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## **The Effects of Quizlet on Secondary School Students' Vocabulary Learning and Attitudes Towards English**

İsmail Çınar<sup>1</sup>, Asım Arı<sup>2</sup>

### **Abstract**

The main purpose of this study is to investigate the effects of Quizlet online vocabulary application on vocabulary learning skills and attitudes towards English course. The pretest-posttest control group quasi-experimental design was used in the study. The study group consisted of 71 ninth grade students who were studying in Eskişehir in the 2018-2019 academic year. English Language Attitude Scale and Vocabulary Test were used to collect data. In the experimental and control groups, a total of eight lessons were conducted in four weeks. The data were collected before and after the implementation phase and analyzed by quantitative and descriptive analysis. The vocabulary post-test and retention test scores of the experimental group were significantly higher than the control group ( $p<0.05$ ). The retention test in the experimental group showed a significant increase compared to the post-test, whereas a significant decrease was found in the control group ( $p<0.05$ ). On the other hand, the positive attitude towards the English course showed a significant increase in the experimental group ( $p<0.05$ ). However, there was no significant difference in the control group. In addition, the Quizlet application has made the lesson more fun, and it has increased the interest and motivation of the students, and facilitated vocabulary learning. Quizlet online vocabulary practice makes an important contribution to students' vocabulary learning, the persistence of the vocabulary learned, and to developing positive attitudes towards English.

**Keywords:** Quizlet, instructional technologies, foreign language teaching

### **1. Introduction**

Today, persons desire to learn a foreign language for various reasons such as professional or economic, recognizing different cultures, interest in works of foreign language or traveling. These reasons have become more diverse and prominent than ever, especially in the century we live in. Therefore, in today's world where there is a more global life than ever, foreign language teaching has a vital and growing place in order to keep up with the developments and not to be behind the age whether it is due to personal benefit or pleasure (Ceyhan, 2007). Therefore, parallel to the growing importance, foreign language teaching is given great importance in all societies, and different approaches, methods and tools are being researched for more effective foreign language teaching (Altunöz, 2017).

A considerable part of these studies is conducted on vocabulary learning in foreign languages since words are needed for effective communication and it is not possible to use a language

<sup>1</sup> İsmail Çınar, Ministry of Education, Teacher, ismailcinar77@gmail.com

<sup>2</sup> Prof. Dr. Asım Arı, Eskişehir Osmangazi University, Faculty of Education, ari@ogu.edu.tr

effectively without having sufficient vocabulary. Because vocabulary form the building blocks of sentences in foreign language, the richer the vocabulary, the more capable of expressing himself and communicating with the others. No matter how good the grammar is, it is impossible for a person to express his or her feelings and thoughts in any way without words. Fluent speaking and reading comprehension are difficult without sufficient vocabulary (Biçer, 2011). Wilkins (1972) emphasized this by stating that “very little can be achieved without grammar, but nothing can be achieved without words”. Also, Lewis (1993) emphasized that “words are the core or heart of language, although grammar brings together groups of words, much of the meaning is hidden in words.”

Moreover, there is an important connection between the achievement of four basic skills named listening, speaking, writing and reading in foreign language teaching and vocabulary. Students are supposed to know the words in order to be successful in them. It is not possible to improve these skills without having sufficient vocabulary. In fact, inadequate vocabulary is an important reason for the problems encountered in the improvement of these skills (Biçer, 2011).

Therefore, vocabulary and teaching are an indispensable part of language teaching (Körlü, 2017; Subaşı, 2014). In the studies on vocabulary teaching in foreign languages, vocabulary teaching strategies such as keyword method, dictionary usage, predicting meaning from context, semantic mapping, vocabulary book usage, metacognitive strategy and corpus usage are emphasized (Barbaros, 2018). In addition, various methods summarized as social methods, memory methods, cognitive methods, metacognitive methods, interaction methods and compensation methods are examined (Çelik & Toptaş, 2010).

Furthermore, the use of technology has become an indispensable element of vocabulary teaching due to its various advantages. Foreign language and vocabulary teaching have been affected by the development of technology. The use of technology has become an indispensable element of modern language teaching methods due to the various benefits it provides to teachers and students (Sarica & Çavuş, 2009). Today, technologies such as computers, internet-based or mobile learning tools are used extensively in language learning. Students, in this way, can learn foreign languages and vocabulary more effectively, quickly, easily and permanently (Korkmaz, 2010).

