Advanced Research & Studies Journal

Open Up The Perspectives Of Students In The Field Of Teaching Historical Subjects Using Virtual Museums

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Abstract

The study was made to determine whether the attitudes of the open education students, will be changed or not by a virtual museum application. A pre-test / post-test experimental design model of was used in this research. The experimental group was comprised of 20 students. The pre-test was given to the group before the study and the post-test was administered at the end of the study. T-test analysis of the data was used to determine whether the attitude scores of open education students was changed or not based on their level of computer knowledge. In the qualitative section, students were asked open-ended questions and their answers were given in a frequency table. The data was analyzed in two phases. In the first phase, T-test, arithmetic mean ($\square$) and standard deviation (Ss) were used to analyse the pre-test and post-test data using the SPSS 11.0 statistical programme. The significance of the data was tested at the 0.05 level of significance. A significant difference in student opinion was found in data gathered to measure attitudes towards the history lesson after the application. The students had a favourable opinion of the virtual museum application in history lessons after observing the various documents and resources.
Keywords: distance education students, virtual museum, history subjects.

Introduction

A museum is important institution which provides detailed information about science, history, art, and life styles of ancient societies to enlighten people now and in the future. As Hetherington (2006) stated, a museum is a key institutional space of modernity implicated in addressing the changing character of experience in the present. A formal definition of museum comes from several sources. For instance, according to International Council of Museums (http1) a museum is a "permanent institution in the service of society and of its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment, for the purposes of education, study, and enjoyment". Another definition of museum is expressed as "Museums enable people to explore collections for inspiration, learning and enjoyment. They are institutions that collect, safeguard and make accessible artefacts and specimens, which they hold in trust for society." by The UK Museums Association (http2)

According to Giral and Dixon, (1996), museums provide images and information. The researchers stated that these images and information could be used by educational institutions for educational purposes. However, recent reports show that annual attendance at many museums is falling. Young people, often

the museum's core audience, have markedly different attention spans compared to previous generations, and have radically different expectations. Many young people see museums as boring and irrelevant (http3). Therefore, according to Giral and Dixon, (1996), considering the falling rate of the annual attendance and the major desire of the museums to make their collections more widely known, publication of objects in electronic format provides students opportunities to visit a museum and access images and information easily. Educators can also access these images and information from museum collections all over the world in electronic format and provide images for lectures, publication, and other teaching purposes (Giral, Dixon , 1996).

Virtual Museums. According to Swank (http), after the invention of printing, the internet (and the WWW) is the most important revolution in the world of human communication. In her critique, she stated that the transformative process from written world to a printed one and the implications of this new way of delivering information and creating knowledge was not immediately accepted nor fully understood by society, nor were the technological innovations used at their full potential. As Bowen (2002) stated, the web is being increasingly used by a wide variety of people, and in all important industrial and related sectors, such as broadcasting, newspapers, hospitals, police, government, etc. Like other sectors, museums have been learning to use the World Wide Web technology at a rapid rate since it has become widely available from the mid 1990s onward. In addition, research into learning and teaching with Internet technology has been widely recognised and discussed in recent years (Omale, Hung, Luetkehans and Cooke-Plagwitz, 2009). According to Omale et. al. (2009), one of the most exciting trends in the field of education is the development of 3-D virtual environments.
Twining (2009) stated that the virtual world provides the ideal vehicle for different models of education for two reasons:

- It allows you to do things which it would be difficult or impossible to do in the physical world—both literally and pragmatically. Pragmatically, it is difficult and expensive to set up a new learning community in the physical world than in a virtual world. Literally, there are things you can do in virtual worlds that are not possible in the physical world; such as flying like a bird (without even having to flap your arms).

- Our experiences of virtual worlds suggested that these are spaces which encourage playfulness and testing of boundaries.

