreadsheet courses in computer lessons in the 6th, 7th, 8th grades of the current curriculum of the Turkish Ministry of National Education, which is considered requiring improvements. During the study, the new curriculum developed for use in computer lessons was compared with the curriculum, which is currently applied by the Turkish Ministry of National Education, in accordance with the EU standards. Total of 80 students participated in the study. The students were divided into two groups. The spreadsheet curriculum was applied to the first group during the computer lessons. On the other hand, the curriculum for the elective computer course 4 of the Ministry of National Education was applied to the second group. The results of the Spreadsheet Application Tests developed by the researchers were utilized in collection of the necessary data. The t-test and single-factor analysis of variance methods were used in the analysis of the data obtained. The results of the study indicate that the newly developed spreadsheet curriculum is more effective compared to the curriculum of the Ministry of National Education for the computer courses in the primary education. This study will serve as a guide for reviewing and revising the Turkish Ministry of National Education's primary education curriculum for the elective computer courses in line with the EU standards and in the light of the new curriculum developed.

Keywords: Spreadsheet Curriculum, Curriculum Development, MS Excel

Bilgisayar Eğitiminde Yeni Öğretim Programının Geliştirilmesi ve M.E.B Öğretim Programı ile Karşılaştırılması

ÖZET
Bu çalışmanın amacı; geliştirilmeye ihtiyacı olduğu düşünülen M.E.B'nın İlköğretim II. Kademe bilgisayar öğretim programında yer alan hesap çizelgeleri (MS Excel) konusunda, günümüz bilgisayar okur-yazarlığı standartlarını sağlayan ve öğrencinin günlük yaşamında MS Excel programını bir araç olarak kullanabilmesine imkan tanıyan yeni bir öğretim programı geliştirmektir. Çalışmada, bilgisayar dersinde kullanılmak üzere geliştirilen yeni öğretim programı ile M.E.B'nın uygulamakta olduğu öğretim programı, AB standartları doğrultusunda karşılaştırılmıştır. Araştırmaya toplam 80 öğrenci katılmıştır. Öğrenciler iki gruba bölünmüş, birinci gruba araştırmacılar tarafından geliştirilen hesap çizelgeleri öğretim programı, ikinci gruba ise M.E.B'nın ilköğretim seçmeli bilgisayar 4 öğretim programı uygulanarak ders işlenmiştir. Verilerin toplanmasında araştırmacılar tarafından geliştirilen Hesap Çizelgeleri Uygulama Sınav sonuçlarından yararlanılmış, elde edilen verilerin analizinde t-testi ve tek faktörlü varyans analizi kullanılmıştır. Araştırmada elde edilen sonuçlar, geliştirilen hesap çizelgeleri öğretim programının öğrencilerin bilgisayar ders başarıları açısından, M.E.B'nın ilköğretim bilgisayar öğretim programına kıyasla daha etkili olduğunu göstermiştir. Bu çalışma, M.E.B'nın ilköğretim seçmeli bilgisayar dersi öğretim programının, AB standartları doğrultusunda ve geliştirilen yeni öğretim programı ışığında gözden geçirilerek yeniden düzenlenmesi konusunda rehber olacaktır.

Anahtar Kelimeler: Hesap Çizelgeleri, Öğretim Programı, MS Excel

Today, in the information age, also the education and training are required to change. This necessity of change specifically increases the importance of computers used as a tool in teaching technology. Feeling the necessity for the knowledge to be learned is an important factor for the permanence of knowledge and for the motivation of students. Also the computer lesson curriculum prepared by the Turkish Ministry of National Education in 1998 should be improved in this direction. In European Union countries, computer lessons are provided under the title ICT "Information and Communication Technology" or IT "Information Technology". Examining the curricula of these internationally equivalent lessons indicates that enabling the students to use information and communication technologies for acquiring access to ideas and experiences of people from different societies and cultures is one of the targets of these programs. Furthermore, abilities of making individual decisions and

thinking independently, and to distinguish where and when to use the information and communication technologies at home, office, at this moment and in future activities, either in other lessons or in daily life, are also among the skills aimed by these programs.

Considering the computer education programs, contents of lessons and computer literacy standards acknowledged in the European Union member countries and throughout the world, it can be observed that the curriculum applied in Turkey is inadequate in this perspective (Özdener and Öztok, 2005; Özdener and Cüre, 2006; Baki and Tatlı 2006). In this context, it can be concluded that the program of the Turkish Ministry of National Education will not sufficiently enable the students to use the developing computer and communication technologies in their daily lives, and in parallel, also in other education subjects as a tool. Regarding these points, it will be suitable to reorganize the curriculum of computer lessons based on the requirements of the society and the world standards.

PURPOSE OF THE STUDY

The purpose of this study is to develop a new curriculum for the subject of "spreadsheets" in elective computer lessons for the second grade primary education of the Ministry of National Education, which will fulfill the standards of computer literacy of our age and enable the students to use computers as a tool in their daily lives. Determination of the required characteristics of the new curriculum to be developed taking into consideration the other curricula (e.g. science), and of the activities to be used during the course of the lessons in accordance with the program are among the basic objectives of this study. In this context, current computer 4 lesson curriculum of the Ministry of National Education and the new curriculum developed by the researchers have been compared in terms of the success of the students.

Hypothesis 1: When comparing the success of students in "spreadsheet creation" in two different research populations (Ministry of National Education Curriculum, New Curriculum), a relevant difference in favor of the new curriculum shall become apparent.
Hypothesis 2: When comparing the success of students in "the ability to organize information" in two different research populations (Ministry of National Education Curriculum, New Curriculum), a relevant difference in favor of the new curriculum shall become apparent.
Hypothesis 3: When comparing the success of students in "the ability to conduct mathematical operations" in two different research populations (Ministry of National Education Curriculum, New Curriculum), a relevant difference in favor of the new curriculum shall become apparent.
Hypothesis 4: When comparing the success of students in "the ability to interpret the relationship between two variables" in two different research populations (Ministry of National Education Curriculum, New Curriculum), a relevant difference in favor of the new curriculum shall become apparent.

RELATED LITERATURE

Since education is a process of producing desired changes in the behavior of students through their own experiences, the program must be able to realize desired behaviors required by this process. Büyükkaragöz (1997, p.6) emphasizes that the curriculum must be both operational (functional) and flexible. The individual learns through mutual action of elements in his education condition when a change in behaviors occurs. Whether the change is in the desired direction or not depends on the carefully chosen education condition which includes subtly organized and arranged elements. This planning and organization works can shortly be called program preparation (Bilen, 1996, p.15).

Indicating that program preparation is a process of planning with the final purpose of creating a draft program, Fidan says that "developing a program includes all activities to make the program more realistic and more effective. A program must be developed subject to continuous evaluation and research activities" (Fidan, 1996, pp.23-24).

Different definitions regarding a curriculum in the education literature naturally result in different approaches, opinions and definitions in program development. In this context, it is quite difficult to make one single definition for program development. Erden (1995, p.3) defines program development in a general sense as "the process of drafting, applying, evaluating curricula and reorganizing them in parallel with the data obtained as a result of the evaluation". According to Feyereisen, Fiorino and Nowak, program development is "in its essence an environmental organization plan made to coordinate the elements of time, place, material, equipment and personnel properly" (Wiles and Bondi, 1979, p.9).

Program development has been falsely perceived in Turkey in the past years in general as the addition or omission of lessons or subjects in the program, and as the increase or decrease of time reserved for these. (Varış,

1986, p.46). As Doll also indicates, "program development is not only developing the program documents and structure, but also encouraging the change of understanding and values in all individuals related with the program" (Doll, 1970, p.232).

McNeil (1996, p.112) classifies the participants of the program development process in social, institutional, educational and individual levels. And Ertürk (1975, p.12) identifies that the program development process includes the program preparation, application and evaluation stages.

Three basic approaches are adopted when developing curricula. These are; subject-centered program design, student-centered program design and problem-centered program design (Demirel, 1997, p.61).

Program Development Models in Education

Purpose of establishment of a model is to make a complex process comprehensible and applicable. Important characteristics of models are that they are personal, aesthetic, transitive and subjective. Needs and interests of students are important. They are student-centered and activity-centered. Students determine their interests themselves. They make personal preferences apparent, they are functional. Most important of these are:

Taba Model: The Taba Model assumes the induction approach and suggests performance of the program development in eight stages.
Rogers Model: Rogers Model is also called the interpersonal model. This model is based on human experiences and is open to innovations and changes.
Miller and Seller Model: Miller and Seller showed how to direct the program in the direction of its purpose in their models. (Büyükkaragöz, 1997, p.218).
Tyler Model: Tyler Model consists of targets obtained from students, society and subject field resources, and includes their filtering through philosophy and psychology to reach the education purposes, in addition to choosing, organizing, managing and evaluating the learning experiences (Demir, 1998, p.67).
Saylor, Alexander and Lewis Model: Program design (Saylor, Alexander and Lewis, 1981) consists of a plurality of smaller plans related to individual parts of the program rather than a single document.

Program Models in Turkey

Results of a research conducted to seek an answer to the question as to how a program development model for the Turkish education system should look like suggested a model similar to that of Taba-Tyler approach (Demirel, 1997, p.72). In order to unify program development efforts in several units of the Ministry of National Education, current program development models applied in developed countries have been examined by domestic and foreign experts and also by experts from the Education Research and Development Directorate (EARGED), and a modern "program development model" has been developed in our country for the first time. This model has been recommended to various units to be used in program development efforts of the field of education for general training.

The Program Development Model developed by EARGED defines program development as a multi-aspect process, in which decisions on the targets that may be achieved by students in a certain field of education and grade are made (http://www.earged.gov.tr/prg.htm).

Program Development Model of the Educational Board of Turkey

Observing that the Turkish education system is becoming insufficient in recent years, the Ministry of National Education initiated studies in this framework by the Educational Board of Turkey (TTKB). The difference of the developed program from previous and current programs is the progression from a rigid behaviorist program approach towards a cognitive and structuring approach. Furthermore, pre-school education, primary education and general intermediary education and vocational intermediary education are redesigned with a unified purpose. Instead of the partitioned program concept organized according to the primary and secondary school approach, it is intended to make the programs suitable for the eight-year uninterrupted education. When attaining these purposes, the program is reportedly considering integration with the world and EU standards.

The Turkish Ministry of National Education adopted the concept of gradual transition to the system starting from the first grade of primary education in the 2005-2006 School Year in order to start execution of the newly developed curricula. The program developed by the TTKB includes a total of 12 stages indicated in Figure 1. (http://ttkb.meb.gov.tr/programlar/program_giris/prog_gelis_3.htm).

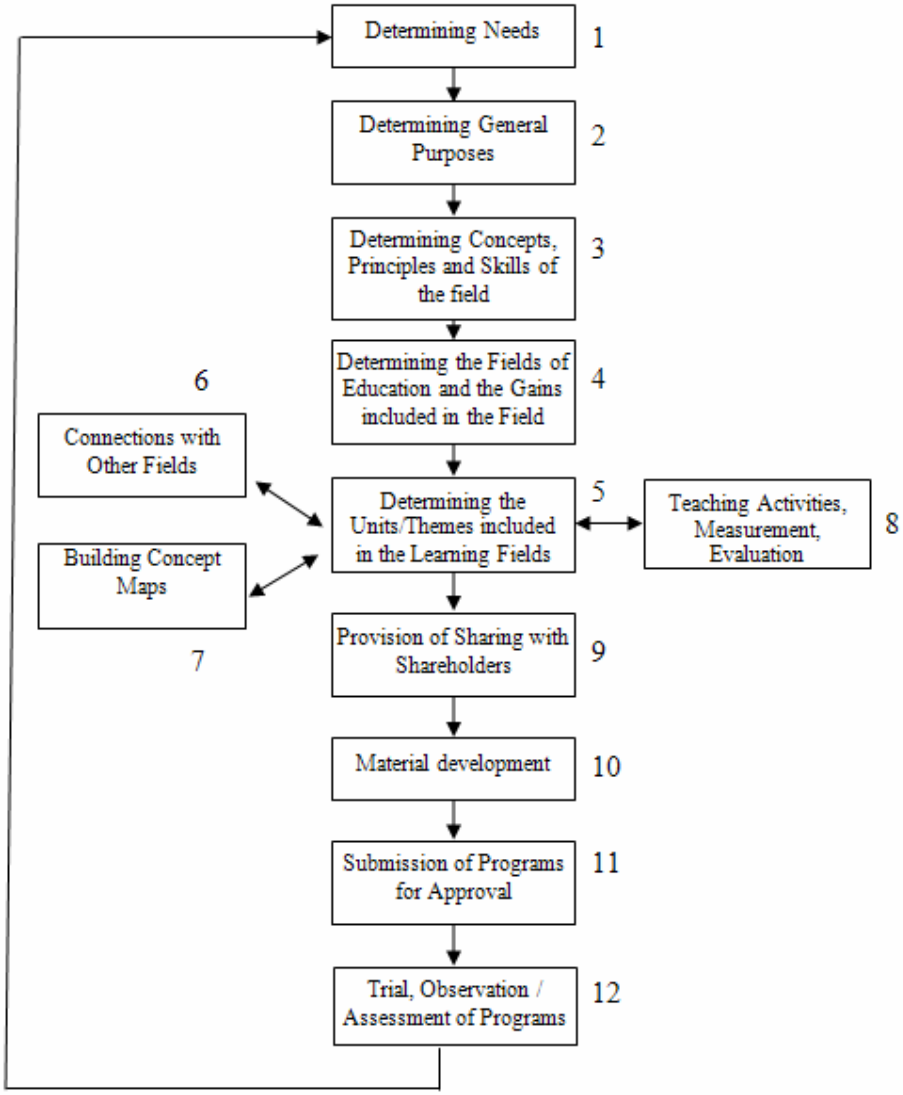

Figure 1 *Program Development Model of the Educational Board of Turkey*

METHOD

The study is conducted using the experimental model with post-test control group. Specifically, in line with the program development model designed by the Educational Board of Turkey in the context of student-centered approach, a new prototype program has been developed. Then, out of two research populations matched in terms of computer literacy, curriculum of the Ministry of National Education on spreadsheets for the primary education 2nd grade elective computer course (Educational Board of Turkey, 1998) was applied to the First Group, while the curriculum developed by the researchers was applied to the Second Group (Appendix 1). While determining identical groups with respect to computer literacy, computer lesson averages of the first Semester in 2005-2006 school year were considered. Final test data obtained at the end of the training were utilized in the comparison stage of the two different curricula that were applied.

Research Population

Research population of the study consisted of 2nd stage 7th grade students of the 75. Yıl Mesut Yilmaz Primary School in Pendik Town of the Istanbul Province, in 2005-2006 School Year. In the study that was conducted with 121 students, considering computer lesson grade point averages of the students at the end of the 1st Semester, a total of 3 classes were examined and 2 classes identified to be statistically closer to each other were

included in the study as research populations. Students in the research population had not received any training on spreadsheets previously. Table 1 shows the distribution of the students in groups.

Table 1. *Student Distributions*

Groups	Num. of student	Female	Male
Group A	41	20	21
Group B*	41	18	23
Group C	39	22	17

* Was not included in the research population of the study since a significant difference from other groups was identified in analysis conducted before the application.

Data Collection Tools

Applied Examination

It has been developed by the researchers to measure the success of the students having completed their education in line with two different curricula. A total of 19 behaviors in 5 categories named spreadsheet creation, organizing information, conducting mathematical operations and interpreting the relation between variables by means of graphics have been evaluated in the examination consisting of 30 questions. The behaviors desired to be gained by students are identified in accordance with the EU standards and European Computer Driving Licence (ECDL) (http://www.ecdl.org.tr) depending on the age group and knowledge levels, and were used after required arrangements in line with the pilot application (Table 2).

Table 2 Behaviors to be measured in the examination

	Behaviors	Question number
1	Starts a spreadsheet program.	
2	Creates a new spreadsheet.	Ability to create spreadsheets in desired format (1, 2, 3, 4, 5, 13, 17, 20, 21, 22)
3	Saves a spreadsheet.	
4	Enters numbers or letters in a desired cell or cells.	
5	Enters a symbol to desired cell or cells.	
6	Copies the contents of a range of selected cells.	
7	Moves the contents of a range of selected cells.	
8	Deletes the contents of a range of selected cells.	
9	Knows how to format desired cell or cells.	
10	Groups data by creating spreadsheets.	
11	Is able to organize the desired data.	Ability to organize data (17, 20, 21, 22)
12	Knows the priorities in arithmetical and logical operations.	Ability to perform mathematical operations (6, 7, 14, 15, 16, 18, 19)
13	Uses arithmetical and logical formulae in a spreadsheet application.	
14	Copies formulae by using auto fill.	
15	Uses standard Excel functions (add, average, sum, max, min ets.) in a spreadsheet application.	
16	Creates a graph from data transformed into tables	Creating graphs (8, 9, 10, 11, 23, 24)
17	Is able to change graph type.	
18	Is able to correct or change a diagram or graph.	
19	Explains the relation between variables by interpreting the graph.	Ability to explain the relation between variables by means of the graph. (25, 26, 27, 28, 29, 30)

A consistency of 83.26% has been determined in the behaviors desired to be measured, as a result of the studies with 3 computer teachers in order to determine the content validity of the prepared examination. Inter-rater reliability of the test has been calculated as 0.88 (Cronbach alpha). The examination developed has been performed under observation of two teachers being applied in the computer classes, and questions numbered 1, 7, 16, 24 have been evaluated as a result of the teachers' observations.

Application

Applications have been performed in line with the annual plan given in Attachment 1 in the spring semester of 2005-2006 school year. The annual plan has been divided in units to include targeted gains, subject hierarchy, education techniques and materials to be used. In line with the annual plan prepared, a total of 10 lessons have

been given over 5 weeks, projectors and worksheets have been used during the application. Worksheets have been developed by the researchers in line with examples from daily life related to the subjects "ability to create spreadsheets in desired form", "ability to organize data", "ability to conduct mathematical operations", "ability to create graphs", and "ability to interpret the relation between variables by means of a graph". Appendix 2 gives the sample worksheets used during the application.

The study respected the parallelism and integrity of the spreadsheet curriculum with programs of other lessons, in this context also science lessons have been included in the study. In the process that attempted to address "spreadsheets" and "movement" subjects together, science and computer teachers planned common activities and continued the lessons together.

FINDINGS

Primarily, the research attempted to identify whether the research populations are equivalent in terms of success in computer lessons, and success points of the students at the end of the 1st Semester in computer lessons have been considered to determine the experimental and control groups. "One-way Anova Test" has been used in group comparisons, and the "Scheffe" test has been utilized to determine from which group the difference that is obtained as a result of the analysis originates.

Table 3. *One-way Anova Test Results According to I. Computer Points*

	Sum of Squares	sd	Mean Square	F	Sig.
Between Groups	3307,43	2	1653,72	7,09	,001
Within Groups	27729,18	119	233,01		
Total	31036,62	121			

According to the test results given in Table 3, a significant difference in grade averages of the 7th classes was determined at the end of the 1st Semester [$F_{(2\text{-}119)}$=7,09, p<0,05]. As a result of the "Scheffe" test, which was conducted to determine which group is favored by the difference between the groups, a difference in group B was identified, and therefore the group B was excluded from the study. According to test results, groups A and C are equivalent groups, and there is no significant difference between the "New Spreadsheet Curriculum" and their initial levels before the start of their lessons. In the light of these findings, it can be said that the groups A and C, which were to be used as experimental and control groups, are equivalent.

Effect of the New Curriculum on "Spreadsheet Creation" Success

The 1st hypothesis tested in the study involves comparison of the curriculum of the Ministry of National Education with the new curriculum in terms of "spreadsheet creation" success. Results of the t test conducted after the application for this purpose can be seen in Table 4.

Table 4. *The independent t-test results related to the difference between "Spreadsheet Creation" success points of experimental and control group students.*

Group	N	Mean	Sd	df	t	p	
Control	41	7,37	1,52	78	7,46	0,00	
Experimental	39	9,41	0,78				

Test results indicate that regarding the success in "spreadsheet creation", the experimental group applying the new curriculum is more successful than the control group applying the curriculum of the Ministry of National Education (t=7,46, p<0,05).

Effect of the New Curriculum on "Ability to Organize Data" Success

The 2nd hypothesis tested in the study involves comparison of the curriculum of the Ministry of National Education with the new curriculum in terms of the "ability to organize data" success. Results of the t test conducted after the application for this purpose can be seen in Table 5.

Table 5. *The independent t-test results related to the difference between "Ability to Organize Data" success points of experimental and control group students*

Group	N	Mean	Sd	df	t	p	
Control	41	2,46	1,07	78	6,09	0,00	
Experimental	39	3,67	0,62				

Test results indicate that regarding the success in the "Ability to Organize Data", the experimental group applying the new curriculum is more successful than the control group applying the curriculum of the Ministry of National Education (t=6,09, p<0,05).

Effect of the New Curriculum on "Ability to Perform Mathematical Operations" Success

The 3rd hypothesis tested in the research involves comparison of the curriculum of the Ministry of National Education with the new curriculum in terms of "ability to perform mathematical operations" success. Results of the t test conducted after the application for this purpose can be seen in Table 5.

Table 6. *The independent t-test results related to the difference between "Ability to Perform Mathematical Operations" success points of experimental and control group students*

Group	N	Mean	Sd	df	t	p	
Control	41	3,27	1,53	78	6,33	0,00	
Experimental	39	5,13	1,03				

Test results indicate that regarding the success in "Ability to Perform Mathematical Operations", the experimental group applying the new curriculum is more successful than the control group applying the curriculum of the Ministry of National Education (t=6,33, p<0,05).

Effect of the New Curriculum on "Ability to Interpret the Relation Between Two Variables" Success

The 4th hypothesis tested in the research involves comparison of the curriculum of the Ministry of National Education with the new curriculum in terms of "ability to interpret the relation between two variables" success. Results of the t test conducted after the application for this purpose can be seen in Table 5.

Table 7. *The independent t-test results related to the difference between "Ability to Interpret the Relation between two variables" success points of experimental and control group students*

Group	N	Mean	Sd	df	t	p	
Control	41	2,95	2,08	78	2,69	0,01	
Experimental	39	4,33	2,51				

Test results indicate that regarding the success in "Ability to Interpret the Relation Between Two Variables", the experimental group applying the new curriculum is more successful than the control group applying the curriculum of the Ministry of National Education (t=2,69, p<0,05).

RESULTS, DISCUSSION, SUGGESTIONS

This research has developed a prototype curriculum to be used in elective computer lessons for the primary school 2nd stage 7th grade students. The newly developed curriculum has been compared with the current curriculum of the Ministry of National Education in terms of computer lesson successes of the students, and following results have been obtained in line with the resulting findings.

In accordance with the findings obtained as a result of the study, the new curriculum has been identified to be more successful than the curriculum applied by the Ministry of National Education in terms of "spreadsheet creation" success. To provide a basis for more advanced subjects in spreadsheet applications, the students have to attain the ability to "create spreadsheets" primarily. While "spreadsheet creation" is not included in the curriculum of the Ministry of National Education, it has a privileged status in the new curriculum. Research results in terms of the students' success have been influenced positively by the examples from daily life included in the application process of the new curriculum, and also by the utilization of worksheet prepared in this context.

According to the results of the study, it has been identified that students being educated in line with the new curriculum can organize data better than the students applying the curriculum of the Ministry of National Education. In other words, it has been seen that students being trained in line with the new curriculum can distinguish data in categories and classes and place them as desired in spreadsheets more successfully. In general, regarding the understanding of the subjects, how and in which hierarchy the subjects shall be taught is of great importance. Therefore, for a student using the spreadsheet program (MS Excel), the ability "to organize information" represents a stage in understanding proceeding subjects. The new curriculum developed in this

perspective includes "the ability to organize data". However, no content or purpose is available in the curriculum of the Ministry of National Education regarding this subject.

It is among the aims of the developed curriculum to enable students to perform "mathematical operations" using the spreadsheet program (MS Excel). In line with this aim, it is among the targets of the new curriculum to "provide students the skills to perform mathematical operations with basic formulae" in MS Excel. However, in the curriculum of the Ministry of National Education, there is no target or any activity related with the "calculation" function, which is one of the basic characteristics of spreadsheet programs. As a result of the study findings, it has been found out that "performing mathematical operations" success of students trained in line with the new curriculum is higher that the students trained in line with the curriculum of the Ministry of National Education.

According to research results, when comparing the "ability to interpret the relation between two variables" success, students applying the new curriculum are identified to be more successful than students applying the curriculum of the Ministry of National Education. In providing this result, the practice-oriented approach adapted in the new curriculum in the subjects of "creating graphics" and "interpreting graphics", practices in line with sample studies taken from daily life, and the purpose of teaching the student the logic of graph creation have been effective.

Study findings indicate that the new curriculum developed in line with EU standards is more successful than the curriculum of the Ministry of National Education regarding general success in computer lessons. These results are supported by the study (Özdener and Öztok, 2005; Baki and Tatlı, 2006) investigating and comparing the curriculum of the Ministry of National Education according to EU standards regarding the success of students. Furthermore, teaching of the subjects constituting the basis in the right order, and transforming the computer lesson to a tool that can be used also in other disciplines have affected the success of the new curriculum positively.

As a result of the applications performed in the study, it has been seen that the curriculum of the Ministry of National Education for the primary education elective computer lessons is inadequate for the requirements of our age, and insufficient for the developing information and communication technologies. Study findings not only emphasize the content of the lesson, but also identify the hierarchy within which the lesson should be provided. Among the factors increasing success is the fact that the new curriculum has been developed considering the behaviors the students can use in their daily life in line with the European Union computer literacy standards.

The Ministry of National Education decreased the elective computer lesson hours in primary schools from 2 hours to 1 hour per week as of 2005-2006 school year. It is obvious that 1 lesson hour per week will not be sufficient for providing computer lessons in which practical application is more important than theoretical information, but also for providing the education required for the student to use computers in his daily life and in other lessons. Specifically, this alteration coming in a period when efforts are made to expand computer-supported training will affect computer training negatively.

In the light of the acquired information, we believe that this study conducted for the subject of "spreadsheets" will serve as a guide in adaptation of the computer lesson to other subjects. In this context, it will be favorable to revise and reorganize the elective computer lesson curriculum of the Ministry of National Education for primary education in line with EU standards and in the light of the newly developed curriculum.

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Appendix 1: Newly Developed Curriculum

Abilities and Activities in Units

UNIT	ABILITIES	ACTIVITY EXAMPLES	REMARKS
BASIC INFORMATION ON THE SPREADSHEET PROGRAM and ENTERING DATA AND MAKING ARRANGEMENTS IN CELLS	**Aim 1:** Ability to create spreadsheets in desired formats **Behaviors:** 1. Starts a spreadsheet program. 2. Creates a new spreadsheet. 3. Saves a spreadsheet. 4. Enters numbers or letters in a desired cell or cells. 5. Enters a symbol to desired cell or cells. 6. Copies the contents of a range of selected cells. 7. Pastes the contents of a range of selected cells. 8. Deletes the contents of a range of selected cells.	**Spreadsheet Examples:** Students are asked to bring ready examples of spreadsheets to the next lesson. 🗎 **Examples from Daily Life:** Examples are given from tables they use in daily life, at school, and people around them use. Importance of tables is emphasized. **Preparing Tables:** Table preparation methods and techniques by means of projection are shown to students. Format characteristics are shown and applied. 🕮 **Preparing sample tables:** Students are asked to prepare a sample table in the distributed worksheets in the spreadsheet program. Important aspects of table preparation are emphasized. The teacher identifies the required format characteristics on the table and asks the students to color and format the sample table as desired.	🕮 Teacher distributes a "sample table" worksheet to all students in the classroom. 💻: Students are shown how to format the sample table by means of projection. ⌘ Students are asked to use the prepared tables in their daily lives and in other lessons.

🗎: In-Class Activity 🕮:Worksheet ⌘: Relating to Other Lessons ⌦ Out-of-School Activity 💻: Teaching Material Used

Abilities and Activities in Units

UNIT	ABILITIES	ACTIVITY EXAMPLES	REMARKS
MENU OPERATIONS	**Aim 1:** Ability to create spreadsheets in desired formats **Behaviors:** 1. Know how to use cell formatting functions. 2. Creates tables to group data. **Aim 2:** Ability to organize data. **Behavior:** 1. Acquires the ability to organize desired data.	🕮 **Preparing sample tables:** Continue to prepare the sample table on the worksheet distributed to students. Explain once again the aspects to be respected when preparing tables. Teacher identifies the required formatting characteristics of the table once again, and asks the students to color and format the sample table as desired. 🗎 Ready data given to students. They are asked to classify these data in categories. Discuss how to transform the data in separate classes into tables. Discussion results are transformed into a table by means of projection and the table providing the best result is identified. Methods required to transform data into tables are identified. **Sample Work:** Students are asked to prepare a league fixture. 🕮 Students are asked to prepare a multiplication table.	🕮 Teacher distributes a "sample table" worksheet to all students in the class. 💻: Students are shown how to format the sample table by means of projection. Sample tables used to organize data are attempted to be prepared by means of projection. ⌘ Students are asked to use the prepared tables in their daily lives and in other lessons. 🕮 Students are asked to prepare a multiplication table.

🗎: In-Class Activity 🕮:Worksheet ⌘: Relating to Other Lessons ⌦ Out-of-School Activity 💻: Teaching Material Used

Abilities and Activities in Units

UNIT	ABILITIES	ACTIVITY EXAMPLES	REMARKS
USING FORMULAE AND FUNCTIONS	**Aim 3:** Ability to perform mathematical operations **Behaviors:** 1. Knows the priorities in arithmetical and logical operations. 2. Uses arithmetical and logical formulae in a spreadsheet application. 3. Copies formulae by using the autofill function. 4. Uses standard Excel functions (add, average, round up) in a spreadsheet application.	🕮: **Preparing a Multiplication Table:** Students are asked to prepare a multiplication table that was asked to be prepared in the previous lesson by using mathematical operations in the spreadsheet program. **Examples from Daily Life:** Students are asked to make calculations they can use in daily life. In this direction, sample calculations are performed. ⌘ They are asked to make the area calculations of geometric figures in spreadsheet program by using area calculation formulae used in the **Mathematics** lesson. Examples: Square, Rectangle, Triangle and Cylinder	🕮 Teacher distributes a "multiplication table preparation" worksheet to all students in the class. 💻: Sample work is shown to students by means of projection. Mathematical operations and simple formulae are shown to the students by means of projection. ⌘ Students are asked to use the prepared tables in their daily lives and in other lessons. ⌘ They are asked to make the area calculations of geometric figures in spreadsheet program by using area calculation formulae used in the Mathematics lesson. Examples: Square, Rectangle, Triangle and Cylinder.

🖹: In-Class Activity 🕮:Worksheet ⌘: Relating to Other Lessons ⌦ Out-of-School Activity 💻: Teaching Material Used

Abilities and Activities in Units

UNIT	ABILITIES	ACTIVITY EXAMPLES	REMARKS
CREATIONG GRAPHS	**Aim 4:** Ability to create graphs **Behaviors:** 1 Creates a graph of data transformed into tables 2. Able to change graph type. 3. Makes corrections or changes on a diagram or graph	⌘: Evaluation of works asked to be done in science lesson. **Examples from Daily Life:** Students are asked to give examples of graphs they see around. Discuss where graphs are used. 🕮: **Daily temperatures:** Students are given worksheet indicating daily temperature values. They are asked to create graphs according to the type of graphs required on these sheets. 🕮: **Speed – Time** Students are distributed worksheets indicating speed-time values. They are asked to create graphs according to the type of graphs required on these sheets. ⌘: Evaluation of activities asked to be done in the previous science lesson. Results transformed into graphs. 🖹 **Most viewed TV series:** Students are interviewed on most viewed TV series. They are asked to make a cake graph according to the results of these interviews.	🕮 Teacher distributes a "daily temperature", "speed and time" and "most viewed TV series" worksheet to all students in the class. 💻: Students are shown a sample table by means of projection. Stages required to be observed while preparing graphs are shown to the students by means of projection. ⌘ Students are asked to evaluate the results of activities made in science lessons in the spreadsheet lesson and transform them into graphs. ⌘ Speed – Time graphs and science lesson subjects are related.

🖹: In-Class Activity 🕮:Worksheet ⌘: Relating to Other Lessons ⌦ Out-of-School Activity 💻: Teaching Material Used

Abilities and Activities in Units

UNIT	ABILITIES	ACTIVITY EXAMPLES	REMARKS
GRAPH INTERPRETATION	**Aim 5** Ability to interpret the relation between variables by means of graphs **Behaviors:** 1 Interprets the graphs and explains the relation between variables.	**Examples from Daily Life:** Students are previously asked to bring examples of graphs they see around. These samples are interpreted. ⌘: Activities required in the science lesson are reevaluated. The question of "What must be considered when interpreting graphs?" is discussed. When to use Graphics displays and types is discussed.	🕮 Teacher makes sample graphs all students in the class and asks to evaluate these graphs. 💻: Students are shown a sample work by means of projection. Which factors to consider when interpreting graphs is shown to the students by means of projection. ⌘ Students are asked to evaluate the results of activities made in science lessons in the spreadsheet lesson. ⌘ Speed – Time graphs and science lesson subjects are related.

🖹: In-Class Activity 🕮: Worksheet ⌘: Relating to Other Lessons ⌦ Out-of-School Activity 💻: Teaching Material Used

Appendix 2: A sample of worksheets used.
Spreadsheet Lesson Worksheet
Activity Number: 6
Activity Name: Preparing a Speed-Time Graph
Subject: Preparing a line graph in the MS Excel program
Purpose: Creating the graph by using tables previously given in spreadsheet program.
Instructions:

- Prepare the tables in the MS Excel program as shown below.
- Select Table 1 and click on the "Chart" in the "Insert" menu.
- Select "XY (Scatter)" graph in the chart wizard, Step-1
- Click on the next button on Step-2.
- On the Step-3 enter "time" and "velocity" as titles of X and Y axes.
- Finish the chart wizard with "Finish" button.
- Create the two other graphs using the same procedure as provided above.

Table 1

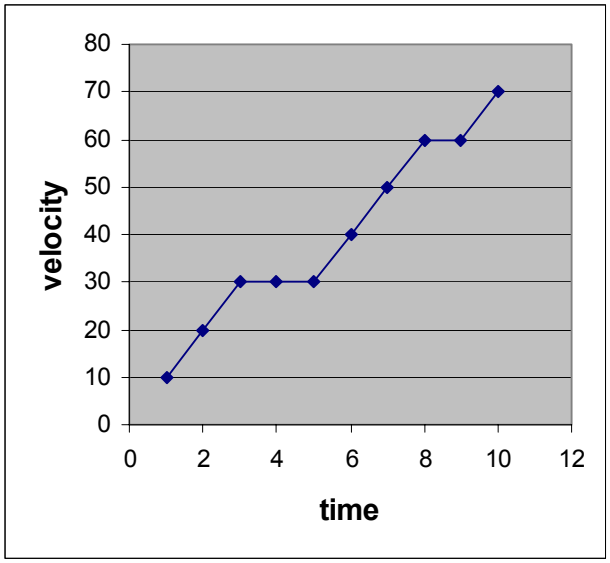
Time	Velocity
1	10
2	20
3	30
4	30
5	30
6	40
7	50
8	60
9	60
10	70

Table 2

Time	Velocity
1	10
2	50
3	80
4	90
5	95
6	98
7	99
8	100
9	101
10	102

Table 3

Time	Velocity
1	10
2	11
3	12
4	13
5	20
6	35
7	55
8	75
9	100
10	130



HOW TECHNOLOGY IS INTEGRATED INTO SCIENCE EDUCATION IN A DEVELOPING COUNTRY: NORTH CYPRUS CASE

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ABSTRACT
A key to the success of science education is the use educational technology which can greatly enhance a student's understanding of science concepts. The educational technology tools can take a difficult to learn science concept and change it from abstract to concrete to make it easier to understand. Hence, the power of educational technology tools in a science classroom should be valued by the science teachers. Is this the case? Do classroom teachers in North Cyprus understand the power of educational technology tools in science instruction? Do they value it's use for science teaching? How often do they use educational technology resources in their lessons? To answer these questions data were collected through a questionnaire from 100 secondary school science teachers. Educational technology tools have been divided into four main categories as classical technology, modern technology, computer technology and laboratory technology tools for easier analysis. Analysis results revealed that most teachers are frequently using classical technology tools whereas modern technology, computer technology or even the laboratory technology tools are not being used to the extent that they should. ANOVA and t-test results indicated that there is no significant difference about the integration of educational technology tools based on gender and level of education of teachers. On the other hand, ANOVA test results revealed that there were significant differences in teachers' responses about the use of educational technology resources based on the location of school, age, and teaching experience of the teachers.

INTRODUCTION

As it is defined by Roblyer (2003) "Educational technology is a combination of the processes and tools in addressing educational needs and problems, with an emphasis on applying the most current tools: computers and their related technologies." (p. 6). Hence, educational technology is viewed to have two components as processes that are simply the learning activities necessary to attain a learning objective and resources to enhance learning. Smaldino, Russell, Heinich and Molenda (2005) stresses that most people think of technology as products like computers, CD players, the Space Shuttle, etc. and they state that "This is one type of technology, which we will refer to as instructional technology when it is used for instructional purposes."(p.21). This study concentrates on the resources component of educational technology with an equal emphasis on all four categories of instructional technology used in science lessons: classical technology, modern technology, computer technology and laboratory technology.

It can be said that technology performs a bridging function between research and theoretical explorations on the one side and the real-world problems faced by practitioners on the other (Newby, Stepich, Lehman and Russell, 1996). In this bridge, educational technologists should use research methods, pay attention to theory, plan activities, implement theoretical knowledge, and evaluate the application results. These steps could help educational technologists to redesign the technological equipment in order to achieve successful use for teaching and learning towards the goals of education in the classroom. As Marcia C. Linn (2003) stresses "The close coupling of science and technology over the past 25 years has stimulated research that reformulates science instruction, introduces new fields, and explores new impacts of new technologies." (p. 727)

Rapid technological developments have its impact on education. It can be said that the practice of teaching science has been more traditional than any other curriculum area, but technological developments have affected science education also. There are some issues and problems in science education. The technological developments could help science teachers to overcome these problems.

ISSUES AND PROBLEMS IN SCIENCE EDUCATION

The three prominent issues of science education are related to

- standards,
- inquiry approaches,
- integrating technology (Roblyer & Edwards, 2000).

First problem is related to science standards. North Cyprus is a developing country and is rapidly progressing to become a technology based society, and as all sectors of the society science educators should also try to adopt new standards parallel to new developments. For this reason, science teachers and curriculum designers and

subject specialists should work collaboratively to develop a new technology based science curriculum which would be in harmony with the technological developments in the society. The standard problems in science courses can be solved by the use of the new technological resources such as the Internet, word processors, presentation software and spreadsheets which are some of the forthcoming examples among many others (Linn, 2003).

Second problem is related to the lack of the use of the inquiry approaches in science lessons. Science teachers "…should emphasize methods for providing students with opportunities to *do* science, in addition to learning the facts and concepts of science." (Flick and Bell, 2000, p.41). Hence, activities involving technology and supporting scientific curricular goals should be planned and implemented to promote student-centred, inquiry-based learning. To improve scientific inquiry computers must be used for the collection, analysis, and display of data and "A variety of technologies, such as hand tools, measuring instruments, and calculators, should be an integral component of scientific investigations." (NSES, 1996, p. 3).

Last problem is about lack of integrating technology into instructional activities. Science teachers should seriously consider the integration of technology into science curriculum because this practice will not only solve the third problem but will also facilitate the solution of the first two problems. As Lederman (2000) asserts "Placing technology within the context of science content, if done effectively, necessitates the use of appropriate pedagogy, takes advantage of the unique features of technology, makes science more accessible, and sets the stage for the development of students' understandings of the relationship between technology and science." (p. 3).