The Quizlet online vocabulary application (Quizlet for Short) is an internet-based and mobile-supported vocabulary learning site and app that can be used free of charge when extra features are not included. It offers services in 130 different countries in 18 different languages deserves the address of <https://quizlet.com/tr> in Turkey. It also provides a mobile-supported learning environment and tool, which can be downloaded free of charge to mobile phones via Google Play and the App Store. In this respect, it has a great potential in foreign language and vocabulary teaching and is used as an important tool. So, it is important to examine the effects of Quizlet on vocabulary learning of secondary school students and is expected to shed light on students, teachers, program development experts and parents in learning vocabulary more effectively and efficiently.

The main purpose of this research is to determine the effects of Quizlet on vocabulary learning of secondary school students. For this main purpose, the answers of three sub-problems were researched:

- Does the Quizlet affect the vocabulary learning of secondary school students?
- Does it contribute to the permanence of vocabulary learning of secondary school students?

- Does it increase the positive attitudes of secondary school students towards English course?

## 2. Methodology

### 2.1. Research Design

The model of this research is the actual experimental model which is among the experimental research types. In the research, “pretest-posttest quasi-experimental design with control group” was used to explore the cause-effect relationships between the variables. The research design is given in Table 1:

**Table 1.** Research Design

Group	Pre-Test	Teaching Process	Post-Test	Retention Test
Experimental Group	English Course Attitude Scale	Quizlet-Based Teaching	English Course Attitude Scale Vocabulary Test	Vocabulary Test
Control Group	English Course Attitude Scale		English Course Attitude Scale Vocabulary Test	Vocabulary Test

The independent variable of the research is Quizlet-based teaching and dependent variables were the level of vocabulary learning and the attitude towards the English course. The relationships between the variables were examined using quantitative analysis methods.

### 2.2. Research Group

The study group consisted of 71 students studying in the 2018-2019 academic year, in a high school in Tepebaşı district of Eskişehir (11 students out of a total of 82 students were not included in the study group due to absenteeism). 35 of the students were in the experimental group and 36 of them were in the control group. Table 2 shows the distribution of the students by classrooms and groups.

**Table 2.** Distribution of Students by Classroom and Group

Classroom	Number of Students	Experimental Group (n)	Control Group (n)	Total (n)
9-A	21	18	0	18
9-B	20	0	18	18
9-C	16	0	18	18
9-D	25	17	0	17
Total	82	35	36	71

In Table 3, the gender, age and the educational status of the parents were given.

**Table 3.** Gender and Age Characteristics of Students

Variable	Group	Experimental Group		Control Group		Total	
		n	%	n	%	n	%
Gender	Male	26	74.3	23	63.9	49	69.0
	Female	9	25.7	13	36.1	22	31.0
Age	14 years	1	2.9	4	11.1	5	7.0
	15 years	25	71.4	29	80.6	54	76.1
	16 years	9	25.7	3	8.3	12	16.9

**Table 3.** (continued)

Variable	Group	Experimental Group		Control Group		Total	
		n	%	n	%	n	%
Education Level of Mother	Illiterate	3	8.6	3	8.3	6	8.5
	Primary education	14	40.0	16	44.4	30	42.3
	High school	13	37.1	13	36.1	26	36.6
	Undergraduate level	4	11.4	4	11.1	8	11.3
	Graduate level	1	2.9	0	0.0	1	1.4
Education Level of Father	Illiterate	3	8.6	1	2.8	4	5.6
	Primary education	11	31.4	13	36.1	24	33.8
	High school	16	45.7	19	52.8	35	49.3
	Undergraduate level	5	14.3	1	2.8	6	8.5
	Graduate level	0	0.0	2	5.6	2	2.8

Accordingly, 69% of the students were male and 31% were female. 7% of the students were 14 years old, 76.1% were 15 years old and 16.9% were 16 years old. The mean age was  $15.10 \pm 0.48$  years. Six (8.5%) of the students' mothers and 4 (5.6%) of their fathers were illiterate. Thirty (42.3%) of the mothers and 24 (33.8%) of the fathers were primary school graduates. 26 (36.6%) of the mothers and 35 (49.3%) of the fathers were high school graduates. The number of undergraduates is 8 (11.3%) in mothers and 6 (8.5%) in fathers. In addition, the number of graduate mothers is 1 (1.4%) and the number of fathers is 2 (2.8%).

