

The Effect of Web-Assisted Education Based on Constructivist Approach on Turkish Preservice Teachers' Academic Success and Attitudes on Otmt Lesson *

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Abstract

The aim of this study is to determine the effects of “Teacher-Centered Education” and “Web Assisted Education” based on constructivist approach on pre-service Turkish teachers' academic achievements, attitudes toward to computer and lesson, skills of preparation three-dimensional materials in “Instructional Technologies and Material Design” lesson and is evaluated in accordance with the opinion of the pre-service teachers. The sample of this study consists of 68 second grade pre-service Turkish teachers in Ağrı İbrahim Çeçen University Education Faculty during the 2012-2013 spring terms of academic years. This study was carried out in two different groups. One of these groups was Web Assisted Education Group (WAEG, n=34) that web assisted education was applied and the other one was Control Group (CG, n=34) in which teacher-centered instruction was applied. As the data collection instruments, Academic Success Test (AST) and Attitude Scale towards OTMT (ASOTMT) were used. The data obtained on instruments were evaluated by using descriptive statistics, t-test analyzes. As a result of this study indicate that teaching of the subjects with Web Assisted Education method was more effective on students' academic achievements and attitudes toward to computer and lesson.

Keywords: Web Assisted Education, Constructivism, Turkish Language Education, Instructional Technologies and Material Design.

1. Introduction

The most basic course in mother tongue teaching is Turkish course. This course aims to improve word attack skills of individuals. Four basic language skills (listening, speaking, reading and writing) forms the basis of Turkish course. The Turkish course which was implemented through the curriculums prepared based on behaviorist approach has been implemented through a curriculum based on constructivist approach since 2006. In constructivist approach, how the student give the meaning to what s/he experiences, which cognitive processes s/he uses during learning process have become prominent rather than observable behaviors as a react to the stimulus in the environment (Malatyalı and Yılmaz, 2010). In this approach, the learner is expected to construct the learning and maintain a meaningful and permanent learning, not memorizing it. With this change, a student-centered teaching method has been adopted, abandoning teacher-centered teaching. Through the education process, student to teacher, teacher to student interaction increases and participation of the family and environment to this process is provided. With these differences in the curriculums, various changes have occurred in the content of the courses, teaching methods, the materials and tools and evaluation and assessment methods (Gelbal and Kelecioğlu, 2007). Especially according to constructivist learning approach, education technologies and materials should be used in Turkish courses in order to construct the information and gain the targeted skills (Arslan, 2009). Thus, it is important that the teacher who are going to conduct Turkish language courses should have the ability to use different materials and technological tools appropriate to the needs of the time.

In today's world, visual and auditory technologic tools come to the forefront in providing multiple learning environments. Teaching-learning environments which address more sensing organs and are supported with visual and auditory tools are preferred to maintain permanent learning (Yaşar, 2004). The materials which address to more and more sensing organs are the technology-supported materials (Fer, 2009, 254). While the remembering rate is only 20 % in reading a book, this rate can increase up to 40 % in remembering the text supported with audio, image, multiple interaction, etc. (Uşun, 2006). This rates clearly show that the materials supported visually leaves a permanent effect on the students. And old saying about this attracts the attention: “Use an image, save ten thousand words.” (Şimşek, 2000, 92).

Technology which is within our lives with various purposes has taken many field under its control. Education, without any doubt, is one of these fields. Education through technology has been no longer teacher-centered and has become to be conducted independently from the physical environments (Tuncer and Taşpınar, 2007, 113). The methods and techniques being used in education has started to change parallel to the developments in technology. The fact that traditional applications do not consider individual differences, do not

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meet the needs of the individuals, the necessity to give education to masses at the same time, not presenting the knowledge through appropriate methods and techniques and transferring the knowledge requires time can be shown among the main reasons of this change (Alkan, 1995; Kaya, 2002, 8). To solve these problems, using technology effectively has become a necessity. For this reason, new concepts and technologies like computers, audio, visual, animation and web have been started to be used in teaching-learning environments (Alakoç, 2003).

