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Student readiness for technology enhanced history education in Turkish high schools

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Abstract

This study examined whether the Turkish high school social sciences major students would feel adequate and fit in a technology-enhanced educational environment, particularly in history classrooms. To this extent, this study investigated high school students' level of proficiency in technology-use and their attitudes toward the use of educational technologies in classrooms. The data for this study was collected using Kolb's Learning Style Inventory (LSI Version-3) and a 27-item Technology Questionnaire. The results revealed that from the point of proficiency and attitude Turkish high school social sciences major students have the essential technology skills and knowledge to feel adequate in a technology-enhanced learning environment. They also have positive attitudes toward use of educational technologies in history classrooms. Therefore they seem to be ready for technology-enhanced instruction.

Keywords: Student readiness; technology enhanced education; history education; attitude; learning style preferences.

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1. INTRODUCTION

When the Republic of Turkey was founded in 1923, the founding father, Mustafa Kemal Atatürk set a national goal for the young republic: to reach to the level of developed countries in every area. The Turkish revolution started with education; the Latin alphabet was adopted, a compulsory education system established, and education was secularized and unified. To modernize educational institutions, the Turkish government asked for help from well known educational theorists such as John Dewey, Alfred Kuhne, Omer Buyse, and Albert Malche (Guvenc, 1998). Recently, the Ministry of National Education (MNE) launched an extensive reform program as a part of Turkey's candidacy process to join the European Union (EU). This reform program includes; restructuring the educational organization,

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management, and teacher training programs, extending the period of compulsory education, developing new curriculum and re-writing textbooks based on EU standards, placing more emphasis on vocational technical education and technology education (MNE, 2002).

After all of these years and reforms, it seems that Turkey hasn't been able to reach her national goal yet. Therefore, it has been accepted and proclaimed by the present Turkish Prime Minister Tayyip Erdogan that Turkey has failed in her transition process from a traditional agricultural society to an industrialized one. The Turkish Prime Minister declared his ideas during the 2nd Council of Informatics (November, 2004) and set a new objective for the Turkish nation, which is to "become an information society."

Through technology-enhanced education in which various media and computer related technologies are used in classrooms to support teaching and learning, students can learn "with and from" (Reeves, 1998) technology. The use of educational technologies in classroom activities and including technology literacy into curriculum can help to establish what is called "the information society."

1.1. Educational Technology in Turkey

The effort of utilizing various technological materials in education goes back to the very foundation of Turkish Republic under the goal of modernizing educational system. In this context, a school museum was established by MNE to exhibit educational technology materials and equipment. Also those materials such as maps, projectors and laboratory equipment were sent to schools to be used in classrooms. In 1961 the Teaching Materials Center was founded in Ankara (Alkan, 1998). Distance education system was introduced to Turkish educational system in 1961 with the establishment of Instructional Center for Distance Learning to spread literacy nationwide at every level of education. In 1962 the Center of Educational Radio was founded to broadcast educational programs for students (Alkan, 1998). Distance education at the college level was started in 1983 with the establishment of Anatoly University's Open Education Faculty in Eskisehir. The goal was to offer college level programs to high school graduates who cannot attend regular colleges (Akkoyunlu, 2002). Through distance education, principles of Basic Law of National Education were put into action such as "education everywhere" and "continuity."

Today many Turkish universities offer distance education through the Internet. Before the Internet, radio and TV were the main tools in distance education by which distance education programs were broadcasted by TRT (Turkish Radio and Television) with the support of MNE and Anatoly University. Today, TRT still broadcasts daily radio and TV programs on its educational channel, TRT-4, for primary, secondary and undergraduate education.