SOME NEW TECHNOLOGICAL APPLICATIONS IN SCIENCE EDUCATION

In science education, teachers and students have a chance to use a variety of valuable resources offered by information technology. The forthcoming information technology tools can be listed as the Internet, simulations, hypermedia, software/video resources, and probeware (Roblyer & Edwards, 2000).

One product of technology is the Internet which can be used extensively for science education. Students can get first hand information from sources such as government offices, universities and other private companies. It could help students to acquire information whenever, wherever, and whatever they want. Science teachers also can design collaborative learning environments. In these environments science learning can become more effective, motivating and interesting for students.

Science teachers can also use simulators for teaching science. A simulator is a device that reproduces the operating characteristics of real equipment (Gagne et al., 1988). Simulations can assist students to get experiences in applications which are dangerous to try in real life situations.

Hypermedia software that connects elements of a computer system such as text, movies, pictures and other graphics through hypertext links could be used to offer more visual instructional materials and activities to motivate students more to learn science. These hypermedia programs are available for all age levels.

Software and video resources can also be used for teaching higher-level science. They can provide effective assistance in the teaching learning process. Students can be exposed to various experiments and concept demonstrations about how to use science in their real lives. They can also offer many experiences that the students can never get in real life situations such as the structure of an atom or the motion of the pistons of an internal combustion engine and so on. Hence, software and video resources can assist students to perform experiments and observe concept demonstrations.

Microcomputer-based lab (MBL) sometimes referred to as probeware has proven to be useful in science classrooms (Roblyer, 2003). MBL consists of a type of instructional software tool accompanied by special hardware sensors (probes) that allow scientific data to be collected and processed by a computer. If a graphing calculator is used instead of a computer then the resulting tool is called a calculator-based lab (CBL). By the use of MBLs students can enjoy doing experiments easily where measurement of phenomena such as light, temperature, voltage and/or speed is required.

Hence, as explained in the above examples, emerging educational technology tools can help science teachers in teaching science effectively and without difficulty. Today's science teachers should be trained in how to use and adopt these technology resources in their classrooms to provide them with the necessary competency as well as the interest for designing their lessons by using technological facilities.

Unfortunately, the very meaning of the term *technology* causes a problem in the sense that educational technology is usually identified with computers. Fernando Cajas (2001) asserts that "A growing number of individuals and institutions acknowledge that technology goes beyond computers" (p. 727). Hence, classical technology tools such as the blackboard, and laboratory technology resources such as the equipment used for science experiments are to be considered as technology tools which must be integrated into teaching science.

THE AIM OF THE RESEARCH

A key to the success of science education is the use of educational technology. As it has been identified above, the use of educational technology tools when teaching science can significantly enhance a student's understanding of science. For example, the educational technology tools can take a difficult to learn science concept and convert it from abstract to concrete to put it in a form to be understood easily. The power of educational technology tools in a science classroom should be valued by the science teachers. Is this the case? Do classroom teachers in North Cyprus understand the power of educational technology tools in science instruction? Do they value its use for science teaching? The main goal of this research study was to find out the responses of teachers about the integration of technology into science teaching. Investigation was carried out to find out how often the science teachers of North Cyprus utilized educational technology which had been divided into four main categories as classical technology, modern technology, computer technology and laboratory technology resources (See Table 2). The research also aims to analyze relationships that exist between teachers' perceptions about the use of educational technology in relation to their gender, age, experience, level of education and location of schools. The quality of science teaching may well be dependent upon the perceptions of science teachers about the use of educational technology resources.

RESEARCH QUESTIONS

Using the current literature as a guide, this study attempted to answer the following questions:

1. How often do the science teachers use educational technologies?
2. Is there any relationship in the teachers' perceptions about the use of educational technology in science lessons based on their gender?
3. Is there any relationship in the teachers' perceptions about the use of educational technology in science lessons based on their age?
4. Is there any relationship in the teachers' perceptions about the use of educational technology in science lessons based on their teaching experience?
5. Is there any relationship in the teachers' perceptions about the use of educational technology in science lessons based on the location of the schools?
6. Is there any relationship in the teachers' perceptions about the use of educational technology in science lessons based on their level of education?

SIGNIFICANCE OF THE STUDY

The results of this study can be used by educators to determine professional development needs of science teachers. According to the responses of the teachers that have been identified by the study professional development opportunities can be planned and delivered to scale up their understanding of educational technology tools and to provide them with necessary skills for practical uses of these tools. Also the educational authorities will be obligated to check for the existence of the technological tools that have been claimed not to be used frequently by the teachers and if any are missing they should try to provide them as soon as possible.

SCOPE AND LIMITATIONS

In this study, a sample of size 100 science teachers was used. They voluntarily filled out the questionnaires but still this study is subject to the following limitations:

1. The data were collected through the administration of a survey instrument.
2. The study assumed truthful, candid responses by the teachers who understood and were not fearful of reprisal for their completion of the questionnaire.
3. The responses to the survey items by the teachers could be subject to unknown personal biases and perceptions.
4. The researchers did not have manipulative control of the independent variables because the study was non-experimental; therefore, no explicit cause-and-effect relationship can be determined.

METHOD

Operational Definitions of Variables

This study was designed to examine teachers' responses about using educational technology for teaching science and to compare their responses based on gender, age, experience, school location, and educational level of teachers.

Independent Variables

Teacher's Characteristics:

a. gender,
b. age,
c. experience,
d. school location,
e. level of education.

Identification of the Population

The population under investigation includes teachers who teach science courses at elementary, middle and high schools in North Cyprus. Groups in this study represent all science teachers in North Cyprus.

Sample

Sample was selected by the method of random sampling as 100 teachers from the public schools of the Ministry of Education and Culture of North Cyprus for administering the questionnaire prepared to assess the perceptions of teachers about the use of technology in their science lessons.

Instrument

For this research study, a questionnaire was prepared by the researchers. This questionnaire was designed to assess teachers' perceptions and consisted of one hundred and fifty three items. Teachers recorded their responses on a series of four-point Likert-scale (1=never, 2=sometimes, 3=often, 4=always).

Data Collection

The teachers' responses were assessed by the prepared questionnaire. Educational technology questionnaires were given to 100 teachers. Two steps for the collection of data were used as follows:

1. A copy of the questionnaire was given to each science teacher.
2. After the completion of the questionnaires, the teachers gave them back to the researchers.

Data Analysis Procedures

In this study, quantitative research methods were used in order to fully investigate the research problem. Teacher responses to the questionnaire were statistically analyzed according to gender, age, experience, location of school, and level of education of the teachers.

The frequency data indicated the level of implementation of each item. ANOVA and t-test were used to analyze each item for comparing potential relationships in ratings based on gender, age, experience, location of school and educational level of teachers. The data were analyzed using the statistical software package SPSS for Windows. In this process, an alpha level of 0.05 was set to test each hypothesis.

PRESENTATION OF DATA

This part presents the summary of the data collected. The main purpose of the study was to investigate teachers' responses about the integration of educational technology resources into science lessons. Hence, quantitative data collected from 100 science teachers are presented as demographic data and as frequencies of individual items of the questionnaire (Tables 1, 2, 3 and 4).

Demographic Data

Teachers completing the questionnaire were 40% (40) Female and 60% (60) male.

The age levels of the respondents were

30% (30) below 25 years,
25% (25) between 26-30 years,
23% (23) between 31-35 years, and
22% (22) between 36-40 years of age.

The experience of teachers were

30% (30) 0-5 years,
25% (25) 6-10 years,
23% (23) 11-15, and
22% (22) 16-20 years of experience in teaching.

68% (68) of teachers work at urban schools and 32% (32) of teachers work at rural schools.
The educational level of the teachers indicated that 80% (80) have a B.S or a B.A. degree, and 20% (20) have a master's degree.

Tables 1, 2, 3 and 4: Frequencies of individual items of the questionnaire

1. Percentage of Teachers who often or always use Classical Educational Technology Tools

Technology	Percentage	Technology	Percentage
Blackboard	100	Graphics	35
Books and Practice Books	95	Drawing Instruments	25
Figures and Tables	68	Slides	10
Bulletin Boards	55	Exercise Books	38
Measurement Instruments	48		

2. Percentage of Teachers who often or always use Modern Educational Technology Tools

Technology	Percentage	Technology	Percentage
Internet and WWW Pages	37	Chat or Teleconference	0
Television and Video	26	VCD or DVD	0
Search Engines Over Internet	25	Laser Disc or Film	0
Overhead Projectors	22	Video Camera	0
Calculators	7	Radio or Tape	0
Internet Cameras	5		

3. Percentage of Teachers who often or always use Computer Technology Resources

Technology	Percentage	Technology	Percentage
Windows and MS-Office	22	Practice Software	0
Data Projector	11	Scanners	0
Special Software	0	Digital Cameras	0
Practice Software	0	Printers	0
Printers	0	CD-ROM or DVD-ROM	0

4. Percentage of Teachers who often or always use Laboratory Technology Tools

Technology	Percentage	Technology	Percentage
Gloves	75	Tubes25	
Safety masks	65	Erlenmeyer Flask	25
Connection cables	61	Bell-Jars	25
Models	58	Dynamometers	25
Power supplies	51	Mirrors and Optic Ray	25
Bulbs and lamp socket	45	Chronometers	25
Electrodes (carbon or steel)	42	Beaker and Spatulas	25
Stoppers	41	Dissecting Cuvettes	25
Circuit switches	40	Bunsen Holder	25
Plastic rods	39	Bulbs 24	
Electroscopes	39	Burettes	22
Hoods	38	Rheostats	22
Magnetic bulbs	38	Compasses	22
Inclined plane carts	38	Litmus Paper	22
U-Tubes	38	Lamp Sockets	21
Lenses	37	Glass Covers	21
Test-tubes and test-tube containers	35	Lamella Sockets	20
Stands	35	Bistouries	21
Cones	35	Bunsen burner	19
Watch glasses	35	PH Indicators	19
Microscopes	35	Capillary Tubes	19
Inclined plane boards	35	Droppers	19

Magnet	35		
Beam balance	33	Electrical Heating	18
Manometers and barometers	33	Pens	18
Prisms	31	Barometers	18
Scissors	31	Lancets	15
Connection pipes	31	Graduated Cylinders	10
Balance	31	Manometers and Ammeters	10
Tube holders	31	Various Filter Papers	11
Conductive wires	29	Thermometers	11
Stirring rods	29	Induction Coils	9
Electrical ovens	29	Diapasons	0
Glass Plates	29	Pendulum	0
Glass Markers	29	Oscilloscopes	0
Tri-pots	28	Metal Gauses	0
Electrodes	28	Gravzant Rings	0
Volumetric Flask	27	Sterilizers and Centrifuges	0
Pulleys	27	Refrigerators	0
Voltmeter	27		

Majority of teachers often or always use *classical* educational technology resources. 100% (100) of teachers often or always use blackboard and 95% use books and practice books in their classrooms. Only a small percentage of teachers often or always use modern educational technology or computer technology. Even laboratory equipments which are essential in teaching science are not often used by the majority of teachers. Pendulums, oscilloscopes, refrigerators or thermometers are some of the examples that are not frequently used by the teachers.

RESULTS OF HYPOTHESIS TESTING

According to independent samples t-test results that were done for gender, all values (between 0.47 and 0.10) were higher than the standard value of α: 0.05. It indicates that there is no significant difference in teachers' responses about the use of educational technology based on their gender.

According to ANOVA test results that were done for age, almost all values (between 0.038 and 0.009) were smaller than the standard value of α: 0.05. This result reveals that younger teachers use educational technology tools more than the older teachers.

According to ANOVA test results that were done for years of teaching experience of teachers, almost all values (between 0.049 and 0.018) were smaller than the standard value of α: 0.05. It indicates that teachers who have an experience of 10 years or less agree more to use educational technology tools than those teachers who have an experience of 11 years or more.

According to ANOVA test results that were done for school location, almost all values (between 0.0428 and 0.019) were smaller than the standard value of α: 0.05. This result reveals that teachers from urban schools use educational technology more than teachers from rural schools.

According to ANOVA test results that were done for level of education of teachers, all values were higher than the standard value of α: 0.05. It indicates that there is no significant difference in teachers' responses about the use of educational technology resources based on their level of education.

CONCLUSIONS

According to frequencies, a small number of teachers agree to use educational technology resources. In addition, t-test and ANOVA test results indicated that there are no significant differences in teachers' perceptions about the use of educational technology based on gender and level of education of teachers. On the other hand, ANOVA test results revealed that there were significant differences in teachers' responses about the use of educational technology tools based on the location of schools, teaching experience and age of teachers.

The results of the study revealed that science teachers unfortunately are reluctant in using educational technology extensively in their classrooms and/or laboratories. Although there are some differences between groups of teachers according to their perceptions, they all need to change their views about educational technology resources. For example, younger teachers are more enthusiastic than older teachers but still most of them do not frequently use educational technology. Therefore, in-service training of all teachers is necessary to increase their

enthusiasm about integrating educational technology tools into their science lessons. Of course, further research is necessary to investigate the reasons why teachers are reluctant in using educational technology tools.

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MIDDLE AND SECONDARY PRESERVICE MATHEMATICS TEACHERS' COMPARATIVE ANALYSIS OF TIMSS VIDEOTAPE LESSON STUDY

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ABSTRACT:
International comparative studies revealed that US students' mathematics performance is not at the level of expectation of mathematics education community. The latest of such study is, Third international Mathematics Science Study-Repeat (TIMSS-R, 1999) continued show poor performance of US students in international arena. Total of 38 countries had participated in TIMSS-R and focus was the mathematics achievement of 8th graders. In TIMSS video study only 6 counties participated along with the US. Five participated in TIMSS 1999 video study outperformed the US in mathematics achievement. Since the teachers and their decisions on teaching plays significant role in students learning, future US mathematics teachers can learn from accomplished practices in international arena. The purpose of this study is to investigate preservice teachers' analyses of such practices. The study is qualitative in nature. Data collection included students' written analyses on videotaped lessons and follow up interviews.

Key words: Video Cases, Teacher Education, Preservice Teachers, Computers in Education

INTRODUCTION:

This presentation focus is a research study focusing teaching and learning mathematics in different cultures and pre-service mathematics teachers' analyses and syntheses of such practices. The comparative nature of this study tends to bring attention of future mathematics teachers to the ways in which how their international counterparts practice. TIMSS 1999 video study brought attention of researchers all over the world since it provides rich source of information about what goes on inside eight-grade mathematics classroom in different nations. (Stigler &Hiebert, 1999; Hiebert, Gallimore & Stigler, 2002; Hiebert at al. 2003). Primary analyses of these data by using qualitative and quantitative methods to explore the mathematical content of lessons, the organization of instruction, instructional processes, and teachers and reform, among other things was done by Stigler et al. (1999). Growing number of researchers (see Chokshi & Fernandez, 2004; Fernandez, 2002; Fernandez, Janon , & Chokshi, 2003; Hollingsworth, Lokan & McCrae, 2003; Kelly, 2002; Klime & Baumert, 2001; Watanabe, 2003) also continued to investigate same data for secondary analyses. All of these analyses done by the experts in the field, none of such studies concentrated on what can future mathematics teachers learn from it. Thus purpose of this study is to investigate future mathematics teachers' learning from TIMSS 1999 video lessons by analyzing and reflection on teaching in different cultures. All six countries (Switzerland did not participate in the TIMSS 1999 assessment) participated in TIMSS 1999 video study outperformed the US in mathematics achievement (see Table-1).

RATIONALE AND LITERATURE REVIEW:

For many years now the International Association for the Evaluation of Educational Achievement (IEA) has conducted several international comparative studies of the mathematics and science performance of students around the world. Third International Mathematics and Science Study-Repeat (TIMSS-R) was conducted in 1999, in which U.S. students scored below the international average at all grade levels on problem solving. (McIntosh & Jarrett, 2000). National Council for Teachers of Mathematics (NCTM, 2000) sees problem solving at the very heart of mathematics and recommends that problem solving be the focus of mathematics education. TIMSS 1999 video study is follow up study and expansion of TIMSS 1995 video study. The TIMSS 1999 Video Study, in addition to the United States, participating countries included Australia, the Czech Republic, Hong Kong SAR, Japan, the Netherlands, and Switzerland. Students in these countries were generally among the top-performing students on the TIMSS 1995 mathematics assessment and, in particular, outperformed their U.S. counterparts.

There is a grooving interest in multimedia, especially use of videos, in teacher education and research. (Anderson ,1998; Hewitt et al. 2003; Masingila, Ochanji, and Pfister , 2004; Stephens et al. 1999; Wang & Hartley, 2003; Van Den Berg, Jansen, & Blijleven, 2004).

Furthermore, accomplished practices from different nations may have potential to broaden future mathematics teachers about learning and teaching mathematics. Along with the experts' analyses, there is a need to document US prospective and practicing teachers' ideas, beliefs and reflections on regarding how top performing countries teachers' teach.

As Stigler and Hiebert (1999) points out "One of the advantages of comparing activities across cultures is that we can see things we might never have noticed had we looked within our own culture" (p.55).Such activities also have significant potentials for both prospective and practicing mathematics teachers' to improve teaching. This is a part of larger project, the study we report here was with prospective teachers.

Table-1(*): Average scores on TIMSS 1995 and TIMSS 1999 mathematics assessments of countries participating in the TIMSS 1999 Video Study

Country	1995	1999
Australia (AU)	519	525
Czech Republic (CZ)	546	520
Hong Kong SAR (HK)	569	582
Japan (JP)	581	579
Netherlands (NL)	529	540
Switzerland (SW)	534	—
United States (US)	492	502
International average	—	487

(*)This table is retrieved from the NCES web site: *http://nces.ed.gov/timss.*

By studying nationally-representative samples of eighth-grade mathematics lessons, the TIMSS 1999 Video Study provides educators and policymakers a better understanding of how national, regional, and local policies related to curriculum and instruction are being implemented in the classroom (Stigler, & Hiebert, 1999). TIMSS 1999 Video Study conducted to; a) To develop objective, observational measures of classroom instruction to serve as appropriate quantitative indicators of teaching practices in each country, b)To compare teaching practices among counties and identify similar or different lesson features across counties and; c)to describe patterns of teaching practices in each country(Hollingsworth, Lokan & McCrae, 2003, pp.1-2)

According to Stigler et al. (1999) using videotaped lessons as a data has some advantages, "The benefits of video are well worth the methodological challenges…Video data are relatively raw because they are not yet categorized or quantified. Unlike narrative observations or on site coding, videos have not been filtered though the eyes of individual researchers, and are not as constrained by the initial hypotheses of those who design the study. For this reason they can be analyzed by researchers with different interests using different coding schemes" (p.197). Furthermore, Hollingsworth et all. (2003) discuss that using national video surveys to study teaching has additional advantages: "Video enables detailed examination of complex activities from different points of view. Video preserves classroom activity so it can be slowed down and viewed multiple times, by many people with different kinds of expertise, making possible detailed descriptions of many classroom lessons" (p.3). Masingila, Ochanji, and Pfister (2004) state "preservice teachers lack the experience necessary to observe meaningfully the complex and rapid interactions that can occur in a classroom. Experienced teachers are continuously making decisions regarding instruction and classroom interaction and appear to make these decisions with ease. Inexperienced preservice teachers often have difficulty recognizing what decisions were made and why, in order to ask questions about these decisions" (p.1).

Stigler and Hiebert (1999) emphatically point out that "Although most U.S. teachers report trying to improve their teaching with current reform recommendations in mind, the video show little evidence for change is occurring" (p.12). Romberg, Zarinnia and Collis (1990) "The crucial point is that the world is changing so rapidly that, unless those involved in mathematics education adopt a proactive view and develop a new assessment model for the twenty-first century, the mathematical understanding of children will continue to be inadequate into the future." (p.21)

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of the TIMSS video study was "to learn something about the way American teachers view reform and whether they are implementing teaching reforms in their classrooms" (Stigler & Hiebert, 1999, p.18)
Videos: TIMSS Video Study is a four-CD set that includes videos from eighth grade mathematics lessons in seven countries. There are 4 videotaped lessons from each country, total of 28 lessons.

From the following websites sample clips from the seven countries can be reached;

http://nces.ed.gov/pubs2003/timssvideo/3A.asp?nav=3

Each lesson has time linked index, text, resources and commentary. (see Figures, 1,2, and 3)

Figure1: Japanese Lesson-1

TIMSS Video Lesson Plan Observation & Analyses Protocol

Through the review of literature on observation and videotaped lesson analysis rubrics, author constructed TIMSS Video Lesson Plan Observation & Analyses Protocol. Observation techniques fall into two broad categories: structured or systematic observation and unstructured or ethnographic observation. (Clark & Leat,

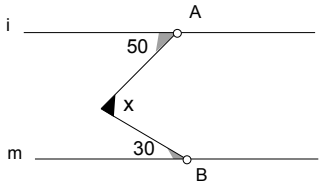
1998). Structured or systematic observation was developed by psychologist in the early 1920 and often used to generate data for statistical analysis of large populations.((Clark & Leat, 1998). This approach typically involves the observation of large samples of teachers and pupils by observers using coding scheme in which activities taking place at regular points in time or in particular time intervals (say every 3 seconds or every 25 seconds) are checked off.

The second category, unstructured or ethnographic observation, records as much of what happens as is possible. As a result, an ethnographic approach appeared to offer the best means of including more rather than fewer, behaviors, and of providing links between observed behaviors and the context. (Tilstone, C., 1998). For the purposes of this research students provided detailed guide called TIMSS Video Lesson Plan Observation & Analyses Protocol. First part of the guide focused on situational factors such as *the classroom climate* (This is the general tone and mood in the classroom. Climate is thought of as the convergence of factors such as nature of interaction, nature of the learning experience, degree of intellectual risk taking encouraged, mutual respect.), *the physical environment of the class* (number of students; arrangement of seating; clustering of students e.g., male, female; ethnic mix, etc.; "private" conversations among students; note taking.), *the style of the instruction*(lecture only; questions and kinds of responses; discussion. Along with the situational factors students were provided series (20) of specific questions (e.g. 6-How is the student engagement with the tasks? What is the extent of student involvement? Were all of the students engaged in the lesson? Cite the evidence. What does this evidence tell you about instruction? 10-Your appraisal of the overall success of the lesson, including supporting evidence. Include what you would do differently.)

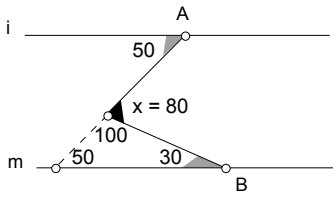
Japanese public release lesson-1: The lesson was on auxiliary lines. With this the classroom full of students is learning about geometric properties. From the extension activity the students took what they previously learned and began to understand the deeper complexities of more difficult problems. Following problem was an example from the class. Three students (Aria, Bunya, and Chika) came up with different solutions.

Figure 2: Japanese Lesson with Commentaries

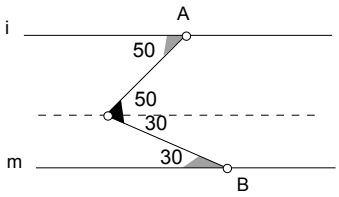
TIMSS Video Lesson Plan Observation & Analyses Protocol is provided before the references.



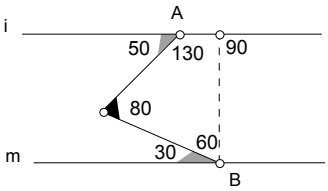
Find the angle in the bend with any method from the three problem solving methods (learned in yesterday's lesson).



Arai's method



Bunya's method



Chika's method

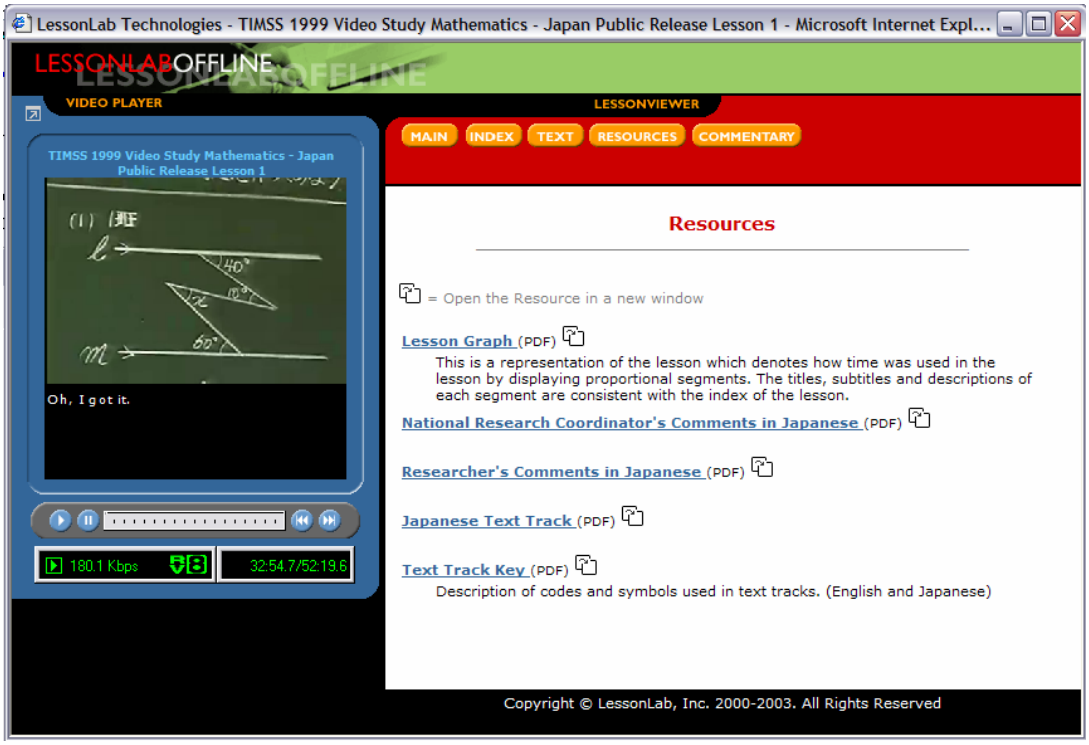


Figure 3: Japanese Lesson Resources

METHOD:

The twenty preservice mathematics teachers participated in this study was member of undergraduate problem solving class. Data were collected on 20 preservice middle and secondary mathematics teachers. All participants viewed Japanese lesson independently and wrote a reflection paper. Data were analyzed using qualitative data analyses(Marshall & Rossman,1999; Rossman & Rallis, 1998).Analyses of data was through analytical induction. Analytical induction is a strategy involving "scanning the data for categories, developing working typologies…" (Goetz & LeCompte, 1984, pp.179-180).

RESEARCH QUESTIONS:

1- To examine the prospective middle and secondary teachers' comparative analysis of TIMSS videotaped lesson (Japanese-1) from problem solving perspective.
2- To what extent preservice middle and secondary mathematics teachers discover new ideas about teaching?

3- To what extent preservice middle and secondary mathematics teachers make connections between learning theories and teaching in Japan.

HIGHLIGHTS FROM STUDENTS RESPONSES:

"Studying and analyzing videos of other cultures' teaching styles helps in gaining a better understanding of education across the globe, as opposed to simply reading about it."

The prospective teachers compared the Japanese lesson and their 8th grade classes and teaching. These are the points which were missing in their education as they compared to what is going on in Japanese class.

MISSING ELEMENTS:

Video data, such as collected in TIMSS, might help preservice mathematics teachers' to discover new ideas of teaching by recognizing the missing elements from their own education.

" I felt like the teacher was telling me what to do whole time and I was not given much of the opportunity to ask a lot of exploration questions."

"I do not remember being encouraged to seek and value alternative modes of investigation and problem solving- it was more like: here is the way dot his type of problem, now do 30 similar to it for homework."

"My teachers did not pose questions and provide activities; such as creating our own problems that we find challenging and perhaps that could have promoted more conceptual understanding of the material we were covering"

"In my high school mathematics classes if we came up with an answer our teacher told us right away that we were right or wrong. This may have hindered our ability to check our work, but if our teacher left the answers a mystery until the end, we may have made sure that we had the correct answer on our own"

"Most American classes I have been involve rote learning and procedural knowledge and not the conceptual knowledge that the students from Japan were receiving."

"In eight grade I was in Algebra-I and mathematics was simply cut and dry. The teacher told us exactly what to do it and how to do it and then we applied that exact method on the test or quiz or homework."

"It was always teacher's way or the problem was wrong"

" I am accustomed to in this country and their playfulness and lack of motivation"

"I do not remember having as much classroom discussion for activities like this. Much of my geometry instruction was done in the lecture fashion. I would have liked to have had instruction like this while taking geometry or other classes that taught geometry concepts and ideas."

"When the students were asked to do something, they did it without any complaints; something that I don't think ever happens in a classroom in the US."

"The Japanese classroom is just so different from the American classroom. I guess that I would have to say that we have less respect for our teachers and for learning than the Japanese."

"The students in the class all seemed to be fully engaged and on-task. You can see this just by looking at them. None of them are doodling on their papers, none of them are digging through their backpacks, none of them are passing notes to their neighbors; they are all looking up at the teacher and the board like they are hanging on to every word that he says. I think that it is amazing; the Japanese students just seem to have so much respect."

Stigler and Hiebert's(1999) primary analyses revealed that "…American mathematics teaching is extremely limited, focused for the most part on very narrow band of procedural skills. Whether students are in rows working individually or sitting in groups, whether they have access to the latest technology or are working only paper and pencil, they spend most of their time acquiring isolated skills through repeated practice." (pp.10-11)

MOTIVATION:

"The one thing caught my attention continuously through out the video was the lack of students that were off the task"

"Their motivation seems so much higher than of students in the American schools that I have observed"

"All of the students seemed interested in the lesson, and engaged in their task."

HIGHER ORDER THINKING AND THINKING OUTSIDE OF THE BOX:

"The students were constantly being challenged and encouraged to think outside of the box and apply ideas they have learned before the tasks."

"There is a high level of intellectual risk taking encouraged by the teacher toward the students. The in-class assignment gave the students the opportunity take what they had learned already and create extension problems. This level of problem solving pushes students beyond their plane of comfortable classroom activity, which usually promotes a deeper understanding of the ideas and material being taught in a class."

"I think that we can see students taking intellectual risks while they are drawing their own problems. The students really had to think creatively to draw these angles and they couldn't just draw crazy lines everywhere

because they had to be able to solve them. I think that the risk comes in because they all seemed to try and make them as hard as possible because they wanted to push the limits."

CREATIVITY:

Jakubowski, Corey, & Unal (2004) discuss that although mathematics and creativity goes hand to hand, unfortunately research on creativity in mathematics education scarce. As a result creativity in NCTM standards very limited.

"The teacher also posed questions that encouraged divergent thinking among the students- those kinds of questions are sometimes difficult to formulate"

"The questions teacher posed helped to trigger a divergent mode of thinking"

Analyses done by Stigler and Hiebert (1999) shows that "In Japan, teachers appear to take a less active role allowing their students to invent their own procedures for solving problems. And these problems are quite demanding, both procedurally and conceptually. NCTM (2000) "Well-chosen tasks can pique students' curiosity and draw them into mathematics ... Regardless of the context, worthwhile tasks should be intriguing, with a level of challenge that invites speculation and hard work. Such tasks often can be approached in more than one way…, which makes the tasks accessible to students with varied prior knowledge and experience. Worthwhile tasks alone are not sufficient for effective teaching. Teachers must also decide what aspects of a task to highlight, how to organize and orchestrate the work of the students ... and how to support students without ... eliminating the challenge"(pp.18-19). Jakubowski and Unal (2004) discuss elements of promoting creativity in mathematics as a teacher being more responsive and less directive with selected rich tasks.

INTERACTION AND GROUP WORKS:

"Going into groups though is a must and is very important for the students to learn from the other students in the classroom. The teacher can only do so much and be in so many places at the same time so groups really help the teacher if the students can answer each other's questions"

"I learned from watching this video the idea of switching from group work to individual work interchangeably. I don't remember ever doing that when I was in 8th grade"

"Critical moments in the students work seem to be when the students are working together to create more activities on their own. At this moment the students are accessing many benefits. For instance, since the students are working in groups they can learn from peer interaction. The students can brainstorm together, bounce ideas off of one another, and check each other's work."

"The active participation of the students was most definitely encouraged and valued, but maybe more required than encouraged. It was valued though because the teacher selected the problems that he liked the most and used them as class work and homework."

PEDAGOGY AND LEARNING THEORIES:

"The teacher worked diligently in supporting and enhancing students' investigation"

"Just from the discourse between the teacher and the students and the visual evidence of a typical classroom it would appear that strong relationships between the educator and those educated is highly valued."

The pedagogical content knowledge concept introduced by Shulman(1986) into teacher education community.

"I think it would have been neat to sit in on a Japanese classroom when I was taking a similar class."

"The Japanese teacher also provided students with plenty of wait time; students really had a lot of time to think and consider what they were learning which probably means that they are learning a lot more."

"The teacher definitely provided opportunity for interaction with the students and the opportunity for interaction among the students. Throughout the lesson the teacher walked around the room and spoke to many of the students and answered many questions"

"The teacher was working to support and enhance the students' investigation and this can be seen in the way he questions them. Instead of telling them the answers he kind of turned their question into a question for them; he answered questions with questions to encourage students to keep thinking for themselves."

CONCLUSIONS

Preservice teachers' comparisons what was going on in Japanese class and how it was when they were in 8th grade, showed that their education was not student centered. They didn't have a chance to explore ideas in depth. Their experiences revealed that solution of the given problem should be done "teachers' way". They exposed to rote learning and similar problem practice instead of conceptual understanding. Most of the preservice teachers mentioned that if they travel in time they wanted to sit in Japanese class and learn. This study shows that observation of teaching different cultures is a valuable activity.

ANALYSES PROTOCOL FOR TIMSS VIDEO LESSON

The purpose of TIMSS Videotape analyses activity was to getting familiar with a different classroom instruction in different cultures. Preservice teachers will have the opportunity to observe and learn from their counterparts in countries recognized for high student performance in mathematics. You are expected to keep careful notes during the observations. One of our discussions will be as a means of understanding the instruction from problem solving window.

Begin by situating your discussion through the following

1. Classroom climate: This is the general tone and mood in the classroom. Climate is thought of as the convergence of factors such as nature of interaction, nature of the learning experience, degree of intellectual risk taking encouraged, mutual respect
2. The physical environment of the class: number of students; arrangement of seating; clustering of students (e.g., male, female; ethnic mix, etc.); "private" conversations among students; note taking.
3. The "style" of the class: lecture only; questions and kinds of responses; discussion (who participated).
4. What is the subject matter, how it is presented, what is being learned (as compared with what is being taught), and what is your evidence?

In relation to these "situational" factors, go on to consider:

1. What the students were learning/understanding, and how do you know?
2. Compare your own previous experience in taking this class as you look back from here.
3. What are the problems as created by the students, at progressive phases in their work? Give examples.
4. What do you see as critical moments in the students' work?
5. Include a direct quote of one or two sentences made by a student that you found "important".
6. How is the student engagement with the tasks? What is the extent of student involvement? Were all of the students engaged in the lesson? Cite the evidence. What does this evidence tell you about Japanese instruction?
7. Include something you noticed or an event that you found surprising, and why.
8. What evidence is there that students took intellectual risks?
9. Did teacher provide opportunities for students to interact with him and with each other?
10. Your appraisal of the overall success of the lesson, including supporting evidence. Include what you would do differently.
11. Active participation of students was encouraged and valued
12. The teacher was working to support and enhance students' investigation
13. The teacher's questions triggered divergent mode of thinking
14. Students' comments and questions often determined the focus and direction of classroom discourse.
15. The lesson promoted strongly coherent conceptual understanding
16. This lesson encouraged students to seek and value alternative modes of investigation of problem solving
17. The lesson designed to engage students as members of a learning community

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SCHOOL CLIMATE AND TEACHERS' PERCEPTIONS ON CLIMATE FACTORS: RESEARCH INTO NINE URBAN HIGH SCHOOLS

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ABSTRACT

This study examined the difference in the levels of the variables related to the school climate factors among the teachers teaching social science courses, the teachers teaching natural science courses, and the teachers teaching art, music and physical education. As a result of the analyzes, all the teachers reported open climate in relation to the factors of team commitment, organizational clarity and standards, intimacy and support , autonomy, member conflict, medium climate in relation to the factors of risk and in reward. Additionally, the teachers teaching art, music and physical education reported higher open school climate than others, man than women, single teachers than married ones, the teachers with more degree of education than the ones with a lower degree of education, older teachers than younger ones, and the teachers with less seniority than the ones with more seniority. Finally, some ideas were suggested about what should be done in helping teachers to work in a more desirable open school climate.

Key Words: School climate, organizational climate factors, high school teachers, and upper secondary high school education

INTRODUCTION

Schools are social institutions (Getzels & Guba, 1970). Within school organizations there are students, teachers, administrators, and many kinds of service personnel. Members of each of these groups occupy distinctive positions and are expected to behave in certain ways. The role expectations of these groups and norms ascribed to them are different from each other. Clearly, the relationships among many kinds of people in schools are varied and complex. Only if those relationships are understood and generally accepted can the school organization function effectively (Campell, Corbally & Nystrand, 1983).

Schools are also hierarchical organizations. The board of education is usually placed at the top of the hierarchy, followed by the superintendent, the principals and the teachers. In terms of the responsibility, students are responsible to teachers; principals are responsible to the superintendent, and the superintendent responsible to the board of education. Structurally, there is a series of superordinate-subordinate relationships within schools. Functionally, this hierarchy of relationships (principal to teacher, teacher to student, and so on) is the basis for allocating and integrating roles, personnel, and facilities to achieve school goals. Operationally, educational organizations are people intensive, thus the process in schools takes place person-to-person interaction (Sergiovanni & Starratt, 1988).

Every educational organization has a climate that distinguishes it from other schools and influences behavior and feelings of teachers and students for that school (Sergiovanni & Starratt, 1988). Climate has been defined in various ways by authors as the perceived subjective effects of the formal system, the informal style of managers, and other important environmental factors that impact on the attitudes, beliefs, values and motivation of people who work in a particular organization (Litwin & Stringer, 1968); personality of an organization (Halpin, 1967); the atmosphere of the workplace, including a complex mixture of norms, values, expectations, policies, and procedures that influence individual and group patterns of behavior (Spencer, Pelote & Seymour, 1998); generalized perceptions that people employ in thinking about and describing the organizations in which they work (Hall, Bowen, Lewicki & Hall 1987); employees' perceptions of the events, practices, and procedures as well as their perceptions of the behaviours that are rewarded, supported and expected within an organization (Schneider, Wheeler & Cox, 1992); the result of valuations or cognitive appraisals of environmental factors in terms of their acquired meanings to the individual (James & James, 1989), and not an assessment of what organizational members believe the organization should be like, but rather is an assessment of the shared perception of what the organization actually is like (Luthar, DiBattista & Gauttschi, 1997).

As for schools, climate is a necessary link between organizational structure and teacher attitude and behavior. It was found that formal characteristics of schools had an important influence on the way in which teachers perceived climate (George & Bishop, 1971). Clearly, climate represents a composite of the meditating variables that intervene between the structure of an organization and the style and other characteristics of leaders and teacher performance and satisfaction (Sergiovanni & Starratt, 1988).