According to Veltman (2001), while the earliest experiments with electronic media in the museum world go back nearly three decades, it is only in the last decade that computers linked via the Internet have become a serious topic. In addition, Novak stated that rapid development of technology results in the new paradigm of museum. Such new challenges as extended types and attributes of media require rethinking the conventional concept of museum (Kwon, Hwang, Lee, Lee, Suhl and Ryu (2003). As Sully (2006) wrote, after the Internet and computers became available, museums realized that they could use the new technologies, not only to manage their collections, but to make their collections accessible to other institutions and their onsite public. In addition, Swank (http) reported that these new technologies provided people with opportunities to visit a museum, the virtual museum, where people can interact with objects, create their own space, express their information needs and so forth.
With the use of new technologies mentioned above, Veltman (2001) stated that the Internet can offer virtual online exhibitions, which otherwise would not be physically feasible. He then emphasized that virtual exhibitions bring fascinating subjects in the sciences and humanities to life by combining text, pictures, video and sounds. These exhibitions can be used as resources for a multitude of subjects, such as history, art and environmental studies.
The creation of virtual museums (or digital museums), as Schweibenz (1998) stated, is a way to reach the audience in a new, more constructive way. A remote user can reach virtual museum services through the Internet with a personal computer. Virtual museums, generally known as virtual libraries, are web sites that contain collections of digitized artefacts and information resources. They can contain text,

Advanced Research & Studies Journal

photos, movies, audio files, maps, graphs, and links to other sites in the Internet (http4). Besides this general definition, Veltman (2001) gave two quite distinct definitions to the term, "virtual museum":

1. It can mean an electronic version of an existing physical collection. In the interests of clarity we shall call this a digital museum.

2. It can mean an imaginary museum without any necessary physical counterpart.

This second meaning has grown partly out of the vision of the French diplomat and author, André Malraux, who introduced the idea of an imaginary museum (*un musée imaginaire*) long before the Internet existed. André Malraux's famous idea about the imaginary museum without walls was presented in 1947. The main factor behind Malraux's questioning of the traditional role of the museum institution was the spreading of photography. The ever-present photographic reproductions of artworks made art accessible to audiences who would never have entered a museum (Huhtamo, 2002).

On the other hand, Lewis described the "virtual museum" as a collection of digitally recorded images, sound files, text documents, and other data of historical, scientific, or cultural interest that are accessed through electronic media. A virtual museum does not house actual objects and therefore lacks the permanence and unique qualities of a museum in the traditional definition of the term (in Schweibenz, 1998). According to Hoptman, the virtual museum provides multiple levels, perspectives, and dimensions of information about a particular topic: it provides not only multimedia (print, visual images through photographs, illustrations or video, and audio), but, more importantly, it provides information that has not been filtered out through traditional methods (in Schweibenz, 1998).

A virtual museum, according to Soren (2004), is a logically related collection of digital objects composed in a variety of media. A virtual museum has no real place or space and its objects and related information can be disseminated all over the world. Within a virtual museum are virtual exhibits in which individuals find their own meanings by using state of the art animation, sound, and search capabilities. A Virtual Exhibit provides an online entrance hall for a global audience in a presentation that brings to life the potential dynamism of objects and their stories.

Veltman (2001) stated that virtual museums cannot replace the experience of the original objects. However, he then expressed the twelve valuable purposes of virtual museums as follows.

- Stimulate persons to look more attentively at the originals in physical museums.

- Include other sensorial effects such as sound, touch, or even smell which would usually be inappropriate in a public physical museum.

- Orientate visitors to find paintings more quickly.

- Raise awareness of other works in storage.

- Contextualize objects.

- Visualize techniques used (perspective, *chiaroscuro*, *pentimenti*, etc.).

- Provide virtual restorations and reconstructions of paintings and sites.

- Bring together objects in a fictive space, which cannot be brought together physically and see works when there when there is no museum.

- Provide a virtual history of exhibitions.

- Provide a history of the museum.

- Show collections in distant sites.

- Show sites not open to the public.

Advanced Research & Studies Journal

A few research studies were conducted recently about online learning in the virtual museum (Castle, 2004; Goldman & Schaller, 2004; Maryse & Marion, 2007; Neill, 2008; Schaller & Allison-Bunnell, 2003; Soren, 2004). For instance, Maryse and Marion (2007) conducted a study that examined the way 125 teachers in Canada used the Internet and museum websites, also called virtual museums, to encourage student learning in history and social studies at the primary and secondary level. The results of this study suggested that Canadian teachers were making increasing use of the Internet in the classroom for the teaching and learning of these school subjects. This study showed that virtual museum websites provided supplemental learning resources for achieving the learning outcomes set out in the various educational programs across the country. According to Schaller & Allison-Bunnell, (2003), learning theory constructivism underlies much educational practice in museums and has come to inform the design of virtual museums as well. A fundamental curriculum change for elementary and middle schools occurred in Turkey in 2004. This fundamental change was based upon constructivist teaching and learning theories. In this curriculum reform, necessity of museum visits were emphasized and use of virtual museums in teaching was included in social science curriculums in middle schools.