Computers have been used for commercial, industrial and scientific purposes in Turkey for a long time. But the use of computers in the educational system was limited to universities and a few technical schools until the 1980s. In 1984 MNE launched a pilot study on computer-based education collaborating with 24 universities and nine private computer companies. With this pilot study, 750 teachers were trained on integration of computers into the curriculum, 2988 computers were allocated at various secondary schools, and several courseware packages were developed (Schware & Jaramillo, 1998). The General Directorate of Educational Technologies (EGITEK) was established in 1992 under the responsibility of MNE. It aimed for the integration of educational technology into schools, training the teachers, and improving computer-based education. EGITEK supplies educational materials (video, audio, picture, graphs, and excerpts) and interactive resources (such as internet TV and internet radio) over the Internet for students in formal and informal education.

In 1995 MNE co-operated with the Scientific and Technical Research Council of Turkey (TUBITAK) to produce educational software for geography, history, Turkish, and science. In 1999 all educational institutions were connected via intranet connection under the project called MEBSIS. This project made sharing information easier for school administrations, teachers and students. In 2003 MNE came to an agreement with Turkish Telecommunication Company (TT) to connect its 42,534 institutions around the country to the Internet via DSL. With this project 20,000 institutions and 300,000 computers were connected to the Internet in 2005 which means 86% of secondary schools and 95% of secondary school students have gained access to the Internet. MNE has also made an agreement with a computer company to deliver a lap-top computer to each one of the 650,000 teachers. MNE also works with international organizations and companies to expand the use of computers and the Internet at schools and home. In this context MNE works with Intel Corp. to translate their interactive learning portal called "Skool" in Turkish for math and science, MNE also made an agreement with Intel and Microsoft to produce less expensive personal computers for schools and lower income Turkish families.

1.2. Conclusion

The reasons for placing computers in schools vary from country to country. The Turkish Ministry of National Education's policy is to meet the national need for catching up with the age of technology. The Ministry of National Education declared a policy of widespread introduction of computers in schools. However MNE needs time and huge amounts of funding to train personal and to buy expensive technological equipment and software in order to implement that policy. Despite the fact that the share of education in the General Budget has increased in recent years; 1) a lack of infra-structure (school buildings and classroom), 2) a lack of teachers, 3) the lack of educational technology materials, and 4) rapidly growing number of students makes it difficult to meet all these existing needs.

These are quite expensive needs, and in a time of economical crisis one does not have the luxury of trial-and-error to find the best working solution. To reach its goal from its current condition, Turkey needs to make wise decisions and the very first step in this decision process is to know your target audience. Knowing Turkish students' learning style preferences and their levels of involvement with today's technology can help us to know better our target audience (students) and help us to choose the right materials and methods to prepare our young generations for the information age.

2. SUBJECTS AND INSTRUMENTATION

2.1 Subjects

The target population for this descriptive study was tenth and eleventh grade Turkish high school students majoring in social sciences. To obtain the maximum number of participants from the targeted population involved in this study, help was needed to administer the instrumentations in different provinces and cities. Seven people were asked to help administer these instruments at the schools accessible for them. Therefore, 1350 students (out of 6140 10th and 11th graders) from 15 high schools in 13 cities in 8 provinces became the convenience sample of this study. Frankel, Wallen and Sawin (1999, p. 36) describe the convenience sample as "a group of subjects selected not because they are representative of a specific population, but because they are (conveniently) available."

2.2. Instrumentation

Required data for this study was collected by a “Technology Questionnaire” and “Kolb’s Learning Style Inventory, Version-3.”

a) Technology Questionnaire: The 27 item (26 Likert scale questions and one open ended question) “Technology Questionnaire” was developed by the researcher to gather data on three sections: 1) demographic information, 2) students’ computer and the Internet knowledge, and 3) students’ attitudes toward use of educational technology.

b) The Kolb’s Learning Style Inventory-Version-3 (LSI-3): The LSI was designed to describe the ways people learn and how they deal with ideas and day-to-day situations (Kolb’s LSI version-3). Kolb (1984) theorized that the process of learning has two dimensions; perceiving and processing. Perceiving relates to either Abstract Conceptualization (AC) or Concrete Experience (CE), and processing relates to either Active Experimentation (AE) or Reflective Observation (RO). In this model people perceive data by experiencing or thinking, and they process this data by reflecting or doing, and these preferences determine ones learning style.

