EFFECT OF BLENDED LEARNING ENVIRONMENT MODEL ON HIGH SCHOOL STUDENTS' ACADEMIC ACHIEVEMENT

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ABSTRACT

This study analyzes the students' academic performance by comparing the blended learning environment and traditional learning environment. It has been observed whether there is a significant difference between the academic achievement grade dispersions and the male-female students' grades. The study has been carried out in Diyarbakir Anatolian High School in 2010-2011 academic year first semester biology courses. For the study, two quantitive courses sections have been selected among the classes formed by secondary school senior students. Cluster analysis has been conducted to provide the objectivity when forming the experiment and control groups. The study has been conducted with 54 participants, 19 males and 8 females for the experiment group and 18 males and 9 females for the control group. The experiment group continued its education in blended learning environment and the control group continued its education in traditional learning environment. The created learning environments have focused the genetics topic of the biology course and lasted for 6 weeks. During the study, pre-test and final-test have been used for the academic achievement analysis. According to the results acquired at the end of the study, a significant difference hasn't been found between the two groups at the end of the pre-test applied to experiment and control groups. Besides, in accordance with the averages of the final test grades, the experiment group has been found more successful than the control group. In both of the learning environments, female students have turned out to be more successful than the male students.

Keywords: Blended learning, Online learning, Face to face learning, Academic achievement

INTRODUCTİON

In our age in which technology has been advancing, and information has been rapidly increasing and refreshing, the importance of the education has been growing accordingly. While the developments observed in science and technology in the 21st century have expanded the duties and responsibilitis of the education system, they have also brought new opportunities. The fact that our world has been turning into an information-based world ,the value of information increases; the acquisition of information in the right place and at the right time is of vital importance for individuals and society. Rapid and easy access to the wide dissemination of information has resulted in information access technology developments that will provide the circulation of this information (Kartal, 2000; Şahan, 2005). Educational technology holds a very important place for the implementation of the theories produced by educational sciences and the improvement of these implementations (Lim & Morris, 2009; Şimşek & et al., 2009; Peşman & Özdemir, 2012).

One of the innovations of technology is the Internet. The 'Internet' is formed by conjoining two words that imply an international network: Inter (**Inter**national) and Net (**Net**work) (İşman, 2003). The educational system has also benefited from the advantages brought by the Internet. The Internet, which offers learners access to information and the opportunity of written, audio and video communication, has entered into a very rapid development process all over the world. This has caused Internet-based education to expand rapidly (Symonds, 2003; Odabaşı & et al., 2005).

New Internet-based education techniques have removed traditional place and time obstacles and have provided students access to information whenever and wherever they want (Yiğit & Özden, 1999). That the learner can access the information without being dependent on time and place has made the Internet an indispensable part of the education.

Courses offered using the Internet can be considered a form of enriched education, and this includes Web-based online courses, blended courses, and other kinds of Internet-supplemented courses (Kaya, 2002).

Şahan (2005) states that Web-based education is a new education model which can be used to support the acquisition of new information skills and for the enrichment of students' learning habits and experiences. Many education techniques such as presentations, discussions, demonstration, answer-question, brainstorming, case studies, information hunt, cooperative learning, problem centered learning can be conducted in a Web-based environment. This way, it is possible for the learners to gain experiences such as reading, writing, observing, listening, and performing tasks (Şimşek, 2002). However, online learning is deprived of many advantages that

traditional learning embodies (Korkmaz & Karakuş, 2009). The biggest deficiency of these new approaches is that they cannot provide the students with social and face-to-face interaction opportunities with other learners and with the instructor.

On the other hand, Laurillard (2002) has stated that technological tools should be used to a certain extent in order for learning and teaching to be more effective. However, he also emphasizes that information and technology tools along with multimedia tools cannot guarantee complete success of teaching and learning.

WHAT IS BLENDED LEARNING?

A stronger learning environment has emerged with combining the strongest aspects of the two available approaches to remove the deficiencies of traditional learning and Web-based learning. This new learning approach is blended learning. In international literature it is also referred as hybrid learning and mixed learning and it is used in very different ways by many researchers. Graham (2006) defines the blended learning as "the combining of the two different education models, traditional face to face learning and distance learning". Blended learning can also be defined as integrating face to face learning and electronic learning or distance learning, using difference learning theories, methodologies and techniques in the same place and supporting the learning with various online technologies during the learning process in the classroom (Rossett, 2002; Discroll, 2002; Singh, 2003). Throne (2003), on the other hand, defines the blended learning as "an education model which can integrate e-learning which has improved in parallel with new and technologic developments with traditional learning which provides the interaction in classroom". Wilson & Smilanich (2005) see the blended learning as "the implementation of the most effective learning solutions in a coordinated way to achieve the desired learning targets". While Horton (2000) defines it as "combining some strong and advantageous aspects of online learning and the learning in classroom" and Morgan (2002) explains that blended learning is conducted to blend the best aspects of online learning and face to face learning.

