Dicle Üniversitesi
Ziya Gökalp Eğitim Fakültesi Dergisi

Dicle University
Journal of Ziya Gökalp Faculty of Education

The Effects of Online Collaborative Learning and Using E-Portfolio on Success, Attitudes and Permanency*

Pınar ERTEN[1], İ. Yaşar Kazu[2], Oğuzhan ÖZDEMİR[3]

[1]Asts. Prof., Bingol University, Faculty of Science and Literature, perten@bingol.edu.tr
[2]Assoc. Prof. Dr., Firat University Faculty of Education, iykazu@dicle.edu.tr
[3]Assoc. Prof. Dr., Firat University Faculty of Education, oguzhan@firat.edu.tr

Geliş Tarihi/Received: 18.11.2019 **Kabul Tarihi/Accepted:** 25.12.2019 **e-Yayım/e-Printed:** 8.01.2020

ABSTRACT

The purpose of this study was to determine the effects of e-portfolio implementation in the Online Collaborative Learning (OCL) setting on students' academic success, attitude, achievement and permanency levels in the Operating Systems and Applications (OSA) course. The randomized pretest-posttest control group model and semi-structured interview techniques, which are true experimental models, were used. In order to apply the e-portfolio implementation in the OCL setting, the Online Collaborative Learning and E-portfolio Portal (OCLEP) and the virtual classroom implementation were used. According to the implementation results, it was observed that all students were successful and the method had a positive effect especially on permanency. The difference between student attitudes on the course and on the OCL settings was not significant. It was observed that the number of students who thought that the method had benefits were high. It was evident that the most frequent problem was related to the application of OCLEP and virtual classroom implementations. Students emphasized that, when compared with other methods, this method has more benefits, it should be applied in theoretic courses and that courses delivered through this method are more comprehensible. Thus, this method can be used in teaching many courses.

Keywords: Collaborative learning, online collaborative learning, e-portfolio, virtual class

1. Introduction

Araştırmada ortaokul öğrencilerinin sosyal bilgiler dersine yönelik motivasyon kaynakları, Beklenti-Değer Kuramının görev değeri bileşenleri açısından incelenmeye çalışılmıştır. Bu amaçla nitel araştırma yöntemlerinden temel nitel araştırma kullanılmıştır. Bu yöntem eğitim dâhil olmak üzere farklı disiplin ve uygulama alanlarında yaygın olarak kullanılan, verilerin görüşme, gözlem ve doküman analizi yoluyla toplandığı nitel araştırma türüdür (Merriam, 2009). Ortaokul öğrencilerinin sosyal bilgiler dersine yönelik motivasyon kaynaklarının kendilerine yöneltilen açık uçlu sorulara vermiş oldukları yazılı cevaplar aracılığıyla belirlenmesi amaçlandığından temel nitel araştırma yöntemi tercih edilmiştir.

Individuality and learner centeredness is becoming more important each day in the field of education. Various learning-teaching methods and settings have emerged after including the new technologies into all stages of education. Together with combining today's technology the internet with education, the term online education has become an alternative to face-to-face education. This has increased the quality and education and diversified its opportunities. Learning has been enabled interactively in settings independent from time and place.

the student to be successful in the learning process by using these skills, individual work along with collaborative work become prominent. Collaborative learning (CL) has been applied in face-to-face settings for longer than half a century (Açıkgöz, 2009). However, the expanded application of online learning technologies has led to the notion that CL can be delivered online. The OCL setting is a platform where students can successfully collaborate, share and communicate and which facilitates the administration of this process. In order to evaluate students throughout the process in these platforms, following every learning activity will increase the reliability and validity of the evaluation (Reeves, Herrington, & Oliver, 2004; Demirli & Gürol, 2007; Johnson & Johnson, 2014). This opportunity can be promoted through e-portfolio implementation in online settings.

Collaborative learning

CL is the process in which students perform by helping each other's learning in small groups (Açıkgöz, 2009, p. 336; Açıkgöz, 2011, p. 172). Students collaborate in order to fulfill their common learning objectives. Each student in the small groups strives to achieve the groups and his own learning objectives (Johnson, Johnson, & Smith, 1998, p. 28). The primary elements of collaborative work consist of positive dependence, individual accountability, promotive interaction, social skills and group processing (Johnson, Johnson, & Smith, 1991).

CL is an instructional method which promotes and encourages students to help, discuss and learn from each other during the courses (Slavin, 1987, p. 1161). It integrates students with unique skills and characteristics in the classroom, increases their sense of friendship and promotes intra-group interaction (Demirel, 2002, p. 210; Demirel, 2003, p. 124). Each member of the group contributes and they share a common goal (Ingram & Hathorn, 2004, p. 218). They work or act as a whole in order to achieve this common goal (McInnerney & Roberts, 2004, p. 205). The success they gain in group work is higher than the success they gain individually (Gabbert, Johnson, & Johnson, 1986). Participation of students who are passive during lessons increases (Bilgin & Akbayır, 2002). Students should always be aware of the "swim or drown together" philosophy in collaborative learning (Johnson, Johnson, Holubec, & Roy, 1984).

Collaborative learning allows active student participation, permanent learning, displaying positive behaviors towards the courses and peers, it promotes individual and group-based success, encourages research, self-confidence, empathizing, communication, dialogue, develops the sense of belonging to a group and direct student participation in the education process (Bilgin & Karaduman, 2005; Gümüş & Buluç, 2007; Bozkurt, Orhan, Keskin, & Mazi, 2008, p. 65; Gök, Doğan, Doymuş, & Karaçöp, 2009).