Neill (2008) conducted a research focused on cultural heritage and aimed to produce a virtual museum of cultural heritage from ten countries in Europe to encourage users to develop an understanding of the cultural heritage of other European countries and to feel more European. He found that rural students were significantly more positive about the educational use of the virtual museums in the Internet, though their cultural attitudes were more parochial than those of urban students. Nah Tah Wash School in Michigan developed a virtual museum project in 2000. Upon completion of this project it was emphasized that the development and maintenance of a virtual museum is an ideal way to provide a student-centred, constructivist learning environment in schools. It allows students to make choices about what they want to study, provides meaningful topics that incorporate academics and culture. They also stated that a typical student assignment would be to select a topic, research it, write about it, and create a web page that demonstrates the knowledge that the student has gained in the activity. It was said that prospective virtual museum projects can come from visiting museums and libraries; researching topics for social studies, English or art classes; or satisfying a student's curiosity about a topic that involves his or her culture (http4).

Purpose of the Study. The purpose of this study is, to determine whether the virtual museum application affect the attitudes of the open education students towards the history lesson, will be changed or not by virtual museum application. For this purpose;

1. An experimental group was formed.

2. A pre-test was given to obtain the attitudes of the students in the experimental group.

3. A post-test was given to the students after the application.

4. Students were asked to express their opinions about the history lesson taught by the virtual museum application.

Method. The pre-test and post-test model of the experimental design was used in this research (Karasar, 2000). A group of 20 was formed as an experimental group. The group was asked to observe the official web-sites of the museums given below.

The pre-test was given to the group before the study and the post-test was given to the group at the end of the study. Furthermore t-test analysis was made on the data to obtain whether the attitude scores of the open education students, will be changed or not according to their computer knowledge. In the qualitative section, the students were asked open-ended questions and their answers were given in a frequency table.

Data Collection. Qualitative and quantitative data was collected in October and November in 2009. Quantitative data was obtained by an "Attitude Scale" prepared for the virtual museum application in history lessons and qualitative data was obtained by "Open Ended Questions". While developing the

Advanced Research & Studies Journal

"Attitude Scale"; an adaptation was made by benefiting from the items in "The Relations Between The Computer Experience of the Teachers and Computer Attitudes"(Deniz and Köse, 2003), "Computer Attitude Scale For Secondary Education Students" (Uzunboylu, 1995 (originally prepared by Jones and Clarke in 1994), "The Attitudes of Teachers in Information Era: Elazığ Sample" (Özan and Erten,2005) studies.

The reliability study of the scale was made and The Cronbach Alfa reliability coefficient was found "0.86". There are 20 items in the scale. In the 5 point Likert type data collection tool in an interval scale the statements were assessed as "Strongly Agree=5; Agree=4; Neutral=3; Disagree=2; Strongly Disagree=1". The minimum score is 20; the maximum score is 100.

In the qualitative section "What did you enjoy most in the virtual museum application?" was asked.

While preparing the questions, opinions were invited from three IT class teachers, three social science teachers and five academic experts on social sciences and history instruction.

The "Attitude Scale" was given as pre-test in the beginning of the study and given as post-test at the end of the study.

The Procedure Steps of the Study:
After applying the pre-test to the students, they were given the chance of implementation for 2 months.
The Procedure Steps of the Experimental Group:
After the group was told about Atatürk's life and the importance of attaining information related to Atatürk, they were asked to get more information from this web-page: http://www.anitkabirsanalmuze.org/. A two-week time-period was given. At the end of the second week an application was made concerning the cultural and historical richness in Turkey.

