THE EFFECT OF WEB BASED INSTRUCTION ON STUDENTS' WEB PEDAGOGICAL CONTENT KNOWLEDGE, COURSE ACHIEVEMENT AND GENERAL COURSE SATISFACTION

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ABSTRACT

The main aim of this research is to determine the effect of web based instruction on students' web pedagogical content knowledge, academic achievement and the general satisfaction of the course. The study was planned and completed according to pre test and post test with control group experimental design. The study was carried out on 29 students. The web content knowledge of the students in both group showed significant change after the experimental procedure. The web pedagogical content knowledge and the attitudes towards web based instruction of the experiment group were found to be higher than control group after the course. Also the academic achievement of experiment group was higher than control group and there was no difference in course satisfaction.

***Keywords**: Web Based Instruction, Web Pedagogical Content Knowledge, Achievement, General Course Satisfaction.*

INTRODUCTION

Internet has become one of the most popular means of communication today. So that according to the data obtained on 31 March 2011, 30.2% percent of the whole world, 58.3% of Europe and 44.4% of Turkey are actively using the internet. The number of total internet users in the World is 2,095,006,005. This number is 476,213,935 in Europe and 35,000,000 in Turkey. The increase in the number of internet users between 2000 and 2011 is 480.4% (Internet World Stats, 2011). As seen from the data the use of internet is increasing every day. Internet is used in every walk of life which eases the everyday life to a great extent. In other word internet has become one of the indispensable tools of human life.

Today internet facilitates the new knowledge to be acquired by the investigation and application of its rich and multiple media. Internet enables to learn both cultural and individual knowledge in both conceptual and applied forms (Holmes & Gardner, 2006).

One of the most widely used applications of internet is web based instruction (WBI). WBI was first applied in the colleges, universities and the big companies of the US in 1997 and within two years time 10% of whole colleges and universities and %25 of the firms put their courses on internet. In 2001 these ratios reached to 80% for the colleges and the universities and 60 % for the firms (Lynch, 2002). In 2005 the number of students following courses on WBI reached to 3.6 million which marked an increase of 360,000 people compared to the previous

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year. 2.6 million of these come from non graduate universities (Allen & Seaman, 2006). This number reached to 4.6 million in 2008 (Allen & Seaman, 2010). In Turkey 10 universities apply this procedure. These developments show that WBI is a very strong medium for teaching and learning and it is more likely to be used in much wider fashion in future.

This widespread use of WBI is largely due to effective use of web tools which support the learning process. Among these tools are the www pages, e-mails, forum etc. (Horton, 2000). WBI provides everyone the learning opportunity at everywhere and at anytime. This is especially useful for those young and old people who wish to pursue a lifelong learning process or those who wish to develop themselves.

In WBI there are so many opportunities for both the teachers and the learners (Aggarwal, 2000). The ease of WBI applications has brought the idea that it may be much more effective than conventional learning process. When we examine the research carried out on WBI it is seen that they largely dwelled upon the their effectiveness as regards to success rate, rate of dropping the course and the attitudes and the skill of the tools used compared to the conventional face to face instruction (Bekele, 2010; Bekele & Menchaca, 2008; Finlay, Desmet & Evans, 2004; Jung, Seonghee, Lim & Leem, 2002; Moore & Kearsley, 1996; Simonson, Smaldino, Albright & Zvacek, 2006).

These comparisons are not limited to WBI. Verduin & Clark (1994) investigated the studies carried out the success and satisfaction up to 1990. They approximately investigated 50 studies and it was seen that they were mainly related to the comparison of the traditional education to those distance education with TV, computer, video and mail. The success and the course satisfaction are the two important parameters in these studies. Bekele's (2010) study where investigated the studies carried out on WBI, found that the effect of WBI on success and satisfaction were not clearly demonstrated or insufficiently addressed. Therefore there was an urgent need of the investigation of WBI as regards to success and satisfaction.