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Numerous studies have been done on organizational school climate. For instance, Halpin (1963) finds that it is behavior of elementary school principals, which in a large measure sets a climate tone for school (Halpin & Croft, 1963). In a more direct investigation leader behavior and organizational climate was found that by varying the leadership style from bureaucratic to human relations and human resources, three different climates- closed; warm, supportive and friendly; supportive goal-oriented-, each with distinct implications for member performance and satisfaction were created (Litwin & Stringer, 1968). The research of David McClelland and colleagues at the Harvard Business School (Litwin & Stringer, 1968) and Hay McBer and Company (Kelner , Rivers & O'Connell 1996), ongoing since the 1950s, indicate that successful leadership competencies and managerial styles produce motivating organizational climates, which arouse employee motivation to do work well, and which predict the desired organizational outcomes: exceptional customer satisfaction and financial performance. Thus, climate makes a difference. That is, it differentiates levels of performance among organizations. Hundreds of studies have demonstrated the link between organizational climate and bottom-line performance measures such as volume, efficiency, productivity, and customer perceptions of service quality. Typically, climate has accounted for 10 to 25 percent of the variance in performance measures. In many cases it has even been possible to predict significant improvements in performance based on climate improvements (Spencer, Pelote & Seymour 1998). In their study, Pirola-Merlo, Hartel, Mann & Hirst (2002) examined how negative events impact on team climate and how team climate relates to performance. Based on the results, team climate had a positive relation with team performance. Zohar (2000) demonstrated that variation in behaviour at the level of the individual supervisor - the group climate level of analysis - affected safety behaviours, and it was plausible that this would hold true for other aspects of climate. Weber (1995) found that the degree of difference in the climate regarding ethics between organizational units depended on how "insulated" the employees in that department were, with technical core employees having a more individual or local climate, while boundary-spanning employees had more of a cosmopolitan ethical climate. Neal, Griffin & Hart (2000) investigated links between general organizational climate and specific safety climate, and found that general organizational climate could influence perceptions of safety climate, and that these perceptions of safety climate influenced safety performance through their effects on knowledge and motivation.

Some instruments were developed to measure organizational climate. One of them is The Organizational Climate Description Questionnaire developed by Halpin & Croft (1963), which examines eight dimensions of organizational climate, four of which focus on teacher behavior- disengagement, hindrance, esprit and intimacy-, and four on the behavior of the principle- aloofness, production, thrust, and consideration. Teachers' responding to the instrument reveal a school climate on the open-to-closed continuum (Halpin & Croft, 1963). The other instrument developed by Schneider (1983) is The Organizational Climate Questionnaire, which measures six dimensions- organizational support, member quality, openness, supervisory style, member conflict and member autonomy (Hall, Bowen, Lewicki, & Hall 1987). One another instrument identifies and describes six organizational climate dimensions- flexibility, responsibility, standards, rewards, clarity and team commitment- developed in the Harvard Business School research that predicts organizational performance (Litwin & Stringer 1968). The most recent instrument developed by Hoy, Hofman, Sabo and Bliss (1996) was called OCDQ-RM (Organizational Climate Descriptive Questionnaire for Secondary Schools). This instrument is a 50 item climate instrument with 6 dimensions that describe the behavior of middle school teachers and principals. It measures three aspects of principal behavior – Supportive, Directive, and Restrictive- and three aspects of teacher behavior – Collegial, Committed, and Disengaged (Hoy, Hofman, Sabo, & Bliss, 1996).

In summary, organizational climate for the effectiveness of an organization is very important. Climate is indicative of how well the organization is realizing its full potential. High-performance organizations tend to make optimal use of everyone's capabilities. An accurate assessment of the climate can identify the unnecessary obstacles to employees contributing their best (LDR-Organizational Climate 2002). Thus, it is of vital importance for managers to measure organizational climate factors, which affect employees positively and negatively in order to create a climate, in which job satisfaction and effectiveness is supplied in an organizational environment.

This study examined the difference in the levels of the teachers' perceptions related to the organizational climate factors among the teachers belonging to different sub groups: teaching categories- social courses, natural science courses, and art, music and physical education-, age, seniority, gender, marital status and educational levels in general high schools. The aims of the study were to determine;

1. The extent to which the teachers at high schools perceived organizational climate factors – organizational clarity and standards, team commitment, autonomy, intimacy and support, member conflict, rewards, and risk - on the open-to-closed continuum.

2. If the levels of teachers' perceptions on organizational climate factors acted differentially in teachers belonging to different sub groups: teaching categories, age, seniority, gender, marital status and educational levels.

METHOD

There were four schools in Afyon city center and five in Usak city centre serving general high school education with total population of 381 teachers (171 in Afyon and 210 in Usak) in the academic year of 2001-2002. Thus, those nine schools with 381 teachers comprised the population of the study. These cities selected because they have nearly the same amount of urban population. However, usable surveys were returned by 204 of total population of 381 teachers to whom they were distributed, which yielded a total response rate of 54 %- response rates per city ranged from 54% for Afyon (93 out of 171), 53% for Usak (111 out of 210).

Finally, the data collected from a sample of 204 (89 females and 115 males) teachers from 9 urban high schools in the centre of Afyon and Usak cities in the west of Turkey by means of the questionnaire developed by the researcher in the academic year of 2001-2002 were analyzed.

High school teachers were asked to complete a personal particulars form. This form inquired about teachers' teaching category, age, gender, seniority, marital status and education levels.

The instrument was developed after thorough review of the literature. First, a list of 68 items was generated related to organizational climate and after consultation with experts on measurement and educational administration, the list was reviewed and items that were agreed to be highly similar were eliminated and thus the items were further reduced to 27 items that had high face validity. I first tested the instrument on a pilot group consisting of 98 candidate teachers who were graduate students in their final academic year and who were enrolled part time in courses at high schools in the city of Usak in order to make the items understandable to the participants. From these, an instrument consisting of 27 Likert-type items developed.

Multiple factor-analytic techniques were utilized in order to investigate the factor structure of the data. The first task of the factor analyses was to identify common factors underlying the large and apparently diverse collection of school climate. The questionnaire was factor analyzed using the Principal Axis factor analysis method. The Kaiser- Meyer- Olkin statistic was .876; indicating sample size was appropriately large. Barlett's test of sphericity yielded a value of 8477 ($p < .00005$), suggesting correlations were substantial enough to justify factor analysis. The eigen values were 7. 34, 1.69, 1.40, 1.38, 1.19, 1.14 and 1.04. After Principal Axis factor analysis with seven factors specified, the factors accounted for 56.7 of the variance (27.5%, 6.2%, 5.1%, 5.1, 4.4%, 4.2%, and 3.8%). Finally, seven factors related with organizational climate of schools were obtained.

The questionnaire was factor analyzed using the principal component method with Equamax rotation. After rotation the eigen values were 2.67, 2.54, 2.10, 2.05, 2.01, 2.00 and 1.90 and the factors accounted for 56.7 of the variance (9.9%, 9.4%, 7.8%, 7.6, 7.4%, 7.4% and 7.1%). As it is seen in Table 1, items loading on factor 1 described organizational clarity and standards consisting of five items asking about clarity in the authority in school, the level of bureaucracy, and whose responsibility the tasks and projects are and the level of performance standards. Items loading on factor 2 defined team commitment consisting of four items asking about the level of commitment to school and working groups. Factor 3 defined autonomy consisting of three items asking about the level of taking responsibility in the accomplishment of tasks. Items loading on factor 4 defined support and intimacy consisting of five items asking about the level of warm and friendly relations and the level of trust and help from principals and colleagues in school. The factor 5 defined member conflict consisting of three items asking about the level of competition and expressing opinions freely. The factor 6 defined rewards consisting of three items asking about the level of promotion system, positive encouragement by principals and the equilibrium of reward and performance. Finally, items loading on factor 7 defined risk consisting of four items asking about the level of taking risks at the right time by principals and teachers.

The questionnaire was also submitted to validity and reliability tests. Alpha reliabilities for the items loading on seven factors were .82 for organizational clarity and standards, .85 for team commitment, .66 for autonomy, .82 for intimacy and support, .79 for member conflict, .88 for rewards, and .68 for risk.

The reliability of the instrument was also tested using the test-retest method and the reliability of the each factor was determined using Pearson Product-Moment Correlation. Consequently, a general high school not included in the sample was chosen. The teachers were asked to take the instrument on a test-retest basis with a fortnight interval. Fifty teachers from this school completed the both tests.

The form used in the test-retest for reliability was the same as the instrument used in the study. However, the teachers did not fill out the personal data sections. The reliability for each organizational climate factor was found out: 'organizational clarity and standards' as p= .8623, team 'commitment' as p= .8327, 'autonomy' as p= .7349, 'intimacy and support' as p= .8627, 'member conflict' as p= .8031, 'rewards' as p= .8747, and 'risk' as p= .7619.

Finally, the questionnaire included 27 statements about seven organizational climate dimensions: organizational clarity and standards, team commitment, autonomy, intimacy and support, member conflict, rewards and risk. Teachers answered each question on a five point scale: 1 I definitely disagree, 2 I disagree, 3 I neither agree nor disagree, 4 I agree, 5 I definitely agree. In scoring the questionnaire, as all the questions were positive, low score in each item indicated closed climate and a high score open climate. Average scores for each of the seven dimensions indicated the degree of teachers' perception levels in these climate dimensions. In scoring the level of the perception of the teachers in organizational climate dimensions, very closed was indicated by the average score of very closed by 1.00 to 1.80, closed by 1.81 to 2.60, medium by 2.61 to 3.40, open by 3.41 to 4.20 and finally very open by 4.21 to 5.00. The level of significance for all tests was 0.05 levels.

RESULTS

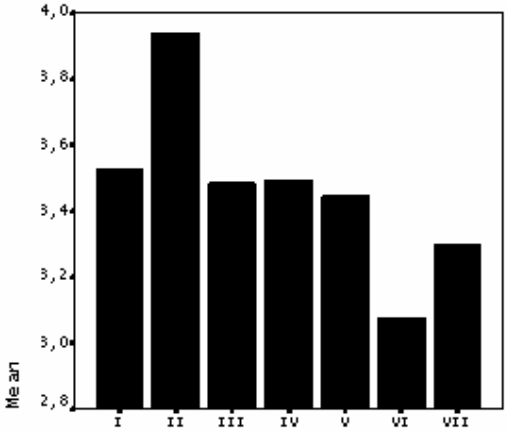
Results of this study are presented in the sections that follow, beginning with a description of the teachers, average scores of teachers' perception and climate score differences among teachers in different categories: teaching category, gender, marital status, education level, age and seniority. The statistical data collected from the teachers were analyzed by t-test for Equality of Means and Analysis of Variance followed by Tukey post hoc analysis.

The teachers from the 9 urban high schools serving high school education-upper secondary education- were total 204 teachers, 43.6% of whom were women and 56.4% men. As it can be expected, the teachers teaching social courses were in majority: the teachers teaching social courses were 51.0% of the sample, teachers teaching natural science courses were less in number with the percentage of 38. 7% and those teaching art, music and physical education courses were the least in number with 10.3%. Most of the teachers who constituted the sample were married. The single teachers consisted only of 19.6% of the sample whereas the married teachers consisted of 80.4%.Nine urban schools had a well-educated teacher force. As reported on their questionnaires, 17.6% of the teachers had less than bachelor's degree and 82.4% had a bachelor's degree 44.2 % of whom were graduates of faculties of education and 38.2 % of whom were graduates of faculties other than education faculties. The teachers in the sample were highly middle aged: 27.5% were under 30 years old; 15.7% between 31 and 35 years old ; 17.6% between 36 and 40 years old and 23.5% between 41 and 45 years old; 12.3% 46 and 50 and only 3.4 over 51 years old. On the other hand, the teachers in the sample were highly experienced: 20.1% had fewer than 5 years of experience; 23.5% had between 6 and 10 years, 14.2 had between 11 and 15 years, 20.1 % had between 16 and 20 years and the remaining 22.1 % had more than 20 years of experience.

Average climate scores of all teachers

As it is shown in Figure I, all the teachers reported open climate in team commitment (3.93), organizational clarity and standards (3.52), intimacy and support (3.49), autonomy (3.48), member conflict (3.44); medium climate in risk (3.29) and in reward (3.07). They reported the highest open climate score in team commitment but the lowest in rewards.

Figure I. Average climate scores of all teachers



I- Organizational Clarity and Standards
II- Team Commitment
III-Autonomy
IV- Intimacy and Support
V- Member Conflict
VI-Rewards
VII-Risk

Climate score differences among teachers in different categories teaching categories

Climate scores among teachers according to teaching categories were analyzed through one way of analysis of variance (ANOVA) followed by Tukey post hoc analyses. ANOVAS showed that there was a significant difference in the climate scores in the organizational climate factors according to teaching categories of the teachers. Teachers teaching art, music and physical education courses reported higher open school climate than the teachers teaching social science courses in relation to the factor of member conflict (being 3.85 versus 3.41) and this was also higher than the teachers teaching natural science courses (being 3.85 versus 3.36). Likewise, teachers teaching art, music and physical education courses reported higher open school climate than the teachers teaching social science courses in relation to the factor of team commitment (being 4.34 versus 3.87) and higher than the teachers teaching natural science courses (being 4.34 versus 3.90). The results of Tukey post hoc analyses according to the teaching categories of the teachers in member conflict and team commitment are shown in Table 1.

Table 1. The results of post hoc tests according to teaching categories

Teaching Categories	N	Member Conflict	F	Team Commitment	F
Social Courses	104	3.4167	3.209*	3.8782	3.656*
Science Courses	79	3.3671		3.9072	
Arts, Music and Physical Education	21	3.8571		4.3492	

*p<.05

Gender

There was not a significant difference in the climate scores in the organizational climate factors according to the gender of the teachers. However, there was a trend for men to report higher open climate than women in relation to the factor of intimacy and support (being 3.54 for men versus 3.41 for women) and in relation to the factor of member conflict (being 3.51 for men versus 3.34 for women). The results of t-test for equality of means for women and men in terms of their school climate levels are shown in Table 2.

Table 2. t-test for equality of means for teachers according to gender

Climate Factors	Women			Men			t
	N	Mean	SD	N	Mean	SD	
Organizational Clarity& Standards	89	3.50	0.48	115	3.54	0.74	0.49
Team Commitment	89	3.92	0.53	115	3.94	0.88	0.21
Autonomy	89	3.42	0.57	115	3.52	0.77	0.99
Intimacy & Support	89	3.41	0.72	115	3.54	0.87	1.16
Member Conflict	89	3.34	0.66	115	3.51	0.90	1.52
Rewards	89	3.11	0.86	115	3.04	0.98	0.52
Risk	89	3.35	0.58	115	3.24	0.91	0.98

df: 202

Marital Status

There was not a significant difference in the climate scores in the organizational climate factors according to the marital status of the teachers. However, there was a trend for single teachers to report higher open climate than married ones in relation to the factor of organizational clarity and standards (being 3.56 for single teachers versus 3.51 for married ones). The results of t-test for equality of means for single and married teachers in terms of their school climate levels are shown in Table 3.

Table 3. t-test for equality of means for teachers according to marital status

Climate Factors	Single			Married			t
	N	Mean	SD	N	Mean	SD	
Organizational Clarity& Standards	40	3.56	0.50	164	3.51	0.67	0.45
Team Commitment	40	3.94	0.69	164	3.93	0.76	0.03
Autonomy	40	3.45	0.59	164	3.48	0.71	0.32
Intimacy & Support	40	3.45	0.65	164	3.50	0.84	0.32
Member Conflict	40	3.40	0.76	164	3.45	0.82	0.37
Rewards	40	3.10	0.89	164	3.06	0.94	0.26
Risk	40	3.32	0.57	164	3.29	0.83	0.24

df: 202

Education Level

Climate scores among teachers according to education level were analyzed through one way of analysis of variance (ANOVA) followed by Tukey post hoc analyses. ANOVAS showed that there was not a significant difference in the climate scores in the organizational climate factors according to the education levels of the teachers.

Table 4. The results of post hoc tests according to teaching levels

Climate Factors	Teaching Levels (Means)			F
	2 Year College	Faculty of Education (B.A.&B.S.)	Other Faculties (B.A.&B.S.)	
	N=36	N=90	N=78	
Organizational Clarity & Standards	3.44	3.49	3.59	0.88
Team Commitment	3.89	3.91	3.98	0.23
Autonomy	3.42	3.48	3.60	0.77
Intimacy & Support	3.41	3.48	3.54	0.32
Member Conflict	3.36	3.41	3.51	0.57
Risk	3.19	3.31	3.32	0.37
Rewards	2.98	2.98	3.21	1.51
Risk	3.19	3.31	3.32	0.37

*p<.05

However, there was a trend, in general, for teachers with a lower degree of education- undergraduate or graduate of two year college- to report lower open school climate than the ones with more degree of education - graduates of a four year faculty of education and other faculties with a diploma of B.A. or B.S. The results of Tukey post hoc analyses according to education levels of the teachers in school climate factors are shown in Table 4.

Age

Climate scores among teachers according to age were analyzed through one way of analysis of variance (ANOVA) followed by Tukey post hoc analyses. ANOVAS showed that there was a significant difference in the climate scores in reward factor according to age of the teachers. Older teachers reported higher open climate than younger ones in relation to the factor of reward. The results of Tukey post hoc analyses according to the age of the teachers in reward are shown in Table 5.

Table 5. The results of post hoc tests according to age

Age	N	Reward (Means)	F
Under 30	56	2.84	
31-35	32	2.96	2.301*
36-40	36	2.98	
40-45	48	3.16	
45-50	25	3.24	
51 over	7	4.00	

*p<.05

Seniority

Climate scores among teachers according to seniority were analyzed through one way of analysis of variance (ANOVA) followed by Tukey post hoc analyses. ANOVAS showed that there was not a significant difference in the climate scores according to seniority of the teachers. However, surprisingly, there was a trend for the teachers with less seniority to report higher open climate than the ones with more seniority in relation to the factor of organizational clarity and standards, rewards, intimacy and support. The results of Tukey post hoc analyses according to the seniority of the teachers are shown in Table 6.

Table 6. The results of post hoc tests for teachers according to seniority

Climate Factors	Seniority (years) Means					
	Under 5 N: 41	6-10 N: 48	11-15 N: 29	16-20 N: 41	Over 21 N: 45	F
Organizational Clarity and Standards	3.59	3.67	3.36	3.51	3.41	1.50
Team Commitment	4.09	4.00	3.73	3.93	3.85	1.20
Autonomy	3.43	3.43	3.51	3.47	3.56	0.27
Intimacy and Support	3.66	3.42	3.34	3.66	3.33	1.67
Member Conflict	3.83	3.47	3.47	3.51	3.37	0.23
Rewards	3.30	2.92	2.77	3.24	3.05	2.11
Risk	3.34	3.28	3.26	3.44	3.15	0.77

*p<.05

DISCUSSION

I assessed school climate through seven organizational climate factors and 27 items related to these seven factors. Results showed that all the teachers reported the highest open climate score in team commitment but the lowest in rewards. The reason why all the teachers reported the lowest open climate in rewards may be because teachers' financial problems have not been solved, yet. They have low and inadequate salary (MEB- Milli Egitim Bakanligi (Ministry of Education)-, 1997). Thus, this affects the school climate perceived negatively by the teachers who are supposed to work with such a poor salary negatively and can also be a tremendous source of stress. The reason why all the teachers reported the highest open climate in team commitment may be parallel with the idea that school is an organization where friendly interpersonal relations should exist (Halpin, 1967).

Analysis of school climate scores in different sub groups -teaching categories, age, gender, marital status, seniority, and education level- showed that, in many cases, teachers belonging to different sub groups experienced differential school climate. For instance; teachers teaching art, music and physical education courses reported higher open school climate in member conflict and in team commitment than the teachers teaching social science courses and natural science courses. This may be because the general high schools' only aim is to prepare the children between 15 and 17 years old for the entrance exam to higher education (MEB, 2001b). While majority of students with 64.5% attend to general high schools in Turkey, only 35.5 of them attend vocational high schools (Dogan, Oruncak & Gunbayi, 2002). The questions asked in this entrance exam are derived from social and natural science courses taught in these schools. Thus, the teachers teaching social courses and natural sciences are more overloaded and under pressed by the demands of students and their parents than the teachers teaching art, music and physical education courses. This may affect the school climate perceived by teachers teaching art, music and physical education courses free from the demands of students and their parents positively.

In terms of gender, results showed that there was a trend for men to report higher open climate than women in intimacy and support and member conflict. This may be because most of the principals and supervisors in Turkey are men. Thus, women teachers may have difficulty in making themselves understood by the principals and supervisors due to the difference in gender, which may affect the school climate perceived by women who have little chance of becoming principals and supervisors negatively.

Whereas there was not a significant difference in the climate scores in the organizational climate factors according to the marital status of the teachers, there was a trend for single teachers to report higher open climate than married ones in organizational clarity. Married teachers are supposed to support a family and have children to look after in addition to their roles of being a teacher and this may cause married teachers to experience role conflict due to being a teacher, a parent and a spouse at the same time. Thus, this role conflict may affect the school climate perceived by married teachers negatively.

Results showed that there was a trend, in general, for teachers with a lower degree of education, who were undergraduate or graduate of two year college, to report lower open school climate than the ones with more degree of education, who were the graduates of a four year faculty of education and other faculties with a diploma of B.A. or B.S. The fact that the teachers with a diploma B.A. and B.S. are more and well educated parallel with the advancements in the new technology and in knowledge and that they know more in theory and practice may be a source of stress for the teachers with a lower degree of education who are supposed to work in the same school with the teachers with the more degree of education and in turn this may effect the school climate perceived by the teachers with a lower degree of education negatively.

Results also showed that older teachers reported higher open climate than younger ones in reward factor. This finding is consistent with the findings that the older the members are, the more job satisfaction they have (Michael, 1974). On the other hand, because younger teachers have high expectations in reward in their early years and they are more idealist than older teachers, they are likely to experience higher levels of job stress. Thus, the level of stress as result of their failure in the realization of high expectations may affect the school climate perceived by younger teachers negatively.

Surprisingly, the results showed that there was a trend in general for the teachers with less seniority to report higher open climate than the ones with more seniority. This finding is not consistent with the finding that as long as the seniority increases, expectations of a staff become more realistic and so his or her expectations become less (Sergiovanni & Carver, 1973). However, this finding is consistent with the job opportunities environment in Turkey. Because of the recent bottle neck in Turkish economy and the increasing rate of unemployment, the students graduated from teacher training faculties have been either not appointed or only some of them have been appointed to the schools as a teacher due to the decrease in supply by the Ministry of Education (MEB, 2001a). Thus, those young teachers who have had a chance to be appointed as a teacher may see themselves luckier and appreciate the value of their job and this may cause them to perceive the school climate where they work more positively than the older ones.
The study reported in this article identifies only high school teachers' perceptions related to school climate factors and their perception levels differentiated according to subcategories such as teaching category, age, gender, marital status, seniority and education level in the cities of Afyon and Usak in Turkey. The studies on the school climate of other schools of pre-school education, primary and junior high school education, and higher education should be done comprehensively throughout Turkey. School climate and its effects on physical and emotional health and job satisfaction of teachers and student outcomes of their learning processes in schools should also be studied.

In helping teachers to work in a more desirable open school climate, (1) teachers' salary should be increased and consistent with their education level; (2) the students graduated from Faculty of Education should have a chance to be appointed to schools as a teacher with the developments in Turkish economy and the increase in supply by the Ministry of Education or private schools; (3) new vocational high schools with up to date programs should be opened and the students graduated from junior high schools should be attracted to these schools in order to diminish the demand to general high schools; (4) teachers should be supplied more facilities in career development and self actualization, and both men and women should have the same degree of chance to become supervisors and principals (5) the teachers with lower degree of education should also be supported in career development via in-service education.

Acknowledgement: This study was supported by Akdeniz University Scientific Research Projects Unit.

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THE ATTITUDES OF THE PHYSICAL EDUCATION STUDENTS TOWARDS INTERNET

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ABSTRACT
Internet is a part of our life today. It offers educators alternative teaching methods. It provides us to get efficient and fast information, establishing contact with everyone and to have a chance for searching all types of data with its globalization effect.

Internet facilities help physical education teachers to search lonely in order to get information in a sTable: and comforTable: way. In addition to this, at educational areas, physical education students get various capacities and properties for their future life. In that sense, technology makes people to have self-differentiated features in order to get wide range of knowledge and about all issues and everyone has same opportunities for gathering this knowledge.

The study is that attitudes of students about internet by considering their tendencies emerging with described statements to realize new generation perspectives whose are graduate and post graduate students. At this research study, questionnaire examined the consciousness of students towards internet to the sample of students whose are a hundred fifty nine in Sakarya University.

Keywords: Internet, Physical Education, Educational Technology

INTRODUCTION

Physical education is an educational process that has as its aim the improvement of human performance through the medium pf physical activities selected to realize this outcome (Bucher, 1987). This education is given by Sport activities. Sports is defined as activities involving powers and skills, competition, strategy, and-or chance, and engaged in fort he enjoyment, satisfaction and-or personal gain (such as income) of the participant, and-or others (e.g.., spectators), including organized and recreational sports, as well as sports as entertainments (Spears, 1993). The term is used widely at this time physical education and sports, which incorporates the traditional emphasis on physical education and at the same time stresses the area of sport with which physical education is vitally concerned and involved.

In this century, technology is getting more important in education to deliver instruction. Fort his reason, educators began to use technology such as internet in their classroom. At this point, having perceptions of students at faculty of education is getting more important because they will be a teacher. Today's teacher should know how to use internet in education to deliver instruction. Fort this reason, the main purpose of this research is to get the perceptions of students on internet.

THE AIM OF RESEARCH

At education system, technology is main facilitator that provides to contribute system under requiring needed knowledge. Technology provides us to know and follow all issues with the help of the basic item. Internet is a wide range of supporter by providing all contacts requirements and all types of information, searching facilities with its various digital tools. Technology has impact on education with today's contemporary term as Educational Technology. Within this perspective; computers and Internet are one of the part of the educational technology not replacing all technological developments but it is part of the common concern term. By the way, it is the time to examine what are the attitudes of students' toward Internet that is apart of technology in order to clarify the role of Internet at students' life. Technology especially in education as computers and computer based system requires and concentrates to the how students can learn and use it effective way. Internet and its multi functions are in the roles of delivering information and gathering with easy navigations and paths. Technology and Internet reflect support for new dimensions under the perspective of education especially students' learning-teaching cycle (Forcier, 1996).

There are many components of Internet that facilitate the easy, sTable: and meaningful learning of students. There is a concrete role of computers and included Internet in society and schools. It is discussable about bringing to educational change through computer developments. Internet provides work speed, work efficiency,

work power and the removal of human error from the work activities. With these brief facilities, it is understandable that high information technology affects the students' learning and studying. With well-known advantages of high technology, students can catch the consciousness of importance about technology and main issue is how they develop attitudes toward it (Grabe, et al., 2001). It is questionable how effectively affect and what are the attitudes of students toward internet as a role in education.

As a result, technology changes societal life by Internet. By this way learning styles, needs of people have been different directions according to technology. People can create different cultures under the Internet boundaries and can be free to choose whatever person needs and expects at his/her life related to their aims. Knowing is key concept at Internet to achieve individualized and equal learning standards. At the aim side of research, main consideration is to realize the attitudes of students towards internet and being aware of consciousness of students about internet.

IMPORTANCE OF THE RESEARCH

At the side of importance of the research, emphasizing the role of the Internet and students' attitudes toward it has been considered. At today's life, Internet becomes our part of societal order by providing various functions. On the other hand, it has great function by effecting styles of education and system at all societies.

Internet is also part of the educational technology. Educational Technology is the process of visualizing, simulating, solving educational based problems with the integration of software and hardware. Educational Technology includes help of the computer and internet as hardware. It's a whole process make learning environment as a constructivist approach with any kind of new, creative educational activities for delivering information in an interactive way through internet. Technology is the way of communicating with students and increasing motivation of students. Educational Technology has internet-based side as well. Educational Technology is the tool to increase the quality of understanding and learning under the integration of technology and content, learning strategies. In addition to this; having consciousness of educational technology and its main part as Internet requires being more productive, willingness, to add new developments, creativeness for learning, letting individuals has own learning with cooperative and shared intelligence, making meaningful learning based on constructivist approach (Maddux, et al., 1997).

METHOD

Operational Definition of Variables

This study was designed to examine students' attitudes about internet and to realize their tendencies based on gender, education level of their mothers and fathers, having computer at their homes, having internet connection at home, Internet education and student's positions. Independent and dependent variables in this study were used as follows:

Independent variables:

Students' Characteristics.

- Gender.
- Education level of their mothers.
- Education level of their fathers.
- Having computer in their homes.
- Having internet connection in their homes.
- Having internet education.
- Position of students.

Dependent variables

Students' attitudes were evaluated by survey.

- Internet is a universal digital library.
- Internet provides easy life.
- Internet is a fastest way to reach knowledge.
- Internet is a digital place that creates close relationship among societies.
- Internet provides endless freedom to people.
- Internet is vital to enhancing exchanging cultures.

- Internet has a potential to be an effective training tool.
- Internet is a way to provide learning for people in order to search.
- It is exciting to get information about internet.
- It is enjoyable to chat at internet.
- Having friends in internet is temporary.
- Internet causes to be far away from real life.
- Chatting in internet prevent to be socialized.
- Internet can provide sTable: friendship by doing chatting.
- Internet creates tendency to people for getting prepared knowledge.
- Internet includes unnecessary, non-useful knowledge.
- Internet causes destroyed societies.
- Internet creates addiction.
- Internet creates cultural dilemma.
- Internet forces people to be alone.
- There should not be any nervous while making shopping at internet.
- Foreign languages that internet includes is not obstacle.
- It is not safety to make shopping at internet.

Identification of the Population
The population under investigation included students whose are the students at undergraduate in Spring 2005-2006 school year in Department of Physical Education Teaching at Sakarya University in Turkey.

Sample
Sample selected by the method of random sampling as a hundred fifty nine undergraduate students taking courses during Spring 2005-2006 school year in Sakarya University.

Instrument
For this research study, questionnaire was designed for analyzing students' attitudes towards Internet. Survey was designed according to outlines of "Tendency Towards Internet" (Kılınçoğlu, Altun, 2002). There were 30 items at this instrument, 7 related with personal information, and 23 items related with Internet attitudes are on a series five-point Likert-scale. (5=strongly disagree and 1=strongly agree).

Data Collection
In Sakarya University, a hundred fifty nine undergraduate students' perceptions and attitudes were analyzed through the prepared questionnaire about internet. Students' responses to the questionnaire were statistically analyzed according to gender, education level of their mothers and fathers, having computer at their homes, having internet education and student's positions.

Data Analysis Procedures
In this study, quantitative research methods (frequencies, t-test, and ANOVA) were used in order to investigate the research problem that is effects of internet on learning. Questionnaire as survey was designed to get the perceptions of student-teachers towards internet and its effects to learning.

DATA ANALYSIS AND PRESENTATION OF FINDINGS
The main purpose of this study was to investigate students-teachers' perceptions and attitudes towards internet based on their gender, education level of their mothers and fathers, having computers at home, having Internet connection, having internet education, and students positions with relating statement type questions by the support of statistical analysis and evaluation that questionnaire results are the basis of these evaluations.

The light of quantitative data analysis examines demographic data and frequencies for all items in the survey.

Demographic Data
The first seven items of survey asked for "Personal Data", including the variable of gender (Table: 1), education level of their mothers (Table: 2) and fathers (Table: 3), having computers at home (Table: 4), having Internet connection (Table: 5), having internet education (Table: 6), and students' positions (Table: 7). The following Tables show the demographic data of students.

Table: 1 - Gender

Gender	Responses	Percentage

Male	94	58.5 %
Female	65	41.5 %

Table: 2 - Mother's education level

Mother's education level	Responses	Percentage
Primary school	105	64.8 %
Secondary school	17	10.7 %
High school	24	15.1 %
Undergraduate	6	3.8 %
Missing	9	5.7 %
Total	159	100 %

Table: 3 - Father's education level

Father's education level	Responses	Percentage
Primary school	64	40.3 %
Secondary school	19	11.9 %
High school	54	40.3 %
Undergraduate	19	11.9 %
Missing	3	1.9 %
Total	159	100 %

Table: 4 - Do you have computer at home?

Do you have computer at home?	Responses	Percentage
Yes	80	50.3 %
No	79	49.7 %

Table: 5 - Do you have Internet connection at home?

Do you have Internet connection at home?	Responses	Percentage
Yes	56	35.2 %
No	103	64.8 %

Table: 6 - Did you have Internet education?

Did you have Internet education?	Responses	Percentage
Yes	72	45.3 %
No	87	54.7 %

Table: 7 - Student education level?

Student level	Responses	Percentage
First class	41	25.8 %
Second class	41	25.8 %
Third class	37	23.3 %
Fourth class	39	24.5 %
Missing	1	0.5 %
Total	159	100 %

An analysis of the characteristics of the target population for the study, indicated that 58.5% of the respondents were male and 41.5% of were female. Similarly, 64.8 of the respondents' mothers' education level were primary school, 10.7% were secondary school, 15.1% were high school, 3.8% were undergraduate degree.

About 40.3% of the respondents' fathers' education level were primary school, 11.9% were secondary school, 40.3% were high school, 11.9% were undergraduate degree. Similarly, 50.3% of the respondents have a computer and 49.7% of them don't have a computer at home.

About 35.2% of the respondents have an Internet connection at home and 64.8% do not have Internet connection at home. Similarly, 45.3% had an Internet education and 54.7% did not have an Internet education. About 25.8% were first year, 25.8% were second year, 23.3% were third year, and 24.5% were fourth year students.

Frequencies of Individual Items

The frequency of all dependent items of responses is shown in Table: 8. The Table: shows the students response about the survey questions.

Table: 8 - Frequencies of Individual Items

	Strongly agree		Agree		Undecided		Disagree		Strongly disagree	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Internet is a universal library	154	96.9	4	2.6	8	5.0	74	46.5	68	42.8
Internet provides easy life.	153	96.2	60	37.7	27	17	49	30.8	17	10.7
Internet is a fastest way to reach knowledge.	151	95.0	13	8.2	8	5.0	63	39.6	67	42.1
Internet is a digital place that creates close relationship among societies.	156	98.1	19	11.9	12	7.5	85	53.5	40	25.2
Internet provides endless freedom to people.	154	96.9	79	46.5	33	20.8	31	19.5	16	10.1
Internet is vital to enhancing exchanging cultures.	156	98.1	44	27.7	32	20.1	62	39.0	18	11.3
Internet has a potential to be an effective training tool.	156	98.1	24	14.1	26	16.4	87	54.7	19	11.9
Internet is a way to provide learning for people in order to search.	154	96.9	13	8.2	7	4.4	83	52.2	51	32.1
It is exciting to get information about internet.	153	96.2	19	11.9	18	11.3	81	50.9	35	22.0
It is enjoyable to chat at internet.	153	96.2	35	22.0	22	13.8	68	42.8	28	17.6
Having friends in internet is temporary.	155	97.5	26	16.3	20	12.6	59	37.1	50	31.4
Internet causes to be far away from real life.	154	96.9	37	23.3	26	16.4	62	39.0	29	18.2
Chatting in internet prevent to be socialized.	155	97.5	49	30.8	29	18.2	59	37.1	18	11.3
Internet can provide sTable: friendship by doing chatting.	153	96.2	81	51.0	31	19.5	35	22.0	6	3.8
Internet creates tendency to people for getting prepared knowledge.	154	96.9	50	31.4	41	25.8	52	32.7	11	6.9
Internet includes unnecessary, non-useful knowledge.	154	96.9	105	66.1	25	15.7	15	9.4	9	5.7
Internet causes destroyed societies.	155	97.5	62	39.0	46	28.9	37	23.3	10	6.3
Internet creates addiction.	155	97.5	24	15.0	17	10.7	75	47.2	39	24.5
Internet creates cultural dilemma.	154	96.9	55	34.6	47	29.6	42	26.4	10	6.3
Internet forces people to be alone.	151	95.0	62	39.0	37	23.3	43	27.0	9	5.7
There should not be any nervous while making shopping at internet.	155	97.5	34	21.4	45	28.3	58	36.5	18	11.3
Foreign languages that internet includes is not obstacle.	154	96.9	40	25.1	33	20.8	69	43.4	12	7.5
It is not safety to make shopping at internet.	154	96.9	26	16.3	48	30.2	48	30.2	32	20.1

According to the single item indicating satisfaction with Internet attitudes (Table: 8), it appears that the students were strongly agreed on having internet attitudes. However, for 3 of the 23 specific items, more than 50% of the students indicated that they were strongly agreed and agreed. At least, 50% strongly agreed and agreed that:

- Internet provides endless freedom to people (%46.5).
- Internet can provide sTable: friendship by doing chatting (%51.0).
- Internet includes unnecessary, non-useful knowledge (%66.1).
- And less than 50% of the students were less positive about 20 items of the 23 indicating undecided disagree and strongly disagree with:
- Internet is a universal library (88.0%);
- Internet provides easy life (48%);
- Internet is a fastest way to reach knowledge (63%);
- Internet is a digital place that creates close relationship among societies (94%);

- Internet is vital to enhancing exchanging cultures (52.0%);
- Internet has a potential to be an effective training tool (66.0%);
- Internet is a way to provide learning for people in order to search (85.0%);
- It is exciting to get information about internet (73.0%);
- It is enjoyable to chat at internet (60.0%);
- Having friends in internet is temporary (68.0%);
- Internet causes to be far away from real life (58.0%);
- Chatting in internet prevent to be socialized (49.0%);
- Internet creates addiction (73.0%);
- There should not be any nervous while making shopping at internet (48.0%);
- Foreign languages that internet includes is not obstacle (50.0%);
- It is not safety to make shopping at internet (50.3%);

t-test of Individual Items

According to Independent Samples Test results at Table: 9 that were done for gender, computer at home, Internet at home, and student position are shown in Table: 9:

Table: 9 - t-test Independent Samples Test

	t-test for Equality of Means - Sig. (2-tailed)			
	Gender	Computer at home	Internet at home	Internet education
Internet is a universal digital library.	.781	.677	.535	.938
Internet provides easy life.	.408	.891	.932	.595
Internet is a fastest way to reach knowledge.	.889	.327	.618	.140
Internet is a digital place that creates close relationship among societies.	.352	.001	.178	.254
Internet provides endless freedom to people.	.433	.228	.233	.615
Internet is vital to enhancing exchanging cultures.	.683	.851	.966	.736
Internet has a potential to be an effective training tool.	.023	.292	.961	.197
Internet is a way to provide learning for people in order to search.	.650	.007	.751	.363
It is exciting to get information about internet.	.583	.000	.002	.305
It is enjoyable to chat at internet.	.032	.642	.687	.849
Having friends in internet is temporary.	.269	.961	.330	.137
Internet causes to be far away from real life.	.856	.839	.074	.730
Chatting in internet prevent to be socialized.	.652	.717	.849	.791
Internet can provide sTable: friendship by doing chatting.	.020	.059	.064	.383
Internet creates tendency to people for getting prepared knowledge.	.044	.616	.508	.359
Internet includes unnecessary, non-useful knowledge.	.025	.080	.259	.877
Internet causes destroyed societies.	.454	.069	.048	.733
Internet creates addiction.	.658	.909	.769	.116
Internet creates cultural dilemma.	.480	.069	.334	.876
Internet forces people to be alone.	.106	.933	.790	.262
There should not be any nervous while making shopping at internet.	.012	.247	.673	.560
Foreign languages that internet includes is not obstacle.	.823	.559	.290	.846
It is not safety to make shopping at internet.	.695	.173	.785	.029

According to Independent Samples Test results at Table: 9 that were done for gender; as indicated above, all values are higher than the standard value that is 0.05 except the values of Internet has a potential to be an effective training tool (0.023), It is enjoyable to chat at internet (0.032), Internet can provide sTable: friendship by doing chatting (0.020)

Internet creates tendency to people for getting prepared knowledge (0.044), internet includes unnecessary and no useful knowledge (0.025), and there should not be any nervous while making shopping at internet (0.012), which are representing meaningful difference between genders variations, on the other hand other values indicate no meaningful difference between genders based on their responds.

According to Independent Samples Test results at Table: 9 that were done for having computer in students' homes; as indicated above, all values are higher than the standard value that is 0.05 except the value of Internet

is a digital place that creates close relationship among societies (0.001), Internet is a way to provide learning for people in order to search (%.007).