Blended learning is a new type of education prepared for a certain group by combining the positive aspects of different learning approaches. Blended learning will provide a big convenience for the course to achieve its target by combining the face to face interaction in traditional learning and time, place and material richness provided by Web-based learning. Yılmaz & Orhan (2010) state that the best way to solve the lack of interaction problem faced in technology-based learning is to blend traditional learning and online learning. Throne (2003) emphasizes that the blending of these two learning approaches occurs by combining CD ROM, e-mail, conference, online animation, audio message, multimedia technology and real classroom environment and he states that it should be presented to the student with traditional classroom management and face to face learning. From this point of view, Blended learning can be a good solution by offering different learning environments to the students who have individual differences as well as approaches to learning.

Besides, blended learning is a learning approach formed with the combination of the different learning environments and activity types for a certain group with the addition of electronic sources to the face to face learning (Bersin, 2004). This approach has the facilities to meet the necessities of our time. The fact that it is applicable and renewable, and it has the technological innovations that are brought by our modern age stands as a proof approach which is worthy of research.

In line with the arguments provided so far, the purpose of this study is to assess the level of success that the students of secondary school will acquire in blended learning environment in biology course. The study aims to compare two learning environments on the basis of the academic achievement grades of the students in blended learning environment and traditional face to face learning environment, and it aims to assess the effectiveness of blended learning environment in biology course and to observe the effectiveness of two learning environments on genders.

That the traditional learning is ineffective in terms of learners' participation and interaction, it is filled into a limited time period and that the distance learning limits the interaction between the learners have caused the emergence of this new learning environment. It is thought that blended learning, which has been tried in many universities and has given positive results, may remove similar problems experienced in primary and secondary schools, too. This study has been planned with the expectation that the opportunities presented by blended learning may be used in secondary schools. To observe the effect of blended learning environment on gender which is also prepared for this research is another reason to make this research.

The research questions of this study were formulated as follows:

- To reveal whether there is a significant difference in learning between blended and face to face instruction.
- Whether there is a significant difference between the academic achievement averages of male-female students.

The criteria for the selection of experiment and control groups are sufficiently objective. The multi choice test used in the study is reliable.

RESEARCH METHODOLOGY

During the research, brainstorming known as student centered learning methods with Web based learning environment, research-study learning method, question answer technique and preparation of a blog page to provide for distance learning have been used. The research tries to determine the effect of blended learning environment on the performance of the students of secondary education 12th grade quantitive courses in their biology courses.

In the research conducted in the blended learning environment, the independent variable is the academic performance level of the students of secondary education quantitive courses 12/B section is the dependent variable. Therefore, the research has been conducted on an experimental model. With the experimental method, it has been tried to find out how and to what extent the independent variable influences the dependent variable. An experiment group and a control group have been formed to implement the experimental method. The groups are as follows;

Experiment Group: The students of the class 12/B studying in a class where blended learning environment has been provided.
Control Group: The students of the class 12/C studying in a class where traditional learning environment is offered.

Furthermore, tests used as pre-tests and final tests have been applied to those groups at the beginning and at the end of the experimental study to assess their academic performance. The dispersion of the students' academic performance, which is the dependent variable, on gender has also been studied in this research.

The pattern of the research model with pre-test and final test control group is as follows:

Table 1. Experimental design

	Pre-Test		Final Test
Traditional Learning Environment	The pre-test conducted for the traditional learning environment	Application	The final test conducted for the traditional learning environment
Blended Learning Environment	The pre-test conducted for the blended learning environment		The final test conducted for the blended learning environment

Participants

The study has been carried on two classes of 2010 - 2011 academic year fall term quantitive courses 12th grader students of Diyarbakir Anatolian High School, Diyarbakir. The two classes to whom the experiment has been applied to consist of 54 students in total. Both of the classes have the same number of students and this is 27. For the determination of the experimental group and control group from these two classes, the students' overall achievement grades of 10th grade, overall achievement of 11th grade, biology course achievement of 11th grade and the pre-test result that the students acquired have been used. 12/B, which has 19 male and 8 female students, has been chosen as the experiment group and 12/C, which has 18 male and 9 female students, has been chosen as the control group.