The students and the teachers who participated in to the WBI are supposed to have computational skills. The teachers must have additional skill of using these tools in the education. It is therefore necessary that the pre-service teachers should be furnished with pedagogically constructed knowledge of web and its technological use (Cox, 2008; Mishra & Kohler, 2006, 2007, 2009; Mishra, Koehler & Kereluik, 2009; Schmidt et al., 2009a; 2009b; 2009c). The biggest difference in web use is that it includes some other technologies so it should be constructed differently. Lee & Tsai, (2010) and Lee, Tsai & Chang (2008) described the web technological pedagogical content knowledge (TPCK-W). The TPCK-W was developed by the use of Shulman's (1986) pedagogical content and Mishra & Koehler's (2006) technological pedagogical content knowledge.

The TPCK-W was established by joining the pedagogical content which the teachers are supposed to have and the knowledge of web use. It has four main components as web knowledge, web content knowledge, web pedagogical knowledge and web pedagogical content knowledge (Lee & Tsai, 2010; Lee Tsai & Chang, 2008).

There are three main components in TPCK-W namely content, pedagogy and web knowledge. The content and pedagogy knowledge are the same as the technology content knowledge. The web knowledge includes the general knowledge such as the use of web tools and web based communication. As result of the interaction of the content, pedagogy and the web there are four components. The first one is the pedagogical content knowledge which is as same as technological pedagogical content knowledge. The web content knowledge is the necessary

knowledge to understand the advantages of the web use and its properties. The web content knowledge does not only include the knowledge of the pure content but also covers the integration to the applications. The knowledge of web pedagogy includes the web facilities and their components that the teachers use in their teaching media. The TPCK-W means the knowledge of WBI (Lee & Tsai, 2010). In the realization of WBI the courses of the TPCK-W and the investigation of the effect of these courses are of utmost importance (Lee & Tsai, 2010; Lee, Tsai & Chang, 2008; Schmidt et al., 2009b; 2009c). Lee & Tsai found in their study they carried out in 2010 that the TPCK-W of the participant is closely related to their previous web and the web application experiences. All these findings constituted the base of the assumption that WBI will increase the TPCK-W of the students.

The literature review revealed that there was often contradictory data related to the comparison of WBI with face to face instruction regarding to success and satisfaction and there were very little studies on TPCK-W. The purpose of this study is that to reveal whether there was any difference between the success rate and the general satisfaction of the students who take the course of internet aided education (IAE), which was directed to increase the computational skills of the pre-service teachers, though internet or face to face instruction.

METHOD

Model
The research was based upon pre-post test with control group experimental design model (Fraenkel & Wallen, 2006). In the model there is one randomly choose control and one randomly choose experiment group. The measurements are made before and after the experimental procedure.

Participants
The research was conducted by 32 out of 40 students who were studying in the third year of Computer and Instructional Technologies Department of The Education Faculty of Sakarya University in the 2010–2011 academic years who regularly attended the IAE selective course. The attending students were randomly divided into two groups of 16 students as control and experiment groups. The students in the experiment group were able to follow the content through internet while the students in the control group were subjected to a face to face instruction. Two students in the experiment and one student in the control group were discarded from the study since they were not able to attend one week of the four week activities. Therefore the study was carried out by 29 students.

Instruments
In the research a success test, TPCK-W and a general satisfaction scale were used. The success test was developed by the researcher. There were 20 multiple questions. The test was the final exam of the previous year. The tests' data obtained final exam and were used in the analyses. After the analysis the item difficulty index of the test was found to be 0.47 and the average item discriminating index was determined as 0.43. The KR-21 value by the use of formulas was .67.

TPCK-W was developed by Lee, Tsai and Chang (2008) and adapted to Turkish by Horzum (2011). Both the original and the adapted scale were consisted of 5 factor containing 30 items. The "web general" factor of the scale contain 5, "web communicative" factor has 4, "web content knowledge" factor was formed by 5 , "web pedagogical content knowledge" factor was made by 8 and "the attitude toward the web-based instruction" factor included 6 items.

The 30 items scale was found to have an Eigen value of 22.75, the total variance which it can explain of 75.8 and Cronbach Alfa internal consistence value of .94.