Various techniques have been established for CL based on the course and subject, the number of students and physical and social structure of the setting (Ekinci, 2005; Maloof & White, 2005; Doymuş & Şimşek, 2007; Köseoğlu, 2010). The most frequently applied collaborative learning techniques are given below (Kagan, 1989; Ekinci, 2005; Efe, Hevedanlı, Ketani, Çakmak ve Aslan Efe, 2008; Senemoğlu, 2010; Açıkgöz, 2011):

- Learning together,
- Academic contradiction,
- Student teams-achievement units,
- Team-game-tournament,
- Team assisted individualization,
- Combined collaborative reading and composition (CCRC),
- Group research,
- Cooperation-cooperation,

In this study, the Jigsaw II technique was applied because a setting in which the contribution of every member is important (Özbuğutu & Hasenekoğlu, 2013, p. 1016), rather than only a few students, was presented.

Online Collaborative Learning

For societies who participate collaboratively in the structure of knowledge, OCL is the use of asynchronous computer communication networks in promoting social settings (Bélanger, 2012, p. 3). OCL settings congregate in virtual settings and promote collaborative work among students and enables learning more effectively with the group (Hoppe, 2007).

There are many numerical technologies which promote OCL. An effective collaboration is achieved by using these in a network or in the internet setting. While there are individual learning settings for students, there are also CL settings which emerge from the mutual communication among students.

Web 2.0, social network technologies and virtual settings are related to collaboration, sharing and active learning. Online education systems and virtual learning environments enable students and teachers to learn collaboratively, access and use the resources and offers individual and group learning settings (Tambouris et al., 2012). Learning is increased and a flexible structure for learning is introduced by creating virtual learning settings through new CL instruments (Sorensen, 2004).

It is important to prepare reports and texts in collaborative settings. Web based applications are used for group members to work together and create these documents in OCL settings. Wiki-based websites, discussion boards and blogs. Collaborative settings such as Google Docs, Buzzword and Etherpad create a group dynamic which are driving forces and increase the sense of accountability and responsibility (Iberri, Kim, & Joppie, 2009).

E-Portfolio

The fact that individual differences are prominent in educational programs obligates multi-evaluation techniques in assessment-evaluation. One of these is portfolio (learner product document) evaluation. It is a collection of achievement which shows the work, effort and stages that the learner has experienced. In addition to displaying the development of the student, it also enables an evaluation of the teacher and the student (Demirel, Başbay, & Erdem, 2006, p. 127-130). The performance and success of the learning throughout the learning process is recorded in portfolio evaluations (Tabuk, 2009, p. 33). It also offers productive opportunities for realistic and guiding evaluations for the program (Korkmaz & Kaptan, 2002, p. 168).

While portfolios were documented on papers in written form, with the use of computer and the internet technologies in education, they started to be created and recorded in electronic settings. While portfolios only consisted of products such as texts, images and graphics, they began including various products such as sound, video, animation and presentation through electronic settings (Demirli, 2007; Barış & Tosun, 2013). E-portfolios are both tools for evaluations and are evaluation instruments for encouraging students in the teaching-learning process. Studies suggest that e-portfolio increases motivation positively affects attitudes and perceptions and increases achievement (Gülbahar & Köse, 2006; Gürol & Demirli, 2006; Demirli, 2007; Demirli & Gürol, 2010; Chou, 2012; Barış & Tosun, 2013).

Purpose of the Study

The purpose of this study is to determine the effects of e-portfolio implementation in the OCL setting on students' academic success, attitude, achievement and permanency levels in the OSA course. With this respect, the following hypotheses were examined:

There is a significant difference between the experimental group students' pre-test and post-test attitude scores related to the OCL implementation.

The qualitative dimension of the study focuses on determining student opinions on the implementation. With this respect, student opinions on e-portfolio implementation in OCL setting were determined.

2. Method

2.1. Study Model

Araştırmada ortaokul öğrencilerinin sosyal bilgiler dersine yönelik motivasyon kaynakları, Beklenti-Değer Kuramının görev değeri bileşenleri açısından incelenmeye çalışılmıştır. Bu amaçla nitel araştırma yöntemlerinden temel nitel araştırma kullanılmıştır. Bu yöntem eğitim dâhil olmak üzere farklı disiplin ve uygulama alanlarında yaygın olarak kullanılan, verilerin görüşme, gözlem ve doküman analizi yoluyla toplandığı nitel araştırma türüdür (Merriam, 2009). Ortaokul öğrencilerinin sosyal bilgiler dersine yönelik motivasyon kaynaklarının kendilerine yöneltilen açık uçlu sorulara vermiş oldukları yazılı cevaplar aracılığıyla belirlenmesi amaçlandığından temel nitel araştırma yöntemi tercih edilmiştir.

Since both quantitative and qualitative data were used together in this study, mixed research method was preferred. Mixed research is a mix of quantitative and qualitative methods or paradigms. It is the use of methods to integrate each other (Creswell, 2003; Balcı, 2009). The randomized pretest-posttest control group model, which is a true experimental model, was used in this quantitative study (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2013). In this model, two groups, which are shaped according to specific goals, are determined through unbiased allocation. One of the groups is identified as the control group and the other is identified as the experimental group. Pre-implementation and post-implementation assessments are conducted on these groups. The extent of how effective these assessed variables are is determined by comparing these assessments (Kaptan, 1998; Büyüköztürk, 2011; Karasar, 2003). The persistency test was conducted without entering any model parameters after the posttest. The models used are given below:

R	G1	O1.1	X	O1.2	O1.3
R	G2	O2.1		O2.2	O2.3

R: Neutrality in the Creating of groups

G1: The experimental group

G2: The control group

X: E-portfolio implementation in the OCL setting

O1.1- O2.1: The pretests

O1.2- O2.2: The posttests

O1.3- O2.3: The permanency test

Qualitative data were used along with quantitative data in this study. The interview technique was conducted on the experimental group in collecting qualitative data. Obtaining concrete data was aimed at in the interview technique (Rummel, 1968).

