The Use of Quizlet in Teaching Vocabulary to 9th Grade EFL Students

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ABSTRACT
In recent years, numerous innovative tools such as digital and online flashcards have emerged in the education field to meet the needs of digital natives. Therefore, the current study, it was aimed at investigating the impact of a digital flashcard tool, Quizlet, on the vocabulary acquisition of Turkish EFL learners. Besides, learners' perception of using Quizlet was investigated through a semi-structured interview with 26 participants. An experimental mixed methods research design was implemented to gather data. Pre and post-tests were adapted from Laufer and Goldstein (2004) and Webb (2009). The tests were implemented in two groups to evaluate the effectiveness of Quizlet on vocabulary learning. The findings of this research indicated that there was a statistically significant difference between the Quizlet group learners' pre and post-test scores. When the Quizlet group and regular class were compared, it was found that both increased their scores at different rates. Secondly, the results of the interviews supported that more than half of the participants' opinions of using Quizlet were mostly positive. The study concluded that teachers should evaluate and try digital tools as learning resources for today's learners as digital natives.
Keywords: Vocabulary Teaching, Turkish EFL High School Students, Digital Flashcards, Quizlet

INTRODUCTION
Vocabulary is needed in educational settings to function in healthy communication. With a great amount of vocabulary, learners can perform successfully in four skills (Folse, 2006). Having a lack of vocabulary results in difficulty in processing, expressing opinions, and conveying messages. On the other hand, having a large stock of vocabulary has a positive effect on oral comprehension and production comparing a lower level of vocabulary knowledge which leads to problems in producing oral and written outcomes. It has been discovered that a larger vocabulary repertoire affects learners' oral and written production successfully. Students may have difficulties without enough lexical stock while producing oral and written outcomes specifically for the tasks of productive skills (Sofian and Salam, 2015; Yang, 2015). Therefore, scholars working in the field of vocabulary tried to shed light on different ways of teaching techniques and strategies (Pourakbari and Biria, 2015; Schmitt, 2000; Zou, 2017). Even though the importance of vocabulary knowledge is unquestionable these days, the techniques and methods have been still explored in many research studies (Hulstijn and Laufer, 2001; Karalık, 2016). Vocabulary instruction should be reformed under the formal instruction framework in language classrooms (Marmol and Sánchez-Lafuente, 2013). Hence, vocabulary teaching and learning techniques and strategies became the areas of interest for researchers, practitioners, and language teachers to find out effective vocabulary instruction methods to boost the learners' vocabulary knowledge (Liu, 2009). Since the sheer memorization of the words and the traditional chalk and board method is no longer considered effective vocabulary teaching method, even though they might be useful in some cases, vocabulary instruction has been morphed into web-based e-learning in recent years (Nejati, Jahangiri, and Salehi, 2018).

As L2 vocabulary learning is known as a complex process, there have been many efforts to facilitate and enhance this process (Groot, 2000). In recent years, technology-enhanced vocabulary teaching has been viewed as the new learning medium in language classrooms. the influence of technology-enhanced instruction on foreign language instruction has expanded in ESL/EFL classrooms by using e-mail, networking, videoconferencing, web-based projects, pen pal activities, use of multi-media contexts, animated texts, e-books, and e-animation. Furthermore, the use of technology-enhanced instruction in classrooms provides many benefits for teaching and learning in the 21st century (Ritzhaupt, Dawson, and Cavanaugh, 2012). Web-based e-learning environments increase motivation, foster autonomy, and enhance interactivity as well as independent learning potential (Cellat, 2008). Web 2.0 technologies are one of the tools that provide these advantages to learners. While Web 2.0 technologies and tools help the development of four skills in foreign language teaching, it also plays a facilitating role in vocabulary

teaching. Therefore, it will be appropriate to increase research studies on the use of educational environments that are enriched with Web 2.0 tools in the vocabulary teaching process.

Nowadays, there are many opportunities to access various platforms and various multimedia applications for vocabulary learning compared to the past. With the fact that CALL offers a variety of activities such as embedded exercises and automatically generated multiple-choice questions, computers have now made it possible to make even traditional class exercises in vocabulary teaching interactive and more useful. With the developing technology, new teaching methods have emerged and the use of digital tools in language teaching has not been supported with movies, listening tapes, and televisions in classrooms as it used to be, but supported with the development of digital language learning programs. Specifically, a form of text, audio, and picture in the multimedia context supports vocabulary acquisition (Chien, 2015), and as they are easily accessible to learners via the internet and smartphone applications, they have replaced traditional vocabulary teaching materials such as word cards and paper flashcards. Additionally, Nakata (2011) exemplified the advantages of using flashcards, especially by adding that computer-based flashcards support the enhanced presentation of materials and exercise types more than traditional paper-based flashcards due to their multimedia capabilities.