The general course satisfaction scale was based upon on 5 Likert with 14 items after discussing with the experts and investigating the literature (Askar, Dönmez, Kızılkaya, Çevik, and Gültekin, 2005; Gunawerdana and Zittle, 1997; Johnston, Killion, & Oomen, 2005; Mellema, Smart, Shull & Salmona, 2009). The validity of the scale was confirmed by the three experts working in the computer and instructional technologies department. According to their suggestion the number of items was decreased to 10. Then this ten item scale was applied to the 70 students who were taught through internet or subjected to a face to face instruction. The data obtained were subjected to exploratory factor analysis for the confirmation of construct validity. During the exploratory factor analysis the care was taken for the Eigen values to be 1 and load factor of the articles to be at least .30 and it should be a single factor entity (Büyüköztürk, 2009).

Before the exploratory factor analysis the samples were first subjected to KMO test which tests the adequacy of the sample. The KMO value was found to be .78. According to Green and Salkind (2005) if this value is above .70 the size of the sample is adequate. Secondly the result of Bartlett's Test of Sphericity (χ^2 = 2308.43, p.=.000) showed that the data obtained are suitable for the factor analysis. Therefore all these 10 items were subjected to a principal component analysis. After the factor analysis it was determined that the 10 items scale had a single factor structure. The load values in the scale ranges between 0.58-0.76 and explain the 56 % of the variance. The item 4 as "*I was very glad to make the necessary studies for this course*" and the item 5 "*I was very glad to choose such a course*" are the examples of these scale items. The internal consistency coefficient of this scale is .88. The data obtained confirm that it can be used without any trouble.
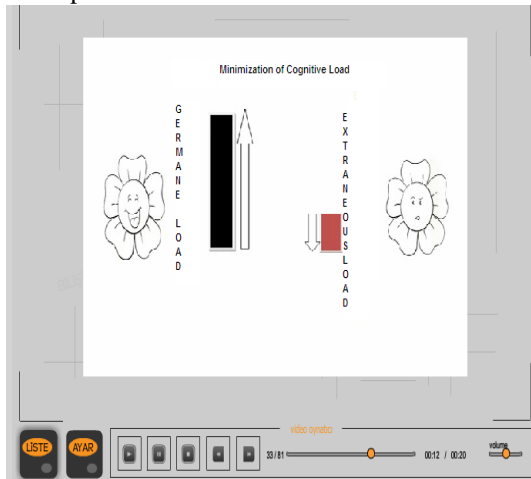
Materials

The samples were divided into control and experiment groups at the beginning of the study. The control group was taught face to face for four weeks and the experiment group was taught by WBI. The course contents consist of web design procedure, the learning activities in Web, cognitive load theory in WBI and content development tools for WBI on weekly basis. The examples given by internet are shown in Figure 1. The contents were divided into smaller pieces to ease of the browsing. The information was animated and the web tools were used in order to facilitate the communication of the students to the teacher. In order to increase the efficiency of the learning with WBI the knowledge was provided by the shows, exercises and independent application as suggested by Alessi & Trollip (2001).
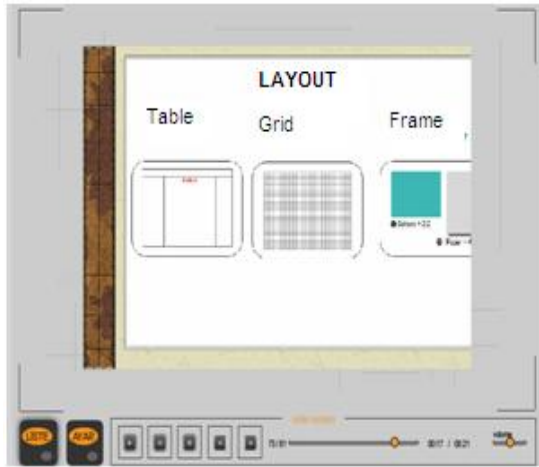
The screen layout of the learning components of the WBI: In this screen the activities such as placing the information in table, grids and frames are explained.

The WBI learning activities example screen: In this screen there is cyber laboratory information one of the important learning activities in WBI.