Because of the opportunities like processing data with a splendid speed and capacity and the support it provides to the function of many new technology, the computer has a prominent place among the technological developments (Şimşek, 1995). After the invention of the computer, the technologies that connect the computers in different places have become important and so web has been emerged. With web, individuals have had the opportunity to access information independently from time and space. Web presents new opportunities from producing information to storing, from processing to using. By this means, the information spreads rapidly and can be produced at the same pace.

Today, computers and public network are the technological tools which is prominent in teaching-learning environments. Public network, particularly, is biggest assistant for the students to access information. As the time they students spend outside is more than the time they spend in school, they have the possibility to use public network, and have the opportunity to learn by having fun on public network environments (Karaağaçlı, 2004, 16). Public network has become an instrument which is frequently needed in educational environments because of its features. Scientists have started to conduct more and more studies about providing a more productive educational environment related to this technology.

Web-supported education (WSE) is an education method based on the opportunities occurring with the use of computer and web technologies. Thanks to WSE, learners have found the opportunity to continue their education whenever and wherever they want. The fact that the classroom are crowded reduces the time that the teachers spare for the students. In this case, the teachers have difficulty in sparing the time each student needs. WSE supports the teachers about this, provides the opportunity for the students to make practices and repetition exercises in their individual learning pace on the web in addition to the face-to-face education in the teaching-learning education. By this means, the teacher can conduct a better training with more students and with the advantages of multiple environment in a richer educational environment compared to traditional education. In addition, the learners can reach audible, visual and constantly renewed contents anywhere in the world.

The purpose of this study is to evaluate the effect of “Teacher-centered Education” and “Web-assisted Education” based on constructivist approach on Turkish preservice teachers’ academic success and attitudes on “Instructional Technologies and Material Design” (OTMT) lesson. Within this purpose, the sub-problems of the study are as below:

1. Is there significant differences in the Academic Success Test scores of the pre-service teachers who take the OTMT lesson with WSE-based and teacher-centered education compared to those before application?
2. Is there significant differences in the Academic Success Test scores of the pre-service teachers who take OTMT lesson with teacher-centered education methods compared to those after application?
3. Is there significant differences in the Education Technologies and Material Design Attitude Scale scores of the Turkish language pre-service teachers who take OTMT lesson with WSE-based and teacher centered education compared to those before application?
4. Is there significant differences in the Education Technologies and Material Design Attitude Scale scores of the Turkish language pre-service teachers who take OTMT lesson with WSE-based and teacher centered education compared to those after application?

2. Method

This study which aims to analyze the effects of WSE which is based on constructivist approach on academic success of the Turkish language pre-service teachers, their attitudes towards OTMT lesson is a quasi-experimental study with pretest-posttest applied on randomly selected groups. Referring to quasi-experimental studies is appropriate with the aim of determining the effects of the materials, methods and techniques particularly on education (McMillan and Schumacher, 2010, 22).

2.1. Target Group of the Study

The target group of the study consists of 68 2nd grade pre-service teachers from two different classes in the Department of Turkish Language Teaching of Faculty of Education, University of Ağrı İbrahim Çeçen in spring term of 2012-2013 academic years. There are two groups which have been created with random sampling in the study. One of the groups is the web-based education group based on constructivist approach (WBEG, n=34) and the other group is the control group on which teacher-centered education method has been applied (CG, n=34).