It is exciting to get information about internet (% .000), and Internet can provide sTable: friendship by doing chatting (%.059) which representing meaningful difference with having computer in their homes on the other hand other values indicate no meaningful difference between have computer in students' home based on their responds.

According to Independent Samples Test results at Table: 9 that were done for having internet connection in students' homes; as indicated above, all values are higher than the standard value that is 0.05 except the value of It is exciting to get information about internet (%.002) and Internet causes destroyed societies (%.048) and other values indicate no meaningful difference between statements and having internet connection in their homes based on their responds.

According to Independent Samples Test results at Table: 9 that were done for internet education; as indicated above, all values are higher than the standard value that is 0.05 except the values of it is not safety to make shopping at internet (0.029). A

nd on the other hand other values indicate no meaningful difference between having internet education and no having internet education based on their responds.

ANOVA of Individual Items
According to ANOVA results at Table: 10 that were done for the education level of student's mothers as indicated, all of the values except one statement represent higher value than standard value that is .05.

Table: 10 - ANOVA

	Sig.		
	Education level		
	Mother's	Father's	Class Level
Internet is a universal digital library.	.073	.051	.016
Internet provides easy life.	.380	.775	.277
Internet is a fastest way to reach knowledge.	.171	.189	.011
Internet is a digital place that creates close relationship among societies.	.039	.923	.079
Internet provides endless freedom to people.	.066	.605	.000
Internet is vital to enhancing exchanging cultures.	.604	.995	.186
Internet has a potential to be an effective training tool.	.950	.069	.008
Internet is a way to provide learning for people in order to search.	.549	.370	.592
It is exciting to get information about internet.	.178	.611	.291
It is enjoyable to chat at internet.	.987	.722	.481
Having friends in internet is temporary.	.698	.363	.750
Internet causes to be far away from real life.	.012	.184	.335
Chatting in internet prevent to be socialized.	.000	.930	.070
Internet can provide sTable: friendship by doing chatting.	.167	.708	.882
Internet creates tendency to people for getting prepared knowledge.	.058	.488	.038
Internet includes unnecessary, non-useful knowledge.	.936	.770	.025
Internet causes destroyed societies.	.968	.494	.192
Internet creates addiction.	.112	.677	.556
Internet creates cultural dilemma.	.069	.427	.492
Internet forces people to be alone.	.515	.764	.622
There should not be any nervous while making shopping at internet.	.564	.201	.720
Foreign languages that internet includes is not obstacle.	.545	.086	.954
It is not safety to make shopping at internet.	.329	.296	.057

According to ANOVA results at Table: 10 that were done for the students' mother education level, all values are higher than the standard value that is 0.05 except the values of Internet is a digital place that creates close relationship among societies (.039), Internet causes to be far away from real life (.012), Chatting in internet prevent to be socialized (.000), Internet creates tendency to people for getting prepared knowledge (.058) which

is representing meaningful difference between statements and students' mother education based on their responds.

According to ANOVA results at Table: 10 that were done for education levels of student's fathers as indicated above, all values are higher than standard value that is .05, that representing no meaningful difference between statements and education level of student's fathers.
According to ANOVA results at Table: 10 that were done for class level, all values are higher than the standard value that is 0.05 except the values of Internet is a universal digital library (0.016), Internet is a fastest way to reach knowledge (0.011), Internet provides endless freedom to people (0.000), Internet has a potential to be an effective training tool (0.008), Internet creates tendency to people for getting prepared knowledge (0.038) and Internet includes unnecessary, non-useful knowledge (0.025) which is representing meaningful difference between statements and students' class level based on their responses.

COMMENTS AND RECOMMENDATIONS

All reflections about the study that is "attitudes of students towards internet" concluded that because of living technology based and knowledge based century, adaptation to technology is ineviTable: conditions. As known, internet is great option for us to catch information any time we want. There is a consensus that internet provides huge alternatives with its advantages but also it includes different dimensions as a shortcoming. In addition to this, research results represent that high percentages concentrated on negative consciousness about internet.

Therefore, the results of research and questionnaire, students have negative tendency the useful and easy reflections of internet. This examine that there is a consciousness about effects and importance of internet by having tendency to apply the consciousness or willingness of new technological style, because students education levels are convenient to apply and use internet otherwise they can not reach the competitive environment.

In addition to this, by the evaluation of all statistical implementations which are T-test as independent, ANOVA and frequency evaluations based on questionnaire results reflect that statements of foreign language is not obstacle in internet, internet is a digital place that creates close relationship among societies and internet provides easy life represent meaningful difference at T-test. But at ANOVA, all values represent no meaningful difference between statements and the independent variables as education levels of student' fathers and mothers.

Fourth class students were more positive than first and third year students on question 1, fourth year students were more positive than first and second year students on question 3, fourth year students were more positive than first, second and third year students on question 5, second year students were more positive than first, second and third year students on question 7, fourth year students were more positive than second and third year students on question 15 and third year students more positive than second and fourth year students. Students whose mother has primary and high school education were more positive than other students. There is no difference based on father education level.

As a result, having consciousness and positive reflections about Internet makes people to be further step at competitive environment. Therefore, at education cycle of students concentrate more to learn internet alternatives and functions for getting great positive benefit their future life by adapting contemporary trends.

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THE CONSEQUENCES OF INTERNET CAFÉ USE ON TURKISH COLLEGE STUDENTS' SOCIAL CAPITAL

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ABSTRACT
This paper draws on a part of the doctoral research study that investigates the potential impacts of Internet café use on Turkish college students' social capital. In this study, Internet café usage was portrayed by the amount of time spent and the frequency of online activities engaged at the cafés. Social capital, on the other hand, was characterized by feelings about loneliness, quality of social network with family, quality of social network with friends, and pro-social attitudes. A quantitative research design with a survey technique was employed. The data were collected from 758 undergraduate students from the College of Education of a major Anatolian university. Multiple linear regression with simple slope analysis were conducted to determine the proportion of variance that Internet café use accounts for in social capital and whether participants' type of accommodation adds anything significant. Results indicated that (a) Internet café usage did not significantly influence on loneliness and pro-social attitudes, (b) spending more time at Internet cafés and frequent entertainment-based online activities led to a decrease in the quality of social networks with both family and friends, (c) frequent online communication activities led to an increase in the quality of social networks with friends, and (d) such effects were the same for participants who stay alone, stay with family, and stay with friends. It was concluded that Internet technology was more than a simple and neutral tool that may constitute complex social dimensions involving profound alterations for youth's social life.

INTRODUCTION

Does the Internet make people socially isolated from the community? Does it undermine family relations or friendships? In the process of negotiating challenges sustained by the global diffusion of Internet technologies, many of the nations around the world have been debating such questions and concerns so far. The proliferation of information and communication technologies (ICT) has influenced many aspects of the lives of young people through creating new social and cultural spaces that have challenged long-established ways of socialization. Regarding interpersonal relations with significant others, for example, Gergen (2002) claims that ICT has expanded the domain of "absent presence", which in turn, leads to an erosion of face-to-face community, centered or privatized sense of self, and a decrease in the "depth" but an increase in the "breadth" of social relationships. This research was an attempt to find empirical evidence in order to shed light on some of these issues.

Recent research about the impacts of Internet use on social traits can be divided into dystopian (negative effects) and utopian (positive effects) perspectives (Katz & Rice, 2002). On one hand, previous research revealed that frequent online interaction leads to a decline in social support, family communication, social network, interactions with community members, or an increase in depression and loneliness (Engelberg & Sjoberg, 2004; Heim, 1993; Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay & Scherlis, 1998; Kroker & Weinstein, 1994; Morgan & Cotton, 2003; Nie & Erbring, 2000; Sanders, Field, Diego & Kaplan, 2000; Shapiro & Leone, 1999; Stoll, 1995; Turkle, 1995). On the other hand, previous studies indicate that online media usage could facilitate more, better, and new social relationships with friends and family, expanding social networks, transferring online relationships to offline ones, reinforcing offline interaction, encouraging normally quiet and shy people in group conversations, and also a decrease in loneliness and depression (Ando, Takahira & Sakamoto, 2005; Hamman, 1999; Katz & Aspden, 1997; Kiesler, Kraut, Mukhopadhyay & Scherlis, 1997; Parks & Floyd, 1996; Pew Research Center, 2000; Shaw & Gant, 2002; Stafford, Kline & Dimmick, 1999; Van Dijk, 1999).

Kraut et al. (1998) conducted a field study that was called HomeNet project to determine whether the Internet is increasing or decreasing levels of social involvement and to examine the impact of the Internet on psychological functioning. They gave computers and free Internet access to 169 people in 73 households residing in the Pittsburgh area of Pennsylvania for a 1-2 year period. Special logging programs recorded their Internet usage during the study, which included the total number of hours they spent on the Internet and the number of e-mail messages sent. Social involvement was measured by four different variables: family communication, size of local social network, size of distant social network, social support. After initially controlling for scores on social

involvement and psychological well-being, the results indicated that increased Internet use was associated with the following: declines in participant's communication with family members, declines in the size of their social network, and elevated levels of depression and loneliness. Participants reported keeping up with fewer friends, spending less time with their families and experiencing more daily life stress. One of the most compelling findings was that these effects were the most pronounced among the teenage participants. More recently, researchers have discovered a significant relationship between self-reported Internet use and psychological variables such as loneliness, depression, and self-esteem (Amstrong, Philips & Saling, 2000; Moody, 2001; Morahan-Martin, 1999; Morahan-Martin & Schumacher, 2000).

Nie and Erbring (2000) were among the most recent researchers to hypothesize that the Internet would transform society into individuals glued to computer screens with impersonal human contact. Drawing from a representative national sample of 2,689 households in the USA, they found that people who spent ten or more hours per week on the Internet substantially cut down on the amount of time spent conserving with friends and family, both in person and by phone. Sanders et al. (2000) further investigated the link between Internet use and depression and social isolation among adolescents. Informants for this study were 89 high school seniors comprised of 37 males and 52 females. Level of Internet use was assessed by asking how many hours per day they spend of the Internet. Those who selected less than one hour a day were classified as low users and others who selected more than two hours a day were categorized as high users. The results showed that low Internet users had significantly better relationships with their mothers and peers than high users.

In contrast to dystopian perspective reviewed above, other studies argued that Internet use has had important positive social impacts on people, communities and society at large by generating improved social interactions, particularly when the individual is constrained by geography, illness or stigma of some sort (Hampton & Wellman, 2001; McKenna & Bargh, 2000; McKenna, Green & Gleason, 2002). Rice (1987) stated that fundamental aspects of social groups and communities could be supported and extended through online communities. The main point related in these arguments is that using the Internet augments involvement in existing communities by offering new social spaces for communication (Katz & Aspden, 1997), which complements and strengthens offline interactions. This indicates that maintaining interpersonal relationships is an important reason that individuals use the Internet. For example, Stafford, Kline and Dimmick (1999) found that people use the Internet to satisfy important social interactions and needs related to communication with family, friends and the world, since it is much less expensive, quicker, simpler and more convenient that other communication devices. Similarly, Pew Research Center (2000) reported that communication via the Internet helped users improve their key social relations and expand their social networks. The study also found that the surveyed users included fewer social isolates, had a greater number of recent social contacts and more access to social support than nonusers.

With the notion of seeing the Internet as a window unto the world, and in the face of low levels of computer ownership and Internet access from home, the emergence of Internet café phenomena was born in the early 1990s when the first Internet café, Cyberia, opened in London. Eventually, the phenomenon has spread out to all over the world from city centers to small villages. In Turkey, they play an important role in Internet usage rate and mostly cater to teenagers especially high school and college students. Approximately forty-two percent of the Internet access in Turkey is provided by independent Internet cafés (Andic, 2003). They have become popular social outlets for Turkish youth to hang out and access to the Internet. On the other hand, the rapid increase in the use of these places in Turkish society has particularly raised concern about social and psychological development of Turkish youth. It has recently been complained that youngsters visit Internet cafés not for educational or informational purposes but rather to access violent-oriented electronic games, pornographic and separatist materials which assumed to undermine their moral values and social inclusion with the community (Andic, 2003; Haberturk, 2005; Yesil, 2003). In fact, the Internet has become a particularly threatening medium for some officials, prompting the government to establish regulations governing Internet cafés.

Much of the existing research on Internet cafés and social consequences of the Internet usage has been conducted in Western societies where ICT has been more widely diffused and reached a deeper level of adoption within the society. Therefore, inspired from concerns and issues mentioned above, this study attempted to investigate such phenomena in a culturally and socially distinct country in which the reactions to technology diffusion may likely be unique to a specific cultural context. The purpose of the study was to examine the potential impacts of Internet café use on Turkish youth's social development. The following research question was formulated to drive the research in accordance to the purpose of the study:

To what extent does Internet café usage impact Turkish youth's social capital with regards to (a) loneliness, (b) social network with family, (c) social network with friends and (d) pro-social attitudes (social involvement with others in the community)? and Does this effect differ across their accommodation type (whether stay alone or with family or with friends)?

RESEARCH METHODOLOGY

A quantitative research design was adopted by employing a survey technique. The study took place in one of the biggest cities in Turkey. By using convenience and purposeful sampling methods, participants were recruited from the population of undergraduate students attending the College of Education of a major Anatolian university. The questionnaire was delivered to 1050 college students whose ages ranged from 17 to 23. A total of 805 surveys were returned for a 76.7% response rate. The number of usable responses was 758 with a 72.2% net response rate. Of these, 45% were male and 55% were female students. There was a balanced distribution in the number of participants from each academic department except for Art Education which has a small proportion of students compared to others in the population as well. Frequency analysis indicated the following percentages: 142 (19%) Science Education; 131 (17%) Mathematics Education; 131 (17%) Social Studies Education; 154 (20%) Elementary Education; 150 (20%) Foreign Language Education and 50 (7%) Art Education. Participants from science, mathematics and social studies education were composed of both elementary and secondary level education. In terms of their status in the college at the time of this study, 289 (38%) were freshman, 126 (17%) were sophomore, 275 (36%) were junior and 68 (9%) were senior students. The demographic summary of the sample is given in Table 1.

Table 1. Frequency and Percentage Distributions for Demographics

Demographic	Frequency	Percentage (%)
Gender		
Female	416	55
Male	342	45
Age[a]		
Under 20	334	44
20 and above	424	56
Major		
Science Education	142	19
Mathematics Education	131	17
Social Studies Education	131	17
Elementary Education	154	20
Foreign Language Education	150	20
Art Education	50	7
Years in the school		
Freshman	289	38
Sophomore	126	17
Junior	275	36
Senior	68	9
Type of accommodation		
Stay alone	18	2
Stay with family	239	32
Stay with friends	501	66

Note. [a]Participants' age ranged from 17 to 23 with a mean age of 19.77.

Data collection was carried out in January and February 2006. A paper-and-pencil type questionnaire was developed as a main data collection tool. The first set of questions was designed to gather demographic/background information of the participants as well as informants' Internet café usage. The remainder of the survey includes questions about social capital. This part of the survey was developed by incorporating several scales that have been widely used in the literature and several items adapted from other surveys with established reliability and construct validity.

Internet café usage was measured by the amount of time spent and the frequency of patterns of activities engaged at the cafes. The former was one of the main independent (exploratory) variables in the study, which referred to the total relative amount of time subjects usually spend in Internet cafés per week. It was operationalized along an open-ended question and coded as minutes. The latter, patterns of activities, referred to a set of four independent variables referring to the frequency of various activities participants engage in while visiting Internet cafés. Types of Internet use have previously been divided into four broad areas in the literature: searching for information, communication, entertainment, and commercial activities (Korgaonkar & Wolin, 1999; Kraut et. al, 1998). Similarly, a total of 13 items related to Internet activities were developed for the purpose of this study and participants were asked to indicate how often they do such activities in Internet cafés on a 5-point ordinal scale ranging from "1" representing "never" to "5" representing "very often". Based on the results of a principal component analysis with varimax rotation, four main patterns of activities were extracted as follows: (a) *educational and informational use* (research for class assignments, read about news and current events, and gathering general information about hobbies, medical, etc.), (b) *communication use* (sending and receiving e-mails, online chat, and participating in forums and discussion boards), (c) *entertainment use* (playing games, surfing for fun, listening to music, watching movies) and (d) *business use* (online shopping, online banking and paying bills). Each of these served as a separate independent variable in the study.

Social capital in this study was characterized and measured by four dependent variables: Participants' feelings about loneliness, quality of social network with family, quality of social network with friends, and pro-social attitudes. The variable of "loneliness" referred to participants' subjective feelings of loneliness or social isolation, and was measured through the short format of the revised UCLA Loneliness Scale Version 3 (Russell, 1996). The scale consists of ten 4-point Likert-type items (never = 1, rarely = 2, sometimes = 3, and always = 4) and asks participants to indicate how often they feel particular feelings that represent a unidimensional measure of social and emotional aspects of loneliness. A composite variable was formed by summing up the scores of ten items for each participant. The variables of "social network with family" and "social network with friends" referred to the quality of participants' social relationships with their family and friends respectively. To measure these variables, the first part of the social development scale was adapted from The Pupils Survey (De Haan & Huysmans, 2004), which was originally developed to assess the relationship of IT/Media use and psychological development among Dutch youth. The scale had several positive and negative statements about relationship with parents and friends on a 5-point Likert-type scale (1 = Strongly Disagree and 5 = Strongly Agree). A composite variable was generated by calculating the mean scores of related statements for each of these variables.

SPSS 10 statistical software package was used for data analysis purposes. Multiple linear regression with simple slope analysis were performed to determine to what extent the dependent variable (e.g. loneliness, social network with family, etc.) could be predicted from the linear combinations of the independent variables (time spent at Internet cafés, and patterns of activities) and whether the magnitude of this prediction was the same for every level of a moderator variable. For the purpose of this study, "type of accommodation" served as a moderator variable. Since it was a categorical variable with three subgroups (stay alone, stay with family and stay with friends), the data were effect coded by creating two vectors. "Stay with friends" group was assigned "1" in the first vector while "stay with family" group was assigned "1" in the second" one. "Stay alone" group was assigned "-1" in both vectors.

RESULTS

Participants' loneliness scores ranged from 10 to 35 with a mean score of 15.91 (SD = 4.43). The higher the score is, the stronger a person feels isolation. Table 2 below demonstrates the regression analysis results for predicting "loneliness" based on internet café usage variables. The results in step 1 showed that the variables taken together explained around 1% of the variance in loneliness. This finding is not statistically significant and the model had a very poor fit {$F(5,752) = 1.85$, $p = .10$}, suggesting that none of the independent variables related to Internet café usage had a significant effect on the dependent variable of loneliness. Therefore, further analysis for testing homogeneity of slopes across type of accommodation was terminated as the result was neither statistically significant nor substantively meaningful.

Table 2. Summary of Regression Analysis of Loneliness on Internet Café Usage

Variable	B	SE B	β
Step 1			
Time spent at Internet cafés	.015	.028	.022
Educational and informational usage	-.433	.185	-.091*
Communicational usage	-.269	.188	-.061
Entertainment usage	.323	.196	.068
Business usage	-.042	.350	-.004

Note. $R^2 = .012$ *for Step 1 (p = .10).*
** p < .05.*

Descriptive statistical analysis for the dependent variable of "social network with family" showed that respondents had a mean score of 4.08 (SD = .73) but the actual score ranged from 1 to 5. Higher scores indicate better relationship with family. In order to examine the association between Internet café usage and the quality of social network with family, the amount of time spent and patterns of activities were entered into the regression analysis predicting the quality of social inclusion with family. As shown in the first step in Table 3, only time spent at the Internet cafés (t = 4.36, p = .00) and the frequency of entertainment usage (t = 3.20, p = .00) had a significant impact on the quality of social network with family. Henceforth, for one unit increase in the amount of time spent and the frequency of entertainment-based usage at Internet cafés, the subjects' quality of social relationship with their family decreased by a .020 and .101 unit respectively. The overall regression accounted for about 5% of the variance in social network with family and this finding was significant {F(5,752) = 8.48, p = .00}.

Two effect coded vectors representing the moderator variable of accommodation was entered into the second step followed by the product vectors by each independent variable in the third step to test the homogeneity of regression coefficients across the condition of whether participants stay alone, with their parents or with friends. The results in the third step in Table 3 revealed that the additional proportion of variance related to product vectors was .017 and was not statistically significant {F(10,740) = 1.39, p = .18}. The increment variance due to type of accommodation in the second step was also not significant {ΔR^2 = .004, F(2,750) = 1.62, p = .20}. Therefore, both slopes (regression coefficients) and intercepts in the linear regression equations are homogenous for each level of the moderator variable. Then, it can be concluded that the effects of time spent at Internet cafés and the frequency of entertainment usage, which were found to be significant in the first step, are the same for participants staying alone, with family, or with friends.

Table 3. Summary of Regression Analysis of Social Network With Family on Internet Café Usage Moderated by Type of Accommodation

Variable	B	SE B	β
Step 1			
Time spent at Internet cafés	-.020	.005	-.179**
Educational/informational usage	.053	.030	.067
Communicational usage	.023	.031	.031
Entertainment usage	-.101	.032	-.130**
Business usage	-.012	.057	-.008
Step 2			
Time spent at Internet cafés	-.021	.005	-.186**
Educational/informational usage	.054	.030	.069
Communicational usage	.021	.030	.029
Entertainment usage	-.101	.032	-.129**
Business usage	-.006	.057	-.004
Accommodation 1	.106	.062	.076
Accommodation 2	.035	.006	.024
Step 3			
Time spent at Internet cafés	-.021	.014	-.188
Educational/informational usage	.162	.088	.205
Communicational usage	.122	.073	.167
Entertainment usage	-.100	.074	-.129
Business usage	-.161	.086	-.104
Accommodation 1	.461	.293	.332
Accommodation 2	.578	.298	.397

Time spent at Internet cafés X Accommodation 1	.001	.014	.012
Time spent at Internet cafés X Accommodation 2	-.002	.015	-.014
Educational/informational usage X Accommodation 1	-.122	.091	-.295
Educational/informational usage X Accommodation 2	-.099	.093	-.211
Communicational usage X Accommodation 1	-.095	.076	-.197
Communicational usage X Accommodation 2	-.136	.079	-.241
Entertainment usage X Accommodation 1	-.021	.077	-.042
Entertainment usage X Accommodation 2	.040	.081	.068
Business usage X Accommodation 1	.262	.096	.266*
Business usage X Accommodation 2	.034	.103	.032

Note. $R^2 = .053$ *for Step 1 (p = .00);* $\Delta R^2 = .004$ *for Step 2 (p = .20);* $\Delta R^2 = .017$ *for Step 3 (p = .18).*
** p < .05. ** p < .01.*

As far as the impact of Internet café usage on the quality of social relations with friends was concerned, a separate regression analysis was conducted and its results were given in Table 4. Participants' scores for this dependent variable ranged from 1.13 to 5 with a mean score of 3.96 (SD = .69). Higher scores indicate better relationship with friends. The overall regression model in the first step accounted for about 11% of the variance in social networks with friends {F(5,752) = 17.42, p = .00}. Further examination of the coefficients in the first step revealed that the amount of time spent (t = 2.84, p = .00), the frequency of communicational (t = 2.32, p = .02), and entertainment based usage (t = 7.78, p = .00) had a significant effect on participants' social relations with their friends. While one unit increase in the amount of time spent and the frequency of entertainment usage at the Internet cafés was associated with a .012 and .228 unit decrease respectively, a one unit increase in the frequency of communicational usage resulted in a .066 unit increase in the quality of social relations with friends.

Regarding slope differences across type of accommodation, the findings in the third and second steps in Table 4 indicated that the additional proportion of variance explained by product vectors in the third step was .019 and was not statistically significant {F(10,740) = 1.64, p = .09}, and neither was the incremented variance due to type of accommodation in the second step {ΔR^2 = .000, F(2,750) = .06, p = .94}. Therefore, neither slopes nor intercepts differ significantly. These results suggest that the effects of time spent at the Internet cafés and the frequency of communicational, and entertainment oriented usage, which were found to be significant in the first step, are the same for the participants staying alone, with their family, or with their friends.

Table 4. Summary of Regression Analysis of Social Network With Friends on Internet Café Usage Moderated by Type of Accommodation

Variable	B	SE B	β
Step 1			
Time spent at Internet cafés	-.012	.004	-.113**
Educational/informational usage	.022	.028	.030
Communicational usage	.066	.028	.094*
Entertainment usage	-.228	.029	-.307**
Business usage	.025	.052	.017
Step2			
Time spent at Internet cafés	-.012	.004	-.113*
Educational/informational usage	.023	.028	.031
Communicational usage	.065	.028	.094*
Entertainment usage	-.228	.029	-.307**
Business usage	.026	.053	.018
Accommodation 1	.018	.058	.014
Accommodation 2	.018	.061	.013
Step 3			
Time spent at Internet cafés	-010	.013	-.091
Educational/informational usage	.108	.082	.145
Communicational usage	.097	.067	.140
Entertainment usage	-.250	.069	-.337**
Business usage	-.096	.080	-.066
Accommodation 1	-.029	.271	.022
Accommodation 2	.578	.276	.418*
Time spent at Internet cafés X Accommodation 1	-.003	.013	-.036

Time spent at Internet cafés X Accommodation 2	-.002	.013	-.016
Educational/informational usage X Accommodation 1	-.066	.084	-.167
Educational/informational usage X Accommodation 2	-.128	.086	-.288
Communicational usage X Accommodation 1	-.030	.070	-.066
Communicational usage X Accommodation 2	-.023	.073	-.044
Entertainment usage X Accommodation 1	.037	.072	.076
Entertainment usage X Accommodation 2	-.003	.075	-.006
Business usage X Accommodation 1	.251	.089	.269**
Business usage X Accommodation 2	-.058	.095	-.057

Note. $R^2 = .105$ *for Step 1 (p = .00);* $\Delta R^2 = .000$ *for Step 2 (p = .94);* $\Delta R^2 = .019$ *for Step 3 (p = .09).*
** p < .05. ** p < .01.*

The final part of the research study sought to investigate the relationship between Internet café usage and pro-social attitudes and whether it differs by type of accommodation. Descriptive statistical analysis for this dependent variable indicated that respondents had a mean score of 13.73 (SD = 1.72) but the actual score ranged from 6 to 15. The higher the score is, the better attitudes a person has regarding involvement or being in touch with others in the community. As shown in Table 5, the R^2 of the model was .010, indicating that approximately 1% of the variation of pro-social attitudes could be explained by the independent variables combined. The insignificant F-ratio {F(5, 752) = 1.46, p = .20} revealed that the overall goodness of fit of the regression model for this data was not satisfactory. This result suggests that Internet café usage does not seem to significantly influence participants' pro-social attitudes. Therefore, the further testing for slope differences across type of accommodation was terminated.

Table 5. Summary of Regression Analysis of Pro-Social Attitudes on Internet Café Usage

Variable	B	SE B	β
Step 1			
Time spent at Internet cafés	.018	.011	.068
Educational/informational usage	.114	.072	.062
Communicational usage	-.031	.073	-.018
Entertainment usage	-.120	.076	-.065
Business usage	-.071	.136	-.019

Note. $R^2 = .010$ *for Step 1 (p = .20).*

DISCUSSION AND CONCLUSION

The present study produced somewhat complex and varied results with regards to the polarized discussion (utopian versus dystopian) about the social consequences of online interaction in previous research mentioned at the beginning of this paper. It revealed mixed evidence and thus supported both sides of the argument. However, the results did not favor either perspective in terms of generating neutral effects. It is important to note that there are a few differences between previous research and the present study. Previous research conceptualized online interaction in two different ways. While some used the number of hours spent on the Internet as an indicator of online interaction, others simply employed a binary opposition to Internet use (user versus nonuser). However, both characterizations might not be adequate because they ignore what kinds of activities individuals practice on the Internet. Therefore, online interaction in this study was characterized by not only the amount of time spent at Internet cafés but also the frequency of patterns of online activities engaged in these places (educational/informational, communicational, entertainment, and business usage) to further analyze whether the social consequences of online interaction depend on what users actually do online. Furthermore, previous studies generally used the amount of time spent with family members and close friends to characterize social involvement with family and with friends respectively. This study, however, operationalized these indicators by directly asking questions about the quality of relationships with family and friends.

The multiple regression analyses on Internet café usage explained an insignificant proportion of variance in loneliness. Therefore, consistent with the findings of previous research (Donchi & Moore, 2004; Subrahmanyam, 2003), in this study, the amount of time spent at Internet cafés and the frequency of patterns of activities performed online did not influence feelings of loneliness. In other words, Internet café usage did not lead to either an increase or a decrease in loneliness. Hence, this result is contradictory to both perspectives (utopian and dystopian) mentioned above. A similar result (neutral effect) was indicated in the regression of pro-social attitudes on Internet café usage. Neither the amount of time spent, nor the frequency of patterns of activities, influenced pro-social attitudes. This suggests that Internet café usage does not lead to weak or strong attitudes

toward a sense of belonging, contributing to a community, and helping others in the community. This result contradicts previous research which reports that Internet users express more positive pro-social attitudes than nonusers (Cole & Robinson, 2002; Liang & Wei, 2002), or that frequent Internet use is associated with less pro-social attitudes (Mesch, 2001).

Negative consequences of Internet use on loneliness in previous research has been explained by the theoretical assumption that Internet use displaces time spent for social activities, which in turn, makes users lonely (Kraut et al., 1998). Based on this premise, for the sample of this study, it can be assumed that Internet café usage does not displace youth's social activities because it was not found to lead to an increase in perceived loneliness. Furthermore, Nie and Hillygus (2002) found that the actual place where online interaction occurs could be a significant factor. Users in Internet cafés can engage in face-to-face social contact with others in the cafés while concurrently using the Internet technologies. This combination of online and face-to-face socialization that characterized Internet café adoption patterns could be another factor that contributes to the lack of evidence for a negative impact in relation to perceived loneliness. It is recommended that future research studies should consider either controlling individuals' face-to-face social involvement or including it as a moderator variable while analyzing the influences of Internet usage on loneliness.

Moreover, the Internet not only offers an alternative sphere of communication to sustain existing social ties, but also facilitates establishing new online social relationships that may also be continued offline (Rheingold, 2000). As a result, interpersonal communications taking place within the social space of the Internet may at least suppress if not decrease the feelings of loneliness even though previous research showed that these online relationships may not be as deep and strong as face-to-face companionships (Parks and Roberts, 1991; Putnam, 2000). Quality of online relationships in relation to the experience of actual face-to-face relationships should also be taken into account in future studies.

The impact of Internet use on loneliness may also depend on the type of culture that Internet users belong to. For instance, Hofstede's (1984) construct of cultural dimensions classifies all cultures around the world into two groups: individualistic cultures versus collectivist cultures. He states that the ties between individuals are loose in the former whereas they are close in the latter. Most of the empirical evidence for the negative effect of Internet use on loneliness has been gathered from individualistic cultures (e.g. United States). However this study was conducted in a collectivist culture and did not reveal any significant effect on loneliness. Thus, it is possible to hypothesize that individuals in individualistic cultures may be more susceptible to loneliness than their counterparts in collectivist cultures. Future research ought to be designed to specifically determine whether the type of culture mediates the effect of Internet use on perception of loneliness

Regarding consequences for social network with family and friends, both regression analyses of college students' perceived quality of social relations with family and with friends in relation to Internet café usage explained significant variances. While the amount of time spent at Internet cafés and the frequency of entertainment-based activities online negatively impacted social involvement with both family and friends, the frequency of communicational usage (e.g. email, chat, forums etc.) positively affected development of a social network with friends but not with family. In other words, for this particular sample, spending more time online and frequent online entertainment activities (e.g. video games) seem to lead to a reduction in the quality of social involvement with both family and friends. In contrast, frequent communicational usage appears to increase the quality of social involvement with friends but does influence socializing with family. The findings are consistent with both utopian and dystopian perspectives outlined earlier, but contradict other studies that did not find a connection between Internet use and socializing with family and friends (Cole & Robinson, 2002; Lee & Zhu, 2002; Mikami; 2002).

Again, the negative impact of time spent at Internet cafés could be explained by the same theoretical assumption related to loneliness mentioned earlier. Internet use displaces time spent with family and friends, which in turn, decreases users' sense of social affiliation with them (Kraut et al, 1998). Or else, as suggested by Coget, Yamauchi and Suman (2002) but was not specifically tested in their study, it could be that users spend their online time in less social activities, or engage in communicational activities less frequently. Such assumptions are supported by the relationship between negative (time spent and entertainment-based usage) and positive (communicational usage) associations germane to social networks with friends. Therefore, it could be indicated that Internet café usage negatively impacts social involvement had the study included only "time spent at Internet cafés" in the regression analysis. In this sense, one of the most important implications of this study for the related literature is that Internet use may not be defined adequately by only measuring time spent online. More specifically, what activities users engage in while using the Internet also needs to be taken into account.

Overall, these complex results suggest that social consequences of Internet usage on social capital is not a simple matter that can be explained by one-directional perspectives (utopian and dystopian) mentioned earlier or the neutral effect perspective. Therefore, the findings seem to support the theoretical assumption that the Internet as a technological medium and its implication for a society is "ambivalent" (Feenberg, 1991). It is also apparent that the Internet, at its substantive core, will continue to act in the manner of a complex medium that transforms social reality in subtle and profound ways. More research is needed to better understand the social dynamics in our contemporary complicated society which Castells (1996) describes as "network society".

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THE EFFECT OF CONSTRUCTIVIST LEARNING PRINCIPLES BASED LEARNING MATERIALS TO STUDENTS' ATTITUDES, SUCCESS AND RETENTION IN SOCIAL STUDIES*

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ABSTRACT
The present study aims to investigate whether the learning materials that based on constructivist learning principles have an effect on fifth grade Social Studies students' attitudes, their academic success and their retention. The study was conducted at Şehit Ali Gaffar Okkan Elementary School, Eskişehir. The participants of the study were 5th grade students in Şehit Ali Gaffar Okkan Elementary School. The data was collected in fall term in 2004-2005 academic year. Participants were divided into two groups: the control group (5-B) and the experimental group (5-C). In the present study, the following data collection instruments were used: a questionnaire for demographic information, pre- and post-tests and open-ended essay-type tests that were used to measure learners' academic success and retention level, lesson plans, various teaching materials for classroom activities, and a questionnaire to gather the learners' perspectives. Social Studies Attitude Scale, developed by Deveci and Güven (2002), was used to determine students' attitudes. The data obtained were analyzed using the SPSS program. The means and standard deviations were calculated for each group. The data were subjected to t-tests for inter- and between- group comparisons. The significance level was taken as .05. Findings of research indicate that constructivist learning principles based learning materials increase students' academic success and retention in Social Studies but don't increase attitudes. Additionally students think that constructivist learning principles based learning materials reflect constructivist learning principles.

Key words: Social Studies, Constructivist Theory, Teaching Material

INTRODUCTION

The education process is ensured by formal and informal education and elementary education is the most fundamental step of the formal education in a country. Elementary education, which prepares the 6 to14 year-old children to the life and to following education through enabling them to gain basic knowledge and skills, is the milestone of the education system. In this period, basic knowledge, skills and values are given to the pupils in order to make them live harmoniously with other individuals in the society and enable them to adopt the life conditions (Fidan and Erden 1998). The elementary education is the fundamental educational step that the child meets the regular education facts for the first time. It is also a period, in which the students experience their most critic terms, namely growing period, and it is the basement of their forthcoming educational lives. It is commonly believed that the way of training an individual in a god manner needs a high quality education (Gürkan and Gökce; 1999).

In elementary education, enabling students to gain the necessary behaviors is mainly supplied by education programs that are designed and practiced beforehand. In elementary education programs there are various courses, which called central lessons, and expression courses as well as skill courses. Social Science course is one of those central lessons in the elementary school education. A common definition of the social science course which is accepted by all the people in the field is difficult to describe (Öztürk and Otluoglu; 2003). However, social science course can be defined as a lesson which gives the learners some the basic cultural elements through findings of various studies and some cumulative knowledge that obtained through interdisciplinary studies. Furthermore, it can be defined as a course which combines the necessary knowledge with reference to global understanding of a young learner (Sözer, 1998). As it is figured in the Chart 1 below, the social science course is also functions as an umbrella which interconnects other disciplines in the elementary education.

* It is the title of an MA thesis which is supervised by Dr. Mehmet Gültekin in the Institute of Educational Sciences of Anadolu University

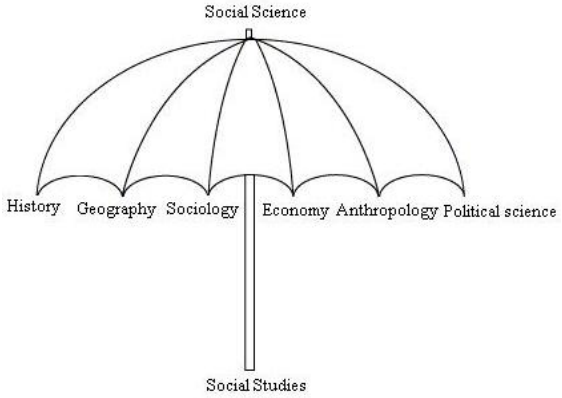

Chart 1. Social Studies Umbrella

The social science course ensures students to become well socialized and excellent citizens through enabling them to gain important social skills. Societies bring up their people, who are robust for their own social structures, through social science courses (Deveci, 2003). Therefore, the social science education has a significant and diagnostic role in practical education which based on modern science, human rights, freedom, democracy, secularity and cultural heritage of national and international sources (TED; 1987). Regarding the fact, students should be educated on various attitudes, personal characteristics, values of the societies and model behaviors through social science courses to encourage them participating to the society effectively (Kaltsounis; 1987)

The main objective of the educational institutions is to help bringing up the individuals as effective and productive citizens, and enable the young learners live happily by realizing their own capacities. In fact, this basic function explains what the objective of social science course is and why it takes place in the elementary education programs. Additionally, another fundamental goal of the social science course is to educate effective and responsible citizens through developing their knowledge acquisition sources and decision making abilities in the global world (NCSS; 1994).

In a global sense, social science courses are regarded as preparatory phase for the citizenship in democracy (Barr, Barth and Shermis;1978). Therefore, the duties of teachers in social science courses of the twentieth century become more complicated and new goals for the social science courses in elementary education are emerged depending on this fact. One of those new goals of the social science courses in elementary schools is to guide the learners to develop a broad understanding for the political and economical developments as well as developing general world knowledge about the environment they live. Another key goal of social science course is to develop critical and intellectual thinking abilities of the students which enable them to fully participate to the society effectively. Furthermore, the social science courses aim at guiding the students to associate their classroom experiences with those of real world experiences through the perspectives and mind activities that they gained in the classroom (Grant ve Vansledrigt, 1996).

The traditional notion of social science teaching, which intends to make individuals to gain a social identity, depends on a teacher centered instruction, which grounds the belief that the best teaching occurs in a quite teaching environment, where the teacher desk symbolizes the wisdom and the authority. Such a teaching notion abstracts the teacher from the classroom, uses the course book as the only teaching material and requires the learners to study on their own. Therefore, teaching of abstract things takes more places in the social science teaching procedures. Accordingly, narration and question-answer approaches play a figurative role in this traditional notion. As a result, the learning becomes through memorization (Yanpar 2001:466). As Teague (2000) states, “actually, the facts and the terms of social science is taught through traditional teacher centered teaching activities which emphasize memorization. However, when the objectives of social science courses, characteristics of the subjects and basic principles of social science teaching taken into consideration, it can be easily observed that the traditional teaching approaches are inadequate and needs to be enlarged (Alkan and Kurt, 1998: 94).

Though the limitations of the traditional teaching, nowadays some skills such as updating, practicing, criticizing, and analyzing the knowledge gain importance. The constructivist theory which plays an important role in the field of education recently, arouses the interests of the experts in the field of social science teaching in terms of designing a curriculum which enables the students to learn through practicing, problem solving and decision

making activities. Reformation of the components of social science curriculum in a way that enables learners to transfer their previous knowledge into intellectual skills such as problem-solving and decision making (Fontana, 1996:5), might provide a teaching environment which forces the limits of the traditional teaching notion and causes reformulation of definition of the effective missions of social science courses.