In the context of Turkiye, although it is common to teach vocabulary with flashcards and traditional methods in English Language Teaching, the studies revealed that newly found digital tools affect vocabulary development (Kılıçkaya and Krjka, 2010; Nakata, 2011; Samur, 2012). Specifically, various e-learning tools focusing on vocabulary acquisition such as My Word Coach, Study Stack, Cram, Word Engine, and the commonly used Quizlet digital tool with 50 million users (Quizlet, 2019) have been developed and integrated into the language classrooms. For this reason, the instructional digital flashcard tool, Quizlet, was administered since it provides student autonomy, and feedback to students, and finally, it provides student observation opportunities for teachers. The Quizlet system which is designed as a website is commonly utilized for language learning. The digital system supports learners' autonomy and pleasure; provides relevancy; and increases the attention span and confidence of the learners.

In this respect, the current study was conducted for high school students who were learning English as a foreign language about improving their vocabulary skills, and a semi-structured interview was conducted to measure the effect of the online tool on students' motivation. The following questions were posed to design the study:
1. What is the effect of Quizlet on the 9th -grade EFL students' vocabulary learning?
2. What are the viewpoints of 9th-grade EFL students about the impact of Quizlet?

REVIEW OF LITERATURE
a- Using Quizlet as a Flashcard Tool to Teach Vocabulary
Digital flashcards have been a focus among learners and teachers. The role that digital flashcards play in vocabulary teaching is a non-negligible trend and the necessity and importance of digitalized flashcards are on-trends in the field. The integration of multimedia and technology types of instruction such as web-based programs, online flashcard games, word annotations, and glossing into vocabulary learning has been recorded in the literature. As a part of multimedia learning, the studies indicated several effects of online flashcards on vocabulary learning concluding that sound, pictures, annotation containing text, and L1 equivalent help EFL learners acquire more words. (Ali, Mukundan, Baki and Ayub, 2012; Browne and Culligan, 2008; Daloğlu, Baturay and Yildirim, 2009; Tuite, Pavlik, Fan, Robison, Jaffe, and Liu, 2012). Most digital flashcards have been specifically designed with capabilities that are not possible with paper flashcards (Nakata, 2011). Several research studies highlighted the efficacy of digital flashcards comparing paper flashcards and the results indicated that using digital flashcards was more effective (Azabdaftari and Mozaheb, 2012; Basoglu and Akdemir, 2010; Kiliçkaya and Krajka, 2010). Additionally, learners' acquisition of word knowledge via online flashcard websites depends on some factors. To begin with, it should have a user-friendly interface regarding how to log in, play online games, or make flashcards. Furthermore, word knowledge of learners encompasses meaning, spelling, pronunciation, connotation, collocation, register, opposite, and a word's derivation (Benjamin and Crow, 2010) the fact remains that it includes the knowledge of meaning, form, and use. Hence, online websites should offer a variety of word knowledge instructions as follows: example sentences, parts of speech, L1 and L2 definitions of words, sound files, pronunciation of the words, and collocations (Browne and Culligan, 2008) and should focus on improving receptive and productive skills by offering exercises to practice and acquire both receptive and productive skills of word knowledge.

As an online flashcard tool, Quizlet with over 50 million users every month (Quizlet, 2019), and offering 18 different languages is known as multidimensional CALL software and an online mobile application. Apart from its extra features for teachers, it can serve as free online learning material.

The Quizlet digital tool can be studied on computers, and cell phones via mobile apps (iPhone or Android). Users can access diverse flashcard sets on numerous topics, or they can create different study sets. Even though the software program presents a prompt on the front and the answer on the back like regular class paper flashcards, the Quizlet flashcard software program enables users to insert visuals to correspond to the target word. Hence, this feature is in line with Mayer's multimedia learning framework that is saying "people learn better from words and pictures than from words alone" (Mayer, 2005, p. 31). Moreover, clicking on the 'Audio on' button supports learners in hearing the pronunciation of the word. Quizlet, with its feature, supports Mayer's 'dual-channel assumptions' by promoting both visual and auditory materials. Following that Crandell (2017) asserts some crucial reasons to utilize Quizlet for vocabulary learning:

1) Learners can hear as well as see the information presented on the cards
2) Users can engage in several activities in which they must type from memory one side of a card when the other side is presented to them, requiring them to do more than passively review the cards (p.22).
Likewise, with its entertaining and competitive atmosphere, Quizlet gives learners control over their autonomy and facilitates their engagement in the class (Cunningham, 2017).