Of the two groups students who joined in the study, general grade point is average of 10th class-students and general grade point is average of 11th class-students in biology course and grade points they gained in pre-test questions are compared. Values gained after comparison are considered acceptable for objectivity in forming experiment and control groups. The data have been formed via Cluster Analysis technique, and they have been evaluated with the statistics program SPSS 16.0 for Windows.

10th grade overall achievement grades of the control and the experiment group students have been compared by means of independents samples test. The data acquired are as follows:

Table 2. T- test results on 10th grade overall achievement grades of control and experiment groups

Groups	N	Mean	SD	Levene test		t	p
				F	p		
Experiment	28	78.90	8.89	0.04	0.843	0.476	0.63
Control	30	77.83	8.19				
Total	58						

10th grade overall achievement grades of the control and the experiment group students have been compared by means of independent samples test, and the data acquired are demonstrated in the table above. According to the findings acquired with the help of the table above, it has been found out that there isn't a statistically significant difference between the 10th grade overall achievement grades of the control group students and the experiment group students. According to this finding, it can be said that the groups have been assigned objectively according to their 10th grade overall achievement grades. 11th grade overall achievement grade average of experiment and control group students have been compared by means of independent samples test. The data acquired are as shown in Table 3 below:

Table 3. T-test results on 11th grade overall achievement grade average of experiment and control groups

Groups	N	Mean	SD	Levene test		t	p
				F	p		
Experiment	28	79.94	8.97	0.210	0.648	1.272	0.209
Control	30	77.01	8.58				
Total	58						

Based on the result of the independent samples test of 11th grade overall achievement grade average of the groups it has been found out that there isn't a significant difference between the groups. According to the data acquired, it can be said that the groups have been assigned objectively according to their 11th grade overall achievement grades.

11th grade biology course achievement grades of experiment and control group students have been compared by means of independent samples test. The data acquired are as shown in Table 4 below:

Table 4. T-test results on 11th grade biology course achievement grade averages of experiment and control groups

Groups	N	Mean	SD	Levene test		t	p
				F	p		
Experiment	28	72.71	11.85	1.102	0.298	0.754	0.454
Control	30	70.14	13.92				
Total	58						

Likewise, the 11th grade biology course achievement grade averages of the groups have been compared by means of independent samples test. At the end of this comparison it has been found out that there isn't a significant difference between the groups. Under the light of this data it can be seen that the experiment and control groups have been chosen objectively according to their biology course achievement grade averages.

The grades that the experiment and control group students have taken in the pre-test have been compared by means of independent samples test. The data acquired are as shown in the table below:

Table 5. T-test results on pre-test grades of experiment and control groups

Groups	N	Mean	SD	Levene test		t	p
				F	p		
Experiment	27	29.25	12.91	0.11	0.73	0.1	0.91
Control	27	28.88	12.27				
Total	54						

After the comparison of pre-test achievement grade averages of the experiment and the average groups, it has been found out that there isn't a significant difference between the two groups. All the data acquired shows that the groups are formed objectively.

The data collection and analysis
Theoretical dimension has been created through evaluating the data acquired with literature review and experts' point of view. Experimental data has been collected by means of achievement test. Achievement test has been given to the students before and after the application. After the forming of the experiment and control groups, traditional method has been applied to the control group and the newly prepared program has been applied to the experiment group. In the improvement of the testing tools in the research and in the evaluation of the data acquired as a result of the research the analysis functions below have been used.

During the data analysis, arithmetical mean, standard deviation, cluster analysis, item difficulty index, item discrimination index, KR_{20} reliability coefficient, percentage and frequency have been used. Besides, paired samples test and independent have been used in order to compare the data acquired from the samples chosen for the research. Reliability interval for the statistical analysis operations has been determined as $0 < 0.05$ and in analysis operations one of the relevant pack programs SPSS 16.0 for Windows has been used.

The data collection tools
The information pertaining to data collection tools are used in order to determine the academic performances according to the learning environments where the experiment and control group students have been applied the study are given below.
Achievement tests (Pre-Test and Final Test)
Inasmuch as the subject of the research is the students' participation to the biology course. Academic achievement test has been prepared according to the goals and attitudes prepared in this subject. The subjects that are covered by the biology course and the attitude dimension of these subjects have been prepared in compliance with Bloom's taxonomy. The achievement test has been prepared as a repetitive test and has been conducted to the students both before and after the experiment.