Regarding the fact, the constructivist theory that take for granted that the whole learning take place in the minds of the learners as a result of constructions (Yaşar, 1998:73), seems one of the proper teaching approaches which provides a meaningful and strong teaching and learning process in social science courses.

Especially, some of the goals of the social science course go with the constructivist learning principles which emphasize emotional and physical involvement effectively. Sunal and Haas (2002) summarized them as follows:

- Understanding the terms (such as alteration and continuity)
- Understanding the generalizations (the variations in a society and their associations)
- To develop high level thinking skills (to develop social science related skills such as classification of different political events, critical thinking, decision making, and problem solving)
- To develop attitudes and views in relation with the social world (for example; not to judge something without detailed and adequate evidence)

Therefore, the social science teachers should encourage their students to employ their high level thinking skills, to cooperate with other students, to construct their own knowledge about the social science terms, and to establish associations between the subjects that they have learned in their courses and their personal experiences (Rice and Wilson, 1999:32). It is because; meaningful social science learning includes an effective construction process. As it is presented in chart 2 below, in a meaningful social science course, the students construct their own knowledge, skills and attitudes with regard to their former experiences (Sunal and Haas, 2002: 23).

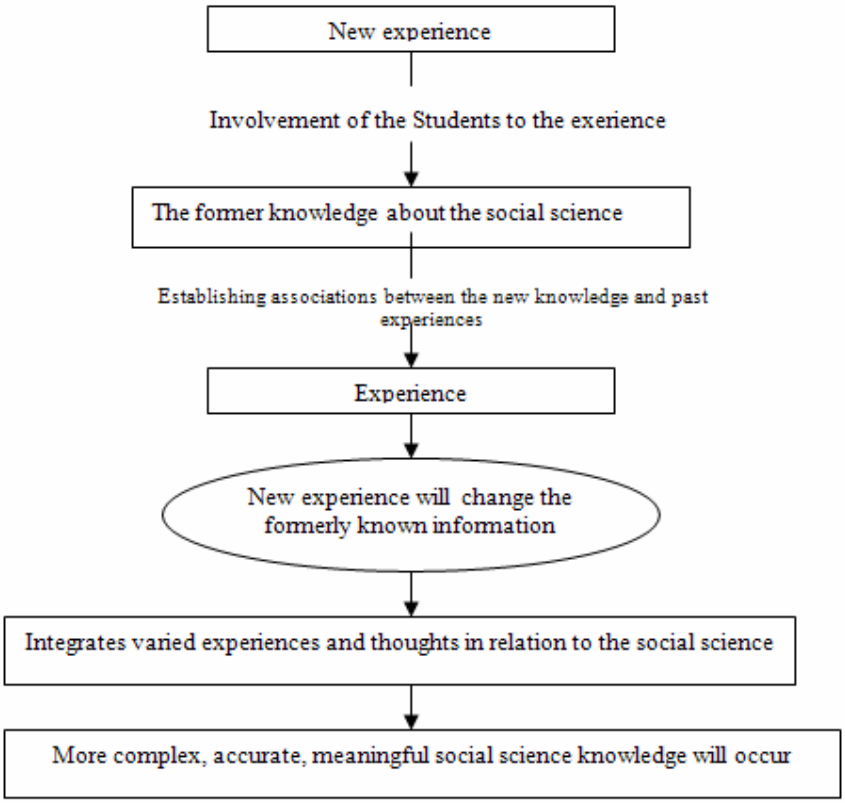

Chart 2. The constructivist learning process in social science course
Source: Adapted from Sunal and Haas (2002; 24)

According to Sunal and Haas (2002; 7) the classroom environment for meaningful learning in social science courses can be obtained through joining the principles of constructivist learning with the roles of instructors and

learners. Since, the main assumption of the constructivism supposes that the students' learning occurs when the new knowledge is presented in relation to the former knowledge within an effective teaching environment, where the new knowledge is practiced through experiences.

In such an environment, the learner brings his/her social life experiences to the classroom, gathers evidence, establishes associations between his/her experiences, able to see his/her newly gained knowledge, skills and experiences from another perspective and able to join his/her experiences with his/her life. Additionally, the learners in such an environment feel confident and enrich their learning with adequate materials and experiences.

Especially the constructivist learning environment, where constructing the meaning is the basis for learners (Tezci and Gürol, 2001), should be designed as an environment where the learners are able to interact with their environment and convey their rich learning into their learning environment. Therefore, teachers in the constructivist learning environment should support their teaching with some interactive teaching materials (Demirel, 2001; 134). The teaching materials, which might enable constructing the meaning, are also strength the teaching-learning process and ease the learners understanding as well (NCSS, 1994b).

The aim of constructivist learning is not to predetermine what the learners will do, but provide opportunities that shape the learners own learning through rich teaching materials which make the knowledge meaningful and useful (Erdem and Demirel, 2002; 81). While stating their opinions, the learners use various sources such as where they might gather the data about the problem (interviews, field trips, etc.) and where they might show the gathered data (cartoons, graphics, photographs, exhibition, telescope, drama, play, scenario, etc.) (Cunningham, 1992). Every source where the information is gained provides new opinions about the problems. Therefore, earlier than using the teaching materials, it is crucial to design them with regard to the principles of constructivist learning.

Application of materials that based on constructivist principles to Social Science courses will provide contributions to the meaningful learning of the learners as well as to the arrangement of effective teaching-learning process. Here, the question "what should be the proper teaching material that based on constructivist principles? comes to mind. When the literature in the field of constructivism is reviewed, it is found that the fundamental principles of constructivism and the way of adapting them into teaching materials are defined clearly. Regarding the definitions in the literature (Aydın, 2002; Brooks and Brooks, 1993; Özden, 2003; Tezci and Gürol, 2001; Yaşar and Gültekin, 2002; Olsen, 1999; Deryakulu, 2000; Şen, 2002; Marlowe and Page, 1998), the material that is proper to constructivist teaching principles should have the following qualities;

The teaching materials that based on constructivist principles should;

- enable learners to explore new knowledge through setting connections with their previous knowledge,
- enable learners to figure out their opinions before they achieve the new information,
- should feed the curiosity of the learners through learning cycle model (discovery, definition and application)
- should cover some key terms such as "define", "classify", "guess", "construct" that guide students' progress in the learning process.
- should support multiple opinions and courage students to declare their opinions
- should provide associations with real life experiences through examples
- should support learner autonomy
- should support an interactive relation with other students as well as teacher
- should guide the learners for search the sources such as encyclopedias and web pages through open ended and curiosity awakening questions
- should cover the answers of questions such as "how to learn" and "what to learn"
- should guide students to the primary sources
- should involve learning strategies such as problem based learning, case studies, project based learning and collaborative learning.

It can be claimed that in order to establish a meaningful and permanent learning in the Social Science courses, the learning environments should be enriched through teaching materials that encourage and guide the learners to think critically, to solve problems, to study collaboratively and that enable the learners to establish their own learning strategies. Seeking to reflect the innovations and developments in the world to the curriculums of national education in Turkiye, Ministry of National Education framed the Social Science curriculum of 2005-2006 within the framework of above considerations. Therefore, forthcoming scientific studies should inquiry the effectiveness of the teaching materials of social science courses that based on constructivist principles and utilization of those developed materials by the social science teachers.

Regarding the fact, the presents study is conducted to examine the role of teaching materials, which are based on the principles of constructivist learning, on the learners' attitudes toward courses, on learner achievement and on retention levels of the students. The present study might be considered as a significant study in its field, because;

- it depicts that constructivist learning principles are applicable to the teaching materials,
- it figures out whether the utilization of materials that based on constructivist learning principles have any contribution to the effectiveness of Social science courses or not, and
- it provides contributions to the new Social science curriculum that developed by the Ministry of National Education with regard to the constructivist learning principles.

PURPOSE OF THE STUDY

The main goal of the present study is to figure out the effectiveness of teaching materials, which were based on the principles of constructivist learning, with regard to the learners' attitudes toward the social science courses, learner achievement and retention levels of the learners. Concerning the above aim, following research questions are posed;

1. Is there any significant difference between the learner attitudes of the learners in the experimental group, which used teaching materials that designed regarding the principles of constructivist learning, and control group, which used traditional teaching materials in their social science courses?
2. Is there any significant difference between the academic achievements of the learners in the experimental group, which used teaching materials that designed regarding the principles of constructivist learning, and control group, which used traditional teaching materials in their social science courses?
3. Is there any significant difference between the retention levels of the learners in the experimental group, which used teaching materials that designed regarding the principles of constructivist learning, and control group, which used traditional teaching materials in their social science courses?
4. What are the viewpoints of the learners in the experimental group on the utilization of the teaching materials that designed with regard to the constructivist learning principles?

METHOD

The Research Model

The present study is designed as a control-grouped (Karasar 1998) experimental research model with pre-test and post-test in order to examine the role of teaching materials, which were based on the principles of constructivist learning, on the learners' attitudes toward courses, learner achievement and their retention levels. Two groups were objectively identified as experimental and control groups, and the learners in both groups were examined through pre and post tests. Additionally, a questionnaire, which inquires the perspectives of the learners on the use of teaching materials that are based on constructivist learning principles, is used in order figure out the learner preferences.

Participants

The participants of the study were 5th grade students in Şehit Ali Gaffar Okkan Elementary School in Eskişehir. The data was collected in fall term of 2004-2005 academic year. Participants were divided into two groups: the control group (5-B) and the experimental group (5-C). The definition of the groups as experimental and control was based on evenhanded principles and they were labeled through drawing of lots. There are 36 students in each of the groups. The reasons behind selecting the Şehit Ali Gaffar Okkan Elementary School as the scope of the research are the willingness of the teachers and school administration to participate and collaborate to this study, their interest and readiness to contribute scientific studies, and the school's technological equipments with its prosperous library.

Equalization

Since the present research is an experimental study the participants in both groups, namely the members of experiment and control groups, were attempted to equalize in terms of some features. Regarding the equalization process, the achievement test scores, learner's attitude scores towards Social science course and participants' demographic data were used in order to form equal groups. The achievement test is used as pre-test which examines the success of the participants, and its results show that the participants in both groups received similar scores. That is, there is not any significant difference between the experiment and control groups in terms of their success prior to the study.

The participants in each group were paired regarding the information that they provide through demographic information questionnaire. If a participant does not have any partner with similar demographic information s/he

is eliminated and dropped from the groups. Accordingly, 20 students out of 36 in each group were selected as pairs, and on account of the equalization process total 40 students form the participants of the study. The demographic backgrounds of the equalized participants are summarized in table 1 below.

Table 1. Demographic backgrounds of the participants

Features	Experiment Group		Control Group	
	N	Frequency	N	Frequency
Gender	8	40.0	8	40.0
Female	12	60.0	12	60.0
Male				
Average income of parents per month	2	10.0		
200 billion and less				
201-400 billion	2	10.0	2	10.0
401-600 billion	3	15.0	3	15.0
601-800 billion	5	25.0	6	30.0
801 billion -1 milliard	5	25.0	5	25.0
1 milliard and over	3	15.0	4	20.0
Educational background outside the school				
Learners who get private courses	3	15.0	3	15.0
Learners who do not get private courses	17	85.0	17	85.0
Report card grades	-	-	-	-
1				
2	-	-	-	-
3	-	-	-	-
4	2	10.0	2	10.0
5	18	90.0	18	90.0

As it is depicted in table 1, the participants in both groups are equal in terms of their gender, their educational backgrounds outside the school, and report card grades of 4th grade. They also show similarities in terms of average monthly income of their parents. Therefore, it can be claimed that the participants in both groups are equal in terms of their demographic backgrounds.

Although it is attempted to equalize the participants in terms of their attitudes, it is observed that there are not enough pairs in terms of their attitudes though they are equal in other aspects of the equalization. Therefore, the participants' pre-test scores of attitudes towards social science course, which depict no significant difference among the participants, will be regarded as equalization standard for their attitudes. If there would be any significant difference in pre-test attitude scores of the participants, then, the data would be statistically analyzed through covariance analysis at the end of the experiment.

Data and data gathering process

In terms of the theoretical background of the study, a variety of literature either in Turkish or in other contexts are reviewed. Furthermore, in order to answer the research questions of the present study several data gathering instruments are utilized. For instance, a questionnaire form is developed by the researcher in order to gather the demographic information about the participants. The participants' responds to the questionnaire are used to equalize the groups and to form pairs. Additionally, an achievement test, which is developed by the researcher, is employed to examine the academic successes of the participants at the beginning of the experiment; the same test is reused to examine retention levels of the participants at the end of the experiment. Furthermore, several lesson plans and teaching materials are designed by the researcher so as to follow the social science courses in connection with the principles of constructivist learning principles and in connection with the teaching materials that planned accordingly. Another questionnaire which inquires the opinions of the participants about the teaching materials that used in the courses is developed by the researcher. Consequently, "the social science course attitude scale" which was developed by Deveci and Güven (2002) is utilized in order to figure out the participants attitudes towards social science courses.

Demographic information questionnaire
This questionnaire form, which is designed for equalization and pairing process of the participants, consists of 6 questions. The questionnaire is reformed and developed through the contributions and opinions of the experts in the field.

Achievement tests which are employed to assess the success and retention levels of the participants
Two interrelated but different assessment instruments are employed to examine the achievement and retention levels of the students. Both of the assessment tools grounded their question from the unit named "How did we achieve the Republic". The first tool consists of a four-itemed 40 multiple choice questions and the second tool consists of 8 open ended essay questions.

In order to establish content validity of the multiple choice achievement test, a special attention is paid on the questions as to cover and exemplify the content of the unit (Tekin, 2000). The questions and their items are also evaluated by 10 assessment experts and 5 social science teachers in terms of their content validity. The final version of the multiple choice achievement test is formed with reference to the evaluations of the experts.

Prior to administrating the achievement test to the control and experimental groups it is administered to a sample group, which has similar characteristics with the participants of the study in order to judge the reliability of the achievement test. The test divided into two sections and the reliability score of the test is calculated through using Spearman- Brown's formula as cited in Tekin's (2000) study. The result of the reliability estimation depicts that the reliability co-efficiency score of the multiple choice achievement test that based on the unit "How did we achieve the Republic" is .88, and this score affirms the reliability of the achievement test.

Since the evaluation process with reference to constructivist learning principles is not solely based on a timed tests and assumed as the reflection of the learning of the learners, additional achievement measurement tool is utilized in the present research. In terms of evaluation procedures, the constructivist learning principles challenge the traditional evaluation procedures and employ authentic evaluation techniques. Therefore, in addition to the multiple choice achievement test, the researcher developed a 10 questioned essay type achievement test with regard to the constructivist learning principles. This 10 questioned achievement test is reviewed by the constructivist learning professionals and 2 questions are eliminated through their recommendations. The grading of this essay type achievement test is handled by two independent raters and the mean scores of raters are assumed as the achievement grades of the participants. As the final step of the achievement evaluation procedure, the participants' grades in multiple choice and essay type exams cumulated and then their average is obtained as the achievement scores of the participants.

The questionnaire which inquires the perceptions of the participants about the constructivist learning principles based teaching materials that used in the Social science courses
A tree-point likert type questionnaire is developed by the researcher in order to obtain the perceptions of the participants about the teaching material, which was designed concerning constructivist learning principles, for social science courses. The items in the questionnaire are developed as to reflect the perceptions of the participants about the teaching material which was intended to involve the constructivist learning elements.

The teaching material which was designed concerning constructivist learning principles
The first step in the constructivist learning principles based teaching material design is to define the general and behavioral objectives of the subject that is "How did we achieve the Republic" which is a unit in the syllabus of 5th grade Social science courses. Subsequently, lesson plans are prepared with reference to the general and behavioral objectives of the unit. Finally, a teaching material, which is involving the constructivist learning elements, is developed.

In terms of selecting the unit two important criteria, which are ease in explanation and ease in making the unit meaningful to the learners, are regarded as main concerns. Accordingly, one of the units in the syllabus of 5th grades, namely "How did we achieve the Republic" which is generally based on historical facts and information, was selected as the course subject for the study.

The literature in Turkish contexts and other contexts is reviewed in order to design teaching material which is proper for the principles of constructivist learning principles. Accordingly, a "check list for the constructivist learning principles based teaching materials" is developed. Finally, the course content is prepared as worksheets regarding the check list and objectives of the unit "How did we achieve the Republic".

While preparing the worksheets, a special attention was paid to their appropriateness to the constructivist learning principles, their aptness to the objectives of the unit, their relevance to the levels of the students and their being interactive. Therefore, the teaching material is designed as colorful and conspicuous and it is ornamented with various photographs, maps and caricatures. Furthermore, some gap filling activities are added to the worksheets in order to make students write down some notes on them. Potential sources that the learners might refer are listed on the worksheets, and some blanks are provided for students to add their own sources beneath the given source list. Students were also guided through some signs on the worksheets for the activities that they should accomplish. The worksheets compiled as small booklets and ten different experts are requested to review the worksheets for their relevance to the principles of constructivist learning. Afterwards, the worksheets were reorganized with reference to the reviews of the experts. Subsequently, the same experts were requested again to assess the relevance of the teaching material by using the "the constructivist learning principles based teaching materials check list". Only 8 out of ten experts have returned their final review. The ratings of the experts for the relevance of the teaching material by using the "the constructivist learning principles based teaching materials check list" is summarized in table 2 below.

Table. 2. The views of experts on the teaching material that designed with regard to constructivist learning principles

Check list for constructivist based teaching material		sufficient	acceptable	insufficient	$\bar{x}$
1. It enables the learners to discover the new information through associating former knowledge.	*f* %	7 87.5	1 12.5	- -	2.87
2. It helps to confirm the learners' opinions on the subject prior to get information about it.	*f* %	7 87.5	1 12.5	- -	2.87
3. It enables students to use the learning cycle model (discovery, definition and application) which feed the natural curiosity of the learners.	*f* %	8 100.0	- -	- -	3.00
4. It covers some key terms such as "compare", "define", "classify", "guess", "construct" that guide students' progress in the learning process.	*f* %	8 100.0	- -	- -	3.00
5. It covers case studies and problems that enable the students to look from different dimensions.	*f* %	8 100.0	- -	- -	3.00
6. It supports multiple opinions and courage students to declare their opinions	*f* %	8 100.0	- -	- -	3.00
7. It provides associations with real life experiences through examples	*f* %	7 87.5	- -	1 12.5	2.75
8. It supports learner autonomy	*f* %	8 100.0	- -	- -	3.00
9. It supports an interactive relation with other students as well as teacher	*f* %	8 100.0	- -	- -	3.00
10. It guides the learners for search the sources such as encyclopedias and web pages through open ended and curiosity awakening questions	*f* %	8 100.0	- -	- -	3.00
11. It covers the answers of questions such as "how to learn" and "what to learn"	*f* %	7 87.5	1 12.5	- -	2.87
12. It directs students to the primary sources	*f* %	8 100.0	- -	- -	3.00

13. It involves learning strategies such as problem based learning, case studies, project based learning and collaborative learning.	*f*	6	1	1	2.62
	%	75.0	12.5	12.5	
Mean					2.92

The mean score of the views of experts on the teaching material that designed with regard to constructivist learning principles is 2.92 over 3. Regarding this mean score, it can be claimed that the experts, who were asked for their evaluations of the teaching materials, believe that the teaching materials that designed with reference to constructivist learning principles are well-matched with the defined constructivist learning principles.

Experimental Process

After preparing data collection instruments and obtaining permission from the relevant authority the test and control groups were determined through unbiased selection. In the test group lessons were performed by the researcher. The researcher had attended various conferences and had taken various courses on constructivism during postgraduate studies. Therefore it is assumed that the researcher is knowledgeable on constructivism.

After determining test and control groups, students in both groups were told that a research to determine the effect of teaching material designed in accordance to constructivist learning principles on students' attitudes towards the course, success and retention levels in Social Studies course was planned and that they were selected as subjects of this study. Later, both groups were given achievement test developed by the researcher for course unit titled "How did we achieve the Republic" and the attitude test developed by Deveci and Güven (2002) as pretest.

After explaining the characteristics of the research to students and teacher in detail a six hour teaching practice per week which was lasting six weeks was initiated. This teaching practice took place between 1 November 2004 and 10 December 2004.

Teaching practice using material prepared in accordance with constructivist learning principles was performed in the following manner:

The material developed by the researcher was distributed to the students prior to the practice in the form of a booklet and the students were asked to review the booklet. Resources to be used by the students during the practice period were brought into the classroom or left at the school library. Some of the lessons were undertaken at the school library or the computer laboratory. Instruction for the test group was undertaken in accordance to the previously prepared instruction set. Accordingly the researcher undertook the lessons in line with the activities indicated in the previously distributed material after stating the objectives and topics of the lessons.

Activities aimed at discovering what the students' know and want to know were given priority in the material and these were shared with the class. Later other activities that mentioned in the material and which were relevant to the topic were undertaken. These activities were carried out in the groups that were previously established. After each group completed their work, a class discussion on the group work was undertaken and relationships with the current period were established. In this manner students' were given the opportunity to voice their own views. Exercises varied according to topics. Some of the students were asked to classify, guess, determine differences and similarities, compare or analyze while at other instances students were asked to examine cartoons, photographs or documents in the distributed materials and indicate their opinions in the blanks provided in the material. Students were also asked to provide solutions to problem cases and case samples provided in the material by the researcher. During a portion of the unit students were directed to perform project work. Projects developed by groups were composed of drama, newspaper, contest, power-point presentation and poster. In performing their project exercise students utilized various resources and technologies. Also poems and drawings created by students were included in projects. Projects prepared by students were evaluated by students and presented in the classroom bulletin board.

Students in the test group participated in the learning process in an effective manner, played effective roles in group exercises and other activities. Whenever confronted with a problem the students attempted to solve the problem through cooperation and when unable to overcome the problem sought the help of the researcher.

Whether the implementation of teaching material prepared in accord with constructivist principles was conforming to the guidelines was observed by another researcher. Evaluation of observation form reports indicated that the implementation was in conformance to the set criteria. In the control group a traditional teacher

oriented teaching method consisting of reading relevant topics from a Social Studies textbook, class presentation of the topic and listening to instructors explanations on the topic was employed.

Social Studies course instruction for the test group was performed through teaching material prepared according to constructivist learning principles while instruction for the control group was performed through traditional teaching. After completion of activities for the unit in six weeks an achievement test for the unit titled "How did we achieve the Republic" and a Social Studies course attitude test was applied as a retest. Twenty days after this retesting the success test was performed again to measure the students' retention levels.

Data Analysis and Interpretation

The data collected through instruments used in the study were controlled and data obtained from this control was entered into a computer. After pretest and retest scores of the test and control groups were determined the score averages of the groups and standard deviations of score distributions were calculated. The t-test was used for inter-group comparisons and a 0.05 confidence interval was determined. Data about students opinions about teaching material prepared according to constructivist principles was grouped as follows; averages between 1.00-1.66 were labeled "no", averages between 1.67 - 2.33 were labeled "partially" and averages between 2.34 - 3 were labeled as "yes" and were interpreted accordingly. SPSS (Statistical Package for the Social Sciences) software was used for statistical analysis of the research data.

FINDINGS AND DISCUSSIONS

In this section, findings of statistical analysis of the collected data and discussions of these findings are presented. In presentation of findings and discussions the same order as that of the objectives of the study is used for internal consistency.

1. To answer the question "Is there any significant difference between the learner attitudes of the learners in the experimental group, which used teaching materials that designed regarding the principles of constructivist learning, and control group, which used traditional teaching materials in their social science courses?" arithmetic averages and standard deviations of attitude measure scores were calculated and the difference between the averages of each group was tested through t-tests. Findings for the pretest scores of test and control groups' scores for attitude measure towards Social Studies course is presented in Table 3.

Table 3. Findings on Pretest Scores of experiment and Control Groups Scores on Attitude Measure towards Social Studies Course

Student Groups	Sample Size (N)	Arithmetic Mean ($\overline{X}$)	Standard Deviation (SD)	t Value	Degree of Freedom (Df)	Level of Importance (P)
Experiment Group	20	129.25	12.63	0.39	38	> 0.05
Control Group	20	130.30	13.51			

$t_{Table} = 2.021$

As can be seen in Table 3 there is a 1.05 point difference between the pretest scores of test group and control group students attitude measures towards Social Studies course in the control groups favor. To test the meaningfulness of this difference t-test was performed on the group averages and a t=0.39 was determined. This is below the 2.021 lever which corresponds to the t value for a degree of freedom of 38 at 0.05 importance level. This shows that the difference between the arithmetic averages of the two groups is statistically insignificant. This can be summarized as that there is no significant difference between the attitudes of the students in the test and control groups towards Social Studies course prior to the experiment.

Later, to determine the effectiveness of the experiment, the existence of a meaningful difference in the retest mean scores of the test and control group was investigated. Findings of the retest scores of the test and control group on the attitude measure towards Social Studies course are presented in Table 4.

Table 4. Findings on **Retest Scores of Experiment and Control Groups Scores on Attitude Measure towards Social Studies Course**

Student Groups	Sample Size (N)	Arithmetic Mean ($\overline{X}$)	Standard Deviation (SD)	t Value	Degree of Freedom (Df)	Level of Importance (P)
Experiment Group	20	127.80	13.36	-1.19	38	> 0.05
Control Group	20	133.20	15.22			

t_{Table}= 2.021

As we can observe from Table 4, the test group students scored 5.4 points higher than the control group in the retest. A t test was applied to find if this difference was meaningful and a t value of 1.19 was obtained, which is below the t=2.021 reference value, meaning that there is no statistically significant difference between the arithmetic averages of the two groups. According to the scores on the attitude measure towards Social Studies applied at the end of the experiment there is no meaningful difference in the attitudes of the test and the control groups. This result shows that the teaching techniques employed in the test and control groups have no different effects in affecting the students attitudes towards Social Studies course. These results can be thought of as confirming the view that attitudes develop in life and there is no quick way to change them.

2. To answer the question "Is there a difference in terms of academic success between test group students using teaching materials prepared according to constructivist learning principles and control group students where traditional teaching was used?" a multiple choice achievement test was used as a pretest to measure the success of test and control group students. Arithmetic means and standard deviations of students scores on this test were calculated and the differences between the score was tested using t test. The scores achieved by the experiment and control groups on the achievement pretest are shown on Table 5.

Tablo 5. Findings on the Experiment and Control Groups Scores on the Multiple Choice Pretest Achievement Test

Student Groups	Sample Size (N)	Arithmetic Mean ($\overline{X}$)	Standard Deviation (SD)	t Value	Degree of Freedom (Df)	Level of Importance (P)
Experiment Group	20	41.35	9.44	0.033	38	> 0.05
Control Group	20	41.25	9.93			

t_{Table}= 2.021

As it can be seen from Table 5 there is a 0.10 point difference between the pretest scores of the experiment and control group students in favor of the test group. T test was performed on the arithmetic means of group's scores to test if this difference is meaningful and a t=0.033 value was obtained. This is less than the standard t score of 2.021 and this shows that the difference between the mean scores of the groups is statistically insignificant. There is no significant difference between the achievement levels of the students in the test and control groups in Social Studies prior to the experiment.

Later, to test the effectiveness of the experiment the existence of a meaningful difference between the mean scores of the groups on the posttest composed of multiple choice items and essays were examined. Findings about the posttest scores of the test and control groups are presented in Table 6.

Table 6. Findings on the Posttest Scores of the Experiment and Control Groups

Student Groups	Sample Size (N)	Arithmetic Mean ($\overline{X}$)	Standard Deviation (SD)	t Value	Degree of Freedom (Df)	Level of Importance (P)
Experiment Group	20	64.40	10.69	3.53	38	> 0.05
Control Group	20	51.65	13.88			

t_{Table}= 2.021

According to the findings in Table 6, there is a 12.75 point difference between the posttest scores of the test and control group students in the test group's favor. The meaningfulness of this difference was tested through t testing and a t value of t=3.25, which is larger than the standard t value of t=2.021. According to this result there is a statistically significant difference between the posttest scores of the groups in the test group's favor.

Posttest results from the achievement tests show that the teaching methods employed for test and control groups have different levels of effectiveness. This study shows that in Social Studies course, learning environments where teaching materials prepared in accordance to constructivist learning principles are used is more effective than traditional teaching. This finding of the present study is parallel with findings of Soeharto (1998), Lord (1999), Abboutt, Jeffery and Duane (2003) and Turgut (2001) where research in different course subjects showed that constructivist theory increased student success.

3. To answer the question "Is there a difference between the retention levels of test group students where material prepared in accordance to constructivist learning principles are used and control group students where traditional teaching is used?" 20 days after the posttest implementation the multiple choice item and essay achievement tests were implemented again and the arithmetic means and standard deviations of students' scores were calculated and the difference between means was tested by t testing.
Findings about the scores of students in the achievement test implemented to determine retention levels are given in Table 7.

Table 7. Findings about the Scores of Students in the Achievement Test Used to Measure Retention

Student Groups	Sample Size (N)	Arithmetic Mean ($\overline{X}$)	Standard Deviation (SD)	t Value	Degree of Freedom (Df)	Level of Importance (P)
Experiment Group	20	64.75	14.15	2.25	38	> 0.05
Control Group	20	54.40	14.92			

t_{Table}= 2.021

As seen in Table 7 there is a 10.35 point difference in the test groups favor as far as the groups mean scores for the retention test is concerned. To test the meaningfulness of this differences t test was performed on the groups' mean scores and a t=2.25 value was obtained. This is higher than the standard t value of t=2.021 and means that the difference in the retention levels of the groups is statistically significant.

Retention level results obtained from the achievement test shows that the teaching methods employed towards the test and control groups gave different levels of effectiveness. This study demonstrates that in increasing the retention levels of students in Social Studies courses learning environments where material prepared in accord to constructivist learning principles are more effective than traditional teaching methods. This finding is consistent with Koç's (2002) findings. Koç (2002) found significant differences between the retention levels of constructivist and traditional classes in favor of the constructivists in his research on university students.

4. In the fourth part of the study the question "What are the opinions of students regarding teaching material in Social Studies courses where teaching material prepared in accordance to constructivist learning principles are used?" is answered. Towards this end an evaluation questionnaire regarding teaching material prepared in

accordance to constructivist learning principles was administered. Findings of this survey are presented in table 8.

Table 8. Students Views on Teaching Material Prepared According to Constructivist Learning Principles

Constructivist Teaching Material Checklist		Yes	Partially	No	$\overline{X}$
1. Did the material provide you with an opportunity to discover information by association to previous knowledge?	*f*	17	16	-	2.60
	%	51.5	48.5	-	
2. Did the material determine your viewpoints and opinions regarding the subject before giving information about the subject?	*f*	23	10	-	2.69
	%	69.7	30.3	-	
3. Did the material feed your curiosity by allowing discovery, introducing the concepts and application?	*f*	24	7	2	2.66
	%	72.7	21.2	6.1	
4. Did the material present you with instructions such as "compare", "determine", "classify", "analyze", "guess", "form" aimed to set you in motion in the learning process?	*f*	26	6	1	2.75
	%	78.8	18.2	3.0	
5. Did the material provide case scenarios and questions designed to help you develop different viewpoints on event?	*f*	26	6	1	2.75
	%	78.8	18.2	3.0	
6. Did the material give you opportunities to form and express your own viewpoints?	*f*	21	11	1	2.60
	%	63.6	33.3	3.0	
7. Did the material help you make real life connections by giving examples?	*f*	17	16	-	2.51
	%	51.5	48.5	-	
8. Did the material support your autonomy and initiative?	*f*	22	11	-	2.66
	%	66.7	33.3	-	
9. Did the material provide opportunities for interaction between you and the teacher or other students?	*f*	25	7	1	2.72
	%	75.8	21.2	3.0	
10. Did the material direct you towards different resources such as books, encyclopedia and web sites by providing open ended, curiosity fuelling and thought provoking questions?	*f*	24	8	1	2.69
	%	72.7	24.2	3.0	
11. Did the material provide for questions regarding "How" you learned alongside the questions about "What" you learned?	*f*	25	7	1	2.72
	%	75.8	21.2	3.0	
12. Did the material direct you towards primary sources such as documents, documentaries and the like?	*f*	13	13	7	2.18
	%	39.4	39.4	21.2	
13. Did the material provide for problem based learning, cooperation based learning and sample case examination during the learning process?	*f*	28	3	2	2.78
	%	84.8	9.1	6.1	
Average					2.64

Table 8. summarizes students responses to the questionnaire. For the items titled: "Did the material provide for problem based learning, cooperation based learning and sample case examination during the learning process?" ($\overline{X}$ = 2.78), "Did the material present you with instructions such as "compare", "determine", "classify", "analyze", "guess", "form" aimed to set you in motion in the learning process?" ($\overline{X}$ = 2.75), Did the material provide case scenarios and questions designed to help you develop different viewpoints on events?"($\overline{X}$ = 2.75), "Did the material provide opportunities for interaction between you and the teacher or other students?" ($\overline{X}$ = 2.72), "Did the material provide for questions regarding "How" you learned alongside the questions about "What" you learned?" ($\overline{X}$ = 2.72), "Did the material determine your viewpoints and opinions regarding the

subject before giving information about the subject?" ($\overline{X}$ = 2.69), "Did the material direct you towards different resources such as books, encyclopedia and web sites by providing open ended, curiosity fuelling and thought provoking questions?" ($\overline{X}$ = 2.69), "Did the material feed your curiosity by allowing discovery, introducing the concepts and application?" ($\overline{X}$ = 2.66), "Did the material support your autonomy and initiative?" ($\overline{X}$ = 2.66), "Did the material provide you with an opportunity to discover information by association to previous knowledge?" ($\overline{X}$ = 2.60), "Did the material give you opportunities to form and express your own viewpoint?" ($\overline{X}$ = 2.60), "Did the material help you make real life connections by giving examples?" ($\overline{X}$ = 2.51), students' responses averaged as "**yes**". Only for the item titled "Did the material direct you towards primary sources such as documents, documentaries and the like?" ($\overline{X}$ = 2.18), the students' response averaged "**partially**".

The arithmetic mean of all of the students' views on constructivist teaching material is 2.64 on a scale of 3. Accordingly it can be stated that the students accept the constructivist teaching material as appropriate to the determined constructivist learning principles. This in turn indicates that the experiment was performed in accordance to previously determined principles.

RESULTS and SUGGESTIONS

The results obtained through this study show that teaching material prepared according to constructivist learning principles increase the academic success and retention levels of students in Social Studies courses. Also students have found the material prepared according to constructivist learning principles appropriate to constructivist learning principles.

In light of the results and findings of the study the following suggestions are brought forth:

1. The teaching material prepared for this research in accordance to constructionist theory can be used by teachers in Social Studies courses and taken as example.
2. Teachers can be provided with occupational training on preparing material in accordance to constructionist theory.
3. Other Social Studies units can be prepared as activity booklets according to constructionist learning principles.
4. The following research can be carried out on teaching material prepared according to constructionist learning principles:
    - Effects of material prepared according to constructionist learning principles on students attitudes towards course, achievement and retention can be examined for other course subjects.
    - Effectiveness of material prepared according to constructionist learning principles on development of students' critical thinking, creative thinking and problem solving skills can be researched.
    - Research on effectiveness of teaching material prepared according to constructionist learning principles on developing students' attitudes towards cooperation and team work can be patterned.

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THE EFFECT OF SIMULATION-GAMES ENVIRONMENT ON STUDENTS ACHIEVEMENT IN AND ATTITUDES TO MATHEMATICS IN SECONDARY SCHOOLS

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ABSTRACT
This study sought to determine the effect of simulation-games environment on students' achievement in attitudes to mathematics in secondary school. Data was collected from a sample of 147 students in senior secondary school in Osun-State, Nigeria. t-test and analysis of variance was used to analyze the data collected for the study. The finding reveals that students' poor academic achievement in mathematics is partly due to the method of teaching used. Also, the findings revealed that, the use of simulation-games environment led to improve achievement and positive attitude towards mathematics. The study conclude that teachers' use of stimulating teaching methods would go a long way in sustaining and motivating students interest in learning mathematics.
Keywords: Simulation-games environment, mathematics achievement, attitude to mathematics.
Key words: Simulation-games environment; achievement; attitudes; mathematics

INTRODUCTION

Research in mathematics education shows the difficulties students have in acquisition of mathematical concepts. Various studies (Akinsola, 1994, 1997), Popoola, 2002) have shown that an instructional strategy is crucial to the understanding of mathematical concepts. Effective instruction requires the teacher to step outside the realm of personal experience unto the world of the learners (Brown, 1997). It is the learners who must be engage for learning to occur, the learner is the one who must make the commitment to learn. Newman et al (1995) pointed out that for learning to be meaningful (authentic) it must be individually constructed. Learning takes place as student process, interpret and negotiate the meaning of new information. To Brown (1997), this is heavily influence by the prior knowledge, values, expectations, reward and sanctions that shape the learning environment.

What then can we use to shape the learning environment? How do we teach mathematics in a way that student can use it, apply it, in general, work with it? Which is appropriate didactic approach that will permit students to broaden their conceptions and become aware that mathematics is a dynamic instrument in solving real life problems? The questions above could not be answered without students engaging in authentic learning. Authentic learning requires the learner to communicate an in- depth understanding of a problem or issues rather than memorize sets of isolated facts and it must result in achievements that have relevance beyond school (Brown, Bettina and Lankard, 1997). Therefore, for authentic learning to take place in mathematics, method or style of teaching needs to be innovative. Adewuyi (2001) noted that the style of teaching employed by teacher is a potent factor in motivating learners to learn. According to him mathematics is a subject, which is very easy to make difficult and very difficult to make easy. The perennial methods of teaching mathematics through listening, looking and learning have not been successful. If anything, it has resulted in making students dislike mathematics (Akinsola, 2002). Coudron (1997) as stated in Akinsola, (2002) offers the following suggestions to teacher for targeting instructions to individuals.

- Focus on outcomes rather than technique.
- Make learning experiential
- Give students control over their own learning

- Respect learners ability to engage in parallel thinking
- Highlight key point
- Motivate learner
- Provide challenges

The suggestions above might not be possible using a single instructional strategy or style. So a combination of strategies might be required. Providing motivational environment, challenging and making learning experiential, demand active participation by students.

Simulation – game instructional strategy might be an antidote. Randel, Morris, Wetzel and Whitehill (1992) are of the opinion that since many students enjoys playing games; it is worthwhile to investigate whether this play aspect could be combined with instruction to enhance learning. It is further stressed that the observation had led educators to explore the feasibility of using a game format to supplement or even replace the teaching of a variety of subjects.

Considering the way many students learn mathematics, it is absolutely nothing to write home about. That is why Adeniran (1993) observes that teachers struggle to teach mathematics against the nature of children; hence the children end up learning to hate mathematics. He stressed further that the traditional learning method of memorization has done much harm to the learning of mathematics.

If a child is asked of what he learnt after one month he may not be able to recall the information. Students may be confused even when real object are made use of to solve mathematics problems not to talk of when only symbols are use to do this. It is hoped that when illustration with physical object coupled with dramatization is made use of in teaching different concepts in mathematics students' understanding might improve.

Thus according to Mills, Middleton and Moran (1974) experimentation with a realistic simulation gives the student insight that is very difficult to conceptualized by conventional teaching method.

Historically, the word game has been used to connote a pastime of trivial, if fun, endeavour. It is this connotation that today seems to cause some educators to flinch when they hear the word game and imagine frivolous time wasted play that serves only to entertain and certainly not educate to significant degree.

The use of games and simulation in education is well documented in history and recent literature. They have been used in preschool, K-12, the university, military, business, and by older adults. (Dempsey, Lucassen, Haynes, & Casey, 1997).
But what exactly, do we mean when we say simulation and gaming? First, though computers have certainly allowed the evolution of simulation gaming, a quantum leap forward, they are by no means the only type of simulation gaming done today (Seay, 1997)

Cruickshank (1980), is of the opinion that simulation are the products that result when one creates the appearance or effect of something else and considered games as contests in which both players and opponents operate under rules to gain a specified objective.