b- Empirical Studies in Various Countries on Quizlet Digital Tool

Bueno-Alastuey & Nemeth (2022), for example, conducted a study with a total of 23 Spanish students to find out whether using Quizlet was useful or not on students' receptive and productive vocabulary acquisition. The study also aimed to compare the effectiveness of Quizlet word sets and podcasts created by the students. The researchers concluded that students scored higher in the productive post-test after the Quizlet treatment even though the Quizlet group achieved slightly lower scores than the podcast group regarding receptive vocabulary. The research study indicated that students identified the Quizlet method as more efficient than the podcasting treatment. Following that Nguyen and Le (2022) compared three study groups to evaluate whether the Quizlet treatment enhanced lexical retention between in-class and at-home learning modes by employing a quasi-experimental design. Regarding data, the researcher revealed that the difference was not significant between in-class and at-home groups. Both groups gained higher scores after using Quizlet than the ones who did not. Further, Waluyo and Bucol (2021) suggested the elements of gamified learning in Quizlet provided significant improvements between pre and post-test vocabulary scores. The research was carried out with 65 low-level university learners in Thailand. The data was collected in two cycles. The learners did not get any instruction with Quizlet in the first one but were supported with Quizlet in the second cycle. The learning outcomes uncovered the positive impacts of the tool. Additionally, there are several studies conducted in Turkiye to investigate the impact of Quizlet on vocabulary learning. To illustrate, a recent study carried out by İnci (2020) applied the Quizlet application to reveal the effect of computer-aided learning on student participation and vocabulary development with 100 participants in a university. Moreover, the researcher investigated whether the groups showed significant differences by conducting the motivation subscale. Finally, the Quizlet group improved in their attendance compared to the regular class. Additionally, the Quizlet group showed significant improvement in terms of productive vocabulary. Another research made by Bilcan (2019) was to find out whether the Quizlet flashcard tool had an impact on learners' vocabulary gain and recall. The researcher compared the progress of the learners on Quizlet to their immediate test scores. The researcher in this quasi-Quizlet study collected data from 93 high school students. Correlation analysis showed that there was a significant relationship between the immediate tests and learners' progress on Quizlet. Post-test results also indicated a strong relationship between Quizlet progress and vocabulary recall. Regarding pair sample t-test results, it was found that differences between immediate and post-test results were significant, which corresponded with the aforementioned studies showing us how using Quizlet online flashcards showed significant differences between pre and post-test and also between pre and delayed post-test.

Table 1: Review of the Empirical studies

	Author & Year	General Aim	Main Findings
1	Alastuey and Nemeth (2022)	Quizlet's impact on receptive and productive vocabulary learning	Quizlet and podcast groups showed different achievements in productive and receptive skills.
2	Yan (2022)	To compare lexical retention in two different learning modes	The groups that used Quizlet scored relatively higher than the ones that did not.

3	**Waluyo and Bucol (2021)**	To test the effectiveness of Quizlet by comparing test scores	Quizlet supported the positive improvement of vocabulary learning after applying it.
4	**İnci (2020)**	To reveal the effect of computer-aided learning on student participation and vocabulary development with 100 participants in a university.	The Quizlet group improved in their attendance compared to the regular class. Additionally, the Quizlet group showed significant improvement in terms of productive vocabulary.
5	**Bilcan (2019)**	To find out whether the Quizlet flashcard tool had an impact on learners' vocabulary gain and recall	There was a significant relationship between the immediate tests and learners' progress on Quizlet. Post-test results also indicated a strong relationship between Quizlet progress and vocabulary recall.

In conclusion, preceding studies suggested the acceptance of Quizlet in various implementations. However, the effect of Quizlet on vocabulary learning comparing two groups and low-level learners is low. It has become apparent that further research on the effect of digital tools on vocabulary is needed. Even though there have been some studies on the use of Quizlet, the relationship between Quizlet and vocabulary gain is a research gap comparing the regular class. Hence, the purpose of the present study is to shed light on the effects of Quizlet digital web tool on 9th -grade EFL learners' vocabulary development.

METHODOLOGY

a. Participants and Setting

52 Turkish EFL learners aged 14-15 years, who were male and female 9th-grade students at a high school in Gaziantep, Turkiye with Turkish as their native language, were chosen to participate in this study. About 250 students took place in the vocabulary familiarity test to get to know which words were known by the learners. After vocabulary familiarity and pilot tests, 52 students took part in the pre-test based on the convenience sampling method. In total 28 of the 52 participants were female and 26 were male. The participants were divided into two equal groups: the Quizlet group, which used (Quizlet), and the regular class, which had no special treatment but regular class methods. To make sure of homogeneity of the classes regarding their proficiency level, the English teachers working at the research school and the researcher investigated the main coursebook and administered a proficiency test. The proficiency test was run to test whether the students at the school were A1 or A2 level learners according to the Common European Framework of Reference for Languages. Concerning their ages and proficiency level, the subjects were homogenous.