The cognitive load theory in WBI example screen: This screen shows what to do in order to decrease the cognitive load in WBI.
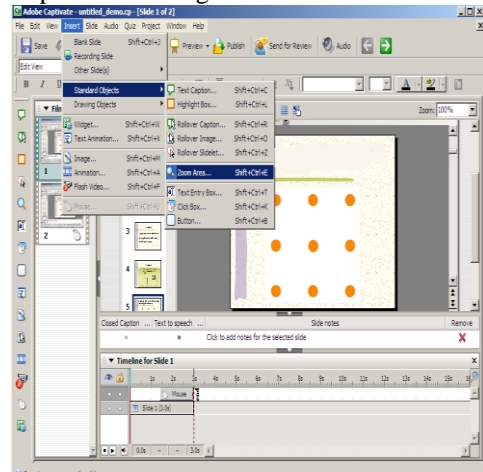
The screen for the designing and the application of teaching materials by the use of Adobe Captivate

Figure 1. Some Examples of the Teaching Material Screens.

Application, Data Collection and Analyses

First the students taking part in this study were randomly divided into two groups. Both groups were then subjected to TPCK-W scale before the experimental procedure. The students in the experiment group were given the name of the web site, the user name and password to enter the internet by the researcher. The experiment group was then subjected to an adaptation process. After the adaptation period the experimental procedure were started which took for four weeks. After the application of the experimental procedure both groups were given a success test and two scales. The data obtained in the study were then analyzed statistically by the use of SPSS 13.0 software. As the data has not distributed normally, they were analyzed by the use of the Mann Whitney U and Wilcoxon Signed Ranks non-parametric tests.

RESULTS

Since the scale from which the data related to the TPCK-W had five factors. Since the scale was applied before and after the experimental procedure the related data were comparable to each other. Table 1 and 2 shows the data related to the first factor of the self-efficacy of the students in knowledge of general web applications.

Table 1. The Comparison of Self-Efficacy of Experiment and Control Group Students in General Web Knowledge

Group	Ranks	N	Mean Rank	Sum of Ranks	Z	p
Experiment	Negative	0	0	0		
(Post-Pre)	Positive	4	2.5	10.0	-1.89	.060
	Ties	10				
Control	Negative	1	2.00	2.00		
(Post-Pre)	Positive	3	2.67	8.00	-1.14	.257
	Ties	11				

When look at the Table 1, there was no a statistically significant difference between the pre and post experiment group scores of the self-efficacy of general web knowledge (Z=-1.89, p>.05). Same goes for the students in the control group (Z=-1.14, p>.05).

Table 2 shows the data related to the fact that the whether the students were in the experiment or the control group causes any difference in their self-efficacy of their general web knowledge.

Table 2. The Comparison of the Self-Efficacy Control and Experiment Group Students in General Web Knowledge.

Test	Group	N	Mean Rank	Sum of Ranks	U	p
Pretest	Experiment	14	13.75	192.50	87.50	.451
	Control	15	16.17	242.50		
Posttest	Experiment	14	14.07	197.00	92.00	.591
	Control	15	15.87	238.00		

As we examined the Table 2, there was no statistically significant difference (p>.05) between the self-efficacy of the students before (U=87.50) and after (U=92.00) the experimental procedure according to the group they are in (experiment or control).

The findings related to the second factor of the scale, Web communication knowledge are listed in Table 3 and 4.

Table 3. The Comparison of the Self-Efficacy Experiment and the Control Group Student in Web Communication Knowledge.

Test	Group	N	Mean Rank	Sum of Ranks	U	p
Pretest	Experiment	14	12.64	177.00	72.00	.158
	Control	15	17.20	258.00		
Posttest	Experiment	14	12.86	180.00	75.00	.201
	Control	15	17.00	255.00		

Table 3 shows that there was no any statistically significant difference between the self-efficacy of the students before (U=72.00) and after (U=75.00) the experimental procedure according to the group they are in (experimental or control).

Table 4 lists the fact that whether the self-efficacy levels of the students in the experiment and control groups varies before and after the experimental procedure.

Table 4. The Comparison of the Self-Efficacy of Students to Web Communication Knowledge Before and After the Course.

Group	Ranks	N	Mean Rank	Sum of Ranks	Z	p
Experiment	Negative	1	1.0	1.0		
(Post-Pre)	Positive	1	2.0	2.0	-.45	.655
	Ties	12				
Control	Negative	2	1.5	3.0		
(Post-Pre)	Positive	1	3.0	3.0	0.00	1.00
	Ties	12				

According to Table 4 both the self-efficacy of the experiment (Z=-.45, p>.05) and the control (Z= 0.00, p>.05) groups in web communication showed no statistically significant difference before and after the experimental procedure. This may be due to the fact that students had already possessed high self-efficacy of general web applications; one of the most commonly used communication and research tools today before the experimental procedure. The data obtained for the web content knowledge (WCK) are tabulated in Table 5.