2.2. Data Collection Tools

To determine the academic success of the teachers related to the determined lesson, Academic Success Test (AST) and Attitude Scale towards OTMT (ASOTMT) have been used. In the development of AST, firstly, the acquisitions of OTMT lesson have been researched and acquisition table has been set down. In the direction of these acquisitions, the academic success test form with 45 items to be tested has been prepared. The views of three experts on the field have been asked to determine the content validity of the question in the test. Pilot scheme has been applied for the prepared academic success test, and the test prepared in this direction has been applied on 124 pre-service teachers who have taken OTMT lesson in the department of Turkish Language Teaching in the spring term of 2011-2012 academic years before the application. As a result of the application, item analysis has been done on the question in the test. Item discrimination index has been calculated in the conducted analysis. Kuder Richardson (KR-20) reliability analysis has been done for the reliability of the prepared AST, and as a result of the analysis KR-20 reliability coefficient has been determined as 0.874. While the calculated reliability coefficient should be .0.70 and above for a psychological test, the reliability coefficient of the tests which are used to choose and classify the individuals should be much higher (Büyüköztürk, 2010, 171). In this direction, it can be said that the value 0.874 means that this value is reliable for AST.

Factor analysis has been done to determine the construct validity of ASOTMT. As a result of the analyses, Kaiser Meyer Olkin (KMO) has been found as 0.76. Barlett test result has been determined as 2235,247. Barlett test has been found to be significant at 0.01 level. According to these results, it can be said that the data is suitable for factor analysis. The items whose factor loads are lower have been excluded from the scale. Cronbach's Alpha coefficient has been used for reliability study of the scale. Cronbach's Alpha internal consistency coefficient of the scale has been found as 0.859. After all these procedures, the final scale with 21 items has been determined.

2.3. The Procedure

The study was conducted on the 2nd grade formal education pre-service teachers of Turkish Language Teaching Department in OTMT lesson in spring term of 2012-2013 academic years. The pre-service teachers were informed about the implementation before the implementation. Within this scope, "The Schedule of Teaching Technologies and Material Design Lesson" about the contents, aims, weekly subjects and references of OTMT was handed to the pre-service teachers. The pre-service teachers in the WBEG were introduced with the teaching material (website) and they were informed about the subjects and activities to be done during the lesson. The pre-service teachers were provided a username and password to use in accessing the website and they were asked to maintain the website with this information during the application. The pre-service teachers were enabled to maintain their learning activities with this information on the website in their extracurricular time. The draft of the website used in the study was used in OTMT lesson in 2011-2012 academic years. Two groups were formed in the conducted pilot scheme, the draft of the website was reflected on the board through computer and projector in experimental group. In the sharing of the weekly subjects and in maintaining the implementations, web 2.0 tools, social media tools and e-mail were used. In the control group, on the other hand, the lessons were conducted through teacher-centered education method. After the pilot scheme, the views of the pre-service teachers in the experimental group were asked. Necessary edits were done on the website according to the feedback and then the website was expertized. With the experts' opinions, necessary edits were done on the website and the website became ready to use. The lessons were conducted through the prepared website.

3. Findings and Discussion

The findings obtained through the study are presented below:

3.1. Findings Obtained from AST

What level the knowledge of WBEG and CG was and whether their knowledge was equal or not was analyzed before the implementation in order to analyze the effects of WBE on OTMT lesson. With this purpose, arithmetic means and standard deviations of WBEG and CG from their pre-test scores, t-test was done to determine whether there were significant differences among the averages of both groups. Table 1 indicates arithmetic means, standard deviations and t-test results of the pre-test scores of WBEG and CG.

Table 1: t-test results obtained from pre-ast

Groups	N	X	SS	sd	t	p
WBEG	34	59,64	10,426	66	1,385	0,171
CG	34	56,11	10,582			

As it is seen in Table 1, the average score of WBEG is $X=59,64$, and the average score of CG is $X=56,11$. As a result of the t-test which was done to determine whether there was a significant difference between the scores of two groups, it is seen that there is no significant difference [$t_{(66)}=1,385$; $p>0.05$]. In the light of this evidence, it can be interpreted that the academic success levels of WBEG and CG show similarities during pre-

implementation in OTMT lesson. After the implementation, what level the academic success of WBEG and CG was and whether there were significant differences between the groups was analyzed. To do this, arithmetic means and standard deviations were calculated, and t-test was done in order to determine whether the difference between the two groups was significant. Table 2 indicates the arithmetic means, standard deviations from post-test and t-test results of WBEG and CG.