The LSI version-3 is a 12-item questionnaire by which respondents attempt to categorize their learning style. Each item requires respondents to rank the given endings from 4 (most like you) to 1 (least like you). By adding these scores in a given order respondents can find their strong and weak learning modes described by Kolb. Kolb named these learning modes as; Reflective Observation (RO) - Reflector, Abstract Conceptualization (AC) - Theorist, Active Experimentation (AE) - Activist, and Concrete Experience (CE) - Pragmatist.

3. RESULTS

The results of this study are presented under three major sections: 1) demographic information; 2) students’ readiness toward technology-enhanced history education; and 3) students attitudes toward use of educational technology in history classrooms.

3.1. Demografic information

The Technology Questionnaire and Kolb’s Learning Style Inventory were used in this study to collect background information on the participating students. These two instruments supplied demographic information such as gender, grade, residence, participant’s reasons to choose social sciences as a high school major, learning style preferences, learning method preferences, access level to various technologies at home, and the level of technology use in social sciences courses.

A total number of 1350 high school students participated in this study from 15 high schools in 7 provinces. Both, small towns, which had a population as low as 13,000, and major big cities were included in this study to get clearer picture of the situation. Among the 1350 participant students 68% (n= 922) were from big cities, and 32% (n= 428) were from small towns. Since high school students pick their major after 9th grade, only 10th and 11th graders were included in this study. Among the 1350 participants of this study 64% (n= 865) were 10th graders, and 36% (n= 462) were 11th graders. With regard to gender 46% (n= 622) of the participants were female, and 54% (n= 721) were male.

3.1.1. Student’s Learning Style Preferences

Kolb’s Learning Style Inventory, Version-3 was used in this study in order to identify Turkish high school student’s learning style preferences.* Responses to Learning Style Inventory were added in given order to find out participant’s Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC), and Active Experimentation (AC) scores. Turkish student’s mean scores for each mode were also compared with USA sample, which also conducted by using Kolb’s LSI, Version-3 in 2005 with a sample of 1,446 adults between the ages of 18 and 60 (Kolb LSI, 1999). The comparison shows that mean scores for each mode are quite similar in both studies (Table 1).

Table 1. Learning Modes (Comparison between the USA and Turkey)

	Mean		Standard Deviation	
	USA	Turkish Students	USA	Turkish Students
CE	26.00	25.85	6.8	5.69
RO	29.94	30.18	6.5	5.05
AC	30.28	30.68	6.7	4.76
AE	35.37	32.94	6.9	5.45
AC-CE	4.28	4.83	11.4	8.48
AE-RO	5.92	2.42	11.0	8.49
Chi-square	0.0748			
p	1.			

The result of the learning style inventory shows that all four learning style preferences are present among the Turkish high school students. Among the participant students 34% of them have an assimilator type learning style preference, 30% a diverger, 22% a converger, and 14% an accommodator type learning style preference. These results were compared to see if any difference exists in the distribution between females and males, 10th graders and 11th graders, and students living in big cities and those living in small towns. At the 0.05 level significance tests show that gender, grade and residence make no significant difference on student’s learning style preferences.

3.1.2. Student’s Access Levels to Various Technologies at Home

Participants were asked to answer which of the given technological devices they have access to at home. The responses showed that among the given technological devices the majority of the participants have access to TV, phone, Video CD or DVD player, and radio. Access level to PC, the Internet and game console turned out to be relatively low (see Figure 1).

* This inventory requires participants to finish all of the 12 sentences by ranking given endings from 4 (most like you) to 1 (least like you). If one or more sentences are left unanswered or answered wrong the inventory is accepted as incomplete, therefore it cannot be used. Among the 1350 participants of this study, 879 (65%) of the responses turned out as either not answered, partially answered or answered incorrectly. Therefore, the response rate for LSI was only 35% (n=471), It’s turned out that the instructions on Kolb’s LSI Version-3 were not clear enough to get proper responses from Turkish high school students. More examples and clearer instructions were needed.