Table 5. The Comparison of the Experiment and the Control Groups According to WCK.

Test	Group	N	Mean Rank	Sum of Ranks	U	p
Pretest	Experiment	14	15.57	218.00	97.00	.747
	Control	15	14.47	217.00		
Posttest	Experiment	14	16.50	231.00	84.00	.377
	Control	15	13.60	204.00		

Table 5 shows that the WCK of the students in both the experiment and the control groups showed no statistically significant difference before (U=97.00) and after (U=84.00) the experimental procedure (p>.05).

Table 6 compares the WCK of the students of the experimental and the control groups before and after the experimental procedure.

Table 6. The Comparison of WCK Self-Efficacy Before and After Experimental Procedure.

Group	Ranks	N	Mean Rank	Sum of Ranks	Z	p
Experiment	Negative	0	0	0		
(Post-Pre)	Positive	14	7.5	105.0	-3.31	.001
	Ties	0				
Control	Negative	0	0	0		
(Post-Pre)	Positive	13	7.0	91.0	-3.20	.001
	Ties	2				

Table 6 shows that the WCK levels of both the experiment (Z=-3.31, p<.05) and the control (Z=-3.20, p<.05) groups showed statistically significant difference after the experimental procedure. It was seen that the both the WBI and face to face instruction caused a significant changes in the WCK self-efficacy of the participants. The data obtained for the fourth factor of the scale WPCK are presented in Table 7.

Table 7. The Comparison of the WPCK Self-Efficacy Experiment and Control Group Students Before and After the Study.

Test	Group	N	Mean Rank	Sum of Ranks	U	p
Pretest	Experiment	14	16.75	234.50	80.50	.290
	Control	15	13.37	200.50		
Posttest	Experiment	14	18.61	260.50	54.50	.026
	Control	15	11.63	174.50		

Table 7 showed that the control and experiment groups WPCK self-efficacy did not show any statistically significant difference before the experimental procedure (U=80.50, p>.05). However the difference was found to be statistically significant after experimental procedures (U=54.50, p<.05). This finding showed that WPCK self-efficacy of experiment group (WBI) has increased more than those taught with control group (face to face instruction).

Table 8 shows the comparison of the WPCK values of the students in the experiment and the control groups before to after the study.

Table 8. The Comparison of the WPCK Self-Efficacy Experiment and the Control Group Students Before to After the Study.

Group	Ranks	N	Mean Rank	Sum of Ranks	Z	p
Experiment	Negative	0	0	0		
(Post-Pre)	Positive	14	7.5	105.0	-3.30	.001
	Ties	0				
Control	Negative	1	1.0	1.0		
(Post-Pre)	Positive	13	8	104.0	-3.24	.002
	Ties	1				

Table 8 shows that the WPCK levels of the experiment (Z=-3.30, p<.05) and the control (Z=-3.24, p<.05) groups showed statistically significant difference between the pre and post test values. This finding showed that WPCK self-efficacy of experiment and control groups have

increased by the effect of experimental procedures. The data related to the attitude toward the WBI, are presented in Table 9.

Table 9. The Comparison of the Attitudes of the Students in the Experiment and the Control Groups Toward the WBI.

Test	Group	N	Mean Rank	Sum of Ranks	U	p
Pretest	Experiment	14	14.46	202.50	97.50	.747
	Control	15	15.50	232.50		
Posttest	Experiment	14	20.89	292.50	22.50	.000
	Control	15	90.50	142.50		

Table 9 shows that the attitudes of the students in the experiment and the control groups showed no statistically significant difference toward the WBI before the experimental procedure (U=97.50, p>.05) but there was statistically significant change after experimental procedures (U=22.50, p<.05). This shows that the attitude toward WBI of those taught by WBI has increased more than those who were subjected to face to face instruction.

Table 10 shows the fact that whether there was any change in the attitudes of the students according to their groups towards the WBI before and after the experimental procedure.