2.2. Study Group

The study sample consisted of students studying in Fırat University, Faculty of Education, Department of Computer and Instructional Technologies Education (CEIT) during the 2012-2013 and who took the OSA course. Because the implementation required the students to be competent in using online settings and electronic settings, students from the CEIT department and the OSA course were selected. With this respect,

2.3. Operations Conducted in the Research Process

Studies Conducted Before the Implementation

In order to apply the e-portfolio implementation in the OCL setting, a website called the Online Collaborative Learning and E-portfolio Portal (OCLEP) and the virtual classroom implementation were used. This website has a dynamic structure which enables student and teacher interactions. OCLEP consists of the course content and e-portfolio implementations. OCL was delivered through the virtual classroom setting. Through the virtual classroom implementation, audible and visual interviews, presentation, using a common board, instant messaging (chat), survey, note taking and screen sharing were performed in virtual meeting rooms. Because the Jigsaw II technique was used in the implementation the student were classified in 7 expert groups and introduced in the system. Administrators of the implementation and the system were assigned as group leaders to each group. The working programs of the groups were determined and introduced to the system. Students performed the virtual classroom implementations according to this program. They carried out the necessary communication and informing among themselves and the administrator through the website.

The achievement test and attitudes towards the course scale were conducted on the experimental and control groups. In addition, another scale was applied on the experimental group to determine their attitudes towards the OCL setting. The normal course organization of the control group was not interfered with during the implementation and the courses were delivered the way they should be.

Studies Conducted During the Implementation

Student groups and the subjects of these groups of the OCL implementation were identified through the OCLEP. A total of 7 groups were created. The groups were asked to determine a leader. The groups carried out online course activities 6 hours on specific days a week through the virtual classroom implementation. After completing the virtual classroom activities, the students got the opportunity to watch the recordings of themselves. This enabled the students to reinforce the lessons and detect their deficiencies.

In order to communicate outside the virtual classroom implementation, the students used the forum section of the OCLEP. At the end of the process, the students were asked to prepare a report on their subjects through the OCLEP. These operations were repeated for each unit. When the virtual classroom implementations were completed, the students created portfolio files through the OCLEP. The students set a goal for themselves based on the directive given in the e-portfolio on OCLEP and prepared their documents according to these goals. Every kind of electronic document (text, video, image, graphic etc.) was collected in these files. The implementation was conducted in six weeks.

Studies Conducted After the Implementation

The achievement test and attitude scale were conducted on the control and experimental groups as a posttest after the implementation. In addition, the attitude towards OCL setting scale was conducted on the experimental group as a posttest. An interview form asking the students to state their opinions on the method being applied was conducted on the experimental group. Six weeks after the implementation was completed, the achievement test was conducted again as a permanency test. The memorization and persistency levels of the students' knowledge were determined through the persistency test.

2.4.Data Collection Instruments and Analysis

The achievement test and the attitude scale related to the OSA course, developed by the researcher, were used as the pretest and posttests to assess the achievements of the students. Also, the scale developed by Korkmaz (2012) was used to determine student attitudes towards the OCL setting.

According to item analysis results concerning the items of the achievement test, the average power of the test was observed to be .37 and the KR-20 value was .57. The Cronbach Alpha coefficient of the two-factor attitude scale consisting of 38 items was .969, the explained total variance was 57.967%, the KMO value was .936 and the Barttlet Test value was 4306.617.

The OCL Attitude scale, developed by Korkmaz (2012), consists of 17 items and two factors. The KMO

and instructors from the CEIT department. The interview form consisted of open-ended questions related to the implementation, the learning environment and administration.

Computer assisted software was used in analyzing the quantitative and qualitative data of the study. Because the experimental design was used in the study, the cluster analysis method was conducted in determining the experimental and control groups. After the implementation, the independent sample t-test was conducted in comparing the experimental and control groups, the paired sample t-test was conducted in comparing the groups among themselves. The .05 significance level was taken as a basis in evaluating and interpreting the data obtained from the scales. The content analysis method was used in evaluating the qualitative data. Direct references were made from the data collected from the participants. Each participant was coded as S1, S2, S3,... (based on the source and row) when making references to their opinions.

3. FINDINGS AND COMMENTS

Findings on the Quantitative Dimension

Findings on the Achievement Test

The achievement test was conducted on the experimental and control groups three times as the pretest, posttest and permanency test. The independent samples t-test was used for comparing the posttest scores of the students in the experimental and control groups:

Table 1. Results of the Independent Samples t-Test Concerning Posttest Scores of the Experimental and Control Groups

Groups	n	$\overline{X}$	sd	df	t	p
Control Group	33	18.88	.29	66	1.389	.170
Experimental Group	35	17.97	.32			
Levene= .873 p= .354						

There were no significant differences observed among the experimental and control groups students' achievement posttest scores ($t(66)=1.389$, $p>.05$). Thus, the hypothesis "There is a significant difference between the experimental and control groups' posttest scores" was rejected. It is evident from the results of the methods conducted on the experimental and control groups that the students learn at a similar level with each other.

The independent samples t-test was conducted on the students to determine the effects of their gain scores on achievement:

Table 2. Results of the Independent Samples t-Test Concerning the Gain Scores of the Experimental and Control Groups

Groups	n	$\overline{X}$	sd	df	t	p
Control Group	33	9.73	3.39	66	.268	.789
Experimental Group	35	9.49	3.99			
Levene= 2.210 p= .142						

No significant differences were detected among the experimental and control groups when their achievements were compared ($t(66)=.268$, $p>.05$). That the averages of the experimental ($\overline{X}=9.49$) and control ($\overline{X}=9.73$) groups are similar indicates that the method applied for each group has reached success in its own framework. These findings suggest that the hypothesis, "There is a significant difference between the experimental and control groups' achievement", is rejected.

Table 3. Results of the Independent Samples t-Test Concerning the Permanency Scores of the Experimental and Control Groups

Groups	N	$\overline{X}$	sd	df	t	p
Control Group	33	13.52	4.06	66	-2.765*	.007
Experimental Group	35	15.89	2.96			
Levene= 3.901 p= .052						

*p<.05

It is evident on Table 3 that there is a statistical significant difference between the permanency scores (t(66)=-2.765, p<.05). This difference was in favor of the experimental group. It was observed that the permanency score averages of the students in the experimental group ($\overline{X}$=15.89) were higher than the students in the control group ($\overline{X}$=13.52). This indicates that the method applied on the experimental group is more effective than the method applied on the control group. It can be concluded that the method applied on the experimental group is more effective in promoting persistent learning. Also, the hypothesis, "There is a significant difference between the experimental and control groups' permanency scores." was confirmed.