Subsequent issues included a two-week application related with "Ankara Museum of Anatolian Civilizations (360 degree Panoramic Tour) http://www.kultur.gov.tr/en/SanalTour/Ankara-AMM/index.html;

A one-week application related with "Ayasofya Museum" http://www.kultur.gov.tr/EN/BelgeGoster.aspx?17A16AE30572D3130239EEA0FCDF038 B6E95C5AED45E6A49;

A one-week application related with Konya Mevlana Museum (360 degree Panoramic Tour); http://www.kultur.gov.tr/en/mevlana-eng/index.html;

A one-week application related with "Mardin Museum (360 degree Panoramic Tour)"; http://www.kultur.gov.tr/en/mardin_muze_english/index.html .

The students were asked to make virtual visits to these museums. The post-test was applied after this process. Then students were asked open-ended questions.

Data Analysis. The data was analyzed in two phases. In the first phase, an analysis was made of the pre-test and post-test using T-test, arithmetic mean (□) and standard deviation (Ss) to analyse the data. Statistical procedures used the SPSS 11.0 programme. Significance of the data was tested at the 0.05 significance level. A Descriptive Analysis technique was used and data was summarized according to themes and quotations (Batı, 2004; Yıldırım ve Şimşek, 2005). Data relating to open-ended questions was analyzed as well. The frequency distribution of the answers was determined and quotations from 3 participants' opinions were taken.

Findings
    A. The Quantitative Dimension Findings of The Research:

Table 1
T values regarding application group's pre-test and post-test scores

	N	□	Ss	df	t	p
Pre-test	20	68.15	5.414			
Post-test	20	84.75	3.978	18	2.417	0.000

Advanced Research & Studies Journal

When Table 1 for the question "Is there a significant difference between the students' pre-test scores' mean and post-test scores' mean?" is examined, a differentiation at a statistical significant level can be seen between the pre-test and post-test score (t_{18}=2.417, $p<0.000$).

The mean of attitude pre-test scores of the application students is ($\square$=68.15) and the mean of attitude post-test scores is ($\square$=84.75). According to this information, the attitudes of students towards history lessons were changed positively by the virtual museum application.

A significant difference emerged regarding the post-test data that measured attitudes of students towards history lesson after the application. The students had a favourable opinion on the virtual museum application in history lessons after observing various documents and sources.

Table 2
T-test result of open education students' attitudes according to the knowledge of using a computer

Experience with computers	N	X	Ss	df	t	p
I know how to use a computer well.	15	87	3,41	28	1,213	,004
I know little.	5	78	2,38			

T-test result indicated that there is a significant difference in the attitude scores of the students on whom the virtual museum application were applied whether they know how to use a computer or not. (t_{18}=1.213, $p<0.004$).

The attitudes of the students who know how to use a computer well (X=87) are more positive than those who know little (X=78). This data suggests that there is a significant relationship between attitudes of the students who can use computer well and those with limited experience.

Considering the students' opinions shown in Table 3,, most frequently expressed opinion is "it was very enjoyable". Then students stated mostly that they couldn't realize how time passed, would like to see virtual version of all of the museums, found it a really useful experience and found rich visual images in virtual museums which are not accessible in most of the text books. Paralleling to these results, when we look at the detailed opinions of students in history classes, importance of the use of virtual museums can be understood better.

Ş. D.: *"Virtual museum application was very good. I am sure that if we use virtual museums in all of the history lessons, most of the students like me would be more willing and they may not be bored during the lessons. We can easily remember the necessary information. I think the integration and application of virtual museums should be widened in all of the schools. We would have a chance to obtain information about cultures and histories of other countries, if there are virtual museums from other countries in Turkish."*

B. A.: *"Virtual museum application was quite impressive. However, there are some deficiencies such as absence of information boxes prevented us from making assertions about the meaning of tools and objects that we saw. But we could still make some assertions. For example, drawings of deer and bison hunters and sharpened stones implied that humans were making their living by hunting and they couldn't use mines yet. In addition, statues of horse heads implied that horses took important places in human life in those ages. We saw hairclips and other kinds of jewelleries made out of stone. We can say that using jewelleries was important for women in those ages as it is now. We can make assertions about human life styles and their costume styles by looking at the human figures that we saw on the tablets. Many objects implied that humans in early ages made their living on agriculture and animal breeding. Therefore, virtual museums give us important information on humans' everyday life in early ages. "*