Besides, the characteristics of the participants' computer facilities and internet usage habits and use of the internet for educational purposes are given in Table 4.

**Table 4.** Computer Opportunities and Internet Habits of Students

Variable	Group	Experimental Group		Control Group		Total	
		n	%	n	%	n	%
Do you have your own computer?	Yes	22	62.9	27	75.0	49	69.0
	No	13	37.1	9	25.0	22	31.0
Is there internet all the time in your house?	Yes	29	82.9	28	77.8	57	80.3
	No	6	17.1	8	22.2	14	19.7
How much time do you spend on the internet weekly?	Less than 1 hour	0	0.0	1	2.8	1	1.4
	1-2 hours	5	14.3	3	8.3	8	11.3
	2-3 hours	2	5.7	4	11.1	6	8.5
	3 hours and more	28	80.0	28	77.8	56	78.9
Do you use online training sites and applications?	Yes	18	51.4	22	61.1	40	56.3
	No	17	48.6	14	38.9	31	43.7
Do you use the internet for learning English?	Yes	19	54.3	25	69.4	44	62.0
	No	16	45.7	11	30.6	27	38.0
Is there a website or application you are using?	Yes	16	45.7	20	55.6	36	50.7
	No	19	54.3	16	44.4	35	49.3

As can be seen in Table 4, 69% of the students have their own computers and 80.3% have internet at home. Weekly; 1.4% of students spend less than 1 hour, 11.3% spend 1-2 hours, 8.5% spend 2-3 hours and 78.9% spend 3 hours or more on the internet. The rate of those who spend more than 2 hours on the internet was 87.4%. In addition, 56.3% of the students use online education sites and applications and 62% use the internet for learning English. 50.7% of

the students answered yes to the question of “whether there is a web site or application that you benefit from”.

### 2.3. Data Collection Tools

In the collection of quantitative data; Personal Information Form, English Course Attitude Scale (ECAS) and Vocabulary Test were used. In the Personal Information Form; gender, age, maternal education status, father education status and the questions given in Table 4 were asked. The answers to these questions were taken as multiple choice and short answers. ECAS was developed by Arci (2015) in order to measure the attitudes towards English courses. ECAS consisted of a total of 20 items and students gave 5-point Likert-type answers to the them. The lowest score that can be obtained from the ECAS was 20 and the highest score was 100.

It has been demonstrated in the studies conducted by Arci (2015) that the ECAS shows valid and reliable characteristics. It was stated that the validity of the scale was 62,019% and the reliability coefficient was 0.947 (Arci, 2015), however, validity and reliability studies were repeated in our study. For this purpose, exploratory factor analysis was performed using principal components and direct oblimin methods. As a result, the Keiser-Meyer-Olkin (KMO) sample adequacy value was 0.885, the Barlett Sphericity Test chi-square value was 1109,032 and the Barlett Sphericity Test p value was 0.000. So, factor analysis was conducted and the validity was found to be 69,506%. In addition, as a result of the reliability analysis, Cronbach’s alpha reliability coefficient was found to be 0.935. According to these results, it was accepted that the validity and reliability conditions were met because the validity rate was more than 50% and the reliability coefficient was greater than 0.70 (Büyüköztürk, 2011).

Furthermore, the vocabulary test was prepared by the researcher with 100 questions about the 9th grade English course “films” unit. In the test, students were asked to write the Turkish meanings of the words given to them and the total success score was calculated by giving 1 point to each question answered correctly.