Pre-Test: It has been implemented to identify the students' knowledge before the experimental study. 25 multi-choice questions have been prepared about biology course participation subject with the help of experts' point of view. The pre-application of the achievement test have been conducted to 82 students and it has been found out that KR-20 = 0.69. 4 items whose item discrimination levels are zero or negative have been removed from the test and the test has been decreased to 21 items and 5 achievement test questions (2, 4, 11, 16 and 18th questions) whose item discrimination levels are below 0.20 have been corrected. The achievement test has been applied to 54 students who are experiment and control group students. Pre-test item difficulties and item discrimination have been calculated. Pre-test item difficulty total has been found as 5.6 and pre-test item discrimination total has been found as 5.35. Achievement test item difficulty and item discrimination levels have been found low. This situation can be explained with the fact that nearly all of the students' pre-knowledge about the subject is inefficient.

Final test: A knowledge test consisting of 21 items and equivalent form to the pre-test has been conducted to the students to test the students' knowledge level they acquired after the experimental operation. 54 students who are in experiment and control groups have participated in the application. The item difficulty total of the final test has turned out to be 14.72 and the item discrimination total of the final test has turned out to be 7.85. Looking at the data acquired, it can be said that the final test is of medium difficulty.

Application
The study has been conducted on 27 students of 12/B class Anatolian High School Quantitive Courses section in biology course. The same course given in traditional learning environment has been conducted on 27 students of 12/C class. Education process in both learning environment has been executed by the same instructor.
Flipped classroom is a form of blended learning which encompasses any use of technology to leverage the learning in a classroom, so a teacher can spend more time interacting with students instead of lecturing. This is most commonly being done using teacher-created videos that students view outside of class time (Barseghian,2011). It has been applied in the classroom where the experiment is executed.

The application period which has lasted for six weeks has lasted for 18 hours being 3 hours a week. The students studying in blended learning environment have studied in classroom environment for 12 hours and have studied in Web environment for 6 hours. A blog page has been prepared for the students to be able to be in interaction for 24 hours a day in blended learning Web environment. The Computer lab in the school has been opened for

the use of the students who don't have Internet connection in their houses. Each student has been given a password so that they could access the Web page and the students' access to the blog page with their own password has been provided.

Throughout the research, the subjects are given in hierarchical order in titles and subtitles so that the students can use the blog page comfortably. The students have been provided to watch relevant videos whenever they want and to reach detailed sources about the subject while they are learning the subject of genetics in multi-environment. Each student who connects to the blog page has been provided to ask questions, take notes and write comments in any chapter of genetics subject they want to. Tests relevant to genetics, including the questions of the exams prepared by OSYM, have been put on the Web page so that the students can practice whenever they want. Apart from the Web page, the students have been given tests on the covered topic each week, *PowerPoint* slides have been shown and materials on the topic have been presented to the class.

RESULTS
Comments to constitute basis for the research results by using data analysis methods have been made to the control group and experiment group during the process of beginning the study for the evaluation of the data after application of the programs and the data collection. The results acquired via data analysis and their evaluation have been given under titles by categorizing them according to their acquisition phases.

Results about the pre-test
Comprehension of how the experiment group and control group students are ready for the program prepared before the research and the relation of the pre-learning of the experiment group and control group students are analyzed in this chapter. The data acquired from the pre-test that has been carried out to both of the groups have been analyzed and it has been explained in this chapter if there is a significant difference between the two groups.

Table 6. The pre-test result points applied to the experiment and control groups

Groups	N	Mean	SD	t	p
Experiment Group	27	29.25	12.91	0.10	0.91
Control Group	27	28.88	12.27		

p<0.05

Table 6 above shows the pre-test academic achievement grade averages of experiment group, who has studied in blended learning environment, and control group, who has studied in traditional learning environment. The pre-test academic achievement grade average of the experiment group students who has studied in blended learning environment is 29,25, on the other hand, the pre-test academic achievement grade average of the control group students who has studied in traditional learning environment is 28,88. In order to assess if there is a significant difference between the pre-test academic achievement grade averages of the experiment group and the control group independent sample tests have been conducted. At the end of the application, it has turned out that there isn't a significant difference between the pre-test academic grade average of 12/B, studying in blended learning environment and 12/C studying in the traditional learning environment. It turned out to be clear that there isn't a significant difference between academic achievement levels of the two groups under the light of the data acquired from the comparison of the academic achievement points of the pre-tests.