F. B. Ö.: *"Learning history is not just memorizing the given information in text books. Visiting historical places such as remains of old civilizations, looking at the objects belonging to those old civilizations and making sense out of those objects are very important for learning history. I saw a virtual museum*

for the first time with this application and I was very impressed with the virtual museums. I was able to move around and look at whatever I want while visiting the virtual museum in this study. I found a good chance to take a closer look at architectural works which express our history. Via virtual museum, I also found a chance to visit Anıtkabir Museum, located in Ankara, where I have never been physically. I was able to compare the content of virtual museums with Adıyaman Museum where I have visited physically before. I would like these kinds of applications to be widened."

Table 3
Student Opinions

Students' Opinions	Frequency
It was very enjoyable.	17
I couldn't realize how time passed.	14
I would like to see virtual version of all of the museums.	13
It was really useful experience for me.	11
Virtual museums provided opportunities to find rich visual images which are not accessible in most of the text books.	11
It would be better if there are audio features and more information about the objects in museums.	10
It would be better, if there are little boxes where we can find detailed information on objects when clicked on.	10
It is very important that the objects were presented in 3D.	8
People can visit many museums in a short time with the use of virtual museums.	8
I found a chance to see how tools and materials used by humans changed over time periods.	8
I think that all students need to see and do this kind of application.	7
Application of virtual museum in instruction increased my motivation in the class.	6
I realized that Anatolia has very valuable cultural heritage.	5
I felt like I was looking around in the actual museum.	5
It was very useful to move around by using arrow buttons.	5
Given plans about what we can see in the virtual museums were very useful.	4
I was able to make assertions about sources of living in the period that we were looking at.	4
I saw that many objects belonging to early ages together for the first time.	2
Bird's-eye view of museums should also be given.	2
With this kind of application I can obtain information about past without a teacher.	2

M.G.: *"I realized that virtual exhibitions and virtual visits are very important for learning related subject in history courses. With the application of virtual museums, I think, knowledge becomes more permanent, and I couldn't realize how time passed. 3D visuals were really nice. I wish all the museums in Turkey even all over the World were in virtual environment. In this way, humans can know different*

cultures and this may bring peace and tolerance to the whole World. I personally would like to express my thanks to Turkish Ministry of Culture and Tourism for providing us such an opportunity."

Conclusion. Using technology is necessary in teaching in order to apply alternative teaching methods for modern education and make lessons more productive. In this study, it was clearly seen that these kinds of applications were very useful and effective in terms of student involvement in learning process more actively. Since 2004, with the integration of constructivist learning theories, educational technology has been used in classroom teaching in Turkey. This opened a new page in education in a positive way.

The students implied that the study was very useful and enjoyable and their motivation was quite high during it.

These results indicated that using virtual museums in teaching history subjects can enhance students' motivation and conceptual understanding. According to results of this study, followings are the positive aspects of using virtual museums in teaching:

Existence of objects in 3-dimensional mode,

It has positive effects on students' motivation,

Many museums can be visited in a short time,

It gives an opportunity to employ student-centred teaching methods,

It gives an opportunity to see many historical objects and to make comparisons among them,

Existence of plans showing different parts of the museum,

Existence of rich visual images which are not accessible in most of the text books.

According to results of this study, followings are the negative aspects of using virtual museums in teaching:

There is no detailed information on objects exhibited in virtual museums,

Video features are somewhat poor,

There is no bird's-eye view of the museums,

There is no audio information system on the objects,

Students participated in this study stated that they used the virtual museums for the first time and they also said that the study was very effective. Students' opinions clearly showed that using virtual museum in teaching history subjects had positive effects on students' motivation.

Conclusions and Implications. These kinds of activities should be applied in the schools.

ØStudents may want to have prior information about museums. In order to develop perspective of common heritage, virtual museums should be used effectively.

ØStudents should have sufficient prior knowledge about the subjects.

ØRecent developments in educational technology should be followed and these modern technologies should be used in history classes.

Schools should be equipped with computer and internet technologies in order for students to make virtual museum applications.

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Advanced Research & Studies Journal

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