Findings Concerning the Attitude Scale

The paired samples t-test was conducted in comparing the pre-test and post-test attitude scale scores of the experimental and control group students:

Table 41. Results of the Paired Samples t-Test Concerning The Pre-test and Post-test Attitude Scale Scores of the Experimental and Control Groups

Groups		n	$\overline{X}$	sd	df	t	p
Control Group	Pre-test	33	2.9	.32	32	1.310	.200
	Post-test		3.0	.29			
Experimental Group	Pre-test	35	2.9	.27	34	1.151	.258
	Post-test		2.9	.32			

While there were no significant differences between the control group's pre-test and post-test attitude scale scores (t(32)=1.310, p>.05), it was observed that the attitudes slightly changed at the end of the implementation. Similarly, there were no significant differences between the pre and post-test attitude scale scores of the experimental group (t(34)=1.151, p>.05). It was observed that their attitudes increased positively at the end of the implementation. Thus, it can be suggested that the experimental and control groups have positive attitudes towards the implementation. With this respect, the hypothesis, "There is a significant difference between the experimental and control groups' pre-test and post-test scores obtained from the attitude scale." was rejected.

Findings on the Attitudes Towards the OCL Setting Scale

The pre-test and post-test scores obtained from the attitudes towards the OCL setting scale conducted on the experimental group were compared. The paired samples t-test was used in this comparison and the results are given on Table 5.

Table 5. Results of the Paired Samples t-Test Concerning The Pre-test and Post-test Attitude Total Scores of the Experimental Groups on the OCL Setting

It was observed that there are no significant differences among the experimental group students' attitudes towards the OCL setting ($t(34)=.142$, $p>.05$). This indicates that the attitudes towards the OCL setting scale score do not have a statistical significant effect. The reason why students display such attitudes could be because they are frequently on online settings. Thus, the hypothesis, "There is a significant difference between the experimental group students' pre-test and post-test attitude scores related to the OCL implementation.", was rejected.

Findings on the Qualitative Dimension

Qualitative Findings on the Contributions of the Learning Setting

Determining the contributions of the implementation is important in identifying whether or not the implementation has fulfilled its goal. Thus, the experimental group students were asked what the contributions of the learning setting implemented were. It was observed that the number of students who thought that the method had benefits were higher. This indicates that the implementation was beneficial. Various students' opinions which contribute to this result are given below:

S7: "Yes, I think it has benefits. Hearing different opinions by different people even for completely structured questions enabled me to look from a new perspective."

S23: "Yes, it contributed because along with my own knowledge, the topic we learnt was supported with the suggestions and assistance from my friends."

S25: "My communication with my friends increased."

S29: "Together with the developing technology, we improved ourselves through these platforms and learnt new methods for raising individuals beneficial for the society."

S14: "Yes. I followed the course better because I was a leader..."

S20: "...it also helped me to make a group work with my friends who I had never interacted within the classroom before."

With regards to student opinions, it can be suggested that it contributes to self-improvement, time, sense of responsibility, learning, communication, becoming familiar with a new educational environment and group and individual work. Few students stated negative opinions and expressed that they found the traditional method better.

Qualitative Findings on the Problems Encountered in the Implementation Setting

Some students stated that they encountered various problems during the implementation. Examples of student opinions that enabled us to reach these results are given below:

S28: "There were problems in the internet, sound and image connections. The screen froze or the sound went off sometimes."

S34: "Yes. We were disconnected form the system, sound quality was poor."

S02: "I had difficulty in communicating with my group friends..."

S27: "...The leader's interference with conversations and behaviors unrelated to the course was insufficient..."

It was observed that the most frequent problem was related to the application of OCLEP and virtual classroom implementations. Although not frequent, issues related to communication and interaction, time, leadership, preparation for the course and documents occurred along with the other problems. The number of students who stated that they encountered no problems was very few.

Qualitative Data on the Comparison between The Implemented Method and the Traditional Learning Methods

center of the process, visuality and permanency increased through the use of technology, accessing documents became easy and repeatability was enabled. Some students stated the differences from the other methods as becoming aware of responsibilities in working together and interacting, researching, actively working, the teacher remaining in the background, lack of discipline and inspection and being convenient with the level of the student. One other finding based on student opinions is that the number of students with negative opinions on this method is very low. These students underlined that this method has felt behind the traditional methods, made the students more passive and learning has become more difficult. In addition, very few students stated that the traditional methods are better because they are teacher-centered and more disciplined, they are ordinary and boring, they enable socialization and promote face-to-face education. Various student opinions which enabled us to reach these results are given below:

S27: "...Unlike the traditional education, it is based on the working-together principle... The teacher is no longer a leader but a counselor. I think that this role of teachers is better and more effective..."

S25: "It has the advantage of repetition."

S4: "The student is more active here..."

S20: "...because it appeals to more than one sense permanency is a bit more in this method."

S19: "This method is more entertaining than the traditional method and is more didactic because it is based on research."

S32: "I think that traditional methods are more effective because they are delivered face-to-face."

Qualitative Findings on Using the Method in Other Courses

The students were interviewed on whether or not they requested this method to be applied in the other courses. Student opinions are given below:

S11: "I don't want it for practice-based courses but I want it for verbal courses."

S20: "I'd like to use this instructional method in some of the other courses. For example, I'd like to receive the English, Turkish, Computer training courses, which are year one courses for our freshman friends, through this method..."

S9: "...we can take un-applied courses by saving on time and without any space and classroom limits."

S25: "No, because I get distracted more because it is a virtual setting."

S13: "Students are very passive."