He further distinguishes between types of games types of games-academic and non-academic games. To him non – academic games such as table tennis or checkers are primarily for fun while academic games, such as anagrams or war games are primarily for or based upon learning. Cruickshank further distinguished between two types of academic games. These are simulation games and non-simulation games. Non- simulation games are those in which a player solves problems in a school subject such as spelling or mathematics by making use of principles of that subject or discipline. The other type of academic game is the simulation game in which participants are provided with a simulated environment in which to play.

So a game is a form of enjoyable play or sport which is bound by rules to achieve specified goals that depend on skill and often involve chance while simulation is a role- playing, which involve people adopting roles in a mock - up of a situation.

Generally, simulation employs selected aspects of a real – life situation. The usefulness of simulation and games in teaching cannot be undermined. Mere teaching the students topics in the class may not be enough to achieve the desire mastery of the subject matter. As Adelakun (1997) says, innovation like games played in the class and outside the classroom could improve the mastery of a topic. She says that teachers should not limit themselves to

the traditional method of teaching the students alone but they should accompany their teaching methods with innovative system such as playing of games during instructional delivery.

The fundamental problem in mathematics is how to persuade students to think mathematically outside the narrow classroom context. It is only when mathematical concepts are presented in a way to link it with everyday life activities that the benefit of mathematical knowledge be directly felt in improving understanding of scientific activities. This also suggests that the common student's complaint of the lack of utility and relevance of the mathematics taught to them stems partly from the students own mental block against using mathematical modes of thinking outside mathematics classes and their consequent failure to benefit from the mathematics taught.

Wensi – Puryear (1975) in Randel, Morris, Wetzel and White Hill (1992) pointed out that games significantly improved learning in a computerized drill and practice mathematics lesson for third to sixth graders over those who did not have the game opportunity, even though the game - playing students did fewer exercises because teachers who used the game to teach did not cover enough ground as teachers who did otherwise.

Aremu (1999) in her study observed that the use of games could be effective for the improvement of female pupil's achievement in mathematics. In conformity with the usefulness of games Plos and Sneider (1994) declare that for over a century, games have been used to teach mathematics and science. They further stress that games provide a unique opportunity for integrating the cognitive, affective and social aspects of learning. Consequently, they have been recommended for inclusion in the curriculum (Old Field, 1991). It is being said here that games appeal to almost all the senses.

The major purpose of the use for simulation as demonstrated by Morris (1974) in teaching is to test the behavior of simple theoretical models, which would otherwise involve tedious calculation, or high level of mathematical expertise. Simulation is shown to be useful not only because of it ability to provide believable numerical answers but also perhaps more importantly because successful simulation require a full understanding of the problem to be solved (Reinhardt and Loftsgadem, 1979). Problems are often unique or inaccessible to students. For such cases, students may be able to use interactive simulation as a supplement to or even a substitute for experiment.

Using games to teach may makes learning remain permanent. Supporting this view, Rendel, Morris, Wetzel, &Whitehill (1992) claim that the positive results obtained for retention over time favors the use of simulation / games. The war of the opinion that since games requires the active participation of students, the material has a greater chance of being integrated into the cognitive structures of the individuals and thus being retained.

According to some studies, games improve learning because practice with games instruction produced better test performance for the games group than the control group (Aremu, 1998, Adelakun, (1997). "D" Augustine, and Charks (1973), highlight some characteristics of games and simulation as follows.

(1) They promote high interest
(2) They may be more time consuming than other method; they may result in greater depth of understanding of a concept or better mastery of a skill.
(3) They are high noise level activities one could see that the interests of the students are likely to be aroused using simulation games to teach though it may consumes time but knowledge is likely to be imparted at a higher rate and retention longer than when traditional / conventional methods are used.

SIGNIFICANCE OF THE STUDY

By emphasizing the use of simulation - games to teach mathematics, it is hoped that the study will lead to the improvement of mathematics teaching and learning in our secondary schools. The general poor performance of students in mathematics and their attitudes towards some aspects of the subject are expected to be better.

With this study, the researcher aims at exposing the teachers and students to the importance of using simulation – games to improve the teaching and learning of mathematics.

HYPOTHESIS

(1) There will be no significant differences in mathematics achievement of students exposed to the simulation game environment and the control group.
(2) There will be no significant difference in the attitude of the students to mathematics between students exposed to the simulation – game environment and control group.

METHODOLOGY

SAMPLE: All the 147 available S.S. 11 students in two of the four secondary schools within Ila – Orangun township of the Local Government Area of Osun State were used for the study. They were all exposed to 3 consecutive weeks of teaching by one of the investigators with the assistance of the subject teacher in the respective schools. A 40 minutes duration representing a period was used per day for the consecutive weeks of teaching. To ascertain the student's level of achievement, a pretest was given to the student on the topics under focus. A pretest on attitude towards mathematics previously validated by one of the investigators was used.

The result of the co-efficient of reliability was 0.87 for the achievement test using test-retest reliability method. The pre-test on achievement in mathematics was subjected to analysis of variance and no significant difference was found between the control and experimental groups. This implies that the groups are equivalent in their entry behavior. The attitude instrument gave a reliability of 0.91 using Cronbach alpha.

METHODS OF INSTRUCTION/ ADMINISTRATION OF THE INSTRUMENT

The two groups were provided with similar text material on the topics treated during the investigation. In group one, after the teacher have introduced and discuss the lesson for between 10 to 15 minutes ,students then converged in their respective groups of 4 to 5 students and make use of the programmed materials supplied by the teacher. In this group there was no order as to who lead the discussion on the programmed text. It was a lazier-faire kind of group. They discussed the material as they deemed fit. After twenty minutes the groups were then dissolved and class exercise were given to be done individually. This was collected by the teacher for the periods of the research and used for analysis. Similarly, in group two (experimental group), after the teacher have discussed as in group one; the students converged into their respective groups of 4 to 5 students in a group. Here who lead the discussion is determined by the results of thrown tow die. Who ever has the highest score on the two die start the discussion. The remaining 3 or 4 students will now contest for the next discussant, until it comes to the turn of the last person in the group. After all the students have had the chance of leading, the process is repeated. Class test is then administered just like the case of group one. The exercise is collected and graded for analysis.

A school was used for the experimental group while the other one was used for the control group. Two arms in each school were used. One of the investigators thought the students personally for three weeks in each of the schools. Simulation – games was used to teach the student that constituted the experimental group while the other group constituted the control group.

The pre-test was done for both achievement and attitude the same day in each of the school with each of the investigators supervised the student with the assistance of the subject teacher(s) in each of the school. The posttest was also done the same way at the end of the experiment.

RESULTS

Analysis of variance was used since the pre-achievement and pre-attitude scores were not significant. The result in table 1 shows no significant difference between the experimental and the control groups.

TABLE 1

Analysis Of Variance For The Pre-Test Achievement Scores Between Experimental And Control Group.

SOURCE OF VARIATION	DF	SUM OF SQUARE	MEAN SQUARE	F – RATIO	**F- TABLE**
Between groups	1	8. 153105	8.153105	0.58	3.84
Within Groups	145	2021.724405	13.94292693		
TOTAL	146	2029.87751			

It may be concluded at this stage that the subjects has equivalent entry behavior in the experimental and the control groups since the table reveals no significant difference between the groups.

TABLE 2

Analysis Of Variance For The Class – Tests Achievement Scores Between Experimental And Control Group.

SOURCE OF VARIATION	DF	SUM OF SQUARE	MEAN SQUARE	F – RATIO	F – TABLE
Between Groups	1	47.4384382	4743.84382	232.63	3.84
Within Groups	145	2956.986112	20.39200767		
TOTAL	146	7700.829932			

Table 2 shows that the there was a significant difference on student's achievement in mathematics on class tests within the period of the research. Thus, hypothesis 1 is rejected. The reason for this may be due to the fact that the student in the experimental group has been exposed to the use of simulation game instead of the conventional teaching method has been used.

The mean score of the experimental group is 18.80 while that of the control group is 15.61 on the cumulative class tests.

TABLE 3
T-Test On Post Achievement Scores Between The Two Groups.

Group	N	X	SD	t- Cal.	t-critical
Simulation game	72	17.90	5.46	2.31*	1.96
Control	74	15.41	3.89		

*P<.005, df=145

The result in table 3 above also confirms that significant difference on post test achievement scores between the two groups , showing that the students in the simulation game environment perform better than there counterpart in the control group.

TABLE 4
Analysis Of Variance For The Pre – Test Attitude Scores Between Experimental And Control Group.

SOURCE OF VARIATION	DF	SUM OF SCORES	MEAN SQUARE	F – RATIO	F – TABLE
Between Groups	1	32.5075	32.5075	0.9585372	3.92
Within Groups	145	4917.48	33.913655		3.92
TOTAL	146	4949.9875			

The above table4 shows the analysis of variance of pre- attitude scores between the experimental and control groups. The result shows that the students' attitudes before the commencement of the treatment are not significant difference.

TABLE 5
Analysis Of Variance For The Post Test Attitude Scores Between Experimental And Control Group.

Source of variation	Df	Summary of Scores	Mean square	F ratio	F Table
Between Groups	1	276.6125	276.6125	7.9836208	3.92
Within Groups	145	5023.8875	34.6475		
TOTAL	146	5300.5			

Table 5 shows the analysis of variance of post attitude scores and it indicates that there is significant difference in the attitude of students towards mathematics at the end of the treatment. The hypothesis 2 is rejected. On examination of the mean post attitude scores, it was discovered that the group with simulation game environment was 28.61 and the other group mean was 21.98. This implies that the simulation game group has a better attitude development.

DISCUSSION

The major findings in the research work have shown that simulation game environment is an important method of teaching which affects students' achievement in and attitude towards mathematics.

In the case of hypothesis 1, there was no significant difference in achievement between the students in the control and in the experimental groups at the initial stage, that is, at the pre test level. But at the posttest level, there was a significant difference in achievement between the students in the control and in the experimental groups.

Simulation games environment were used to teach the students in the experimental group, while conventional method was for the control group. This result is in consonance with the finding of Randel, Morris, Wetzel and Whitehill (1992); Pulos and Sneider (1994).

It could be keenly observed that generally in hypothesis 2 that there is also significant difference in the attitude of students between the experimental and the control groups at the posttest level. The result of this work as shown that the teacher's role is not simply that of a facilitators whose task is to provide a suitable environment in

which students are presented with new opportunities for learning, but his task includes encouraging students ' motivation so that their academic performance could be improved.

The outcome of this research also indicates that students' attitude is positively affected by the use of simulation – game environment. The fact that the significant difference exists between the experimental and control groups in relation to their academic achievement encourage desirable changes in attitude of individuals and behavior towards mathematics.

The data collected in this research confirm that student' poor academic achievements are partly due to the method of teaching used in teaching them. Most of the teachers teaching in schools were not even ready to diversify their teaching methods and this will not help teaching / learning situations.

In the light of the finding from the data that the students have difficulties in learning mathematics and that only the traditional method of teaching is in vogue in schools, this study contends that the situation needs to be changed. Mathematics teachers in the secondary schools should channel students' towards positive attainable goals in learning mathematics by reducing their difficulties and making the teaching and learning of mathematics practical and meaningful through the use of simulation – game and other activities based strategies. Through simulation game generally requires extra time to develop concepts, students' getting a depth of understanding in the subjects and consequently developing a strong liking for it. Changing students' attitude from negative to positive through instructional methods is a must for teachers of mathematics. Teachers need to engage student in creating their own learning environment. By transferring classroom rules and management to students for their directions, teacher becomes facilitators of the learning, enabling students to determine the strategies that will motivate them to learn. Also, teachers should engage students in role playing and cooperative experiences. Knowing how to work cooperatively with one another, to build on the knowledge and experiences of diverge nature of the classroom, bringing different perspective to the thinking and reasoning process in the mathematics classroom, can help students to expand their thinking and explore new approaches to learning mathematics(Brown,1997).

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THE NECESSITY AND APPLICABILITY LEVELS OF THE COURSES THAT ARE OFFERED IN THE DEPARTMENTS OF COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGIES (CEIT)

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ABSTRACT
The main purpose of this study is to identify the levels of the necessity and applicability of the courses offered in the Departments of Computer Education and Instructional Technologies based on the views of the fourt grade and graduated students. In the study descriptive research model was used. The population of the study were final-year and graduated students in the departments of computer education and instructional technologies, which were established within the faculties of education. The sample were randomly selected from fourth grade and graduate students. As an assessment tool, a questionnaire was used in data collection. In analyzing data, arithmetic mean and standard deviation were calculated and t test was used to test if there was a significant difference among variables. According to the results of the study, pedagogical formation courses, informatics and informatics education application courses were found as the most necessary courses for the branch. The least necessary courses were science and mathematics courses.

INTRODUCTION

Education and technology play important roles in the development of human beings. Both education and technology mainly aims at contributing effectively to human development. Educational technology, in a broad sense, all design processes and methods that aim at supporting and facilitating teaching and learning and motivating the students and concerning the development and implementation of programs designed based on certain teaching and learning systems (Alkan,1984). Gagne uses systematic approach to explain educational technology. According to Gagne, educational technology is the summmation of techniques that aim at effective learning and employs media in the teaching and learning environments. In Gagne's model, knowledge is organized systematically in teaching and learning contexts (İşman, 2003).

Following the developments in science and technology and utilizing them is the precondition to become a civilized society and this affects the whole society (Uluğ, 1999). Education cannot afford to lag behind developments in science and technology. The developments make it imperative that technology be used in schools. As a result of these considerations, by the Board of Education and Discipline's (BED) Resolution 180 on 26.08.1998, Elective Courses Teaching Programs was developed, and computer classes became part of the Elementary Education curriculum as an elective course at fourth and above grade levels (Vural, 2002). This new development required expert teachers to teach these courses. To fulfill this requirement and to employ teachers at secondary schools Faculty of Educations were reorganized and Computer Teaching and Instructional Technologies Departments were founded in 1997.

Teacher training is a braod and multi-dimensional issue. The selection of teacher candidates, pre-service education, teacher practice and observation and evaluation of teacher practice, in-service courses are all inculuded within the teacher training. Teachers are the most important elements in the educational system because successful and quality education is carried out by quality teachers (Kavcar, 2003).

In Turkey, from the very beginning, teacher training has always been considered to involve three aspects. Varış (1996) explains these three aspects as pedagogical knowledge, subject area knowledge, and general knowledge. Teacher candidates should take pedagogy classes, have a common general knowledge and equipped with strong subject area knowledge.

XI. National Education Council adopted parallel design method in determining the content of teacher training programs. According to this model, all pedagogy, subject area, and general knowledge courses are taught at all class levels in a parallel manner. As the classes progress, subject area courses are maintained but general knowledge courses are diminished and the number of pedagogy classes increase. In this model, the weights of the each content category is emphasized along with the content itself. According to the views adopted at XI. National Education Council, subject area courses should comprise 62,5%, pedagogy courses 25%, and general knowledge courses 12,5% of the teacher trainning programs. When we examine the content categories of

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Computer Education and Instructional Technologies Teacher Training Programs in terms of credit/class hour weight, pedagogy courses make up 25%, general knowledge courses, when we consider elective courses under this category, 23%, and subject area courses, when we consider science and math classes under this category, 52% of the curriculum. When science and math courses are not considered under subject area category the ratio of these clases is 32% which is below the recommended ratio. Therefore, it might be a meaningfull to evaluate Computer Education and Instructional Technologies Teacher Training Programs based on classes.

One of the main conditions to increase the quality of the educational institutions and to train individuals who can adapt to changes is the quality of the educational programs. Educational programs determine human profile in a country. By evaluating an institution's educational programs, it is posible to make predictions about a country's educational output (Gözütok, 2003). Developing the programs, in other words, detecting and removing inconsistencies and correcting the mistakes not only increase the quality of the programs but also the quality of the education. Making decisions that will make the programs more effective is possible by investigating the basis underlying these decisions scientifically and by evaluating the implementations (Erden, 1995). By evaluating the programs, the effectiveness of the programs are revealed and the extent to which the objectives are realized is determined.

Evaluation has four main purposes. These are assessment of merit and worth, oversight and compliance, programme and organizational improvement, and knowledge development (Fitzpatrick et. al, 2004). Evaluations may serve different purposes depending on the purpose, views, and perceptions of the evaluators (Kelly, 1989). Program evaluation is the last cycle of the program development studies and a process in determining the realization degree of educational purposes.

Program evaluation criteria and the method of program evaluation vary depending on the kind of evaluation, the approach used, and the model of program evaluation. In the process of education evaluation is generally done for two purposes (Erden, 1995). The first is the evaluation of learner success and taking the necessary precautions. The second is to make judgement concerning the effectiveness of the education programs and identify the source of the inconsistencies and fix them. Evaluation that is done for both purposes can be both norm-referenced and objective-referenced (Ertürk, 1993).

Norm-referenced evaluation: This kind of evaluation can be used to compare and select individuals; however, in terms of program development it is not sufficient (Demirel, 2004).

Objective-referenced evaluation: Objective Referenced evaluation is generally done at the beginning, during, and at the end of the program. It is divided into three groups.

1. Evaluation at the beginning of the program: Diagnostic evaluation.
2. Evaluation during the program: Formative evaluation
3. Evaluation at the end of the program: Summative evaluation (Ertürk, 1993; Yaşar,1998; Gözütok, 2003; Demirel, 2004).

The Process of Program Evaluation: The beginning of program evaluation process starts with making a good plan. While preparing an evaluation plan, the purpose of the evaluation, the purpose to which the evaluation questions will serve, the model or models to be adopted in the evaluation, the methods to be used, the data collection tools and possible assessment problems to be encountered should be taken into consideration. Different approaches adopted in program evaluation have led to the emergence of different program evaluation models. The main different evaluation models are as follows:

Objectives-Oriented Program Evaluation (Behavioral Objective) Model: Pioneered by Tyler, this model is based on assessing behavior changes in learners as a result of the objectives determined at the beginning of the program. According to Erden (1995) objective-oriented evaluation is appropriate for experimental research methods.

Decision Making Model: (Stufflebeam's Context, Input, Process and Product Evaluation Model) According to this model, the purpose of evaluation is to inform decision makers about the inputs, processes, and outputs of the program under evaluation (Fitzpatrick et. al, 2004).

Goal Free Decision Making Model: In this model, developed by Scriven, the adequacy of the educational objectives to meet the needs is determined.

Proficiency Model: In this model a commission comprising the staff, administrators, professionals, citizens, parents and students identify the standards to evaluate the program (Gözütok, 2003).

Provus's Discrepancy Evaluation Model: The model, based on system management theory, divides evaluation into five phases and four components. The four components are identifying the program standards, identifying the performance of the program, comparing the performance to the standards, and determining if there is a difference between the performance and the standards. Information regarding the differences is constantly made available to the program evaluators.

Stake's Countenance Framework: Developed by Stake, in this model, which is also called "Responsive Evaluation Model", attempts to decribe the thing being evaluated and render judgment about the thing's value or worth.

Expert Opinion Model: Developed by Eisner in 1975, this model emphasizes qualitative evaluation. Expert opinion model is comprised of three phases of description, interpretation, and evaluation.

Saylor, Alexander, and Lewis Model: This model emphasizes five components of evaluation. These are goals, subgoals and objectives, program of education as a totality, specific segments of the education program, and instruction and evaluation programs(Oliva, 1988).

Each of the models discussed above have different characteristics and adopts different approaches. By the help of program evaluation models, the programs can be evaluated effectively and their shortcomings and weaknesses can be overcome. In order to achieve this it is important that the characteristics of the models be recognized and the appropriate model be chosen. Research about the evaluation of the educational programs is common in literature. This research, however, mostly focuses on primary and secondary education programs and evaluates learning and teaching processes (Turan, 2004; Güler, 2004; Baykul ve Tertemiz, 2004, Yaşar ve Selvi, 1997, Yaşar, 1998). According to Yaşar (1998), research on higher education program evaluation is mostly in the form of single course evaluations in pre- and post-test format. Recently Başboğaoğlu (2004), Aksu (2004) and Şahinkayası (2004) conducted evaluation research on the basis of courses. Since Computer Education and Instructional Technologies Department was founded after the restructuring in 1997, the number of studies evaluating the programs in these departments is rather limited. This study aims to fill this gap by evaluating these programs based on the views of fourth-year students and students who graduated from the department.

PROBLEM

The research question for the study is "What are the views of the teachers and students regarding the level of necessity of the courses for the major and the applicability level of the knowledge learned in these courses for profession? More specifically, the following questions were addressed in the study:

1. What are the teachers and students' views on the necessity level of the courses in the Computer Education and Instructional Technologies Department?
2. What are the teachers and students' views on the applicability level of knowledge learned in courses in the Computer Education and Instructional Technologies Department?
3. Is there a significant difference between the necessity level and the applicability level of knowledge learned in these courses in the Computer Education and Instructional Technologies Department?

METHOD

This study is a descriptive research. The population of the study is faculty of educations which have CEIT Departments in Turkey. The sample of the study are fourth-year students in the Computer Education and Instructional Technologies Departments and former students of these departments who graduated and working as teachers in Turkey. The sample was randomly selected for the study.

Measurement Tool

For data collection a questionnaire was prepared. The questionnaire included the courses offered in the Computer Education and Instructional Technologies Department, and to elicit the necessity level of the courses for major a continuum with four intervals ranging from "very essential" to "not essential at all" was devised. Also, a second continuum with four intervals, regarding the applicabilityof the learned information in the courses was developed.

Data Collection and Analysis

The scales prepared were applicibility to elicit student responses by the researchers at the faculty of educations at five different departments. The graduated students who were teaching were reached via e-mail and they replied back through e-mails as well. The data obtained were analyzed by statistics program package. For analysis, mean scores and standard deviations were computed, and meaningul differences between variables were tested by t-test.

RESULTS

Current and graduated students' views on the necessity of the courses for the major and the applicibility of the knowledge learned in the courses in the departments of Computer Education and Instructioanl Technologies (CEIT) were elicited and the means for each course were calculated. The courses were grouped into six categories and their total scores were computed. These findings were presented in Table 1. and interpreted.

The Necessity Level of the Courses for the Major

For each course, the mean scores of the students' views on the necessity of the courses were obtained. Based on the scores, the location of each course within the groups, the importance levels within the groups, the location of the each course across all courses, and based on the scores of all the courses, the importance level of the each course was determined.

Course Name	Necessity level for the major					Applicability level of knowledge							
	N	X	Sd	level within the group	Rank of in all courses	N	X	Sd	level within the group	Rank of in all courses	X Difference	t	Ser. Der. P
Classroom Management	130	3,65	0,75	1	3	130	3,09	0,93	4	7	0,55	8,56	129,000
Scholl Experience II	129	3,63	0,87	2	4	129	3,22	1,06	2	2	0,4	5,83	128,000
Introduction to Teaching Profession	130	3,59	0,61	3	5	129	2,98	0,83	7	14	0,61	8,99	128,000
Development and Learning	130	3,55	0,76	4	10	130	3,15	0,91	3	4	0,4	6,62	129,000
Scholl Experience I	130	3,51	0,84	5	13	129	3,01	0,99	6	11	0,5	6,74	128,000
Instructional Pln. and Evl.	130	3,47	0,83	6	15	130	2,98	0,95	8	15	0,49	7,59	129,000
Teaching Practise	127	3,47	1,14	7	16	127	3,23	1,2	1	1	0,24	4,01	126,000
Instruc. Tech. and Mater. Development	130	3,42	0,82	8	17	130	3,05	0,9	5	10	0,37	5,4	129,000
Computer Edu. Teaching Methods I	130	3,21	0,87	9	22	130	2,81	0,97	9	19	0,4	6,32	129,000
Guidance	128	3,17	1,16	10	25	127	2,76	1,22	10	23	0,43	5,97	126,000
Computer Edu. Teaching Methods II	129	3,08	1,12	11	26	129	2,74	1,13	11	25	0,33	5,33	128,000
Pedagogical Knowledge	**127**	**3,44**	**,49**			**126**	**3,00**	**,63**			**,44**	**9,86**	**125,000**
Computer Networks and Communic.	129	3,71	0,65	1	1	129	3,11	1,02	3	6	0,6	7,28	128,000
App. of Auth. Language in Internet Env.	128	3,66	0,66	2	2	128	3,16	0,99	1	3	0,49	6,69	127,000
Programming Languages II	129	3,58	0,69	3	6	128	2,78	1,07	11	20	0,8	8,56	127,000
Information Techno. in Education II	129	3,57	0,73	4	7	129	3,05	0,97	5	9	0,52	6,3	128,000
Programming Languages I	129	3,56	0,75	5	8	129	2,78	1,11	10	21	0,78	8,83	128,000
App. of Auth. Languages in PC Env.	129	3,56	0,76	6	9	129	3,00	1,01	6	12	0,56	7,33	128,000
Use of Operating Systems	129	3,54	0,82	7	11	129	2,98	1,05	7	13	0,56	2,75	128,000
Information Technologies in Education I	129	3,54	0,77	8	12	129	3,07	0,95	4	8	0,47	6,2	128,000
Internet Applications in Education	129	3,48	0,99	9	14	129	3,13	1,1	2	5	0,35	5,1	128,000
Material Usage in Education	129	3,31	0,75	10	18	129	2,96	0,9	8	16	0,35	5,38	128,000
Foundation of Computer Aided Inst.	129	3,24	0,94	11	21	129	2,74	1	12	24	0,5	6,4	128,007

Instructional Design	129	3,21	1,05	12	23	129	2,78	1,15	9	22	0,43	5,6	128,000
Design, Development and Evaluation of Educational Software	129	3,21	1,18	13	24	128	2,71	1,22	13	26	0,49	6,28	127,000
Foundations of Distance Education	129	2,96	1,03	14	27	129	2,50	1,1	14	29	0,47	6,37	128,000
Information systems and Information systems application	**128**	**3,44**	**,53**			**126**	**2,99**	**,70**			**,44**	**9,86**	**125,000**
Calculus I	129	2,43	1,09	1	35	129	2,18	1,09	1	35	,25	3,44	128,001
Calculus II	129	2,30	1,00	2	37	129	2,05	1,00	2	37	,26	3,62	128,000
Physics I	129	1,99	,97	3	39	129	1,78	,91	3	39	,22	3,95	128,000
Physics II	129	1,93	,93	4	40	129	1,72	,86	4	40	,21	3,99	128,000
General Biyology	129	1,88	,92	5	41	129	1,67	,86	6	42	,21	3,49	128,001
General Chemistry I	129	1,85	,87	6	42	129	1,69	,85	5	41	,16	3,17	128,002
General Chemistry II	128	1,83	,87	7	43	128	1,65	,82	7	43	,18	3,35	127,001
Science and Mathematics	128	2,03	,82			128	1,82	,78			,21	4,23	127,000
Foreign Languages II	129	3,27	0,92	1	19	129	2,87	1,04	1	17	0,4	5,55	128,000
Foreign Languages I	128	3,26	0,96	2	20	128	2,85	1,02	2	18	0,41	6,24	127,000
Turkish II (Oral Expression)	129	2,85	0,99	3	28	129	2,66	1,09	3	27	0,19	3,38	128,001
Turkish I (Written Expression)	129	2,71	0,99	4	30	129	2,51	1,07	4	28	0,2	3,38	128,001
The Principles of Ataturk and The History of Turkish Revolution I	128	2,59	1,1	5	32	129	2,29	1,13	5	33	0,29	5,2	127,000
The Principles of Ataturk and The History of Turkish Revolution II	129	2,6	1,11	6	31	129	2,26	1,11	6	34	0,34	5,81	128,000
General knowledge	**127**	**2,88**	**,68**			**128**	**2,58**	**,73**			**,30**	**6,80**	**126,000**
Elective I	127	2,75	1,30	1	29	127	2,43	1,30	1	30	,32	5,37	126,000
Elective II	127	2,59	1,39	2	33	127	2,38	1,36	3	32	,21	4,00	126,000
Elective III	127	2,47	1,44	3	34	127	2,25	1,43	2	31	,22	4,12	126,000
Elective IV	127	2,35	1,55	4	36	127	2,16	1,50	4	36	,20	3,67	126,000
Elective V	125	2,25	1,57	5	38	125	2,04	1,51	5	38	,21	3,88	124,000
Elective Courses	**125**	**2,48**	**1,33**			**125**	**2,28**	**1,34**			**,20**	**3,65**	**124,000**

Table 1. The views of the students concerning the necessity of the courses for the major and the applicability of the knowledge learned in the courses for profession and t values for the differences between necessity and applicability scores.

As Table 1. shows, the pedagogy courses, and information systems and information systems application courses are viewed as the most essential courses for the major. The mean score for information systems and information systems application courses is 3.44. This score indicates that this group of courses are viewed as highly essential. Similiarly, pedagogy courses have a mean score of 3.44, which also shows that students view pedagogy courses as highly essential. With 2.88 mean score, general knowledge courses rate third in the essentiality list. It can be said that general knowledge courses are rated as essential at medium level. Elective courses, on the other hand, are viewed as moderately essential with a mean score of 2.48. The group of courses that scored the lowest in terms of essentiality is science and math group courses. The mean score for science and math courses is 2.03 which can be interpreted as low in terms of their necessity as viewed by students.

With regard to the essentiality of each course two rankings were devised. One shows the importance level of each class within the goup, and the other shows the ranking of the courses across all courses. In terms of necessity, within the group of pedagogy courses, classroom management ($x = 3.65$) has the highest score. Classroom mangement also ranks fourth among all courses. Courses with mean scores higher than 3.50 and viewed as essential for the major are as follows: School Experience II ($x = 3.63$), Introduction to Teaching Profession ($x = 3.59$), Development and Learning ($x = 3.55$), School Experience I ($x = 3.51$), Instructional Planning and Evaluation– Teaching Practice ($x = 3.47$), Instructional Technologies and Material Development ($x = 3.42$). The lowest mean score within the group is for Special Teaching Methods II ($x = 3.08$). In this group, the courses viewed as the least essential for the major are Computer Education Teaching Methods II ($x = 3.08$) and

Guidance courses. However, these two courses still have mean scores higher than 3.00. It can be said that these two courses are evaluated as essential at medium level.

Within information systems and information systems application education group most courses are viewed as highly essential. Computer Networks and Communications (x = 3.71), Applications of Authoring Languages in Internet Environment (x = 3.66) are the two courses with the highest score in terms of essentiality for the major. Within this group, the courses with the lowest score are Foundations Of Distance Education (x = 2.96), Design, Development & Evaluation of Educational Software (x = 3.21), and Instructional Design (x =3.21). Although these courses did not score high on the list, their mean scores show that their essentiality mean score is in the middle. Foundations of Distance Education course, however, with a mean score of 2.96, can be said to rate low on the essentiality.

Science and Mathematics courses group, on the other hand, has the lowest mean scores with Calculus I (x = 2.43) ve Calculus II (x = 2.30) with the highest means. The courses with the lowest means within this group are General Chemistry I (x = 1.85), General Chemistry II (x = 1.83) ve General Biology (x = 1.88), and it should be noted that these courses were thought to be not essential for the major. These three courses ranked also the lowest across all courses.

The Applicability of the Knowledge Learned in the Courses for the Profession

As can be seen in Table 1. pedagogy courses along with information systems and information systems application education rank the highest in terms of the applicability of the knowledge learned in these courses for the profession. Pedagogy courses have a mean score of 3.00, and their applicability can be considered to be moderate whereas information systems and information systems application education courses with a mean score of 2.99 are slightly below moderate applicability. The applicability of the general knowledge group courses is low with a mean score of 2.58. Elective courses, on the other hand, have a mean score of 2.28 and the applicability of these courses is rather low. Finally, science and math group courses with a mean score of 1.82 have the least applicability.

In terms of their applicability, the courses were ranked in two categories. The first ranking concerns how each course rates within the groups and the second ranking concerns the ranking of each course across all courses. Within Pedagogy courses, which have the highest applicability value as a group, Teaching Practice course ranks the highest with a mean score of (x = 3.23). This course also ranks the highest acroos all courses. Teaching practice is followed by School Experience II (x = 3.22), Development and Learning (x = 3.15) courses. The courses with the lowest pfofession applicability scores within this group are Computer Education Teaching Methods I (x = 2.81), Guidance (x = 2.76), Computer Education Teaching Methods II (x = 2.74). The rest of the courses rank moderately useful.

The group that followed Pedagogy Courses group in terms of its applicability is information systems and information systems application education. Within this group Applications of Authoring Languages in Internet Environment (x = 3.16) was found to be most useful. The rest of the courses within this group ranked as follows: Internet Applications in Education (x = 3.13), Computer Networks and Communication (x = 3.11), Information Technology in Education (x = 3.05). The least useful courses for the job are Foundations Of Distance Education (x = 2.50), Design, Development & Evaluation of Education (x = 2.71), Foundations Of Computer Aided Instruction (x = 2.74). The rest of the courses, except for the three least useful courses, rank somewhere in the middle or near the middle in terms of the utility of the information learned in these courses.

General knowledge group courses ranked third in terms of profession applicability. Of these courses, Foreign Language I (x = 2.85) and II (x = 2.87) were found to be the most useful. Principles of Kemal Atatürk and History of Revolutions I (x = 2.29) and II (x = 2.26) were the least useful for the profession. In terms of Elective Courses, Elective I (x = 2.43) and II (x = 2.38) had higher profession applicability scores than the rest of the elective courses and Elective IV (x = 2.16) and V (x = 2.04) were the least useful.

Science and Mathematics group courses had the lowest profession applicability score. In this group Maths I (x = 2.18) and II (x = 2.05) had the highest profession applicability scores and General Biology (x = 1.67), General Chemistry I (x = 1.69) and II (x = 1.65) had the lowest profession applicability scores. These courses were also found to be the least useful across all courses.

The Evaluation of the Learning Process in Courses

The learning process in courses was evaluated by assessing the difference between the necessity of the course for the major and the applicability of the knowledge learned in these courses for profession. Therefore, the

difference between the mean scores for necessity for the major and the applicability for the profession was found by using t-test. The results showed that the biggest difference between the scores of necessity for the major and the applicability of the knowledge learned in the courses was in information systems and information systems application education. The difference in pedagogy courses was also rather high. In the courses within these two groups that were thought to be highly necessary for the majors the difference was remarkably high. Since these two groups were thought to be the most necessary for the major, it can be assumed that the activities involved in these courses were far from satisfying the expectations. In general, the difference in courses within science and math and elective courses was less because in these courses both profession applicability and necessity for the major levels were relatively low. Therefore, it can be said that the relatively high differences observed are more due to the high necessity scores of these courses than the level of profession applicability of the knowledge learned in these courses.

Significant differences on the basis of courses, on the other hand, can be interpreted as the inadequacy of the learning activities to satisfy learner expectations and the level of necessity of the learned knowledge to be significantly less than applicability for the major. When the courses are examined , the difference is especially remarkable for Introduction to Teaching Profession, Classroom Management, and School Practice I courses. These courses are viewed highly essential for the major; however, there may be certain problems in the teaching and learning process. The courses within the pedagogy group with the least significant difference are Teaching Practice and Computer Education Teaching Methods. In Information Technology and and Information Technology Education Application group, Programming Languages I and II courses also display significant differences indicating that knowledge learned in these courses is far from satisfying the expectations. In these courses too there seems to be problems in terms of teaching and learning processes. Also, it can be seen that in Computer Networking and Communication, Applications of Authoring Languages in PC Environment, and Applications of Authoring Languages in Internet Environment courses there are differences between the expectations and what has been learned in the courses. In this group the difference was relatively low in Internet Applications in Education and Material Use in Education classes.

In science and mathematics, general culture, and elective courses the difference was low and thus the expectations were realized to a certain extent; however, it can be said that this result was more due to the low applicability level of knowledge learned in these courses. The courses in these groups should be re-evaluated more in terms of their necessity for the major than the teaching-learning processes involved in these courses..

RESULTS

1. Pedagogy courses and information systems and information systems application courses are viewed as the most necessary course groups. Science and mathematics courses group is viewed as the least applicable.
2. In pedagogy courses group, in terms of necessity, “Classroom Management” ranks first and “Computer Education Teaching Methods II” ranks the last in the list.
3. Information systems and information systems application courses are viewed as highly essential . In this group “Computer Networking and Communication”,”Applications of Authoring Languages in Internet Environment”are the most necessary courses according to the subjects. These two courses are also considered as the most necessary courses among all courses. In this goup “The Foundations of Distance Education” has the lowest mean.
4. In science and mathematics group courses, Calculus I and II are thought to be the most and General Chemistry I and II and General Biology as the least essential course.
5. Knowledge learned in pedagogy and information systems and information systems application courses were viewed to be the most useful and science and mathematics courses as the least useful.
6. Of pedagogy courses, information learned in “Teaching Practice” was found to be the most useful for the profession and “Computer Education Teaching Methods II” and “Guidance” was considered as the least useful for the profession.
7. In information systems and information systems application courses “Applications of Authoring Languages in Internet Environment” had the highest level of applicability in terms of knowledge learned in these courses whereas “Foundations of Distance Education”, “Design, Development & Evaluation of Educational Software”, and “Fundations of Computer Aided Education” had the lowest necessity scores for the job.
8. Science and mathematics group courses were considered the least applicability for the profession, and of these courses, “Calculus I and II” were the most and “General Biology”, “General Chemistry I and II” were the least useful for the profession.
9. The group of courses with the biggest difference between necessity for the major and applicability for the profession was the information systems and information systems application courses, and there was also

considerable difference between these two variables in pedagogy courses. The explanation for this finding can be that these two groups of courses were viewed as the most necessary for the major and the course activities did not meet the expectations of the learners adequately.

10. In science and math courses the necessity-applicability difference was low as a result of low scores on both necessity and applicability levels. Therefore, the issue with these courses is more about the level of necessity of these courses for the major than what the students learn in these courses.
11. In terms of necessity and profession applicability, in pedagogy courses group, "Introduction to Teaching Profession" and "Classroom Management", in information systems and information systems application courses group, "Programming Languages I and II" courses were found to display the biggest difference. This finding indicates that these courses are considered highly necessary for the profession; however, there are some problems in terms of the teaching-learning activities students are exposed to in these courses.

SUGGESTIONS

1. Science and mathematics courses should be restructured and based on expert view some of these courses should be eliminated and the most necessary ones should be determined.
2. Elective courses should be determined by taking learners' interests, needs, and expectaitions into consideration.
3. For the courses that are considered most necessary for the major yet less applicable for profession, the teaching-learning processes and course content should be re-evaluated and the course activities should be geared more towards developing the competencies of computer teaching skills.
4. In order to restructure Computer Education and Instructional Technology Programmes; school administrators, instructors, learners, academic staff, field experts, and private institutions should be involved in a needs assessment process.

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THE PROFILES OF THE USE OF THE INTERNET FOR STUDY PURPOSES AMONG UNIVERSITY STUDENTS

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ABSTRACT
This study aims at revealing the student profiles in terms of their use of the Internet for general and educational needs in accordance. In this study, the students were given questionnaires to determine their purpose of using the Internet, the location and the times they use it and also related information about the use of Internet. They were also asked open-ended questions. Sampling is based on layered model and students were selected according to the ratio of numbers of their sex, classes and faculties. Statistical analysis was done using frequencies, percentage and K2 techniques and the data was evaluated accordingly. The results show that the students mostly use the Internet to correspond via e-mail, %60 percent log on to the Internet out of the campus, and only less than %50 use it for educational purposes. The findings also varied according to the features of the subjects, (for instance, boys connect to the Internet for study purposes* more than girls). Analysis of the open-ended questions led to a modeling and aimed to form a structure about how it could contribute to the educational process of the students within a term or a full academic year.