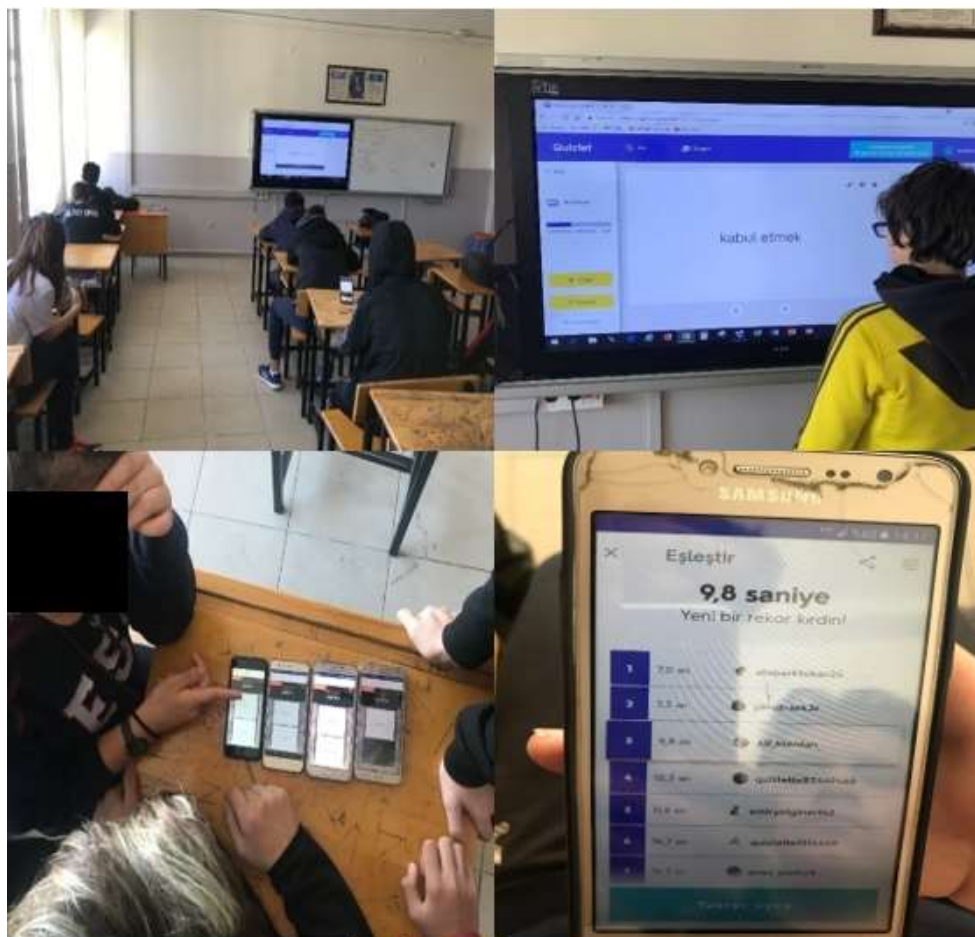
### 2.4. Data Collection

After the study group was determined, the lesson plans were prepared by the researcher for the 9th grade “Films” unit to be used in the experimental group. The plans, which were also presented to the review of 3 program development experts and 2 English teachers, were piloted for two weeks in a class apart from experimental and control groups. The words to be taught in each lesson plan were loaded into sets by classifying the related unit title and sections into the Quizlet application.

In addition, the students in the experimental groups were informed about what the Quizlet is in a 40-minute lesson time. Its use in vocabulary teaching and the ways in which they would be able to reach the practice outside of the class were explained so that the students gained the basic knowledge and usage skills about Quizlet before application. Moreover, after preparing the lesson plans and presenting the preliminary information to the students in the experimental group, 2 lessons per week (80 minutes in total) were applied for 8 lessons in 4 weeks.

At this stage, first of all, the experimental and control groups were pre-tested (ECAS and vocabulary test). Then, teaching was conducted based on the Quizlet activities in the experimental group and in accordance with the Ministry of National Education’s English Course Guide in the control group. In Figure 1, in-class pictures of education based on Quizlet activities in the experimental group were given. At the end of the teaching process, the ECAS was repeated as a post test. In addition, the vocabulary test was re-applied with 63 questions at the

end of the application by removing 37 words that all the students knew at the beginning. Furthermore, four weeks after the end of the practice, the vocabulary test was repeated as a retention test.



**Figure 1.** In-Class Application Views of Quizlet Activities

## 2.5. Data Analysis

In the analysis of the data collected from the tests and scales, quantitative analysis method was used through SPSS25 program. Within the scope of quantitative analysis; descriptive statistical methods such as mean, standard deviation, percentage, skewness and kurtosis coefficients and t-test and variance analysis (ANOVA) were used for dependent and independent groups. The level of significance in the analyses was  $p < 0.05$  and confidence interval was accepted as 95%. Also, the normal distribution was determined by examining the skewness and kurtosis values.

## 3. Findings

### 3.1. Descriptive Findings of Vocabulary Test and Attitude Scale

Table 5 presents the descriptive findings of the attitude scale (ECAS) applied before and after the application phase and the vocabulary post and retention tests performed after the application.