Results on the comparison of pre-test final test academic achievement grades
In this chapter, the pre-test and final test grades acquired by experiment and control groups have been compared. Whether there is a significant difference between the pre-test and final test grades of the experiment group is explained via the data acquired from Table 7 and whether there is a significant difference between the pre-test and final test grades of the control group is explained via the data acquired from Table 7.

Table 7. The Pre-Test and Final Test Results of the Experiment Group

Groups	N	Mean	SD	t	p
Pre-test	27	29.25	12.91	-15.52	0.00
Final Test	27	78.70	13.05		

p<0.05

As it can be seen from the table, the pre-test grade average of experiment group who have studied in blended learning environment has turned out to be 29.25 and their final test grade average has turned out to be 78.70. Paired Samples Test has been conducted in order to see if there is a significant difference between the pre-test and final test grades of the experiment group who has studied in the blended learning environment. At the end of

the study, it has been understood that there is a significant difference between the pre-test and final test grade average of the experiment group students who have studied in blended learning environment. The significant difference shows that the blended learning environment has turned out to be successful.

Table 8. The Pre-Test and Final Test Results of the Control Group

Groups	N	Mean	SD	t	p
Pre-test	27	28.88	12.27	-14.64	0.00
Final test	27	72.22	9.12		

p<0.05

Based on the information Table 8 provides, it is understood that the pre-test and final test academic achievement grade averages of control group who have studied in traditional learning environment. The pre-test academic achievement average of the control group has turned out to be 28.88; their final test achievement average has turned out to be 72.22. Paired Samples Test has been conducted in order to see if there is a significant difference between the pre-test and final test grades of the control group who has studied in the traditional learning environment. At the end of the application, it has turned out that there is a significant difference between the pre-test and final test academic achievement grade averages of the control group students who have studied in traditional learning environment. The difference shows that the traditional learning process has turned out to result in success.

Results on the final test
At the end of the study, the students have been presented the same test with the one they had at the beginning of the topic. Experiment and control group students have answered the test. The data acquired and the results acquired under the light of this data are included in this chapter.

Table 9. The Final Test Results of the Experiment and Control Group

Groups	N	Mean	SD	t	p
Experiment Group	27	78,70	13,05	2,11	0,03
Control Group	27	72,22	9,12		

p<0.05

Table 9 shows the final test academic achievement grade averages of the students of experiment group who have studied in blended learning environment and the students of control group who have studied in traditional learning environment. The pre-test academic achievement grade average of the experiment group students who have studied in blended learning environment is 78.70; the academic achievement average of the control group students who have studied in traditional learning environment has turned out to be 72.22. Independent Samples Test has been conducted in order to find out if there is a significant difference between final test academic achievement grade averages of experiment group students and control group students. At the end of the application it has turned out that there is a significant difference between the final test academic achievement grade averages of experiment group who have studied in blended learning environment and control group who have studied in traditional learning environment.

In general terms, when we look at the final test results which have been conducted to the control and experiment group students after the study, it has been observed that the students who have studied in blended learning environment turns out to be more successful after the study. Looking at this situation, it can be said that blended learning have been more effective than traditional learning all along the study.

Table 10. Pre-Test and Final Test Group Statistics Depending on Gender

	Groups	Gender	N	Mean	SD	Std. Average Error	p
Experiment Group	Pre-test	Male	19	27.10	8.38	1.92	0.18
		Female	8	34.37	19.89	7.03	
	Final Test	Male	19	75.78	13.56	3.11	0.07
		Female	8	85.62	9.03	3.19	
Control Group	Pre-test	Male	18	25.00	11.11	2.61	0. 01
		Female	9	36.66	11.18	3.72	
	Final Test	Male	18	71.11	10.64	2.50	0.38
		Female	9	74.44	4.63	1.54	

p <0.05

As it is seen in the table above, the academic achievement grade averages of experiment group and control group students depending on gender are given. According to the table experiment group male student' academic achievement average is 27.10; final test academic achievement average is 75.78. The same experiment group's female student academic achievement grade average is 34.37; final test academic achievement average is 85.62. Control group students' academic achievement average depending on gender is as follows: male student pre-test academic achievement grade average is 25.00; final test academic achievement grade average is 71.11. Female student academic achievement grade average is 36.66; final test academic achievement grade average is 74.44.