Table 10. The Comparison of the Experiment and the Control Group Students Toward WBI Before and After the Course.

Group	Ranks	N	Mean Rank	Sum of Ranks	Z	p
Experiment	Negative	0	0	0	-3.31	.001
(Post-Pre)	Positive	14	7.5	105.0		
	Ties	0				
Control	Negative	0	0	0	-3.07	.002
(Post-Pre)	Positive	12	6.5	78.0		
	Ties	3				

Table 10 shows that the attitudes of the experiment group students towards WBI showed statistically significant difference before and after they took the IAE course (Z=-3.31, p<.05). The students subjected to WBI were found to have a statistically significant increase towards it after its application. It was also observed that the attitudes of the control group students towards the WBI showed a statistically significant increase after the experimental procedure (Z=-3.07, p<.05). This finding showed that the attitudes of the students who were subjected to the face to face instruction towards WBI showed statistically significant increase after the application.

The second dependent variable of the research is the achievement in the IAE course. The data related to the achievement of the students in the experiment and the control groups were tabulated in Table 11.

Table 11. The Comparison of the Course Achievement of the Students in the Experiment and the Control Groups.

Group	N	Mean Rank	Sum of Ranks	U	p
Experiment	14	18.64	261	54.00	.026
Control	15	11.60	174		

Table 11 shows that the course achievement of the students in the control and the experiment group was statistically different each other (U=54.00, p<.05). The line average achievement scores of the students in the experiment group was higher (MR= 18.64) than the student in the control group (MR= 11.60). This showed that the WBI has much more positive effect than to the face to face instruction in the academic achievement of the students. Finally the data related to the general course satisfaction was presented in Table 12.

Table 12. The Comparison of the General Course Satisfaction of the Students in the Experiment and the Control Groups.

Group	N	Mean Rank	Sum of Ranks	U	p
Experiment	14	14.71	206	101.00	.880
Control	15	15.27	229		

When table 12 is examined it is seen that that there was no statistically significant difference as regards to general course satisfaction between the experiment and the control groups (U=101.00, p>.05). This shows that taking the course by WBI or by face to face instruction does not make any difference for the general course satisfaction. In other words WBI is as effective as FTF instruction.

DISCUSSION

The main aim of study is to show whether there were any difference arises by giving the IAE selective course with WBI or face to face instruction manner in TPCK-W, academic achievement and the general course satisfaction.

The self-efficacy in the general web and web communicative skills of the students in both the experiment and the control groups was found to show no statistically significant difference before and after the experimental procedure. This can be attributed that the students had already taken so many related courses for the last three years and the fact that they had already been using the common internet communication tools such as e-mail, facebook and MSN. Atav, Akkoyunlu & Sağlam (2006) showed that 86.9 % of the pre-service teachers are using internet and they were reported to use it for learning, browsing or simply seeing something new (Akkoyunlu & Yılmaz 2005; Atav, Akkoyunlu & Sağlam, 2006; Duggan et al., 2001; Scherer, 1997) or for communicative purposes (Lubans, 2000; Luan, Fung, Nawawi & Hong, 2005; Scherer, 1997). These data in the literature show that the pre-service teachers are commonly using the internet for general or communicative purposes which compiles well with the data obtained in this research.

The WCK values of the all students were found to increase after the experimental procedure. However this increase showed no difference between the experiment and control groups. WCK represents the information related to web technology and the advantages of the use of internet (Lee & Tsai, 2010; Lee, Tsai & Chang, 2008; Mishra & Koehler, 2006). WCK

teaches the pre-service teachers to know how much to teach and the ways to integrate the web content into education activities. Chou & Tsai (2002) reviewed so many sites related to WCK content and emphasized the need of connecting them. In this way WCK needs information more than application and may make no difference in the results of the study.

While the WPCK and attitudes towards WBI did not differ between the experiment and the control groups before the experimental procedure, the students who were subjected to a WBI showed a statistically significant difference after experimental procedures. This can be explained by the fact that the WBI application gives them the practice of WPCK (Lee & Tsai, 2010; Lee, Tsai & Chang, 2008). The fact that the experiment group who was subjected to WBI application has the higher computational skills is an expected outcome. This result was consistent with literature (Frederickson et al., 2000; Hiltz, 1997; Hislop, 2000; Hong, Ridzuan & Kuek, 2003; Howland & Moore, 2002; Kai-ming, Yiu-sing, Pak-hung & Kwok-leung, 2002; Mitra & Steffensmeier, 2000; Richardson & Price, 2003).