With respect to these interviews, the majority of the students emphasized that this method should be used. The students underlined that the method should be applied especially in verbal courses which are theory-based rather than practice-based. Among the reasons that the students expressed for the need to use the method in other courses was the advantage in time-space, visuality, permanency, attention-grabbing and preparing a report at the end of the implementation. Few students stated that it shouldn't be applied in other courses due to time, distraction, supporting the traditional method, being reluctant, finding it useless and inconvenient for the structure of the other courses and for student application.

Qualitative Findings on Learning the Course Through the Method

The students were asked whether or not the course is better understood through the method being implemented. The number of students expressing that learning is achieved were higher. The fact that learning was promoted collaboratively was emphasized most by the students. In addition, it was also stated that learning took place because it encouraged research, offered an opportunity to repeat, the comfortable atmosphere, due to being student-centered, the sense of responsibility, self-learning and because there are no time limitations. It was observed that a small group of students stated that they learnt but rather less through this method. These students emphasized that they learnt but rather less because the method is image-based

inappropriate courses, student-centeredness, lack of sense of responsibility and lack of interaction. Examples of student opinions in reaching this result are given below:

S14: "Yes. It encourages research."

S9: "Because it gives a sense of responsibility with the aim of learning the subject better, the student puts more effort and the learning activity becomes more productive. It grants freedom to students."

S18: "Because there was group, I became successful."

S21: "I can't say that I learnt the course better but it helped me acquire various information and competences." These statements indicated that partial learning took place."

S25: "No, I think I learn better through the traditional method."

S34: "No. We encounter systematical problems more."

4. CONCLUSION AND DISCUSSION

The implementation results indicate that both methods have positive effects on student success. Also, the fact that the achievement levels of both methods are similarly supports this finding. No significant differences were observed between the achievement of the groups. However, it was observed that permanency was higher in the e-portfolio implementation in the OCL setting than in the traditional method. This is a qualitative and quantitative result and is crucial for the consistency of the study. Many studies have proved that the OCL method has positive effects on academic achievement (Zhu, 2012; Korkmaz, 2013). According to the study conducted by Çayırcı (2007), web-based e-portfolio implementation has positive effects on academic achievement; however, Chang (2008) detected no significant differences in the web-portfolio implementation.

According to the study, the e-portfolio implementation in the OCL setting led to positive changes in the attitudes of the students, who took the OSA course, from the beginning of the course. It was observed that experimental and control groups' attitudes towards the course did not differ significantly before and after the implementation. Also, no significant differences were observed between the experimental group students' attitudes towards the OCL setting. The study conducted by Nam and Zellner (2011) also suggested no significant differences. Korkmaz (2013) states that attitudes towards OCL are positive and at a high level. Similarly, according to the study conducted by Lee and Bos (2011), attitudes of students change positively after the implementation based on the activities organized in OCL settings.

Qualitative and quantitative findings of the study support each other. Individual work and group work were stated as the contributions of the learning settings by the students. There is a dependency in CL settings which emerge from individual work towards collaborative group work. Because there is a high level dependency among collaborative group members, group work is conducted through common goals and activities (Graham & Misanchuk, 2004). The study indicates that the implemented learning settings affected the learning experiences of students, enabled them to become familiar with various educational settings and offered them benefits such as saving on time. Many studies suggest that OCL settings have positive effects on individuals (Daradoumis, Martínez-Monés, & Xhafa, 2006; Brindley, Walti, & Blaschke, 2009; Janssen, Erkens, Kirschner, & Kanselaar, 2009; Blake & Scanlon, 2013). Similarly, it was suggested that web-portal based e-portfolio implementations have positive contributions to the learning experiences and self-developments of individuals (Gülbahar & Köse, 2006; Demirli, 2007, Chang & Tseng, 2008). One other result of the study is that the implemented setting has contributions to self-development. Individuals who are open-minded, creative and who have multiple perspectives improve themselves in such settings (Johnson, Johnson, & Holubec, 2012). Students were observed to emphasize the contributions of the learning method concerning communication skills and acquiring a sense of responsibility. Working with collaboration teams in online

unprepared for the lesson, unable to access the documents and the leaders failing to perform their duties were among the other problems stated. It was observed that self-efficacy, instructional design, technology use and the problems related to the collaborative process cause negative experiences and a decrease in the learning performance in OCL settings (Jung, Kudo, & Choi, 2012). Leaders are necessary in order to fully design and implement online activities, share learning experiences and conduct group work within online collaborative groups (Kukulska-Hulme, 2004). Problems can occur when leaders fail to perform their duties. In the study, there were students who didn't have any problems as well.

The method implemented was compared with traditional methods and it was observed that it has many benefits. It was stated that because the method has a comfortable atmosphere and is independent from time and space, it is better than the traditional method. In addition, technology use, visuality, permanency, access to documents, repeatability, teachers remaining in the background, student-centeredness, working together, interaction, sense of responsibility, self-learning, researching, convenient for student levels and being active are other features of the method. Student-student, student-teacher and student-content interactions are promoted successfully through Web 2.0 and social software in online settings (Rossi, van Rensburg, Harreveld, Beer, Clark and Danaher, 2012). The most crucial characteristics of CL are sense of responsibility and interaction. With this respect, it has positive outcomes such as assistance, leading, coping with contradictions and making group decisions (Açıkgöz, 1990). Student opinions suggest that it has negative features with regards to the traditional methods. The implemented method remaining at the background, being ineffective, discipline and inspection issues and the students remaining passive were stated as the drawbacks. When the traditional method was evaluated based on the implemented method, it was suggested that traditional methods were better, they were ordinary and boring, teacher-oriented and disciplines, that they promoted socialization and face-to-face education. According to what Johnson and Johnson (2014, p. 1) narrated from Johnson and Johnson (2013), face-to-face interaction in CL is more effective than online interaction. Using technology offers instant feedback in CL. It also increases learning experiences of students who are inactive in the classroom (Johnson & Johnson, 2014).