Keywords: University, Course, Internet, Studying, Student

INTRODUCTION

The rapid innovations in the field of science and technology have certain effects on economic, educational and social systems. It has become a must that educated individuals be endowed with such skills of accessing, organizing, evaluating information and communicating it (Toprakçı 2005:44). One way to secure this is facilitating the use of the Internet in education. Universities, which are at the top of the educational system, are key institutions where individuals are inculcated so as to become productive brain- and work-force for the society today and tomorrow at large. Their key role places universities at a vital position in the effective use of the Internet. If those individuals who are to shape the future lag behind in the use of the tools for effectively designing and realizing the future, their future designs and efforts of finalizing the future are doomed to be insufficient. The Internet is probably the most important of these tools for university students. It provides students with the facilities and media in which they can communicate, research, access and share information. This technology is unique for students, instructor and administrators who feel the need to have access to increasingly accumulating information, keep track of the world more closely and shape it, and who are the most important agents of the educational process.

A study carried out by State Statistics Institute (TUIK 2005) shows that in Turkey 66.84% of the household members use the Internet for sending and replying messages, 43.58% for playing games, downloading pictures and music, 55.77% for reading online newspapers or magazines or downloading news stories, 30.7% for finding information about education, and 40.39% for chatting. It has been found that the age group among male and female subjects of all age groups with the highest use of the Internet is 16-24 years. In all age groups, these figures are higher among male users than female ones, and the percentage of the Internet users tend to decrease as the age groups get higher. Accordingly, between the ages of 16 and 24, the percentage for the use of computer is 43.79% and 37.41% for the Internet among men; while among women the corresponding figures are 25.02% and 18.82 %.

In terms of the university education, the use of the Internet among university students has two forms and three purposes. As to the forms, one is the use of the Internet during and for distance learning the student is attending, and the other is the use of the Internet as a supplementary tool for education. As to the purposes, the first is communication (determinants: e-mail, chat, etc.); the second, entertainment (determinants: games, betting-gambling, etc.), and the third, learning (determinants: courses, news, etc.). Various combinations of these can be included among the purposes for the use of the Internet. The student's relation to the Internet can be categorized in three headings according to the degree of the student's active role: producing, consuming, and copying the content on the Internet. Again, various combinations may be regarded as kinds of relationship.

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The position of the student's relationship with the Internet in terms of both forms and purposes is, by all means, an outcome of various factors. The factors may be classified as individual, social, educational and situational. What is meant by the individual factors is the student's background before and during university education and the collection of student's cognitive, receptive and behavioral characteristics that condition his background. A typical example for this could be "student's curiosity." If the student's curiosity, one of the perceptive characteristics, is not inclined towards the Internet, his relationship with it will either be nonexistent or less significant than others. Amongst social factors that determine the student's background before and during university education are familial, economic and cultural conditions (Odabaşı 2005). The most typical example is "the student's economic level." If the student cannot afford to visit an Internet café, this will diminish or destroy his relationship with the Internet. The educational factors denote the student's background before and during university education as well as the education, the place where the education is carried out (e.g. the campus), curriculum (the content of the education), academic staff, administration and technological facilities. For instance, the lack of effective technological infrastructure in terms of computer hardware that will enable the student to have access to the Internet will obviously have an adverse effect on his relationship with the Internet. And, finally, situational factors comprise the student's background before and during university education and all the other things that determine this background. Amongst these are international events and interactions between countries (treatises, wars, etc.), natural disasters (earthquakes, floods, etc.), epidemics, terrorist attacks, and other chance occurrences. The kind of disadvantages that an underdeveloped residential region —where no Internet connection is available — when there arises a need to have Internet access can be given as an example.

Several studies have been carried out (Shaver 1999; Calif 2000; Stezo 2000; Wilson and Hord 2000; Bakay 2001; Dybek 2002; O'Hanlon 2002; Sayan 2002; Usun 2002; Ünal 2004; Fischer et al. 2003; Toprakçı 2006) on the relation between the Internet and education. It is worth mentioning a few of them. In his work originally presented as a master's dissertation called "The Correlation between the Use of the Internet among University Students and Their Feelings of Loneliness", Avaroğlu (2002) underlines the effect of the Internet, namely isolating the student from his social milieu. A study by Gölge and Arlı (2002) reveals that students use the Internet mainly to send and receive e-mails, to do search on various topics, and send messages to mobile phones. Gürol and Sevindik's (2001) study comes to the conclusion that the use of the Internet contribute immensely to education, endowing it with a new dimension in learning strategies. Ünal's study (2004) suggests that traditional education practices have lagged behind in learning and teaching, and therefore, need to be reinforced with learning through computers and the Internet. In their article "An Evaluation of the Levels of Use of the Internet among University Students and Their Expectations" Karahan and İzci (2001) point out that Basic Information Technologies courses are far from teaching university students adequate computer and Internet skills. This study also concludes that university students do not have practical skills needed for sending e-mails and designing web pages. Rüzgar (2005), who carried out a survey among 744 students at Marmara University in Istanbul, states that 52% of the students surveyed are found to be spending 6 to 20 hours a week on the Internet, and that the majority of them use the Internet to benefit from e-mail services.

A survey done among students between the ages of 12 to 17 by Dybek (2002) maintains that students make use of the Internet mainly while doing their homework. In a survey on the rate of the use of the Internet among university students for study purposes (Peek 2002), 67% out of 2054 students have been reported to be making use of the Internet. In another survey carried out by Ritter and Lemke (2000) on the degree to which students utilize the various media and facilities on the Internet for study purposes, it has been found that 89% of the students benefit from the Internet. On the other hand, there are surveys and studies on the rate of the use of the Internet among university students for study purposes which focus specifically on different disciplines. (Baker et al. 1999; Lemke and Ritter 2000; Bork 2001; Zaiane, 2001; Cummings et al. 2002; Solem et al. 2003; William et al. 2004).

The above mentioned researches both in Turkey and abroad on the use of the Internet for study purposes among university students are dispersed and (though indirectly related) rather limited in number. The observation that the use of the Internet at universities in Turkey is yet at a premature stage (Çağıltay 2001; Usun 2003) can also attest the fact that there is probably just a handful of research in this field. There are, in addition, studies that reveal the relative scantiness of research abroad in the field mentioned above (Cheung and Huang 2005).

Cumhuriyet University was founded in application of the Act No. 1788 on February 9, 1974. The university, on which this study focuses on, is composed of ten faculties or college, namely, Medicine (MF), Science and Letters (SLF), Engineering (ENF), Economic and Administrative Sciences (EASF), Dentistry (DF), Education (EF), Physical Training and Sports (PTSF), Nursing (NF), Theology (TF) and Fine Arts (which has not been included in this study since it was newly established when this study was in progress) and twelve vocational school. As a whole, all the faculties have some computer labs and Internet access rooms, albeit with poor hardware and

software (CÜ 2001:6). There are the 1200 staff members (academician and administrative) and 35000 students (graduate, undergraduate etc.).

This study has attempted to lay bare the profiles in terms of the students' use of the Internet both for general and study purposes by means of their own statements. In our time, in which the Internet has pervaded all facets of life, it has become a very common practice to benefit from it in the field of education. However, one should bear in mind the fact those students who are to use the Internet should have the basic awareness as to what the Internet is and the kind of advantages it presents to its users.

The purpose of this research is to identify the conditions of the students in terms of their Internet usage at the universities and thus, generate suggestions which will help students in general and other parties and authorities concerned take measures so as to improve the student-Internet relationship.

METHOD

Two methods have been used in this study. The first method for collecting quantitative data aims at identifying the variables in terms of the student's relationship with the Internet, that is, the location, time, frequency and purposes of the Internet access. To this end, a questionnaire has been devised and implemented. The questionnaire form is made up of a total of 19 questions— 4 questions covering sex, faculty, year, level of academic performance; 6 questions exploring the time, frequency per week, duration, etc. for the Internet use; and 9 questions clarifying the purpose of the Internet use. Information regarding the population and sampling can be seen in Table-1. As is seen, a sampling based on the layered model has been devised and implemented proportionately on students depending on the number, sex, and year. However, it should be kept in mind that approximately 50 questionnaire sheets have been discarded due to the fact that they have been marked incorrectly or left blank. Levels of significance in terms of difference have been presented as they have come out of SPSS package program. In terms of difference significance, the minimum level of significance has been taken as p<, 05.

Table-1: Population and Sampling

FACULTY/COLLEGE	P Male	**S Male**	P Female	**S Female**	P Total	**S Total**
Science and Letters	1081	**82**	1077	**80**	2158	**162**
Engineering	1538	**112**	336	**36**	1874	**148**
Education	948	**71**	904	**69**	1852	**140**
Economic and Administrative Sciences	655	**48**	513	**40**	1168	**88**
Medicine	433	**48**	319	**38**	752	**86**
Physical Training and Sports	241	**33**	140	**22**	381	**55**
Nursing	9	**0**	360	**43**	369	**43**
Dentistry	93	**25**	78	**14**	171	**39**
Theology	65	**11**	97	**20**	162	**31**
Total	5063	**430**	3824	**362**	8887	**792**

P: Population, S: Sampling

The second method for collecting data is "quantitative data collection." To this end, taking as starting point the assumption that there are three stages in using the Internet for study purposes (before, during, and after the course), the students who use the Internet at every stage of the course (beginning -20.8%-, middle -49%- and end -34%-) has been asked the question "In what ways does the Internet contribute to your success in your course?". A modeling has been created paying attention to such characteristics of the answers as inclusion, correspondence, similarity, and difference. For instance, nearly all the students have stated that having prior knowledge about courses via the Internet can have a motivating force thanks to their stimulating and interesting content. The findings gathered in this way have helped formulate a model on the university students' process of benefiting from the Internet for study purposes.

FINDINGS AND INTERPRETATION

First, various characteristics of the participants (students) have been given in percentage. Then, it has been inquired whether the students' answers bring about differences in terms of the characteristics which might have a bearing on the use of the Internet. Finally, a modeling has been devised as to how students make use of the Internet for their studies.

1. Personal Characteristics of the Participants

The male participants who filled in the questionnaire forms amount to 54.3% while the female participants constitute 45.7%. The percentages of participants as regards faculties are as follows: Faculty of Economic and Administrative Sciences 11.9%, Faculty of Science and Letters 20.5%, Faculty of Dentistry 4.9%, School of Physical Training and Sports 6.9%, Faculty of Engineering 18.7%, Faculty of Medicine 10.9%, Faculty of Theology 3.9, School of Nursing 5.4%, and Faculty of Education 17.7%. The following is about the percentages of participants as regards year: First year students 23.1%, second year students 25.5%, third year students 25.6%, and forth-year students 25.8%. And the participants have also responded to the question whether they considered themselves successful in academic performance. The results are as follows: 3.3% not at all, 10.2% not enough, 62.4% average, 21.1% good, and 4% very good.

2. The Overview of the Location, Time, Frequency per Week, Duration, etc. for the Internet Use and Variations in Terms of the Personal Characteristics of Participants (See Table-2, 3, 4 and 5 at the end of the text.)

To the question whether their parents use the Internet, 21% of the participants responded in the affirmative and 79% in the negative. These figures imply the fact that the use of the Internet is gradually on the rise; however, they are still far from being sufficient when one considers the fact that families too should be included in certain steps of the process of education.

In the questions regarding sex, it has been found that the families of the female participants have more access to the Internet ($p< .034$) (see Table-2). Those participants whose parents are Internet users turned out to come predominantly from faculties of medicine and engineering ($p<.000$). It can be put forward that there is no correlation between the use of the Internet amongst parents and the year the student is attending ($p<.670$).

The period during which students were introduced to the Internet has the following results: kindergarten 4.4%, primary school 10.6%, secondary school 56.4%, and higher education 28.5%. Looking at these figures, one can come to the conclusion that a change is indispensable in the content of "the mentality in teaching computer skills" at higher education institutions since the students come to the universities with prior knowledge of these skills. It seems to be almost obligatory to provide students with a course content that will help them learn or master computers skills in their prospective professions.

The answers given to the question concerning sex reveal that male participants got acquainted with the Internet first during their secondary school while the female participants were introduced to the Internet mostly during their university years ($p< .001$). In relation to the period during which the participants were introduced to the Internet, most of the participants who had first access to the Internet at university years come from the Faculty of Science and Letters ($p< .000$). There are significant differences in terms of the year during which participants were introduced to the Internet. It turns out that the number of fourth and third-year students who had first access to the Internet during their secondary school and university education is higher than that of the first and second year students ($p< .001$). Table-2 demonstrates the gradual decrease in the age during which the students are introduced to the Internet.

The question about the location where the Internet access takes place yielded the following results: 18.6% home, 21.1% school, and 60.4% Internet café. The study conducted by Dündar and Kıyıcı (2004) at Sakarya University indicates that approximately 31.3% of the students surveyed gain access to the Internet on the university campus. This figure may lead one to think that Sakarya University has better computer and Internet facilities than Cumhuriyet University. It is striking to note that Internet cafés provide access to thousands of students. A similar finding has been reached in a survey by Karahan and İzci (2001), who conclude with the suggestion that the facilities at Internet cafés ought to be improved.

The findings about location for Internet access according to the sexes reveal that females opt more for the school while males mostly prefer Internet cafés ($p<.000$). The highest number of Internet connection takes place in the following faculties on the campus in descending order: Faculty of Science and Letters, Faculty of Education and Faculty of Engineering ($p< .000$). There seems to be no correlation between the locations where the Internet access takes place and the year the students are in ($p< .329$).

The following outcomes are reached as to the times during which the participants use the Internet: 4.5% between 6:00-12:00 a.m., 40.9% between 12:00-6:00 p.m., 49.9% between 6:00-12:00 p.m., and 4.7% between 12:00-6:00 a.m. It is significant that the majority of the Internet use takes place in the afternoon and evening. The data about the location of the Internet access and the concentration of the time during which the Internet is used

expose the fact that the students are mostly out, i.e., outside the dormitory or home, during this time. This implies staying awake till late hours and/or the possibility of being exposed to dangerous situations in the street.

Another finding that came out of these questions was the fact that male participants usually prefer to use the Internet at night, while female applicants prefer daytime ($p < .000$). In terms of the faculties, it has been found that students at Faculty of Education and Faculty of Engineering tend to use the Internet mostly between 6:00 and 12:00 p.m. ($p < .000$). There is no correlation between the times during which the Internet access takes place and the year the students are in ($p < .607$).

The question as to how often students use the Internet per week have revealed the following percentages: 21.1% once a week, 22.3% twice a week, 23.9% three times a week, 14.1% four times a week, 8.2% five times a week, 2.5% six times a week, and 7.8% seven times a week. The information about duration of the Internet on a daily basis is as follows: 0-1 hour 21.7%, 1-2 hours 39%, 2-3 hours 23.9%, 3-4 hours 7.8%, 4-5 hours 4%, 5-6 hours 0.9%, and longer hours 2.7%. These figures about the use of the Internet on the basis of the number of days and daily duration seem to prove the fact that the Internet has become a vital part of students' lives. The findings of Karahan and İzci (2001) about Inönü University (where, in the year their study was executed, 46% of students had access to the Internet once a week) support the conviction that students tend to use the Internet more often.

In terms of frequency, female participants use the Internet on fewer days of the week ($p < .005$) and spend less time on the Internet on a daily basis ($p < .001$) than male participants. In terms of the number of days a week ($p < .002$) and the number of hours a day ($p < .005$) students from Faculty of Engineering, Faculty Education, and Faculty of Engineering have higher percentages. There is no correlation between density of the Internet use on a weekly ($p < .129$) and a daily ($p < .481$) basis and the year of the students.

22.5% of the participants have their own personal web-page, while 77.5% do not. When participants with their own web-pages were questioned to what extent they themselves have created the content and fashioned the design of their page, following results have come out: 0.3% said 0%, 16% claimed 25%, 3% claimed 50%, 3.2% claimed 75% and 2.1% claimed to have done 100% of the content and design of their web-pages themselves. The students' having their own web-pages is important in the sense that it effects their being active rather than passive. What is more, the originality of the web-page on the Internet does act as a safeguard against cheating and lethargy of the student. It must be admitted that students at Cumhuriyet University are not in this sense very successful.

It is noteworthy that male participants have more web-pages of their own ($p < .046$) and possess more original content in their web-pages ($p < .001$) than female participants. There seems to be no difference between faculties in terms of the number of participants with a web-page of their own ($p < .082$). However, students from Faculty of Education, who have a rate of 25% originality in their web-pages, and those from Faculty of Engineering, who have a rate of 100% originality in their web-pages, merit consideration compared to students form other faculties ($p < .000$). There is no correlation between the originality of the web-pages and the year which students are attending.

3. Determinants of the Internet Use and Difference among These Determinants Depending on Personal Characteristics (See Table-2, 3, 4 and 5 at the end of the text.)

The most frequently clicked sites during the Internet access are as follows: e-mail 59.2%, study 49.1%, news 41.7%, chat 32.2%, game 29.2%, sports 26.9%, shopping 16.9%, travel 14%, finance 10.6%, porn 9.7%, and betting-gambling 8.7%. Perusing these results, one may consider the second place in which study-related web-sites appear in the list as a promising situation. The first place is occupied by e-mails, which implies the fact that applicants use the Internet primarily for communicative purposes. A number of studies exist that have reached the same conclusion (Baker et al 1999, 263; Green 2001, 7; Rüzgar 2005). On the other hand, one should not disregard the fact that sites with betting-gambling and pornographic content do have a considerable percentage.

Of the first three items in the list of the most frequently visited sites among female participants (though this listing may show variety), sites with study content are dominant. Male participants, on the other hand, seem to have more interest in visiting other sites [porn ($p < .000$), betting/gambling ($p < .000$), finance ($p < .000$), game ($p < .000$), sports and ($p < .000$)] than their female counterparts. All the sites [except for chat sites ($p < .491$)] frequently visited by participants fluctuate according to the faculties. Participants from various faculties tend to visit the following sites: Faculty of Engineering and Faculty of Science and Letters: e-mail sites ($p < .000$); Faculties of Science and Letters, Engineering, and Education: sites with study content ($p < .000$); Faculty of Science and Letters news sites ($p < .000$); Faculty of Science and Letters and Faculty of Engineering: game ($p < .049$) and sports ($p < .000$); Faculty of Education: travel ($p < .001$), shopping ($p < .000$), porn ($p < .002$); Faculty of

Economic and Administrative Sciences: finance (p< .000); and Faculty of Education and Faculty of Engineering: betting-gambling (p< ,015). Except three kinds of sites [travel (p< .016), shopping (p< .016), and betting-gambling (p< .002)], there is no correlation between the pages visited and the year students are in. First and second-year students generally visit travel pages, while third and fourth-years visit sport pages. It is also interesting that betting-gambling sites are mostly visited by third-year students.

4. The Overview of the Use of the Internet as a Supplementary Tool for Education among University Students and Differences in Terms of Personal Characteristics (See Table-2, 3, 4 and 5 at the end of the text.)

The percentage of the participants who have done a search on the Internet about a course they are going to before the beginning of a new term is 20.8%, while that of those who have not is 79.2%. On the other hand, the percentage of students who made use of the Internet at the beginning of a course or while the course is under way is 49%, and that of those who do not is 51%. Finally, the percentage of students who make use of the Internet at the end of the term in order to internalize and share what they have learned better and strengthen their weak points is 34.2%, and that of those who do not is 65.8%. One can conclude that students' use of the Internet at the beginning, middle and end of their studies is fairly satisfactory. However, one should take into consideration the fact that students more often than not seem to act out of an anxiety and use the Internet for immediate ends in the middle of their courses.

The number of female participants who make use of the Internet either at the beginning (p< .017) or in the middle of the course (p< .005) is higher than that of the male participants. On the other hand, the numbers of female and male participants who make use of the Internet at the end of the course are the same (p< .638). The students from the Faculty of Science and Letters and Faculty of Education opt for making use of the Internet for getting prepared for the courses (p< .000), while students from the Faculty of Science and Letters and Faculty of Engineering opt for the use of the Internet during the courses (p< .000). However, there is no significant difference between the faculties in the use of the Internet after the end of the courses (p< .197). There is, nonetheless, a correlation between the use of the Internet for preparatory purposes at the beginning of a new term for a course which the students are registering for the first time and the year students are attending. This relationship is more frequent amongst first year students (p< .020). This is something promising, since it may herald the increasing rate of the use of the Internet before the beginning of courses for preparatory purposes. There is, nevertheless, no difference between the rates of the use of the Internet for study purposes while the courses are under way (p< .091) and after the courses are over (p< .920) in terms of the year.

Students, who make use of the Internet at every stage of the course [before (-20.8%-), during (-49%-), and after the course (-34.2%-)], have been asked the question "What kind of benefits does the Internet bring about at each stage of the course for effective learning?" The answers to this question can be modeled for each stage in Diagram-1. (*bkz. Metnin sonu)

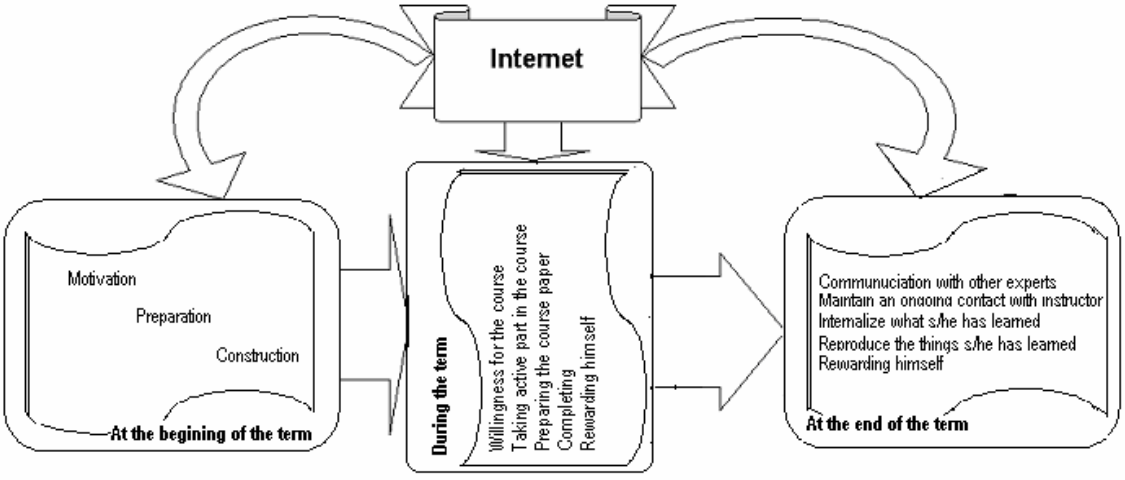

Diagram-1 A Model of Using Internet with the Aim of Studying

The use of the Internet before the course can facilitate preparatory work and motivate the student psychologically, physically and socially by prompting eagerness to learn. That the Internet has psychological, physical and social effects that induce the student has already been emphasized in various studies (Blatt et al.

1999; Crane 2000; Thornburg and Hill 2004). The student can come to the class having read other sources as well as those assigned by the instructor. The Internet provides an easy access to a wide range of information; therefore, it is a unique tool (Clemmit 1996; İşman et al 2004). On the other hand, it makes it easier for the student who has had reached various different outlooks on a topic (Makitalo et al. 2002) to construe what he has learned.

Depending on the contribution it facilitates to the student's preliminary work during the term, the Internet can aid the student to foster their willingness, taking active part in the course, preparing and sharing the course paper and completion his/her read or study (John et al. 1998; Broad et al. 2003; Altun and Altun 2000; Kurubacak 2002) and complete his/her construe in line with what has been learned in the class.

After the end of the term, it can help him to facilitate his collaboration and communication with other experts and instructors other than his/her teacher (Irgat 2002; Kurubacak 2002), maintain an ongoing contact with his/her instructor (Dyril and Kinnamen 1995; Ritter and Lemke 2000; Kurubacak 2002; Broad et al. 2003), internalize what s/he has learned, re-produce the things s/he has learned by interpreting the whole in-class learning process, and possibly contribute to rewarding himself by way of chat programs, interactive games, etc.

INTERPRETATION AND CONCLUSION

It is rather significant that students are reported to have access to the Internet in places outside the campus. From the student's viewpoint, one of the facets of this infrastructure is the extent to which university instructors themselves make use of the Internet and have web skills both within and between universities (Wiske et al. 2001: 488). When the instructors themselves have shortcomings in this facet, the interaction between the student and the Internet will become problematic. Rutven et al. stress the necessity of establishing pedagogical strategies so as to form a classroom atmosphere based on sources from the Internet electronic sources (2004:3). One of the ways of securing the Internet's place as an effective supplementary tool in the process of education is to introduce changes with "university programs" (Harris 1999). University programs and courses ought to be designed in such a fashion so that they suitably contain the conditions and possibilities of employing the Internet. Fraser (1999) mentions "turning all the course materials into electronic ones" as an example for such an adjustment. It is possible to say that Cumhuriyet University does not have a favorable atmosphere in this respect. This conviction is supported by the fact that less than 5% of the academic staff has their own personal web-pages (how relevant these pages are to courses being offered is another issue to be considered), and the poor condition of the computer and Internet labs (CÜ 2006). Carrying out studies of similar nature can help have a bigger picture of the situation and reach more reliable conclusions.

One of the conclusions reached in this study is the fact that students employ the Internet for "communicative" purposes. Only when this communication gains a study dimension, then will it begin to contribute to the student academically. To what extent this communication will contribute to the student's studies still remains a question to be clarified, since there is the risk of this purpose turning into mere "communication" The following observation in a study based on qualitative method by Yalçınalp (2003) can in fact act as a defense of the urgency of the above-mentioned suggestion:

> [One of the students states that] he uses [the Internet] mainly for study purposes; however, it has been observed that this students prefers to send e-mails to his friends about nonacademic subjects at every chance he gets … In the same manner, it has been noticed that he opts for sites with entertainment content. …

One of the debates that could alter all the results is the accuracy of the information gathered form the Internet. Students can come to the class with false or invalid convictions and approaches about the course they are attending when they make use of the Internet. In a study by Paris (2002) it has been found that students are inclined to "take things granted". This attests to the fact that the Internet may spoil the course rather than contribute to it. This can be curbed by the instructor by preparing a virtual space carefully created, edited, announced, monitored and guided by himself/herself on the Internet, in addition to other methods to check the reliability of materials on the net.

Balcıoğlu (2006), on the other hand, stresses the fact that the Internet, which ought to be an educational tool, once out of control, can turn into a social catastrophe, producing undesirable results. Further, in a survey carried out by Union of Independent School Teachers (2005) it has been emphasized that students, who often use the Internet with the pretext of "doing homework", tend to have a chat rather than study, and ignore their studies wasting their time.

As a result, it can be put forward that the Internet is/should be a beneficial tool for university students. However, one should always bear in mind that the use of this tool can prove to be harmful, less fruitful, or fail due to the certain factors. It is obvious that certain measures should be taken both overall and specific with regard to the kind of complications and cases that may ensue.

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TABLES

Table-2 Answers in terms of Sex.

Questions	Perceptions	Sex		*Total (%)*	Pearson Chi-Square		
		Male %	Female %		Value	Df	Sig.(P)
My father or mother uses the Internet	Yes	18,1	24,3	21,0	4,516	1	,034
	No	81,9	75,7	79,0			
I was introduced to the Internet in	higher education	22,8	35,4	28,4	16,340	3	,001
	secondary school	62,1	49,7	56,4			
	primary school	10,5	10,8	10,6			
	kindergarten	4,7	4,1	4,4			
The location where I use for the Internet access is at	Internet café	65,1	54,7	60,4	17,333	2	,000
	school	15,6	27,6	21,1			
	home	19,6	17,7	18,6			
Time-frame when I use the Internet is between	12:00-6:00 a.m.	6,0	3,0	4,7	21,110	3	,000
	6:00-12:00 p.m.	55,6	43,1	49,9			
	12:00-6:00 p.m.	34,0	49,2	40,9			
	6:00-12:00 a.m.	4,4	4,7	4,5			
How often I use the Internet per week is	seven times	10,0	5,2	7,8	23,887	6	,001
	six times	3,7	1,1	2,5			
	five times	8,1	8,3	8,2			
	four times	16,0	11,9	14,1			
	three times	23,3	24,6	23,9			
	twice	22,6	22,1	22,3			
	once	16,3	26,8	21,1			
How often I use the Internet on a daily basis is	0 or 1 hour	20,2	23,5	21,7	5,422	6	,49
	1 or 2 hours	38,4	39,8	39,0			
	2 or 3 hours	24,4	23,2	23,9			
	3 or 4 hours	8,1	7,5	7,8			
	4 or 5 hours	4,2	3,9	4,0			
	5 or 6 hours	1,4	,3	,9			
	6 hours and then	3,3	1,9	2,7			
The sites I clicked most frequently during the Internet access are	chat - Yes	30,9	33,7	32,2	,692	1	,40
	news -Yes	40,	43,4	41,7	,796	1	,37

		2					
	game -Yes	34,7	23,5	29,5	11,781	1	,001
	sports- Yes	39,1	12,4	26,9	70,937	1	,001
	travel- Yes	14,0	14,1	14,0	,003	1	,954
	course- Yes	40,2	59,7	49,1	29,707	1	,001
	shopping- Yes	17,9	15,7	16,9	,653	1	,419
	porn- Yes	13,3	5,5	9,7	13,384	1	,001
	e-mail- Yes	58,1	60,5	59,2	,452	1	,501
	betting-gambling - Yes	12,3	4,4	8,7	15,445	1	,001
	Finance- Yes	13,7	6,9	10,6	9,627	1	,002
I have my own personal web-page.	Yes	24,9	19,6	22,5%	3,133	1	,046
	No	75,1	80,4	77,5			
The originality of my web-page on the Internet is	No	72,6	78,7	75,4	21,042	5	,001
	100%	3,7	0,3	2,1			
	75%	4,4	1,7	3,2			
	50%	2,3	3,9	3,0			
	25%	17,0	14,9	16,0			
	0%	0,0	0,6	0,3			
I have done a search about a course on the Internet before	Yes	17,7	24,6	20,8	5,692	1	,017
	No	82,3	75,4	79,2			
I have done a search about a course on the Internet during a term	Yes	44,4	54,4	49,0	7,867	1	,005
	No	55,6	45,6	51,0			
I use the Internet relation for the courses at the end of the term	Yes	33,5	35,1	34,2	0,222	1	,638
	No	66,5	64,9	65,8			

Table-3 Answers in terms of Faculties.

Questions	**Perceptions**	**FAKÜLTIES**									***Total (%)***	**Pearson Chi-Square**		
		EASF	**DF**	**PTTSF**	**ENF**	**MF**	**SLF**	**TF**	**NF**	**EF**		**Value**	**Df**	**Sig.(P)**
My father or mother uses the Internet	Yes	1,8	,9	,8	4,8	4,7	2,7	1,3	1,5	2,7	21,0	45,076	8	,000
	No	9,3	4,0	6,2	13,9	6,2	17,8	2,7	3,9	15,0	79,0			
I was introduced to the	higher education		,1	,4		,3	,1			3,5	4,4	151,366	24	,000
	secondary school	,3	1,3	,5	2,8	1,4	1,0	,6	,6	2,1	10,6			

Internet in	primary school	6,9	2,7	3,8	11,5	7,2	11,5	2,0	2,1	8,7	56,4			
	kindergarten	3,9	,9	2,3	4,4	2,0	7,8	1,3	2,7	3,3	28,5			
The location where I use for the Internet access is at	Internet café	2,3	1,0	,9	4,4	4,0	3,7	,3	,6	1,4	18,6	99,127	16	,000
	school	1,4	1,0	1,9	4,5	1,0	1,9	2,4	1,0	5,9	21,1			
	home	7,4	2,9	4,2	9,7	5,8	14,9	1,3	3,8	10,4	60,4			
Time-frame when I use the Internet is between	12:00-6:00 a.m.	,4		,1	,3	,3	,5		,1	2,9	4,5	109,805	24	,000
	6:00-12:00 p.m.	4,4	1,4	3,4	6,3	3,9	8,7	3,4	1,5	7,8	40,9			
	12:00-6:00 p.m.	5,9	3,2	3,2	10,6	6,6	10,0	,5	3,7	6,3	49,9			
	6:00-12:00 a.m.	,4	,4	,3	1,5	,1	1,3		,1	,6	4,7			
How often I use the Internet per week is	seven times	2,1	,8	1,8	2,0	2,8	5,3	,9	1,4	4,0	21,1	81,123	48	,002
	six times	2,1	1,4	1,1	3,3	1,9	4,7	1,1	1,4	5,3	22,3			
	five times	2,5	,5	1,6	4,4	2,4	4,9	1,1	1,1	5,2	23,9			
	four times	1,9	1,1	,9	3,2	1,3	2,4	,5	,6	2,3	14,1			
	three times	,8	,6	,3	2,5	1,8	1,4	,1	,4	,4	8,2			
	twice	,5	,3	,3	,	,4	,3		,1	,1	2,5			
	once	1,1	,3	1,0	2,7	,4	1,5	,1	,4	,4	7,8			
How often I use the Internet on a daily basis is	0 or 1 hour	3,3	1,8	2,1	2,1	2,5	4,4	1,0	,9	3,5	21,7	77,003	48	,005
	1 or 2 hours	3,7	1,5	2,9	6,9	4,2	6,8	1,8	2,9	8,3	39,0			
	2 or 3 hours	2,9	1,0	,8	5,1	2,5	6,3	,9	,9	3,5	23,9			
	3 or 4 hours	,8	,4	,5	1,6	,6	1,5	,3	,5	1,6	7,8			
	4 or 5 hours	,3	,1	,3	1,8	,9	,4		,1	,3	4,0			
	5 or 6 hours			,1	,1		,6				,9			
	6 hours and then	,3	,1	,3	1,0	,1	,4		,1	,4	2,7			
The sites I clicked most frequently during the Internet access are	chat - Yes	3,4	1,8	2,9	5,9	3,8	6,1	1,6	2,0	4,7	32,2	7,341	8	,491
	news -Yes	6,3	2,1	1,9	6,7	5,1	10,2	2,1	2,5	4,7	41,7	36,609	8	,000
	game -Yes	2,4	2,4	1,5	5,8	4,0	6,2	1,0	1,8	4,4	29,5	15,557	8	,049
	sports- Yes	2,0	1,9	3,9	6,4	2,5	4,5	,3	,6	4,7	26,9	48,733	8	,000
	travel- Yes	1,3	,8	,9	2,0	,5	2,3	,9	1,1	4,3	14,0	25,150	8	,001
	course- Yes	2,7	1,4	1,8	3,0	1,1	1,4	,6	,3	4,7	16,9	37,453	8	,000
	shopping-Yes	,4	,4	,8	1,8	,8	2,0		,3	3,4	9,7	24,209	8	,002
	porn- Yes	7,4	3,0	2,8	13,5	9,1	12,0	2,4	2,8	6,2	59,2	77,827	8	,000
	e-mail- Yes	4,4	,4	,3	1,8	,4	,9%		,3	2,3	10,6	99,709	8	,000
	betting-gambling - Yes	5,7	2,1	3,2	7,3	4,9	13,1	1,3	4,2	7,3	49,1	41,951	8	,000
	Finance-Yes	1,0	,5	1,0	2,4	,8	,9			2,1	8,7	19,845	8	,015
I have my own personal web-page.	Yes	2,0	,5	1,5	4,0	2,0	4,8	,5	1,5	5,6	22,5	13,977	8	,082
	No	9,1	4,4	5,4	14,6	8,8	15,7	3,4	3,9	12,1	77,5			
The originality of my web-page on the Internet is	No			,1		,1					,3	158,755	40	,000
	100%	1,0	,1	1,6	1,5	,9	1,9	,4	,9	7,7	16,0			
	75%	,1	,1	,3	,4	,3	1,3		,1	,5	3,0			
	50%	,3	,1	,1	,5		,8	,1	,3	1,0	3,2			
	25%	,1			1,3	,5	,3				2,1			
	0%	9,6	4,5	4,8	15,0	9,1	16,3	3,4	4,2	8,5	75,4			

I have done a search about a course on the Internet before	Yes	5,7	10,3	23,6	14,2	18,6	27,8	22,6	34,9	27,9	20,8	33,505	8	,000
	No	94,3	89,7	76,4	85,8	81,4	72,2	77,4	65,1	72,1	79,2			
I have done a search about a course on the Internet during a term	Yes	42,0	51,3	40,0	56,8	30,2	64,8	45,2	86,0	30,7	49,0	77,996	8	,000
	No	58,0	48,7	60,0	43,2	69,8	35,2	54,8	14,0	69,3	51,0			
I use the Internet relation for the courses at the end of the term	Yes	27,3	33,3	43,6	31,1	36,0	34,6	19,4	46,5	36,4	34,2	11,084	8	,197
	No	72,7%	66,7	56,4	68,9	64,0	65,4	80,6	53,5	63,6	65,8			

Table-4 Answers in terms of Class.

Questions	**Perceptions**	**Classes**				***Total (%)***	**Pearson Chi-Square**		
		First Class %	**Second Class %**	**Third Class %**	Fourth **Class %**		**Value**	**Df**	**Sig.(P)**
My father or mother uses the Internet	Yes	5,3	5,1	4,8	5,8	21,0	1,528	3	,671
	No	17,8	20,5	20,8	19,9	79,0			
I was introduced to the Internet in	higher education	4,7	6,2	7,6	10,1	28,5	32,559	9	,001
	secondary school	13,3	16,5	13,6	13,0	56,4			
	primary school	3,4	2,3	3,2	1,8	10,6			
	kindergarten	1,8	,5	1,3	,9	4,4			
The location where I use for the Internet access is at	Internet café	12,9	17,2	14,6	15,7	60,4	6,918	6	,329
	school	5,6	4,3	5,7	5,6	21,1			
	home	4,7	4,0	5,3	4,5	18,6			
Time-frame when I use the Internet is between	12:00-6:00 a.m.	1,5	,9	1,6	,6	4,7	7,286	9	,607
	6:00-12:00 p.m.	11,0	13,0	12,6	13,3	49,9			
	12:00-6:00 p.m.	9,3	10,7	10,4	10,5	40,9			
	6:00-12:00 a.m.	1,3	,9	1,0	1,4	4,5			
How often I use the Internet per week is	seven times	2,3	1,8	2,0	1,8	7,8	17,466	18	,491
	six times	,8	,5	,5	,8	2,5			
	five times	1,8	2,1	1,1	3,2	8,2			
	four times	3,3	3,9	2,8	4,2	14,1			
	three times	4,9	6,6	6,7	5,7	23,9			
	twice	5,3	5,9	6,3	4,8	22,3			
	once	4,8	4,7	6,2	5,4	21,1			
How often I use the Internet on a daily basis is	0 or 1 hour	5,3	4,5	6,2	5,7	21,7	24,859	18	,129
	1 or 2 hours	8,6	10,9	10,1	9,5	39,0			
	2 or 3 hours	5,1	5,7	6,7	6,4	23,9			
	3 or 4 hours	1,6	2,4	2,1	1,6	7,8			
	4 or 5 hours	1,5	1,0		1,5	4,0			
	5 or 6 hours	,3	,5		,1	,9			
	6 hours and then	,8	,5	,5	,9	2,7			
The sites I clicked most frequently	chat - Yes	7,2	7,7	8,3	9,0	32,2	1,106	3	,771
	news -Yes	10,7	9,5	10,9	10,6	41,7	3,494	3	,322

during the Internet access are	game -Yes	7,6	8,2	7,2	6,6	29,5	3,418	3	,332
	sports- Yes	7,6	5,2	8,0	6,2	26,9	10,331	3	,016
	travel- Yes	4,0	4,7	3,0	2,3	14,0	10,304	3	,016
	course- Yes	10,2	11,9	13,3	13,8	49,1	4,336	3	,227
	shopping- Yes	3,2	5,3	4,5	3,9	16,9	4,064	3	,251
	porn- Yes	2,4	2,3	2,7	2,4	9,7	,371	3	,941
	e-mail- Yes	12,1	15,3	15,9	15,9	59,2	4,732	3	,192
	betting-gambling - Yes	1,3	1,8	3,9	1,8	8,7	15,090	3	,002
	Finance- Yes	1,9	2,8	2,3	3,7	10,6	4,589	3	,205
I have my own personal web-page.	Yes	4,7	6,4	5,7	5,7	22,5	1,457	3	,691
	No	18,4	19,1	19,9	20,1	77,5			
The originality of my web-page on the Internet is	No	17,6	18,7	19,2	19,9	75,4	18,647	15	,231
	100%	,3	,6	,5	,8	2,1			
	75%	1,1	,5	,6	,9	3,2			
	50%	,3	,9	,5	1,4	3,0			
	25%	3,9	4,7	4,7	2,8	16,0			
	0%		,1	,1		,3			
I have done a search about a course on the Internet before	Yes	6,1	3,5	5,7	5,6	20,8	9,470	3	,020
	No	17,0	22,0	19,9	20,2	79,2			
I have done a search about a course on the Internet during a term	Yes	13,1	12,4	11,6	11,9	49,0	6,306	3	,091
	No	10,0	13,1	14,0	13,9	51,0			
I use the Internet relation for the courses at the end of the term	Yes	7,8	9,1	8,3	9,0	34,2	,485	3	,920
	No	15,3	16,4	17,3	16,8	65,8			

Table-5 Answers in terms of Self-evaluation.