These findings of access levels seem to be consistent with other studies. NSI (National Statistics Institute, TUIK) statistics shows the internet usage level of general Turkish population is 18.57% in urban areas and 6.05% in rural areas between the ages of 16 and 74 in year 2005. The use on internet rate is 11.5 for females and 23.9 for males. In this study the Internet usage rate is 11% for females and 19% for males among the participant students.

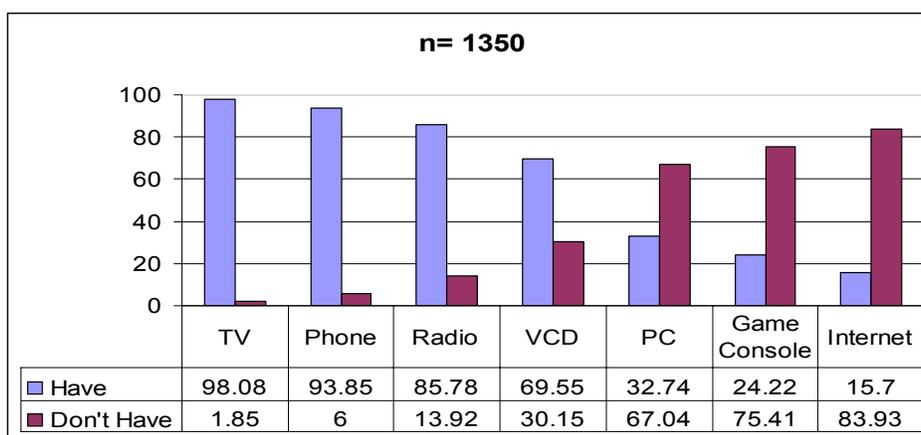


Figure 1: Technology Access Levels (%)

Comparing participant’s access levels to these technological devices by their residence shows that residence makes a difference in access levels for all given devices except for game console. The level of difference is especially bigger on PC access levels. Significance test shows that (see Table 2) students living in big cities have significantly higher access levels to given technological devices than students living in small towns, except for game consoles.

Table 2. Access Level to Various Technological Devices by Residence

Device	Big Cities		Small Towns		Chi-square	p
	N (Have)	%	N (Have)	%		
TV	911	98.8	413	96.7	6.979	0.01
Phone	874	94.9	393	92	4.223	0.05
PC	349	37.9	93	21.8	34.524	0.001
CD/VCD	666	70.9	273	63.9	10.069	0.01
Internet	160	17.4	52	12.2	5.936	0.025
Radio	814	88.5	344	80.2	14.467	0.001
Game Console	236	25.7	91	21.4	2.951	0.10

3.1.3. Level of Technology-use in History Courses

Even though the use of technology in education goes back as early as 1961 the levels of use for various educational technology materials are still low (see Table 3). Based on participant student’s responses, most of the time educational technology materials (TV, VCR, audio tapes, PC, Internet, and overhead projector) are not being used in history classrooms (Table 3). For any of the listed educational

technology materials included in this study, the level of usage at any frequency (including rarely usage) never exceeded 32% and it dropped as low as 14% (see Table 4).

Table 3. Level of Educational Technology Use in Social Sciences Courses (Ranked by mean scores)

	<i>N</i> [†]	<i>Score Range</i>		<i>Mean</i>	<i>Standard Deviation</i>
		<i>Min.</i>	<i>Max.</i>		
History	766	0	4	1.0206	1.13385
Geography	746	0	4	.9608	1.14834
Foreign Language	729	0	4	.9470	1.16348
Turkish Literature	744	0	4	.9211	1.17086
Philosophy & Psychology	740	0	4	.7212	1.09931

Table 4. Level of educational technology use in history classrooms.