With regards to whether the method should be applied in other courses or not, the students stated that it should be applied in theoretic and verbal courses. In the e-portfolio student Demirli (2007) conducted on a portal, students were observed to fail to display positive attitudes towards applying the process on numerical courses. While these findings were reached based on student opinions, the study conducted by Francis and Jacobsen (2013) suggests that OCL is especially effective in the numerical course mathematics. Visuality, being interesting, lack of time-place limitations, permanency and preparing reports were listed among the reasons why the method should be applied in other courses. By removing the geographical and communication obstacles that teachers encounter and establishing electronical reading (e-books and texts), writing (Google documents), discussion (social media websites, video conference etc.) settings, a CL settings based on visuality and supported by various software can be created. At the end of the study, reports, which are furnished with visual elements and in which each group member participates, are prepared through electronic media (Johnson & Johnson, 2014). Effective CL can be said to take place in online settings through such a use of technologies. The reasons stated by the students who didn't want the method to be applied in other courses were requesting the traditional methods, being inappropriate for every course and student, lack of benefits, being reluctant, distraction and having no time. Students with negative opinions were observed to request face-to-face education and traditional methods in other courses. Group members failing to contribute to performing the objectives or the negative experiences while designing the activities lead to negative opinions (Lee & Bae, 2011).

establish learning societies and groups within the classroom and around the world, they conduct researches through websites and links and learn by solving the problems together (Johnson & Johnson, 2014). Students who stated that learning was achieved partly emphasized that the atmosphere is comfortable, visuality, permanency, being appropriate for the courses, acquisition of various knowledge and skills and various deficiencies. Students who supported traditional methods and face-to-face education stated that learning did not take place. The implementation being student-centered and guiding towards sense of responsibility were listed as negative impacts on learning to fail. Also, based on student opinions, lack of interaction, failing to comprehend the subject and the courses being inconvenient can be said to play a role in the failure of the learning process. Lack of face-to-face interaction can cause confidence issues in team work during online communication (Bennett, 2004). Thus, student opinions on the implemented method can be negative.

Suggestions

Because study results indicated that e-portfolio implementation in the OCL setting contributed positively to student achievement, attitudes, persistent learning experiences and self-developments, it can be applied in many other courses.

Because it enables conducting various learning methods together and when the effects it has on the courses are considered, the opportunities in implementing this method in some courses should be increased. In addition to verbal courses, after delivering the theoretical framework of numerical courses it can be used so as to diversify the activities and help the subject to be learnt.

CL should be promoted after organizing online settings according to the courses. Positive outcomes through such a method should be encouraged for applied and theory-based courses.

Implementation in various sections of education should be encouraged Such educational methods should be included in the curriculum of teacher training educational units and should be introduced to the students, the benefits should be explained and they should be furnished so as to be competent in conducting the method in the future professional life.

Implementations, which are student-centered, encourage learning, improve the sense of responsibility, promote self-learning, in which the teacher remains as a counselor, which develops communication skills and which enables sociability should be increased.

Student-oriented approaches rather than teacher-oriented approaches should be adopted in educational implementations. Students who adopt teacher-centered approaches will have difficulty in learning through different approaches and will face reactions. Student-centered approaches should be emphasized more so as to prevent and extinguish this understanding.

The OCL settings and e-portfolio implementation were conducted together in this study. It can be combined with various learning approaches.

5. REFERENCES

Açıkgöz, K. Ü. (1990, September). *İşbirliğine dayalı öğrenme ve geleneksel öğretimin üniversite öğrencilerinin akademik başarısı, hatırda tutma düzeyleri ve duyuşsal özellikleri üzerindeki etkileri [Collaborative learning and the effects of traditional teaching on the academic success, reminiscence and affective characteristics of university students]*. I. Ulusal Eğitim Bilimleri Kongresi [National Congress of Educational Sciences], (pp. 187-201). AnkaraÜniversitesi Eğitim Bilimleri Fakültesi, Ankara.

Açıkgöz, K. Ü. (2009). *Etkili öğrenme ve öğretme [Effective learning and teaching]*. (8th ed.). İzmir: Biliş Publications.

Açıkgöz, K. Ü. (2011). *Aktif öğrenme [Active learning]*. (12th ed.). İzmir: Biliş Publications.

Balcı, A. (2009). *Sosyal bilimlerde araştırma yöntem, teknik ve ilkeleri [Research methods, techniques and principles in social sciences]*. (7th ed.). Ankara: Pegem Akademi Publishing.

Bennett, S. (2004). Supporting collaborative project teams using computer-based technologies. In T. S. Roberts (Ed.), *Online Collaborative Learning: Theory and Practice* (pp. 1-27). USA, Idea Group Publishing.

Bilgin, İ., & Karaduman, A. (2005). İşbirlikli öğrenmenin 8. sınıf öğrencilerinin Fen dersine karşı tutumlarına etkisinin incelenmesi [Investigating the effects of cooperative learning on 8 grade students' attitudes toward Science]. *İlköğretim Online [Elementary Education Online], 4*(2), 32-45.

Bilgin, T., & Akbayır, K. (2002, September). *İşbirlikli öğrenmenin dizi ve serilerin öğretimindeki etkililiği [The effectiveness of collaborative learning in teaching sequences and series]*. V. Ulusal Fen Bilimleri ve Matematik Eğitimi Sempozyumu [National Science and Mathematics Education Symposium], Vol. 2, pp. 933-938, Ankara.

Blake, C., & Scanlon, E. (2013). Design for collaboration. *Journal of Interactive Media in Education, 2,* 1-15.

Bozkurt, O., Orhan, A. T., Keskin, A., & Mazi, A. (2008). Fen ve Teknoloji dersinde işbirlikli öğrenme yönteminin akademik başarıya etkisi [The effect of cooperative learning method to the academic achievement in Science and Technology lesson]. *Türkiye Sosyal Araştırmalar Dergisi [The Journal of Turkish Social Research], 12*(2), 63-78.

Brindley, J. E., Walti, C., & Blaschke, L. M. (2009). Creating effective collaborative learning groups in an online environment. *International Review of Research in Open and Distance Learning, 10*(3), 1-18.