Table 2:t-test results obtained from post-ast

Groups	N	X	SS	sd	t	p
WBEG	34	86,70	7,350	66	4,382	0,000
CG	34	79,05	7,036			

As it can be seen in Table 2, post-test average of WBEG is $X=86,70$, and the post-test average of CG is $X=79,05$. As a result of the t-test which was done to determine whether the difference in the averages of the two groups were significant, it was determined that the difference was significant and this difference was on behalf of WBEG. In the light of this evidence, it can be said that the academic success levels of the pre-service teachers in WBEG increased significantly, and so WBEG increased the academic success level in OTMT lesson.

The collected data shows parallelism with the data collected by Altıparmak and Karacak (2010), Altunçekiç (2010), Balkan (2013), Başal (2011), Bayrak (2011), Biber (2009), Çakır (2006), Çetin (2010), Emmungil (2004), Frederickson, Reed and Clifford (2005), Gül and Yeşilyurt (2011), Karagöz (2010), Leonard and Guha (2001), Şengel (2005), Uzun (2008), Uzunboylu (2002) and Uzunokca (2012), while the data of this study does not match up with the data collected by Erkan (2009), Güveli (2004), Katz and Yablon (2003), Steen (2002) and Tekin (2007). On the other hand, according to the data obtained by Olcay (2011), it was determined that the control group was more successful than the experimental group in terms of academic success; Linn, Bell and His (1998) and Demirli (2002) determined that WBE and teacher-centered education showed similar effects on academic success. The reason why the findings of this study was differed from the mentioned studies can be the factors such as planning and evaluating of WBE process, the quality of the materials chosen and prepared for WBE, the duration of the applications, the path followed during the applications and the resource used in the applications. The reason why the academic success of WBEG was found significant compared to CG in this study can be the method which was used in this study. With this method, the pre-service teachers increased their academic success through the strong characteristics of WBE such as continuing learning in their learning pace, maintaining their learning whenever they wanted, repeating as much as they want, evaluating themselves and accessing the information easily. Besides, the pre-service teachers had the opportunity to be taught a lesson via the materials servicing multimedia like videos, audios, texts, models and figures. It can be said that all these factors played an important role in increasing the academic success of the pre-service teachers and the applied method created the desired behavior changes in the pre-service teachers.

3.2. Findings obtained from ASOTMT

Before the implementation, the attitude levels of the pre-service teachers in the two groups at the beginning were analyzed to determine whether the effects of WBE and teacher-centered education were significant on the attitudes of the pre-service teachers towards the lesson in OTMT lesson. For this purpose, the arithmetic means and standard deviations of the scores of WBEG and CG from ASOTMT were calculated and t-test was done to determine whether the difference between the two groups was significant. Table 3 indicates the arithmetic means, standard deviations and t-test results of the pre-test scores of WBEG and CG.

Table 3:t-test results obtained from pre-asotmt

Groups	N	X	SS	sd	t	p
WBEG	34	59,735	5,136	66	0,199	0,843
CG	34	60,029	6,934			

As it is seen on Table 3, the arithmetic mean of the scores of the pre-service teachers in WBEG from ASOTMT done before the implementation is $X=59,735$, and the arithmetic mean of the pre-service teachers in CG is $X=60,029$. As a result of the t-test which was done to determine whether the difference was significant, it was found that the difference is not significant [$t_{(66)}=0,199$; $p>0.05$]. According to this finding, it can be said that the attitudes of WBEG and CG towards OTMT lesson show similarities with the ones pre-implementation.