		OH Projector	TV	PC	CD / VCD	Internet	VCR	Audio Tapes
Valid N		633	692	635	641	633	640	620
Missing		718	659	716	710	718	711	731
Mean		1.09	1.07	.83	.79	.73	.66	.38
Std. Deviation		1.522	1.344	1.304	1.181	1.299	1.165	.896
Valid %	Almost Never	59.6	52	63.6	60.2	70.9	69.8	81.3
	Rarely	8.4	15	12	17.2	7.7	10	6.9
	Sometimes	11.8	16.9	9.9	12.2	7.9	9.2	7.1
	Frequently	4.3	6.5	6.3	4.5	4.7	6.1	2.3
	Almost Always	16	9.5	8.2	5.9	8.7	4.8	2.4

This low level of educational technology usage was consistent across big cities and small towns, although it was higher in big cities than in small towns.

When compared with other courses, history turned out to have the highest educational technology usage level among social sciences courses (see Table 3). History is followed by geography (in general and in small towns) or by foreign language (in big cities). Among the given educational technology materials, the overhead projector is the most often used material in history courses (followed in order by TV and PC, CD/VCD, the Internet, VCR, and audio tapes). In social sciences courses in general, however, TV is the most often used educational technology material followed in order by PC, CD/VCD, the Internet, VCR, overhead projector, and audio tapes.

3.2. Student Readiness

The objective of this study was to examine Turkish social sciences major student’s levels of readiness for technology-enhanced education. In this study both cognitive (thinking, knowledge), affective

[†] The average return rate for these questions (questions 15-19) was 52%. Probably some of the participant students thought it would take too long to answer all these questions in proper way. Therefore 48% of the participant students decided not to answer these questions or answer them all with “0”s. In order to produce a healthier conclusion from these questions, participants who did not answer any of these questions at all or answer them with nothing but “0”s were not included in this analysis.

(feeling, attitude), and psychomotor (acting, skills) abilities of students were targeted under student readiness. These abilities altogether play a key role in determining student's levels of fitness in a technology-enhanced educational environment, which will have dramatic effects on their motivation and achievement. If the students lack cognitive and psychomotor abilities in computer-use and the internet-use, they may feel deficient when they are asked to use relatively complicated educational technology materials (such as Word, Excel, Power-point etc.). Or if the students have negative attitudes toward the use of technology in education then they might develop a dislike toward a technology-enhanced education approach.

3.2.1. Level of Proficiency

Students need to acquire at least the basic knowledge of how to use a computer and the Internet in order to feel proficient in a technology-enhanced educational environment. Thus, in the Technology Questionnaire students were asked to rate their level of proficiency (from never tried to expert) on both computer and the Internet knowledge in order to reveal participant student's level of proficiency in computer and the internet use.

a) Computer Knowledge:

Student's level of computer knowledge is examined under four areas;

- 1) Basic computer knowledge; exploring through the files, finding, opening, and carrying a file on a Windows-based operation system.
- 2) MS Word knowledge; student's expertise on using MS Word was examined with two questions in Technology Questionnaire, one targeting creating a basic word document, and second one targeting creating a more complex word document with tables, figures, and pictures.
- 3) MS Power-point knowledge; creating a presentation by using MS Power-point.
- 4) MS Excel knowledge; creating datasheets, tables and figures, and making calculations by using MS Excel.

Most of the participant social sciences major students rated themselves very well experienced on the four areas of computer knowledge examined in this study. The rate of students who rated themselves as having no experience on the given four areas of computer knowledge was always under 50% (the lowest is MS Word with 19.1% and the highest is MS Power-point with 44.2%) (see Figure 2). The effect of gender, learning style preferences and residence on student's computer knowledge was examined. Gender was correlated with computer knowledge, since fewer males rated their level as beginner than females, and more males rated their level as expert than females ($df= 3$, $p= 0.001$). There were no significant correlations between learning style preferences and residence with basic computer knowledge.

b) The Internet Knowledge:

Student's knowledge of the Internet is examined under three areas;

- 1) Research: searching course related information on the Internet.
- 2) Communication: communicating over the internet with e-mail and chat.
- 3) Creating a web-page.