Büyüköztürk, Ş. (2011). *Deneysel desenler: Öntest-sontest kontrol grubu desen ve veri analizi [Experimental design: pretest-posttest control group design and data analysis]*. (3th ed.). Ankara: Pegem Akademi Publishing.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2013). *Bilimsel araştırma yöntemleri [Scientific research methods]*. (18th ed.). Ankara: Pegem Akademi Publishing.

Chang, C. C. (2008). Enhancing self-perceived effects using web-based portfolio assessment. *Computers in Human Behavior, 24*(4), 1753-1771.

Chang, C. C., & Tseng, K. H. (2008). Use and performances of web-based portfolio assessment. *British Journal of Educational Technology, 40*(2), 358-370.

Chou, C.-M. (2012). Influence of teachers' perceived e-portfolio acceptance on teacher evaluation effectiveness in Taiwan. *Australasian Journal of Educational Technology*, *28*(4), 719-739.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (Second Edition). Thousand Oaks, London, New Delhi: Sage Publications.

Çayırcı, Ç. (2007). *İlköğretim 7. sınıfta web tabanlı portfolyo uygulaması: Fen bilgisi ve sosyal bilgiler örnekleri [Web-Based Portfolio Application in Primary School 7th Grade: Samples of Sciences and Social Sciences]*. (Unpublished master thesis). Dokuz Eylül Üniversitesi Eğitim Bilimleri Enstitüsü, İzmir.

Daradoumis, T., Martínez-Monés, A., & Xhafa, F. (2006). A layered framework for evaluating on-line collaborative learning interactions. *International Journal of Human-Computer Studies, 64*(7), 622-635.

Demirel, Ö. (2002). *Kuramdan uygulamaya eğitimde program geliştirme [Cirriculum development from theory to practice]*. (4th. ed.). Ankara: Pegem A Publishing.

Demirel, Ö. (2003). *Öğretimde planlama ve değerlendirme öğretme sanatı [Planning and evaluation in teaching art of teaching]*. (6th. ed.). Ankara: Pegem A Publishing.

Demirel, Ö., Başbay, A., & Erdem, E. (2006). *Eğitimde çoklu zeka kuram ve uygulama [Multiple intelligence theory and practice in education]*. Ankara: Pegem A Publishing.

Demirli, C. (2007). *Elektronik portfolyo öğretim sürecinin öğrenen tutumlarına ve öğrenme algılarına etkisi [The effect of electronic portfolio process on learners' attitudes and learning perceptions]*. (Unpublished doctoral dissertation). Fırat Üniversitesi Sosyal Bilimler Enstitüsü, Elazığ.

Demirli, C., & Gürol, M. (2007). An overview of the electronic portfolio process. *e-Journal of New World Sciences Academy Education Sciences, 2*(3), 254-271.

Demirli, C., & Gürol, M. (2010, March-April). *Teacher candidates' attitudes and perceptions towards electronic portfolio process.* 21st Annual Conference of The Society for Information Technology and Teacher Education

Ekinci, N. (2005). İşbirliğine dayalı öğrenme [Cooperative learning], In Ö. Demirel (Ed.). *Eğitimde Yeni Yönelimler [New Trends in Education]*. (1st ed., pp. 91-107). Ankara: Pegem A Publishing.

Francis, K., & Jacobsen, M. (2013). Synchronous online collaborative professional development for elementary mathematics teachers. *The International Review of Research in Open and Distance Learning, 14*(3), 319-343.

Gabbert, B., Johnson, D. W., & Johnson, R. T. (1986). Cooperative learning, group-to-individual transfer, process gain, and the acquisition of cognitive reasoning strategies. *The Journal of Psychology: Interdisciplinary and Applied, 120*(3), 265-278.

Gök, Ö., Doğan, A., Doymuş, K., & Karaçöp, A. (2009). İşbirlikli öğrenme yönteminin ilköğretim öğrencilerinin akademik başarılarına ve fene olan tutumlarına etkileri [The effects of cooperative learning on elementary school students' academic achievement and attitudes toward science]. *Gazi Eğitim Fakültesi Dergisi, 29*(1), 193-209.

Graham, C. R., & Misanchuk, M. (2004). Computer-mediated learning groups: Benefits and challenges to using groupwork in online learning environments. In T. S. Roberts (Ed.). *Online Collaborative Learning: Theory and Practice.* (pp. 181-202). USA: Idea Group Publishing.

Gülbahar, Y., & Köse, F. (2006). Öğretmen adaylarının değerlendirme için elektronik portfolyo kullanımına ilişkin görüşleri [Perceptions of preservice teachers about the use of electronic portfolios for evaluation]. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi, 39*(2), 75-93.

Gümüş, O., & Buluç, B. (2007). İşbirliğine dayalı öğrenme yaklaşımının Türkçe dersinde akademik başarıya etkisi ve öğrencilerin derse ilgisi [The Effects Of Cooperative Learning Approach On Students' Achievements And Interests Towards The Turkish Course]. *Kuram ve Uygulamada Eğitim Yönetimi, 49*, 7-30.

Gümüş, S. (2007). *Çevrimiçi işbirliği ekiplerinde öğrenenlerin sorun çözerek öğrenmeyle ilgili tutum ve görüşleri [Attitudes and views of online cooperative learning teams toward learning by problem solving]*. (Unpublished master thesis). Anadolu Üniversitesi Sosyal Bilimler Enstitüsü, Eskişehir.

Gürol, M., & Demirli, C. (2006, *April*). *E-portfolio sürecinde öğrenci motivasyonu [Students' motivation in e-portfolio process]*. VI. Uluslararası Eğitim Teknolojileri Konferansı, Doğu Akdeniz Üniversitesi, Gazimağusa, KKTC.

Hoppe, H. U. (2007). Educational information technologies and collaborative learning. In H. U. Hoppe, H. Ogata and A. Soller (Eds.). *The Role of Technology in CSCL* (pp. 1-11). New York: Springer Science+Business Media.