**Table 5.** Vocabulary Test and ECAS Descriptive Statistics

	Experimental Group			Control Group		
	$\bar{x}$	Sd	%	$\bar{x}$	Sd	%
Vocabulary Post-test Score	17.94	8.66	28.5*	12.42	9.14	19.7
Vocabulary Retention Test Score	18.34	9.00	29.1	11.17	8.23	17.7
ECAS Pre-test Score	54.66	9.24	43.3**	56.17	9.28	45.2
ECAS Post-test Score	59.54	14.17	49.4	57.61	9.44	47.0

\* Percentage of success according to 63 questions in the vocabulary test.

\*\* The lowest score that can be obtained from the ECAS is 20 and the highest score is 100. The percentage of positive attitudes calculated accordingly.

As can be seen in Table 5, the averages of the experimental and control groups were found to be  $17.94 \pm 8.66$  and  $12.42 \pm 9.14$  as a result of the vocabulary test after the application phase. Proportioned to the highest score can be achieved, the success in the experimental group was 28.5% and in the control group it was calculated as 19.7%. In addition, after 4 weeks after the end of the application phase, the average of the experimental group was  $18.34 \pm 9.00$ . The average of the control group was found to be  $11.17 \pm 8.23$ . Proportioned to the highest score can be achieved, the success in the experimental group was 29.1%; and 17.7% in the control group.

Also, the pre-test averages of the Ceasing the experimental and control groups were found to be  $54.66 \pm 9.24$  and  $56.17 \pm 9.28$ . Proportioned to the highest score can be achieved, the positive attitude towards English course is 43.3% in the experimental group; 45.2% in the control group. And, the post-test averages of the ECAS in the experimental and control groups were found to be  $59.54 \pm 14.17$  and  $57.61 \pm 9.44$ . Again, proportioned to the highest score can be achieved, the positive attitude towards English course is 49.4% in the experimental group; and 47% in the control group.

### 3.2. Impact of Quizlet on Vocabulary Learning

In order to determine the effect of the Quizlet on the vocabulary learning of secondary school students, the vocabulary post-test averages of the experimental and control groups were compared with unrelated samples t-test (Table 6).

**Table 6.** Comparison Experimental and Control Groups' Vocabulary Post-test Averages

	Group	n	$\bar{x}$	Sd	t	Df	p
Vocabulary Post-test Score	Experimental	35	17.94	8.66	2.614	69	0.011
	Control	36	12.42	9.14			

As can be seen in Table 6, the post-test score of the vocabulary test was  $17.94 \pm 8.66$  in the experimental group and  $12.42 \pm 9.14$  in the control group. The mean of the experimental group was 5.53 points higher than the control group and this difference was significant in favor of the experimental group ( $t=2,614$ ;  $p=0,011 < 0,05$ ). That is, the experimental group is significantly more successful.

Moreover, after the comparison of the post-test averages, the averages of the retention test of the experimental and control groups were compared with the t-test of unrelated samples (Table 7).

**Table 7.** Comparison of Experimental and Control Groups' Vocabulary Retention Test Averages

	Group	n	$\bar{x}$	Sd	t	Df	p
Vocabulary Retention Test Score	Experimental	35	18.34	9.00	3.507	69	0.001
	Control	36	11.17	8.23			

As can be seen in Table 7, the vocabulary retention test scores were  $18.34 \pm 9.00$  in the experimental group and  $11.17 \pm 8.23$  in the control group. The mean of the experimental group was 7.18 points higher than the control group and this difference was significant in favor of the experimental group ( $t=3,507$ ;  $p=0,001 < 0,05$ ). That is, the experimental group is significantly more successful.

At this stage also, the effect of Quizlet application on the vocabulary learning level was also determined in the experimental and control groups by comparing vocabulary post-test and retention test scores in two groups. For this purpose, related samples (repeated measures) t-test were performed and the findings are presented in Table 8.