The ones who were subjected to WBI application were more successful than the others. This was consistent with the studies of Ferguson & DeFelice (2010), Finlay, Desmet & Evans (2004), Gagné & Shepherd (2001), Lim, Morris & Kupritz (2006), Manathunga (2002), Manuel (2001), Matuga (2001), Ryan (2000), Sener & Stover (2000), Serban (2000), Wegner, Holloway & Gordon (1999). However they contradict to those of Carswell (2000), Collins (2000), Hong, Lai & Holton (2003), Kearsley (2000), Ostiguy & Haffer (2001), Wegner, Holloway & Gordon (1999) who says that there was no difference between the WBI and the face to face instruction. This contradiction may be attributed to search for the data equal to the face to face instruction. This causes the distant education modes such as WBI be regarded as a second class education. So much that there were new concepts developed for the equality of the face to face instruction named as "equality" (Simonson, 1999; Simonson & Schlosser, 1995; Schlosser & Simonson, 2002).

Staring from this concept the studies investigating whether there were any changes in achievement and other variables between WBI and the face to face instruction have become very popular (Simonson, Smaldino, Albright & Zvacek, 2006; Simonson, Schlosser & Hanson, 1999). Due to the fact that these studies focuses solely on the equality of the concepts the result came out equal as regards to success may be the reason behind the different data.

There was not a statistically significant change as regards to the general course satisfaction between the experiment and control groups. This finding is in accordance with the studies of Allen, Bourhis, Burrell & Mabry (2002), Ferguson & DeFelice (2010), Lim, Morris & Kupritz (2006), Ocker & Yaverbaum (2004), Stein & Wanstreet (2003). However it contradicts with the studies such as Collins (2000), Fredericksen et al. (2000), Hislop (2000), Motiwalla & Tello (2000), Richardson & Price (2003), Shapely (1999), and Swan et al. (2000) which say that WBI increases the general course satisfaction.

There were also contradictory data with the literature regarding to the dependent variables of the study such achievement and general course satisfaction. Regarding to success the WBI were found to be superior than the face to face instruction. However there was not any statistically significant difference as regards to the general satisfaction of the course. The reason for the contradiction of these data are explained by Oliver & Omari (2001) as the duration of the course in WBI is too long and forces the students a lot. The students who spend much longer time on WBI are more successful but have a lower satisfaction level. The study carried out by Ferguson & DeFelice (2010) was able to show the origin of this difference. In this study the students were separated into two groups. Both groups were subjected to WBI

but one for five weeks and the second one for whole term. The achievement rate of the groups which were subjected to a five weeks procedure had a higher achievement rate but the ones who had longer application had much higher satisfaction. Since our findings cover a period of only 4 week it may not be enough to monitor any significant change in the satisfaction. However our findings are in good accordance to data of Ferguson & DeFelice (2010).

The study showed that the IAE course has been beneficial for both WBI and the face to face instruction as regards to internet application. It is important that internet tools should be used in the schools by the teachers assigned there. The teaching of this course by WBI was found to cause a significant increase in their academic achievement and their attitudes towards WBI as well as furnish them with permanent learning and the skills. The pre-service teachers may continue their courses with WBI in order to increase their skills and attitudes.

There were two elective courses in the university where the study was carried out. When the quota of one course was filled up then the students had no option but to choose the other course. This had a very adverse effect on motivation and the satisfaction towards the course. The data were analyzed by the use of non-parametric test due to the fact that the number of the students who attend the study was not simply sufficient. The lack of participant may result that the WBI much more successful and satisfactory than it actually is. One can search whether the sufficient number of participant is the cause of these differing results. The duration of the study can be extended and the data may be modified accordingly. The satisfaction of the application can be measure instead of the satisfaction of the course. The dependent variables were taken as academic achievement and satisfaction of the course in this study. These parameters can be changed to self-confidence levels, fear or anxiety against WBI. The success rate was measured by the use of multiple tests. The future studies can be based upon rubric evaluation.

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