Iberri, E., Kim, J., & Joppie, A. (2009). *Collaboratively writing about collaborative-writing tools.* Retrieved from http://www.iddblog.org/?p=161

Ingram, A. L., & Hathorn, L. G. (2004). Methods for analyzing collaboration in online communications. In T. S. Roberts (Ed.). *Online Collaborative Learning: Theory and Practice* (pp. 215-241). USA: Idea Group Publishing.

Janssen, J., Erkens, G., Kirschner, P. A., & Kanselaar, G. (2009). Influence of group member familiarity on online collaborative learning. *Computers in Human Behavior*, *25*(1), 161-170.

Johnson, D. W., & Johnson, R. T. (2014). Using technology to revolutionize cooperative learning: An opinion. *Frontiers in Psychology, 5*(1156), 1-3.

Johnson, D. W., Johnson, R. T., & Holubec, E. (2012). The cooperative link: Cooperative learning. *The Newsletter of The Cooperative Learning Institute, 26*(1), 1-4. Retrieved from http://www.co-operation.org/wp-content/uploads/2011/01/Volume-261.pdf

Johnson, D. W., Johnson, R. T., Holubec, E. J. and Roy, P. (1984). *Circles of Learning: Cooperation in the classroom.* Alexandria, VA: Association for Supervision and Curriculum Development.

Johnson, D. W., Johnson, R. T., & Smith, K. A. (1991). *Cooperative learning: Increasing college faculty instructional productivity*. ASHE-ERIC Higher Education Report No: 4. The George Washington University, School of Education and Human Development, Washington, DC.

Karasar, N. (2003). *Bilimsel araştırma yöntemi [Scientific research method]*. (12th ed.). Ankara: Nobel Yayın Dağıtım.

Korkmaz, H., & Kaptan, F. (2002). Fen eğitiminde ögrencilerin gelişimini değerlendirmek için portfolyo kullanımı üzerine bir inceleme [An investigation on using portfollo for assessing students' development in science educatlon]. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 23*, 167-176.

Korkmaz, Ö. (2012). A validity and reliability study of the online cooperative learning attitude scale (OCLAS). *Computer & Education, 59*(4), 1162-1169.

Korkmaz, Ö. (2013). BÖTE öğretmen adaylarının çevrimiçi işbirlikli öğrenmeye dönük tutumlarıve görüşleri [CEIT Teacher candidates' attitude toward online collaborative learning and their opinions]. *İlköğretim Online [Elementary Education Online], 12*(1), 283-294.

Köseoğlu, P. (2010). The influence of jigsaw technique-based teaching on academic achievement, self-efficacy and attitudes in biolology education. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, *39*, 244-254.

Kukulska-Hulme, A. (2004). Do online collaborative groups need leaders? In T. S. Roberts (Ed.). *Online Collaborative Learning: Theory and Practice* (pp. 262-280). USA: Idea Group Publishing.

Lee, K., & Bos, B. (2011, November). *Online collaborative learning: Promoting a culture of cooperation.* 17th Annual Sloan Consortium International Conference on Online Learning. Lake Buena Vista, Florida. Retrieved from http://olc.onlinelearningconsortium.org/conferences/2011/aln/online-collaborative-learning-promoting-culture-cooperation

Maloof, J., & White, V. K. B. (2005). Team study training in the college biology laboratory. *Journal of Biological Education, 39*(3), 120-124.

McInnerney, J. M., & Roberts, T. S. (2004). Collaborative or cooperative learning? In T. S. Roberts (Ed.). *Online Collaborative Learning: Theory and Practice* (pp. 203-214). USA: Idea Group Publishing.

Nam, C. W., & Zellner, R. D. (2011). The relative effects of positive interdependence and group processing on student achievement and attitude in online cooperative learning. *Computers & Education, 56*(3), 680-688.

Özbuğutu, E., & Hasenekoğlu, İ. (2013). Bitkisel dokular konusunun öğretilmesinde işbirliğine dayalı öğretimin öğrenci başarısı ve kalıcılığına etkisi [The effects of cooperative learning on students' successand retention in learning plantal tissues]. *Turkish Studies-International Periodical for The Languages, Literature and History of Turkish or Turkic, 8*(8), 1013-1025.

Reeves, T. C., Herrington, J., & Oliver, R. (2004). A development research agenda for online collaborative learning. *Educational Technology Research and Development, 52*(4), 53-65.

Rossi, D., van Rensburg, H., Harreveld, R. E. B., Beer, C., Clark, D., & Danaher,P. A. (2012). Exploring a cross-institutional research collaboration and innovation: Deploying social software and web 2.0 technologies to investigate online learning designs and interactions in two Australian universities. *Journal of Learning Design, 5*(2), 1-11.

Rummel, J. F. (1968). *Eğitimde araştırmaya giriş* (Trans. R. Taşçıoğlu). Ankara: MTÖ Publications.

Senemoğlu, N. (2010). *Gelişim öğrenme ve öğretim: Kuramdan uygulamaya* [*Developmental learning and teaching: From theory to practice*] (16th ed.). Ankara: Pegem Akademi Publishing.

Slavin, R. E. (1987). Development and motivational perspectives on cooperative learning: A reconciliation. *Child Development, 58*(5), 1161-1167.

Sorensen, E. K. (2004). Reflection and intellectual amplification in online communities of collaborative learning. In T. S. Roberts (Ed.). *Online Collaborative Learning: Theory and Practice* (pp. 242-261). USA: Idea Group Publishing.

Tabuk, M. (2009). *Proje tabanlı öğrenmede çoklu zeka yaklaşımının matematiksel öğrenme başarısına etkisi [The effects of multiple intelligence approach in project based learning on mathematics achievement].* (Unpublished doctoral dissertation). Marmara Üniversitesi Eğitim Bilimleri Enstitüsü, İstanbul.

Tambouris, E., Panopoulou, E., Tarabanis, K., Ryberg, T., Buus, L., Peristeras, V. et al. (2012). Enabling Problem Based Learning through Web 2.0 Technologies: PBL 2.0. *Educational Technology & Society, 15*(4), 238-251.