Based on the data derived from this table, Independent Sample Test has been conducted in order to assess if there is a significant difference between control group and experiment group students' academic achievement grade averages depending on gender. And the end of this application, the dispersion of the results acquired at the end of the pre-test and the final test carried out with experiment group and control group students on gender has been examined. First of all, in order to examine if there is a significant difference between the academic achievement grade averages it has been analyzed if the groups have homogenous variances by means of Levene's Test. At the end of the study it has been observed that the academic achievement grade average of the experiment group does not have significant difference depending on gender.

CONCLUSION
At the end of this study, it has been observed that the students who have studied in blended learning environment are academically more successful than the students who have studied in traditional learning environment. The results of the study are examined below as articles.

- At the end of the achievement test conducted before the study, a significant difference hasn't been found between the academic achievements of the students who have studied in blended learning environment and the students who have studied in traditional learning environment. It has been observed that the academic achievement average of the two groups is close to each other when the averages of their achievement tests are taken.

- It has been observed that there has been a positive increase in the academic achievement averages of the students who have studied in both of the environments.

- A significant difference has been found between the final test achievement grades of the two student groups having studied according to two learning approaches which demonstrate the academic achievement averages acquired at the end of the study. According to this result, one of the learning environments that have been applied during the study, blended learning environment and its effect on the academic achievement grades of the students who have studied in this environment have been found more than the effect of traditional learning environment's effect on the students' academic achievement. The academic achievement average of the students who have studied in blended leaning environment has been found higher than the academic achievement average of the students who have studied in traditional learning environment.

- It has been analyzed if the study has a significant difference on gender. At the end of the study the academic achievement averages of the female students have turned out to be higher than the academic achievement averages of the male students in both the pre-test and final test which have been conducted in both of the learning environments. A significant difference hasn't been observed between the academic achievement averages of male-female students when the experiment group students' academic achievement grades are analyzed depending on gender. When the academic achievement averages of the control group students are analyzed depending on the gender and when the academic achievement grade averages of pre-tests are observed there has been observed a significant difference between male and female academic achievement grade averages. Also, when looked at the academic achievement grade averages of the final test that has been applied to the experiment group, the difference that previously considered as significant between the academic achievement grade averages of male and female students has been removed.

DISCUSSION
All in all, this study focuses on what blended learning means and on the differences between traditional learning and blended learning prepared for 12th grade biology course. The effect of blended learning environment on the students' academic performance has been analyzed. Under the light of the results of the study, it has been observed that the academic success of the students who have studied in blended learning environment in which online learning environment and face to face learning environment are used together, increases.

Any time period, place or distance is not important for the learners in online learning environment (Tatlı, 2009). The fact that the students can get access to information in any place without being limited by boundaries or spaces with blended learning environment and the fact that blended learning environment provides exchange of information and ideas in cyber world are the factors causing the increase of their achievement grades. The result of this study asserting that blended learning environment increases the academic achievement averages is also supported by Demirer (2009); Ünsal (2007); Usta & Mahiroğlu (2008); Bañados (2006); Robinson (2004); Dziuban, Hartman & Moskal, (2004); Boyle & et al. (2003); Singh (2003); Doo, Morris & Virginia, (2006); Morgan (2002) in the studies conducted on blended learning. In addition, according to Hopper (2003), the best courses are those which have ample and timely feedback, use the technology in compliance with intelligence and provide learning by action. They are the courses in which the online courses are used in the best way. Not only blended learning provides an environment in which there are simultaneous feedback and effective usage of technology but also it provides the learners in online learning environment to be in interaction. This benefit of blended learning is a proof that it will gain an effective and significant place in modern education system.

SUGGESTIONS

This study has been carried out in a secondary school institution, one of the Anatolian High Schools. Similar studies can be conducted in other schools, non-math courses and balanced courses sections study. The online learning material that has been used during the study has been developed by the researcher himself. Taking into account that the preparation of the online learning material used in this study requires expertise, the prospective online learning materials to be used in next studies should be prepared with experts' support and they should be provided to be of more quality and to be more useful.

Apart from Web based learning in blended learning environment, some techniques such as brainstorming and question answer techniques have been used in this study. The future studies can be carried out with available techniques and methods apart from learning methods and techniques that have been used. This study has offered a blended learning environment by using traditional learning environment and online learning environment together. By using the same learning environment, online learning and traditional learning can be carried out separately from each other without keeping them simultaneously.

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