Questions	**Perceptions**	**Rate of perceiving myself successful**					***Total (%)***	**Pearson Chi-Square**			
		Very-little %	**Little %**	**Middle %**	**Fine %**	**Very-well %**		**Value**	**Df**	**Sig.(P)**	
My father or mother uses the Internet	Yes	,6	1,6	10,0	7,1	1,6	21,0	31,125	4	,000	
	No	2,7	8,6	51,4	14,0	2,4	79,0				
I was introduced to the Internet in	higher education	,9	1,5	20,3	4,9	,9	28,5	158,820	12	,000	
	secondary school	1,6	5,1	35,0	12,5	2,3	56,4				
	primary school	,5	,6	5,4	3,5	,5	10,6				
	kindergarten	,3	3,0	,6	,1	,4	4,4				
The location where I use for the Internet access is at	Internet café	1,4	4,8	41,3	10,1	2,8	60,4	47,607	8	,000	
	school	,6	3,9	11,0	5,3	,3	21,1				
	home	1,3	1,5	9,1	5,7	1,0	18,6				
Time-frame when I use the Internet is between	12:00-6:00 a.m.	,3	1,0	1,3	1,4	,8	4,7	76,141	12	,000	
	6:00-12:00 p.m.	1,8	4,8	30,8	10,7	1,8	49,9				

	12:00-6:00 p.m.	1,0	2,5	27,4	8,5	1,5	40,9			
	6:00-12:00 a.m.	,3	1,9	1,9	,5		4,5			
How often I use the Internet per week is	seven times	1,0	,5	3,3	2,3	,8	7,8	87,014	24	,000
	six times	,1	,1	1,4	,5	,4	2,5			
	five times	,1	,3	3,9	3,3	,6	8,2			
	four times	,5	1,6	7,8	3,4	,8	14,1			
	three times	,9	3,7	14,0	4,5	,8	23,9			
	twice	,3	1,6	15,9	4,5		22,3			
	once	,4	2,4	15,0	2,5	,8	21,1			
How often I use the Internet on a daily basis is	0 or 1 hour	,6	2,3	14,9	3,4	,5	21,7	129,150	24	,000
	1 or 2 hours	,8	3,7	25,0	7,8	1,8	39,0			
	2 or 3 hours	,3	2,8	14,1	5,9	,8	23,9			
	3 or 4 hours	,4	1,0	4,2	1,9	,4	7,8			
	4 or 5 hours	,3	,1	1,6	1,9	,1	4,0			
	5 or 6 hours		,3	,6			,9			
	6 hours and then	1,0	,1	,9	,1	,5	2,7			
The sites I clicked most frequently during the Internet access are	chat - Yes	,4	3,3	18,7	7,8	2,0	32,2	12,265	4	,015
	news -Yes	1,3	3,2	26,0	9,5	1,8	41,7	4,882	4	,300
	game -Yes	,6	3,2	19,3	4,8	1,6	29,5	7,859	4	,097
	sports- Yes	,8	4,0	14,9	5,4	1,8	26,9	13,171	4	,010
	travel- Yes	,4	1,9	8,8	2,3	,6	14,0	3,077	4	,545
	course- Yes	1,1	3,9	30,4	11,5	2,1	49,1	8,179	4	,085
	shopping- Yes	,6	1,4	9,5	4,5	,9	16,9	4,620	4	,329
	porn- Yes	1,3	1,	5,7	,9	,8	9,7	33,555	4	,000
	e-mail- Yes	1,8	4,8	36,0	14,8	1,9	59,2	15,602	4	,004
	betting-gambling - Yes	,4	,8	5,6	1,1	,9	8,7	9,796	4	,044
	Finance- Yes	,6	,8	6,4	2,4	,4	10,6	3,076	4	,545
I have my own personal web-page.	Yes	1,3	2,1	13,6	4,8	,6	22,5	4,804	4	,308
	No	2,0	8,1	47,7	16,3	3,4	77,5			
The originality of my web-page on the Internet is	No	1,8	6,6	47,5	16,0	3,5	75,4	59,793	20	,000
	100%	,6	,4	,8	,4		2,1			
	75%	,1	,1	2,1	,5	,3	3,2			
	50%		,4	1,6	1,0		3,0			
	25%	,8	2,8	9,1	3,2	,3	16,0			
	0%			,3			,3			
I have done a search about a course on the Internet before	Yes	,8	2,7	10,0	6,3	1,1	20,8	16,958	4	,002
	No	2,5	7,6	51,4	14,8	2,9	79,2			
I have done a search about a course on the Internet during a term	Yes	1,1	3,9	28,2	13,3	2,5	49,0	22,969	4	,000
	No	2,1	6,3	33,2	7,8	1,5	51,0			
I use the Internet relation for the courses at the end of the term	Yes	,9	3,9	17,9	9,3	2,1	34,2	19,244	4	,001
	No	2,4	6,3	43,4	11,7	1,9	65,8			

THE SCHOOL WEBSITE AS A VIRTUAL LEARNING ENVIRONMENT

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ABSTRACT
Although school websites have existed on the Internet for over fifteen years, in practice the website is not integrated into the organizational-pedagogical system of the school.
Against the challenging background of the modern education system and the theoretical facets of realizing a learning environment, this paper will present an online learning environment from the school's organizational and pedagogical perspectives, and will expand on the rationale behind the school website, while describing its characteristics. The proposed website will be characterized by both virtual areas accessible to the general public and by areas restricted to the learning community of teachers and students. In addition, both virtual tools capable of integration into the diverse components comprising the site, and the recommended structure of the website will be presented. The site will fulfill the role of an online learning environment and will reflect schools' activities on various organizational and pedagogical levels.

INTRODUCTION

In recent years it has been acknowledged that the Internet has changed the direction, time, and location of learning (Moore, 1993; Nachmias et al., 1999). Moreover, the typical class is also no longer limited to four walls and set hours; the Internet facilitates learning from any location at any time and this significant transformation is gradually occurring in schools as well.

School websites have existed on the Internet for several years and many are recognized as Web-Based Learning (WBL) (Blanchard & Marshal, 2005). In practice, however, the website is not incorporated into the organizational-pedagogical system of most schools and is not an integral part of school procedures. Schools are still operated under the principles established by the academy of Pythagorus of Samos[i] and it is apparent that the assumption that technology would radically alter this situation has so far not been realized. Additionally, the attempt to formulate a rationale whereby utopian learning (ideal learning by ideal learners) is a prerequisite for integrating technology into education appears doomed to failure. Up to the present, twenty years after computers were introduced into classrooms and students' homes, no significant findings have emerged. Technology is still not sufficiently integrated into the learning environment of students in the modern school to allow researchers to establish whether its integration is crucial for reinforcing the quality of learning and the achievements of the education system. Even positive findings regarding the influence of the computer on learning achievements (Organisation for Economic Co-operation and Development [OECD], 2006) reveal that it is relatively minor.

As yet, no structured, unanimously agreed-upon rationale for integrating an online learning environment into schools has been defined. Such a rationale would set guidelines for determining feasible tools and models for constructing a high-quality system (Stimson, 1989). The best proof of this is the plethora of arguments over the importance of realizing utopian pedagogy in everything connected to utilizing technology in teaching and learning, the condition , in fact, for using the online environment. In practice, it is currently accepted that the realization of pedagogy through technology is actually an expression of the aspiration to achieve an overall improvement in the education system.

In order for the school website to play an essential part in school procedures, its place in teaching, learning, and the organizational operation of the school must be clarified and emphasized, and its structure and principal functions must be elaborated upon.

Necessity of the School Website as an Authentic Learning Environment for Learners

The necessity of integrating an authentic, comprehensive online environment into school to meet the needs of teaching and learning and to support its organizational management does not stem from the aspiration that the combination of utopian learning and technology will lead to higher achievements and standards. It is much more

prosaic, but also more powerful than any educational theory or hypothesis and pseudopedagogy of the PreNet generation paradigm. This paradigm, in essence flawed, maintains that the use of technology in education is feasible as long as it is conditional on achievements and high standards of learning. The learner is thereby transformed into a self-regulated learner, curious and inquiring, for whom learning is a natural process with no need for the guidance or encouragement of an instructor or a professional teacher because this can be attained independently through the Internet.

Unlike the PreNet generation paradigm, which has become a prominent conceptual obstacle to real change, the NetGen paradigm focuses on lifestyle and a worldview whose essence is alien, and even strange, to the previous generation. The virtual environment of the NetGen generation is an inseparable part of its lifestyle, as natural as oxygen to breathe, and in effect knowing no other reality (Brown, 2006). This generation does not need the benevolence of the school establishment to engage in fascinating collaboration that revives the rules of the collective thought by some to have vanished for ever (contribute according to your means and consume according to your needs). It effortlessly circumvents the legal obstacles erected by giant multimedia content corporationsii. The NetGen learner is both participant and contributor, connecting diversely and instantaneously with a group of like-minded colleagues, some of whom he or she may never have met, in common fields of interest. Using a virtual environment is instrumental in shaping the personality and worldview of every young person. There is no need for the intervention of "educational" structures; personal and collective reflective interaction is combined in an empowering, nurturing virtual community whose strength is remarkable. The NetGen generation has no need of an official organization to satisfy its interpersonal and personal needs. It achieves this independently of an education system that is still mired in the PreNet paradigm. This paradigm defers to theories and impractical aspirations and persists in classifying routine activities – such as, participating in virtual discussions, retrieving information for personal needs, instant messaging, and sharing digital material – as innovative, and even revolutionary, learning. It continues to aim for control and supervision over everything related to the power of self-expression and to the interpersonal interaction the Internet offers young learners.
If we wish to encourage the NetGen generation into learning activity relevant to the learner, learning must be transferred to the learners' natural environment: the virtual environment; if not, school will become increasingly irrelevant, a fact that significant quantitative research has clearly indicated (Condition of Education, 2002). Also indicated was the large gap between accessibility to, and use of computers at home, and the relatively scarce use of them in schools (OECD, 2006).

School Website's Objective
The objective of a school website is to provide a pedagogical response to the school's requirements and to serve as an effective, organized online learning environment. In addition to the implementation of pedagogy in a virtual environment, the school website constitutes a virtual organizational mantle for managing administrative requirements. These requirements include establishing relationships with the local, regional and national education system, efficient organizational management of teaching staff, and maintaining contact with parents and the community.

Through the website, school will become a vital hub in the learner's life and thus its relevance to learners and society, following its gradual decline from the early 1980s up to the mid-twenty-first century (Condition of Education, 2002), will be restored and will increase. Concurrently, it is essential that the objectives of the school website be exempt from the stipulation of raising teaching standards and students' achievements. This challenge has no connection to the existence of a website or to a virtual learning environment.

Challenges of the Education System as a Theoretical Framework Characterizing the School Website
Characterizing the basic outlines of a school website as the realization of an online learning environment constituting part of the ongoing management of teachers and students compels a reconsideration of the basic challenges confronting modern education. The root of the societal vicissitudes society is undergoing in the postmodern era, including the educational context, relates to two conflicting trends that exist concurrently: uniformity and uniqueness.

Education's contemporary pedagogical challenge is to adapt and acclimatize itself to the educational challenges in modern society where both these contradictory trends are dominant and where each demand a concrete response:

a. Uniformity: the trend of transforming the world into a global village characterized by a low common denominator at the expense of the prosperity, initiative, and creativity that varies the local and global cultural arsenal through multifaceted opinions, cultures, and worldviews. In addition, uniformity demands that the

fulfillment of predetermined standards of information arsenal and skills (Programme for International Student Assessment [PISA], 2006) be maintained as an entrance requirement to the global village.
b. Uniqueness: guarantees a personal response to the profile of individual and group behavioral tendencies and capabilities. This trend preserves cultural and ethical individualism, including a theological and civil worldview, as part of the functioning of a multicultural society by permitting learners to express themselves and operate in a supportive, challenging environment.
It is the responsibility of the school website to provide an appropriate solution to both trends despite the apparent discrepancy between them.

Theoretical Aspects of a Virtual Learning Environment for Integration into the School Website
In characterizing the administrative environment of a school, two pivotal aspects must be discussed and unified into a virtual administrative entity:
a. Organizational management
b. Learning management
As yet, there is no significant theoretical validity for an online learning environment. The need for such an environment is still in its infancy and the practical experience accumulated is insufficient to facilitate the development of theories of any great consequence. However, it may be argued that in actual fact there is no need for such theories in a virtual environment because it is realized in the established and familiar environment of the school.

Organizational Perspective
In the information/ knowledge age the power, relative advantage, and output standard of organizations stems to a great extent from their ability to develop, maintain, and utilize specific information supporting the organization's learning processes. The doctrine of organizations illustrates that an organization that does not develop, change, and expand is doomed to failure and regression (Peters, 1997).

The term "learning organization" was coined by Peter Senge, who defines it as an organization constantly broadening its capacity to shape its future (Senge, 1990). De Vito defines a learning organization as the creation of a new language (cited in Craig, 1996). The organizational learning process facilitates the strengthening of implicit knowledge in an organization and its transformation into explicit knowledge. Business Intelligence (or Business Information) – BI^3 – is a sub-discipline of business discipline. BI is a business outlook amalgamating culture, business procedures, and supportive infrastructures for the rational utilization of information existing in the organization, and for the creation of new information. It aims to realize the organizational vision and business objectives of the organization effectively and efficiently (Halamish, 2004).

The education system is one of the largest and most complex organizations in the world. Despite its complexity and size, it is considered a conservative organization where twentieth-century thinking has not made any significant inroads (Chen, 1999). The same holds true for the school which, with a diminishing budget, must provide ongoing teaching and learning services while constantly dealing with parents, unions, and teaching staff; maintain achievements and standards; and fulfill its obligations to every student.

The virtual organizational perspective has different rationales based primarily on the need of the giant software corporations, which have developed online management tools, to justify and to develop for themselves a convincing, detailed rationale (Microsoft White Paper, 2005; Omilian, 2003). Many specialize in specific software or computer applications. The organization's success is dependent on the metamorphosis of the entire system into a learning organization capable of planning, operating, and drawing the appropriate conclusions (Chen, 1999). A study conducted over a period of two years in Texas reveals that the use of virtual organizational management tools in the school organization led to a fundamental re-organization of the system (Fourqurean, 2001). These and other outcomes demonstrate that schools must become "learning organizations" capable of drawing the appropriate conclusions from the processes of change and of incorporating the lessons learned into the entire system; it reveals that the most effective way of actively achieving this is in a virtual environment.

The marketing perspective, crucial for the survival and prestige of the school, is also an important facet of the school website. A customized school website has the potential to be a powerful marketing tool if it focuses on the needs of the users and presents the materials correctly and methodically (Say et al., 2001).

Pedagogical Perspective
The pedagogical perspectives of an online learning environment are critical for the characterization and understanding of pedagogical realization through such an environment. It should be borne in mind that a virtual

learning environment is primarily the learning environment related to in the literature (Blanchard & Marshal, 2005). The challenge lies in establishing and adapting these theories to the rationale of a virtual learning environment. Accordingly, every discussion on the subject must begin with the adoption of a paradigm to characterize a virtual learning environment. Therefore, discussion must revolve around two fundamental, key approaches characterizing teaching and learning from which to select a central pedagogical paradigm:

1) The behavioristic approach to learning is concerned with acquiring instinctive command of skills. It supports an environment where the practice and the clear, didactic explanations of every detail constitute the main characteristic. This approach is typical of the inflexible, dogmatic education system that distinguished conservative education in the past.
2) The cognitive approach to learning deals with the acquisition of an understanding of conceptual content and relates to the learner as a unique individual in a learning community. These are the pedagogical theories of Ausubel (1963, 1978), Gagne (cited in Perry, 2002), and Bruner (1996). In this context, Ausubel coined the term "advance organizer" (1963: 81) where, prior to a lesson, learners were introduced to the general context that assisted them to absorb the lesson's constituents in a wider schema.
   The cognitive approach is concerned with the phase of learning whereby the information transferred to the learner is transformed into knowledge and personal insight that is integrated into his or her existing knowledge (Rotem & Peled, 2006). These methods attempt to illuminate the "black box," those internal, cognitive, and emotional processes that occur between the phase of introducing information to someone and the subsequent outcome. They focus on processes, avoided by behaviorists, that are unpredictable and which cannot be directly mediated.
   Since 1980 educational research has to a large extent been engaged in both identifying factors that offer a significant contribution to learning and in characterizing a learning environment. On this basis Silberstein has established a model describing the characteristics of a learning environment (Silberstein & Berkowitz, 1994) whose principles are flexibility and compatibility, encouragement of choice, assistance, development of self-evaluation, democratic conduct, encouragement of internal motivation, open learning, taking advantage of information gleaned from outside sources, cooperation, encouragement of both independent thinking and assertiveness, presentation, and reasoning. Other researchers propose an ideal environment for learning oriented toward understanding as part of a computerized environment (Winn & Snyder, 1996). The Internet offers learners new learning techniques beneficial to both cognitive and interpersonal levels, and that lead to increased internal motivation and enhanced satisfaction from learning processes (Acker, 1995; Levin, 1995).

Added Value of Learning in a Virtual Environment to Facilitate Characterization of a School Website

Several studies have indicated the high potential of a virtual environment for learning and for the user's enrichment outside the classroom (Parsad, 2005). According to Winn and Snyder (1996), the characterization of computerized learning and the analysis of the learning environment's attributes referred to by Silberstein et al. (1994) are realized in a virtual learning environment.

Based on this hypothesis, six prominent facets, which are amplified in a virtual environment in comparison to other learning environments, may be highlighted:

(1) Availability of choice, both on the personal level of every learner and also as the heterogeneous response of a learning group.
(2) An ongoing, intimate dialogue between learner and teacher.
(3) Availability of unrestricted learning conditions
(4) Availability of maximum accessibility to information sources and up-to-date information.
(5) Availability of high-standard collaborative learning.
(6) Encouragement of independent work; diversified, critical thinking; and personal research.

These six facets comprise the cornerstones characterizing an online learning environment and its operation. How these characteristics are expressed in the learning process, which technology is liable to enhance, together with other extant pedagogical characteristics, are dependent solely on the teacher activating and guiding the learning. These characteristics are meant to be the guideline in every facet of a virtual learning environment, especially the school website.

Basic Assumptions in the Characterization of the School Website Derived from the Theoretical Framework of the Challenges of Education and the Integration of a Learning Environment

Based on the theoretical framework and the added value focus of learning in a virtual learning environment, as well as on the practical-pedagogical experience in managing school websites amassed by the authors of this

paper since 1995, a rationale to characterize, establish, and operate a school website founded on nine basic principles is recommended:

I. *Learning and organizational management services*. The school website is designated to provide services to operate an online teaching and learning environment and acts as a virtual organizational management environment.
II. *Restoring the relevance of school to the learner and society*. A basic principle for the authentic use of a school website is founded on the acknowledgement that a major factor in restoring relevance to school in the eyes of the learner and society is the integration of school management by means of a virtual environment encompassing every team of learners, teachers, and management.
III. *Collaborative learning in a school cluster*. The school website does not operate in a vacuum and is not established or managed by any one school, but rather as part of a cluster of schools (local or regional) utilizing the same platform. The principal factor stems from the acknowledgement of the need to learn in structured collaboration, which is an important part of high-quality learning that utilizes a virtual learning environment. The school cluster offers more diverse collaborative learning opportunities than a single school. Collaborative learning's contribution to the quality of learning was recognized in the pre-computer era by Miller and Dollard (1941). In their wake other researchers such as, Vygotsky (1978), Bandura's Social Learning Theory (1977), and Wenger and Lave's theory of situated learning (1990) expounded on the theory of the development of the learner from a societal and personal perspective. Openness: accessibility to all. The school's activity is reflected in an open section of the school website that is accessible to the general public. This has no connection with virtual personal areas that facilitate the management of a group of learners and pre-designated authorized personnel for efficient management of learning.
IV. *Uniformity*. Standards and rules of presentation must be adhered to, together with explicit, clear online management of each page and area of the school website to ensure structured and user-friendly uniformity for proper and simple usage. This will also make it easier for learning groups, parents, and teachers from other schools to participate in virtual activities.
V. *Uniqueness*. As well as maintaining uniformity, each school, teacher, and student must be able to express their uniqueness. Teachers' readiness to use a virtual environment will be greater the more autonomy they have over managing learning, designing learning environments, and making decisions on the presentation and organization of material. We found that a site managed under strict supervision and criticism of the quality of materials, the standard of teaching and how learning and teaching is implemented cannot function properly, and certainly does not reflect the school's authentic activity. The school website therefore misses its target, becomes a burden, does not provide a service, and does not lead to more efficient school management. This autonomy is also important with respect to the personal choice of the learning model according to personal or group context; it is on no account dictated by the school or by pedagogical consultants both within and outside the school.
VI. *Virtual personal area*. To facilitate efficient learning management, every user – management staff, teachers, and learners – have their own virtual personal area that operates autonomously according to their choice. It serves as a virtual locker, accessible from any computer via the Internet. The virtual locker saves learning and other materials according to personal choice. Simultaneously, the area is a site of personal and group learning management. This is all achieved with full autonomy for teacher and learner according to their choice as a response to the principle of uniformity.
VII. *Virtual area for management and teaching staff*. This area replaces lockers in teachers' lounges and the incessant correspondence between teachers and management, with students, and with parents. It serves as a forum for registration, reports, and regional and national exams, and as a liaison with educational institutions to whom the school is answerable such as, the local Department of Education, regional and national administration, and regional and national professional, pedagogical supervisory bodies.
VIII. *Resources center*. A resources center, which constitutes the management of pedagogical information accumulated in school over the years, is operated through the website.

Rationale of the School Website Structure

As in every virtual environment whose role is to integrate into the management of an organization, the organization's rationale must be defined and from this its pedagogical-organizational characteristics are derived (Oster & Rotem, 2006). It therefore follows that the structure of a school website will be described as a derivative of the school's pedagogical-organizational rationale.

The structure of school activity will be related to without elaborating upon the complicated definitions of the school's role and, through the school, the realization of education's role overall (Rotem & Peled, 2006):

1. The lesson is the smallest component of learning activity in school as far as its management is concerned. In a lesson, a learning group is activated in order to learn a particular content unit. It also achieves results through the utilization of advanced technologies of editing, production, broadcasting, and distribution and publication on the Internet.
2. A whole complex of lessons, including single lessons, comprises the topic or subject. The topic or subject is characterized by specific learning material that stands alone and is taught over a number of lessons throughout the semester.
3. A learning group may be a class, age level, or specific orientation learning groups concentrate on several topics or subjects that are taught in small lesson units.
4. The lesson, topic/subject, and class are part of the pedagogical-organizational framework of the school website.

These four components, three of which are basic components encompassing the pedagogical-organizational structure of the website, comprise the discernible foundations of a virtual learning environment. Subordinate to these are other indiscernible components fundamental to the understanding and construction of online learning tasks (the equivalent of lessons in the physical school environment), which constitute the core of actual learning. This refers to a learning object or small learning unit concerned with a narrow topic where the duration of learning is no more than one lesson, and usually only a small part of that lesson (Hodgins, 2000; Urdan & Weggen, 2000; Gibbons, Nelson & Richards, 2000). All this is conveyed on the Internet by rich, diverse digital text via a multitude of the most advanced processes from a simple webpage, word processing file, or PowerPoint presentation to an educational weblog, Vodcast, or Podcast, and even collaborative state-of-the-art products, such as Wiki and other web tools that influence teaching and learning in class (Richardson, 2006).

Accessibility of the School Website to the User

The website is organized on three levels that are accessible to the user through the following virtual areas:

I. Open to the general public and reflecting the school's marketing perspective.
II. Open only to learning groups according to the social and learning context and reflecting how learning is managed.
III. Personal areas for the learner and teacher through which they maintain direct contact with one another, with learning groups or with other activities.

The reflection and expression of school activity is expressed in the composition detailed hereunder:

(1) Lessons in practice: virtual learning tasks; the website supplements the lesson as part of the learning management of the teacher allocated to the learning groups. In addition, it supplements learning products that indirectly serve teaching such as, educational weblogs and other state-of-the-art technology.
(2) Online area of a "topic": contains all the relevant information and activity.
(3) Online area of a "subject**"**: contains all the relevant information and activity.
(4) Virtual classroom: the pedagogical-organizational management of the classroom as a virtual environment that constitutes a "home" for the learner where authentic interaction, learning, and socializing is conducted through the Internet.
(5) Personal work area for the student and teacher: manages learning. Some of the learning management is conducted in the personal area accessible to authorized personnel only.
(6) General virtual mantle of the school: contains, in addition to the five abovementioned elements, components related to the school itself such as, social and cultural activities and general information about the school.

Online Web Tools: A Service for School Website Designers

A virtual environment, such as the school website where learning groups and individuals are managed, will include online web tools intended for designers of any kind of virtual environment. The designer will integrate certain online tools according to requirements. A modular attitude toward online tools is essential to ensure the management and construction of a dynamic website. This may be achieved through a system whereby objects are integrated and connected by local and immediate context from any location with no need to "reinvent" the tool. An example would be the integration of an online bulletin board, events board, or online discussion group into the subject/topic site or a class site constructed by the teacher.

The contents of a school website's virtual toolbox include:

- Bulletin board
- Events board
- Class Timetable
- Online interaction tools: virtual discussion, online "blackboard and chalk" (tools for managing a synchronous distance lesson), and educational weblogs (Davis, 2003).

- Various online learning aids such as, "virtual lockers", exam generators, and online surveys.
- Information retrieval tools from school cluster, school, class, or other school learning groups.

The above tools will be integrated according to the needs of the website designer or the persons responsible for the virtual area in question; for example, integrating learning task such as a virtual discussion into an online learning task, class timetable, or subject bulletin board. Such an organization of online tools will prevent their decentralization as there is no justification for situating them in a single location. It is therefore possible, for instance, to integrate a survey as part of a concrete virtual learning activity rather than classifying it under the category of "surveys." Likewise, discussion groups may be integrated into a specific topic rather than a "forum" listing the discussion groups active on the website; similarly, the bulletin board may be assigned to a class or a learning group and not merely classified under "announcements."

The integration of an online web tool in the most appropriate location transforms it into a powerful force for tangible, focused pedagogy. In this event, care must be taken to ensure that the virtual toolbox, from which the tools deemed appropriate are chosen and embedded in the appropriate location and context, is made available to those responsible for the online areas of the school website such as teachers and subject coordinators.

Table 1: Online Tools Available to School Websites

Online Web Tool	**Description**	**Use**
Bulletin Board	The bulletin board will appear as a list of titles; clicking on a title will display the message content. The message content appears as digital text including photographs or animation. The titles are either static or move horizontally or vertically.	School board (e.g., on the general homepage). Class or learning group bulletin board, or concrete activity. Topic or subject area bulletin board. Bulletin board for specific fields such as projects or holidays.
Events Board	Monthly/annual board with each date indicating an event.	School events board (e.g., on the school homepage). Class or learning group events board, or concrete activity. Subject area events board. Class or age level examinations board.
Virtual Interaction	Virtual discussion	Integration into any nominated place in the school website for a designated activity. Entering all the discussions as one section is not recommended.
	Exchange of instant messages	Instant communication with parents (to cellular phones for instance); communication with students (grades, schedule changes, important announcements that must be conveyed immediately); sending photographs and lists by direct cellular link or other means to the school website; exchange of photographs and video clips between students through state-of-the-art technology.
	Online "blackboard and chalk"	Web-based lesson: an online group lesson that is usually a combination of diverse video and digital text. The lesson is conducted synchronously – in real time – thus facilitating students' questions and immediate feedback from the online teacher. Exchange of a repeat "playing" of a lesson either already conducted or pre-recorded for this express purpose, including methods such as Podcast and Vodcast.
	Educational weblog / virtual notebook	Management of unrestricted or moderated weblog and/or virtual notebook with rich digital text. The notebook is written so that the writer can save sections according to choice for his or her personal requirements that are either accessible to the teacher or to the learning group only, or to all. Likewise, the writer may permit the feedback of

		other participants in the notebook (the teacher or other learners).
	Distance learning	Structured lessons pre-prepared in an organized course similar to the instruction of the teacher and/or the online "blackboard and chalk" that constitute a course or a defined topic and serve as a supplement to the class curriculum in addition to an external school supplier as enrichment or an external increment.
	Miscellaneous	Video conference and responses to content broadcast by Podcast, Vodcast and other similar products.

It is apparent from the virtual (online and asynchronous) tools detailed in Table 1 that integration of different online interaction processes occurs in school. Despite the overriding significance of interaction in every learning process, in online lessons and assignments, its expression on the school website requires reconsideration. In general, most interaction in learning activity is expressed in the virtual discussions that have so far been explored by many researchers and which, since 2005, have been part of an educational weblog comprised of editing and updates casting tools. Hereunder are a few basic rules for the integration of interaction tools in the school website to achieve significant objectives such as learning management:

(1) Integration into a website in a location where the activity takes place: virtual tools related to a topic of activity will be integrated into the area where activity is occurring rather than in one specific area. For instance, instead of constructing a "forum" category, the forum will be integrated into the area where a discussion is being conducted; instead of constructing a "web-based lessons" category, every lesson will be held in the appropriate location: a subject or topic site.
(2) Pre-planned use: an interactive tool integrated specifically for activity in a pre-planned topic. Termination of use will occur on completion of the activity.
(3) Managing through a "tool manager": the tool will be integrated only when it is defined as a "tool manager." For example, integrating a virtual discussion into a learning task will occur when a member of the teaching staff is designated a "discussion manager." The "tool manager" will constitute the authoritative body for editing and deletion. Likewise, it will possess the required capabilities such as the ability to convey and guide virtual discussion. In certain contexts, in the event that a student is permitted to use the tool, it must be ensured that a member of the teaching staff has overall responsibility.

Planning a School Website

In planning a school website, its three areas of activity will be elaborated upon: general school area (Table 2), pedagogical area (Table 3), and community-society area (Table 4).

Table 2: General School Website Area

Item	Description
Homepage	The homepage constitutes the site map and includes the institution's logo; information retrieval (from the resources center described hereunder); "contact us"; entry of authorized persons automatically logged in to the site's online areas accessible only to authorized personnel; important messages posted on the school cluster site (to whom the school or the regional authority under discussion is subordinate); the general bulletin board, timetable, and central events board. The most important links to the sub-site areas referred to above: subject and class areas, and major areas that must be displayed prominently such as the library. Additionally, according to the individual needs of every school, there will be referrals to central areas of activity such as an online newspaper and virtual broadcasting that are of great importance to most learners and/or instructors and for the school's public relations.
About the school	"About" (the school) is a crucial part of every school website. It is accessible to all and includes the school's details: history, guiding principles and policies, management and teaching staff; orientation and subjects (specific reference to the site areas that describe the various orientations and subjects); registration and contact information; and directions (such as, maps and public transport to the school).
Society and culture	Expressions of the social-cultural operation of the school: holidays, ceremonies, projects, reports on liaison, activities with other institutions, a section for school graduates, and a memorial notice.

Table 3: Pedagogical School Website Area

Item	Description
Class site (unrestricted)	Each classroom has an unrestricted area under the responsibility of the teacher in his or her role as a sub-site manager. This is where class activity is presented, the annual curriculum (referral to subject area), teaching staff, and learning groups; class announcements of events and organizational information; timetable; events board; photograph album; online toolbox available to the learners (such as, dictionaries, encyclopedias, and atlases); special sections (recommended reading, special events, invitations to events, or obituaries); online discussion.
Class site (restricted)	Restricted to authorized personnel in every learning group.
Subject site (unrestricted)	Presentation of class subject, annual curriculum, and general enrichment sources related to the subject, learning requirements, subject teachers, subject-related pedagogical activities, bulletin board, and virtual discussion.
Subject site (restricted)	Accessible only to the learning groups and designated for teaching including learning materials, announcements, enrichment materials, exam preparation, and learning tasks.
Teacher's personal area (restricted)	Each teacher has a personal area for the management of materials in virtual lockers and for communication with other teachers and school management. Online tools integrated into this area include online learning task generators, virtual discussions or surveys (accessible to pre-selected learning groups), and the implementation of managing follow-up procedures after the assignment of learning tasks, including instructions to students and grading.
Resources center (unrestricted)	The school's organizational and pedagogical information is stored in the school's resources center as a small-scale digital school library.

Table 4: Community-Social School Website Area

Item	Description
Students (unrestricted)	Accessible to students. This area includes expression of the students' activities in school: students' council, students' newspaper, announcements oriented toward students on activities or other information, and discussion groups under the supervision of a member of the teaching staff.
Virtual locker – students' personal area (restricted)	The students have their own personal, private virtual area where learning and other materials are stored. They manage their learning in conjunction with the teacher – receiving and sending learning tasks, private mailbox, and accessibility to all the learning groups they participate in. In advanced platforms it is also possible to design a personal website with the option of making it available (either entirely or partially) to the class or to the general public.
Parents	A virtual area where parents may express their involvement in school activities. This area may be either unrestricted where parents' specific activities are presented or restricted only to the school council. Based on the experience of the authors of this paper, the participation of parents in school activities via the school website constitutes a factor motivating participation and makes a positive contribution to the school. In unrestricted class sites, parents are kept informed of the students' weekly and daily curriculum and payments due.
Graduates (unrestricted)	School graduates play an important role in the school and an online environment encourages their involvement. An active graduates' club is likely to yield benefits, both in monetary terms and in human resources (advising students in further education, offering expertise in different disciplines). An active graduates club is expressed in the site through announcements and information, organization of conferences, memorial notices, and biographies of prominent graduates.

Resources Center as a Digital School Library

The resources center constitutes a focal part of the school site where the organizational, pedagogical information of the school is digitally concentrated, stored, and preserved. It constitutes, in effect, the organizational-pedagogical memory of the school from its establishment. The ideal resources center is managed, supervised, and maintained by the school librarian or a member of the teaching staff possessing the appropriate skills. The activity output is that of a small-scale digital school library linked to similar libraries in other schools that together constitute a database of learning activity and descriptions of learning and social activities. Cataloging and classifying the materials is effected through official, professional meta-data. The online resources center is divided into two main parts:

1. Local resources center serving the school only.
2. Resources center serving the school cluster sites that are also linked to other similar resource centers and constitute a customized, digital school library.

The teachers, who usually write the material, are responsible for posting material on the website at their discretion. Material is only posted after all the details have been entered into a special digital form containing the required meta-data.

Quality control and the correct classification of material is vital for the maintenance of a dynamic, professional resources center, a center capable of meeting the needs of both learners and teachers. Accordingly, there exists a system of confirmation of publication for new material published online after inspection. However, in order to attain the full cooperation of teachers responsible for entering data into the database, caution should be exercised against rigid, over-supervision in everything related to the quality of materials.

Retrieval of information will also be implemented according to the name of the school in addition to the meta-data according to which the material is classified.

Presentation and Operation of a Virtual Environment via the School Site

With respect to the presentation of a virtual environment, the decision over "how to present what" is acquired from an analysis of the potential site user. It must relate to the habits, abilities, perceptions, and behavioral characteristics of the intended user. In order to achieve this, it must be examined from the perspective of the inclination and understanding of the average user. The organization of the student's personal online area, for example, must reflect the practices, understanding, and conduct of the average student for the designated age group. There is no pedagogical behavioral justification for a childish design because "this is what the child understands," or for flawed assumptions concerning the standard of the learning process and the abilities of the learner such as, "the student doesn't like to read/write….he/she needs only visual/dynamic information."

The golden rule that should guide site designers is to visualize the site's user in their mind's eye. Site designers tend to characterize online information services from the perspective of the information and service supplier. This inclination should be suppressed, and the perspective of the average user taken into consideration in order to provide a more convenient and accessible online service. To facilitate this, the nature of the presentation must be decided upon once the behavioral-cultural profile of the intended user has been understood. Attention should be paid to convenience, transparency, accessibility, and clarity of information for the user, even at the expense of abandoning "modern" graphics and a complex, effective (from the site designer's perspective) presentation. Although the outcome may be a more cumbersome presentation, it will also produce a clearer and more familiar environment, even if less sophisticated and "modern."

A school website is not a high-tech company site; it does not sell products and is not an arena of games and excitement for computer-addicted teenagers. There is no need to attempt to duplicate and reproduce design principles that have neither a direct link to the target audience of the school website, its aims, the emotional and behavioral character of its users, the role it is assigned, nor to learning how to use and take advantage of its online services.

The justification of an online environment is primarily to provide the target audience with a designated service that has been meticulously pre-planned; it is not intended to be educational in the sense that it causes a change of general perception that is indirectly related to the functional requirements of using the site. It may be that part of the pedagogical objective is improved and enhanced usage for learning-personal needs in an online environment. This is achieved by the mediation of the teacher through learning tasks conveyed through the environment to the learners. However, it must not be assumed that this will automatically occur and no attempt should be made to

induce it; rather than an educational factor molding and transforming, the sole purpose of the school website is to provide a service.

CONCLUSION

The objective of the school website is to provide a pedagogical response to the needs of the school and to constitute an efficient, organized, online learning environment. This paper presents the characteristics of an online learning environment from the organizational-marketing and pedagogical perspectives of the school and proposes a rationale for the school website founded on several basic principles: providing learning management and organizational services to the school; restoring schools' relevancy to the learner and to society; making the site accessible to all; maintaining consistency and providing explicit, clear online management of all web pages; meeting the special needs of each school, teacher, and student; providing an automatic personal virtual area for every learner and management and teaching staff user; providing a virtual area for management and staff as an alternative to lockers in teachers' lounges and the incessant correspondence that is a feature of schools; and a resources center to manage the school's accumulated pedagogical information.

The recommended site is organized into three levels: an online area accessible to the general public, restricted areas accessible to learning groups to facilitate learning, and personal work areas for teachers and students. Available to the site designers is a virtual toolbox whose tools may be integrated into every area; the tools include a bulletin board; an events board; a timetable; tools facilitating online interaction; various online learning aids, such as exam generators; and tools for information retrieval from the Internet.

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1. Pythagorus of Samos (*c*.569-475 BC).

2. Laws such as the Digital Millennium Copyright Act (DMCA) restricting free accessibility to Internet entertainment. The law was passed in the United States in 1997; in the ensuing years many rulings have been made against open cooperation on the Internet and legal obstructions whose purpose is to terminate the cooperation are increasing, a phenomenon that is alien to those raised on the PreNet paradigm of enlightened capitalism and neo-capitalism.

3. There is a certain amount of logic to the claim that a firm distinction should be made between BI and Knowledge Management (KM). While BI is practicable and important, KM is unrealistic because it relates to the personal knowledge of every employee in an organization. This personal knowledge may only be managed if the employee transforms it into public information through publication.