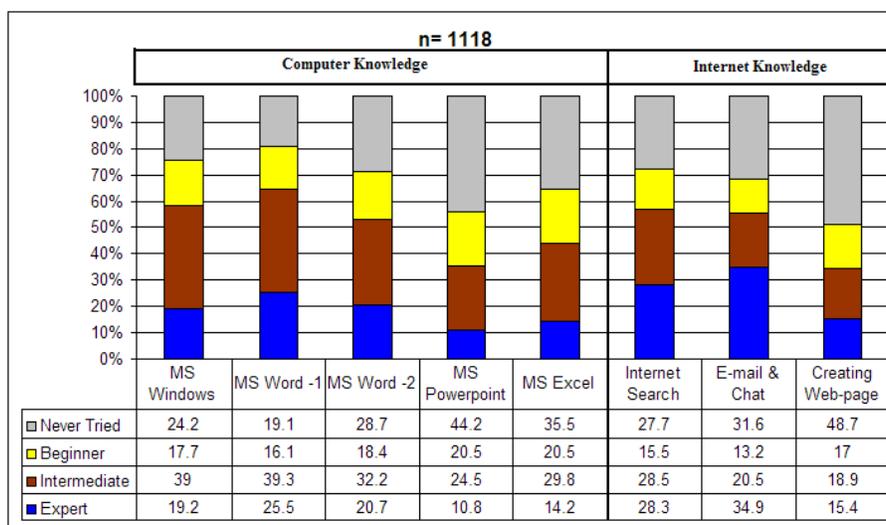


Figure 2: Computer and the Internet Knowledge

Social sciences major students also rated themselves well experienced on the three given areas of the Internet knowledge (see Figure 2). Creating a web-page seems to be the area in which Turkish social sciences students have the least experience, which is reasonable since it is a skill that requires a good combination of all of the skills examined in this study. Still less than half (48.7%) of the students stated that they never tried to create a web-page, the rate is much lower for other Internet related skills. Once again fewer males rated their level as beginner than females, and more males rated their level as expert than females ($df= 3, p= 0.001$) on the Internet knowledge. No significant effect was found on this distribution for learning style preferences or residence with the internet knowledge.

Results showed that there was a consistent difference between female and male students on the levels of computer and the Internet knowledge. This finding is also coherent with other studies such as the National Statistics Institute’s (NSI, TUIK) findings on technology use, where the average internet use in Turkey is 11.5 % for females, and 23.9% for males.

These results were also compared with participant student’s technology access levels to see if higher access levels of technology lead to better computer and the Internet knowledge. It can be seen in Figure 2 that 32.7% of the participating students have access to personal computer and 15.7% have access to the Internet at home. A measure using the Pearson Product Moment Correlation showed that there was a significant correlation between technology access level and computer and the Internet knowledge (see Table 5).

Table 5. Correlation between Technology Access Level and Computer and the Internet Knowledge

		Technology Access Level	Computer and the Internet Knowledge
	Pearson Correlation	1	.406 ^a
Technology Access Level	Sig. (2-tailed)		.000
	N	1349	1314
	Pearson Correlation	.406 ^a	1
Computer Knowledge	Sig. (2-tailed)	.000	
	N	1314	1315

^a Correlation is significant at the 0.01 level (2-tailed).

3.3. Attitudes

Even though modern and varied teaching methods are encouraged by the Ministry of Education, traditional teaching methods such as lecture are still vastly used in Turkish schools. The traditional teaching method gives the most important role to teachers. This study examined this notion, and tried to discover the most important element of education in the eyes of Turkish high school students.

On the Technology Questionnaire participating students were asked to rank the seven elements of education (teacher, textbooks, educational technology materials, school building, library, sports, and social activities) from least important to most important. Students' responses to this question show that social sciences major students perceive 'teacher' as the most important element of education followed by textbooks. Educational technology materials came in third in their ranking.

When compared by gender, the rank changes: For example educational technology materials comes in second in male student's ranking after teacher, while it ranked in fourth in female's ranking after teacher, textbooks, and library). Also female students gave more emphasis on teacher, textbooks, and library than male students, while male students gave more emphasis on sports than females. The top three in this ranking did not change when compared by grade, residence, and learning style preferences.