**Table 8.** Comparison of Experimental and Control Groups' Vocabulary Post-test and Vocabulary Retention Test Averages

Group	Test	n	$\bar{x}$	Sd	Difference Between Averages	t	Df	p
Experiment	Post-test	35	17.94	8.66	0.40	2.119	34	0.041
	Retention Test	35	18.34	9.00				
Control	Post-test	36	12.42	9.14	-1.25	-4.938	35	0.000
	Retention Test	36	11.17	8.23				

As seen in Table 8; vocabulary retention test scores increased by 0.40 points in the experimental group and this increase was significant in favor of retention test ( $t=2,119$ ;  $p=0,041 < 0,05$ ). Quizlet application in the experimental group made a meaningful contribution to the students' vocabulary learning skills. On the other side, in the control group, the vocabulary test scores decreased by 1.25 points between the post-test and retention test, and this decrease was significant ( $t=-4.938$ ;  $p=0.000 < 0.05$ ). In other words, in the control group, students' levels of vocabulary learning decreased significantly. Based on these results, it was concluded that Quizlet significantly increased the vocabulary learning skills of secondary school students and significantly contributed to the permanence of vocabulary learning.

### 3.3. The Effect of Quizlet on Attitude towards English Course

In order to determine the effect of the Quizlet on the attitudes of secondary school students towards English course, firstly the ECAS pre-test and post-test averages of the experimental and control groups were compared with the independent samples t-test (Table 9).

**Table 9.** Comparison of Experimental and Control Groups' ECAS Pre-test and Post-test Averages

	Group	n	$\bar{x}$	Sd	t	Df	p
ECAS Pre-test	Experimental	35	54.66	9.24	-0.687	69	0.495
Total Score	Control	36	56.17	9.28			
ECAS Post-test	Experimental	35	59.54	14.17	0.974	58.9	0.503
Total Score	Control	36	57.61	9.44			

As can be seen in Table 9; the pre-test averages of the ECAS was  $54.66 \pm 9.24$  in the experimental group and  $56.17 \pm 9.28$  in the control group. The average of the control group was 1.51 points higher than the experimental group, but this difference was not significant ( $t = -0.687$ ;  $p = 0.495 > 0.05$ ). In other words, the experimental and control groups were identical in terms of attitudes towards the English course prior to the implementation phase of the research.



In addition, the post-test averages of the ECAS were  $59.54 \pm 14.17$  in the experimental group and  $57.61 \pm 9.44$  in the control group. The experimental group outperformed the control group by 1.93 points; however, this difference was not significant ( $t=0.974$ ;  $p=0.503 > 0.05$ ). The experimental and control groups were found to be equivalent in terms of the attitude towards the English course after the application phase of the research.

At this stage, the effect of Quizlet application on attitude was also determined by comparing the pre-test and post-test scores of the ECAS, respectively in the experimental and control groups. For this purpose, the related samples (repeated measures) t-test was performed and the findings are presented in Table 10.

**Table 10.** Comparison of Pre-Test and Post-Test Averages of ECAS

Group	Test	n	$\bar{x}$	Sd	Difference Between Averages	t	Df	p
Experiment	Pre-test	35	54.66	9.24	4.88	2.528	34	0.016
	Post-test	35	59.54	14.17				
Control	Pre-test	36	56.17	9.28	1.44	1.354	35	0.185
	Post-test	36	57.61	9.44				

As shown in Table 4.10; as a result of the Quizlet application, the ECAS scores increased by 4.88 points in the experimental group. This increase was significant in favor of the post-test ( $t=2.528$ ;  $p=0.016 < 0.05$ ). Quizlet application in the experimental group made a significant contribution to the students' attitudes towards the English course. Also, in the control group, the ECAS scores increased by 1.44 points. However, this increase was not significant ( $t=1.354$ ;  $p=0.185 > 0.05$ ). There was no significant change in the attitudes of the students towards the English course in the control group. Based on these results, it was concluded that Quizlet significantly increased the positive attitudes of secondary school students towards English course.

### 3.4. The Effect of Quizlet on Vocabulary Learning and Attitude According to Various Variables

In this section, the effect of Quizlet on vocabulary learning and attitude is examined according to various variables, respectively in the experimental and control groups, and the findings are presented as subheadings.

#### 3.4.1. Gender

The effect of Quizlet on vocabulary learning and attitude according to gender was examined by using unrelated samples t-test (Table 11).

**Table 11.** Comparison of Vocabulary and Attitude Post-test Averages by Gender

	Group	Gender	n	$\bar{x}$	Sd	t	Df	p
Vocabulary Learning	Experiment	Male	26	18.65	9.57	0.822	33	0.417
		Female	9	15.89	5.11			
	Control	Male	23	12.43	8.70	0.016	34	0.988
		Female	13	12.38	10.24			
Attitude	Experiment	Male	26	61.31	13.76	1.263	33	0.215
		Female	9	54.44	14.93			
	Control	Male	23	59.26	7.83	1.414	34	0.166
		Female	13	54.69	11.54			

As seen in Table 11; the averages of the vocabulary and the ECAS tests did not differ significantly in both experimental and control groups by gender ( $p > 0.05$ ). Gender did not affect the results of vocabulary test and attitude in both experimental and control groups.