The arithmetic means and standard deviations of the post-implementation scores of ADEG and CG from ASOTMT were calculated to determine whether the attitudes of the pre-service teachers towards OTMT lesson were increased as a result of the conducted implementation. t-test was done to determine whether the difference between the groups was significant. Table 4 indicates the arithmetic means, standard deviations and t-test results of the pre-test scores of WBEG and CG from ASOTMT.

Table 4:t-test results obtained from post-asotmt

Groups	N	X	SS	sd	t	p
WBEG	34	66,794	5,168	66	3,047	0,003
CG	34	62,500	6,387			

On analyzing Table 4, it is seen that the arithmetic mean of WBEG ($X=66,794$) is higher compared to the arithmetic mean of CG ($X=62,500$). t-test was done in order to determine whether the difference between the two groups was significant. It is seen that there is no significant difference between the two groups as a result of the t-test done to determine the difference between the groups [$t_{(66)}=3,047$; $p<0.05$]. In the direction of this finding, it can be said that the attitudes of the per-service teachers towards OTMT lesson increased significantly, and so WBE was effective in increasing the attitudes towards OTMT lesson.

The research findings related to the effectiveness of WBE on the attitudes of the pre-service teachers towards the lesson show parallelism with the findings of Biber (2009), Can (2008), Çetin (2010), Şengel (2005) and Yalçınalp (2001), however they don't match up with the findings of Altıparmak and Karacak (2010), Başal (2011), Gül and Yeşilyurt (2011), Karagöz (2010) and Katz and Yablon (2003). In the light of these results, it can be stated that the close relationship between academic success and attitude was reflected on the attitudes of pre-service teachers, the increase in the academic success in educational environment increased the attitudes towards the lesson at a similar rate. In the studies whose findings differ from the findings of this study, the reason why no positive results in terms of attitude can be the factors such as the experiences of the learners with WBE, their negative attitudes towards computer and web, excessive workload of WBE compared to teacher-centered education, and the materials and the activities presented to the students in the studies.

4. Results and Recommendations

As a result of the study, an increase on behalf of experimental group was observed among the AST post-test score averages of the pre-service teachers in WBEG in which the lessons was conducted through WBE and CG in which the lessons were conducted through teacher-centered education. It was determined that this increase was significant. This result shows that WBE is more effective for the implementation conducted in OTMT lesson. Moreover, an increase on behalf of experimental group was observed among the post ASOTMT score averages of the pre-service teachers in WBEG and CG. It was determined that this increase was significant. This result show that WBE was effective in increasing the attitudes of the pre-service teachers towards OTMT lesson. In the direction of these results, it can be said that WBE is an effective method in increasing the academic success in OTMT lesson and the attitudes towards this lesson, and this lesson can be conducted with WBE.

Recommendations in the direction of the results obtained within the study can be listed as below for the practitioners in this field:

1. As a result of the study, considering the effect of WBE on academic success and attitudes of the pre-service teachers towards the lesson conducting WBE in OTMT lessons can be supported.
2. A lesson called "Computer-assisted Turkish Education" or "Computer-assisted Language Education" can be included besides OTMT lesson in Turkish Language Teaching Undergraduate Program for the pre-service teachers to know and use WBE and other technologies.
3. The educators who will include WBE in their classes should be supported to know and have the ability to use the technologies based on web effectively.
4. In-service trainings should be given to the educators who have met the technologies about the theoretical basis and practical applications of WBE.
5. Elective web design courses can be included in teacher training programs in order for the pre-service teachers to use the web effectively and have the knowledge about web design.
6. Technological infrastructure in all school should be made appropriate for the WBE to be applied.
7. This study is limited to OTMT lesson taught in the Department of Turkish Language Teaching. In this respect, new studies on different grades in Turkish language education and in different lessons should be done and the obtained findings can be evaluated.
8. WBE materials can be developed considering different approaches parallel to the one based on constructivist approach and the results can be revealed in evaluating these materials.
9. Researches about asking the views of academicians, teachers, school principals and parents can be done.

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