So the students still see educational technologies as less essential than the teacher (in some cases teacher and textbooks) in the educational process. On the other hand, a majority of participant students agreed that involving more educational technologies in classroom activities would help them focus their attention, learn the content better, and improve their academic achievement. When they were asked about their opinions on involving more educational technologies in classroom activities 77% agreed (strongly agree and agree) that they can learn better with technology assistance compared with 4% disagreed (disagree and strongly disagree). Among the participating students 65% agreed that involving educational technologies in classroom activities would help them focus their attention compared with 7% who disagreed. Also 65% of participant students agreed that involving more educational technology in classroom activities would improve their academic achievement compared with 8% who disagreed. Participant students were also asked if they saw educational technologies as wasting time and money. Only 11% believed so, while 70% of participant students did not see educational technologies as wasting time and money.

When students were asked their opinions on involving more educational technologies, specifically in history classrooms, 81% stated that they can understand a historical topic better if they watched a movie or documentary on it, only 6% disagreed with this statement. Even though many students saw the textbook as more essential than educational technologies in general, only 27% of them believed that history can only be learned from books, and 43% of participant students disagreed with this statement. Overall the responses show that Turkish high school social sciences major students have positive attitudes toward using educational technologies in classroom activities.

Educational technology contributes to both educator's and student's lives in various ways. For students, these contributions include, but are not limited to, improved retention, attitude, and achievement; higher engagement and test scores; and richer classroom content. In this study, social sciences students were also asked in what areas (such as; finding resources, reinforcing what they learned in school, or putting fun in learning) they found educational technology to be most helpful in their daily and school lives. In general, students found educational technology to be helpful in all of the given areas since the lowest mean score for any of the five areas is 2.5 out of 4. Students consider educational technology to be most helpful in reinforcing the content being taught in the class followed by finding resources.

4. CONCLUSIONS

Four fundamental findings have been emerged from the data collected for this study. These are;

1. *Turkish high school social sciences students have the necessary skills and knowledge to feel adequate/fit in a technology-enhanced education environment.*

Results show that regardless of their grade, gender or residence most of the Turkish high school students have a high level of proficiency in basic computer (MS word, MS Excel, and MS Power-point) and the Internet (communication and research) use. With these results it can be concluded that Turkish high school social sciences students seems to be ready for technology-enhanced education.

2. *Turkish high school social sciences students have positive attitudes toward use of educational technologies in history classrooms.*

Participant students of this study believe that they can learn and understand history better if more educational technology materials are integrated in classroom activities. They also believe that the use of educational technology can help them focus better and improve their academic achievement. Social sciences students support the effort to put more educational technology in classrooms, and they do not see these efforts as wasting time or money. And finally they do not see textbooks as a main (most of time the only) resource to learn history. Overall Turkish high school social sciences major students have positive attitudes toward involving and using more educational technology materials in history classrooms.

3. *Current history education program in Turkish high schools (which mostly use lecture, narration, and dictation) favors only 1/3 of the students preferred learning style while ignoring learning styles of 2/3 of the students.*

One of the objectives of this study was to explore the learning style preferences of Turkish high school social sciences students to determine what individual differences might exist. This objective was chosen because the literature shows that history teaching in Turkey is dominated by the narrative approach (Ozbaran, 1994); it focuses on dictation and memorization[‡] (Aksin, 1975; Safran, 1993); and it is not designed to teach history in an active way (Demircioglu, 2002). By looking at these characteristics it can be easily interpreted that history teaching in Turkey is not designed to serve students with different learning style preferences. This type of teaching can only be effective for students who prefer abstract conceptualization and reflective observation (as described by Kolb, 1984) while learning. Kolb defines this type of learners as “assimilators,” and it is the assimilator who prefers learning through lectures, theory readings, thinking alone, case studies, papers, and analogies. If other learning style preferences exist among Turkish students, current history teaching which focuses on lecture, narration, dictation and memorization would not be as effective for them as much as it is for students with the assimilator type learning style preference. Based on Kolb’s Learning Style Inventory (Version-3) that was used in this study only 1/3 (34%) of the participant students (n= 471) have an assimilator type learning style preference, the rest (2/3) have other types of learning style preferences; diverger (30%), converger (22%), and accommodator (14%). That means the style of current history teaching in Turkey does not address 2/3 of the students’ preferred mode of learning in an appropriate way.