### 3.4.2. Mother's Educational Status

The analysis of variance analysis (ANOVA) was used to determine the effect of Quizlet on vocabulary learning and attitude according to mother's educational status (Table 12).

**Table 12.** Comparison of Vocabulary and Attitude Post-test Averages by Mother's Educational Status

	Group	Mother's Educational Status	n	$\bar{x}$	Sum of Squares (intergroups)	Sum of Squares (within groups)	Df (Total)	F	p	Post-Hoc
Vocabulary Learning	Experiment	Illiterate	3	10.67	585.703	1925.826	33	3.041	0.054	-
		Primary education	14	19.93						
		High school	13	20.54						
		Undergraduate	4	9.50						
	Control	Graduate	3	8.33	290.146	2632.60	35	1.176	0.334	-
		Illiterate	16	10.94						
		Primary education	13	13.00						
		High school	4	19.50						
Attitude	Experiment	Undergraduate	3	76.67	1137.04	5673.20	33	2.004	0.135	-
		Graduate	14	57.71						
		Illiterate	13	56.08						
		Primary education	4	63.25						
	Control	High school (1)	3	47.00	856.310	2264.245	35	4.034	0.015	4>1
		Undergraduate	16	59.56						
		Graduate	13	54.77						
		Illiterate (4)	4	67.00						

The average of vocabulary post-test did not show a significant difference in both experimental and control groups according to maternal education level ( $p > 0.05$ ). However, while the average ECAS scores were not significantly different in the experimental group ( $p > 0.05$ ), there was a significant difference in the control group ( $p < 0.05$ ). The education level of the mother affected the attitudes in the control group. As a result of the post-hoc multiple comparison test, the attitudes of the students whose mother graduated from the university were significantly higher than those whose mother had not completed any school.

### 3.4.3. Father's Educational Status

The analysis of variance analysis (ANOVA) was used to determine the effect of Quizlet on vocabulary learning and attitude according to father's educational status (Table 13).

**Table 13.** Comparison of Vocabulary and Attitude Post-test Averages by Father's Educational Status

Group		Father's Educational Status	n	$\bar{x}$	Sum of Squares (intergroups)	Sum of Squares (within groups)	Df (Total)	F	p	Post-Hoc
Vocabulary Learning	Experiment	Illiterate	3	12.33	679.583	1868.30	34	3.759	0.021	3>4
		Primary education	11	17.18						
		High school (3)	16	22.00						
		Undergraduate (4)	5	10.00						
	Control	Graduate	13	14.15	88.594	2696.15	34	0.526	0.596	-
		Illiterate	19	10.89						
		Primary education	3	10.67						
Attitude	Experiment	High school	3	56.67	103.433	6727.25	34	0.159	0.923	-
		Undergraduate	11	59.18						
		Graduate	16	59.13						
		Illiterate	5	63.40						
	Control	Primary education	13	57.08	66.872	3033.87	34	0.353	0.706	-
		High school	19	57.05						
		Undergraduate	3	57.49						

Accordingly, the vocabulary post-test average did not show a significant difference in the control group ( $p>0.05$ ) according to the father's educational level, but showed a significant difference in the experimental group ( $p<0.05$ ). In the experimental group, father's educational status affected the vocabulary test results.

As a result of the post-hoc multiple comparison test, it was found that the vocabulary test scores of the students whose fathers were high school graduates were significantly higher than those whose fathers had bachelor's degrees. Furthermore, there was no significant difference in terms of attitudes to course between the experimental and control groups according to the educational background of the father ( $p>0.05$ ).

#### 3.4.4. Having Constant Internet at Home

In order to determine whether the effect of Quizlet on vocabulary learning and attitude showed significant differences according to the status of constant internet at home, the vocabulary test and the ECAS post-test scores were compared using unrelated samples t-test (Table 14).