4. *Schools need to provide more access to computers and the Internet in order to*

- a) *Ensure equal opportunity for all students*
- b) *Decrease the negative effects of internet cafes*

[‡] Some of the participant students (9%) who picked up social sciences thinking that they can do better in this area (n= 353) did so because social sciences courses involves more memorization (p. ?).

Results from this study also showed that Turkish high school students have a high proficiency level on computer and the Internet use. But the question is: where do they learn how to use these technologies? As previously mentioned, participating students' access levels to personal computer and the Internet connection at home is very low; 32.% for personal computer and 15.7 percent for the Internet (see Figure 1). In this case they are learning/using these technologies either at school or at the Internet cafes. As discussed before the level of technology use in Turkish high schools is very low. These results are also coherent with the NSI's findings which revealed that only 8.77% of the students reported they get access to computer and the Internet at school. The insufficiency of access to the computer and the Internet at school or home is filled by internet cafes in Turkey. NSI's statistics reported that 36.6% of the Turkish population have access to computer and the Internet at internet cafes. This rate is higher for people living in rural areas (where there are fewer computers in homes), where 47.37% of the population have access to computer and the Internet through internet cafes compared with 34.56% in urban areas.

As a developing country, it would take quite long time for Turkey to provide all students with access to a personal computer and the Internet connection at home even with the "\$100 laptop computer project." It would be much easier and less expensive if Turkey were to put more computer labs in schools and libraries especially in lower income areas. This would also help to diminish the role of internet cafes in offering access to computers and the Internet for young generations in Turkey. Right now 47% of the general population in rural areas and 35% in urban areas have access to computer and the Internet through the internet cafes. Internet cafes carry out a very important public service in Turkey for the general population. But for the younger generation their service is controversial. First of all, minors are out of their parents' or teachers' supervision in internet cafes, where they can easily access to inappropriate web-pages or games. According to current regulations, internet cafes must be smoke-free areas, minors under 12 years old should not be allowed to use these facilities, and any access to inappropriate web-pages or games must be prevented. But recent inspections show that many internet cafes do not obey these regulations. In fact most of the time children (even under 12 years old) use these facilities to play violent multiplayer video games. In a country where the violence in schools is becoming a very big problem, it would be very wise to prevent youths' access to inappropriate web-pages and violent games. Since, it is not an easy task to control the thousands of internet cafes that are spread out across the country, a better way to do it is to offer access to computers and the Internet for the younger generation in places that are more reliable and secure, that is in schools and libraries.

Giving schools a more active role in offering access to technology is also a requirement for the Turkish educational system due to the "equal opportunity" principal of national education. From the point of the young generations' technology access and technology knowledge, the current situation does not grant equal opportunities especially for females and students from lower income families. As stated in the results section, male students have higher proficiency levels in computer and the Internet use than females. The difference results from more technology access opportunities. Even though there was no gender difference on technology access levels at home or at schools, access levels are different for males and females at internet cafes. Internet cafes in Turkey are mostly used by males. Therefore the overall technology access level of females is lower than males, which is possibly the main reason why females have lower proficiency levels in computer and the Internet use. Similar to females, students living in rural areas have less access levels to computer and the Internet at home than students living in urban areas. They also have lower proficiency levels in computer and the Internet use when compared with students living in urban areas. Therefore in order to prepare the nation as a whole (across from gender and socio economic status) for the information age the Turkish educational system should consider increasing available educational technologies in schools especially in rural areas.

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