**Table 14.** Comparison of Vocabulary and Attitude Post-test Averages by Having Constant Internet at Home

Group		Is there constant internet at home?	n	$\bar{x}$	Sd	t	Df	p
Vocabulary Learning	Experiment	Yes	29	17.52	9.41	-1.186	27.93	0.246
		No	6	20.00	2.83			
	Control	Yes	28	13.64	9.71	1.535	34	0.134
		No	8	8.13	5.19			
Attitude	Experiment	Yes	29	57.83	12.56	-1.610	33	0.117
		No	6	67.83	19.56			
	Control	Yes	28	58.04	9.75	0.499	34	0.621
		No	8	56.13	8.71			

Accordingly, the averages of the post-tests of the vocabulary and ECAS did not show a significant difference in both experimental and control groups according to the presence of continuous internet at home ( $p>0.05$ ). The presence of continuous internet at home did not affect the results of vocabulary test and attitude in both experimental and control groups.

#### 4. Discussion and Conclusion

As a result of this study, which was carried out with 71 students in four different 9th grade classes of a high school in Eskişehir, remarkable consequences were reached. It is possible to present them as follows:

1. It was concluded that the Quizlet online vocabulary application provided a significant contribution to the students' vocabulary learning and retention. After the application phase, the average of the experimental group was found to be significantly higher in the vocabulary tests. In addition, the average of the retention test after 4 weeks was found to be significantly higher again in the experimental group and the retention test average of the experimental group showed a significant increase slightly, while there was a significant decrease in the control group.
2. The effect of Quizlet on vocabulary learning did not differ significantly according to gender, mother's education level and having constant internet at home. These variables did not differentiate the impact of Quizlet on vocabulary learning.
3. However, father's education level had an effect on vocabulary learning. Quizlet has been more successful on students whose father was a high school graduate.
4. On the other hand, Quizlet made a significant contribution to students' positive attitudes towards English course. Before the applications, the attitudes of the students in both experimental and control groups towards English were statistically coequal. However, after the applications, the attitudes of the experimental group became more positive ( $p<0.05$ ), while the control group did not change significantly ( $p>0.05$ ).
5. Gender, mother's and father's education level and having constant internet at home do not have a significant effect on students' attitudes.

Consequently, it was concluded that Quizlet online vocabulary application is a method that makes a significant contribution to secondary school students' vocabulary learning and attitudes towards English and should be utilized effectively. It is an important achievement of Quizlet that the students who are given Quizlet-based training develop their vocabulary learning skills more than other students. This result showed similarity with the results of researches conducted by Dizon (2016), Barr (2016), Körlü (2017), Crandell (2017) and Pham (2018). In these studies, it is stated that Quizlet facilitates vocabulary learning, ensures noteworthy benefits and positively contributes to the students' perceptions of the English course.

In addition, Tokaç (2005), Baturay (2007), Kocaman (2015) and Çelik (2015) stated that computer-aided education and digital vocabulary teaching applications provide significant benefits on students' word achievement, increase their permanence and affect their attitudes positively. Findings obtained from this study showed similar results.

Moreover, Saran (2009) stated that mobile phones have an impact on vocabulary learning. Tavacı-Gelir (2015) found that tablets provide the same benefit. Zengin-Ünal (2015), Köse (2017) and Okumuş-Dağdeler (2018) showed the contribution of mobile applications on word

learning in their studies. The results of this study in this respect showed parallelism with the literature and supported the results of this research.

The fact that Quizlet's vocabulary learning and attitude towards English learning does not differ significantly according to gender, mother's educational status and having constant internet shows that Quizlet is an application that appeals to all students regardless of their characteristics. The Quizlet application provides equal opportunities and ease of use for every student, whether they use the internet or online education sites or applications, whether they have a computer or not, and offer similar opportunities regardless of background. All students can easily use and benefit from the application without any disadvantage. However, Quizlet was found to be more effective on the vocabulary learning of students whose father was a high school graduate. This may be due to the fact that high school fathers are more motivated to learn a foreign language as they know that language learning can offer them better job opportunities.

In the light of the above findings, it can be suggested that Quizlet vocabulary learning application should be used in foreign language teaching as a student-centered, effective and permanent teaching technique and its usage should be disseminated. In this context, in-service trainings about the application should be provided to teachers. In order to expand the use of online vocabulary applications in English teaching, Quizlet can be included in the ELT curriculum under the title of vocabulary teaching. Also, it would be good to research Quizlet and similar educational methods and techniques in new studies.

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