b. Research Design

The study centers upon the digital program called Quizlet as a teaching method to build learners' vocabulary. The research was an experimental mixed-methods design. This study involved two instructional conditions. These included 1) Quizlet group: The participants studied flashcards in class at the school laboratory and on their own time after class for two weeks to make them autonomous learners. 2) Regular class: The participants did not get any treatments, but they had the same class materials as the Quizlet group. Both groups stuck to the same reading materials, however, the vocabulary activities differed between the groups. The design of the study was based on a comparison of the pre and post-test scores between groups to assess the effect of the Quizlet digital app. Even though the pre and post-tests were conducted in both groups, the treatment was only received by the Quizlet group. The research lasted 8 weeks.

c. Data Analysis

To test the reliability of the vocabulary tests designed by the researcher, Cronbach's Alpha analysis was run. At the end of the analysis, Cronbach's Alpha coefficient was found to as 0.924. Before applying the pre-test, ten English teachers were asked to rate questions by marking appropriate numbers to match their opinion to ensure the content validity of the test. Receptive/ productive knowledge of orthography, meaning, form, and grammar tests was found valid by 9 out of 10 teachers.

For this study, an independent samples t-test was used to see whether Quizlet had an impact on participants' vocabulary gain. An independent sample t-test was also used to present the difference between before and after the treatment and the differences between the Quizlet and regular class. Furthermore, a paired t-test was needed to compare the means of the very same subjects to interpret the effects of the Quizlet on the Quizlet group.

d. Data Collection Procedures

The length of the study was eight weeks. In week 1, the students in the Quizlet group received learner training to increase their familiarity with the Quizlet tool before the start of the treatment. The researcher explained how to log in and how to use features (flashcards, test, spell, learn, write, matching game, gravity) of Quizlet about receptive and productive vocabulary knowledge. The Quizlet group presented tasks and assignments through Quizlet adapted from Schmitt (1995) that are: a) parts of speech; examining whether the target word is a noun, an

adverb, an adjective, or a verb, b) translation; translating the target word into L1, c) making full sentence; constructing a sentence with target words, d) synonyms and antonyms; investigating synonyms and antonyms of the words. During the creation of the cards, the English and Turkish definitions are provided on one side of the cards and how they would be presented in the flashcard format was considered.

Next, a piloting test was conducted to decide whether there would be any modifications to the pre and post-tests such as time allocation and question types. It was done to test some question items to make them easier to understand. The piloting study was administered with 30 students which corresponds to more than 10% of the number of students in the main study. The participants took the pre-test during the regular class time in the first week. Following the piloting and pre-test, the actual data collection started in the second week and lasted 7 weeks. Then, the post-treatment test was administered to 52 students at the end of the 8 weeks. Also, at the end of the last week to examine the Quizlet group's pronunciation production level, the participants were asked to read the target words aloud in a sentence while the instructor was recording them. Finally, to analyze whether a digital flashcard program called Quizlet affected learners' vocabulary and pronunciation knowledge, a semi-structured interview was applied to all subjects in the Quizlet group for the qualitative research part after the post-treatment test.

e. Qualitative Analysis of the Interviews

First, the coding was determined as the first step of the analysis. The answers of the students were coded for each question according to the negative and positive answers of the participants, and common patterns were categorized. Through this analysis, the categories were formed, and participants' utterances were put into categories based on the similarities of codes. After putting together, the relevant codes, the number and percentage of learners for each category were presented. Finally, the findings were determined as 2 themes: positive and negative findings of the semi-structured interview. Those two themes were analyzed under 5 categories for negative findings and 9 categories for positive findings. To provide consensus for codes and categories, a few examples (30% of the whole data) of coding were analyzed together with the research assistant and the researcher, and the rest of the content analysis was carried out by individuals.

f. Data Collection Instruments

Pilot study

The researcher specifically prepared a pilot test designed with non-target words to construct a pre-test. The pilot study was a researcher-made piloting vocabulary test (adapted from Laufer and Goldstein, 2004; Webb, 2009) that consisted of 8 parts and 5 vocabulary items. Expert opinion was taken for the validity of the test.

Vocabulary familiarity test

To determine the words the learners were familiar with a self-checking vocabulary familiarity test was administered to 250 participants from the research school. They were asked to only indicate whether they knew the word or not. To prevent the overuse of tick words they did not know, the researcher constructed a word list including some nonwords. The students who ticked nonwords more than three times were excluded to control unreliable marking.

Vocabulary tests

To collect data, pre-and post-test were used in the current study. Vocabulary tests were comprised of eight tests assessing knowledge of orthography, and grammatical functions which were adapted from Webb (2009) and meaning & form adapted from Laufer and Goldstein (2004). The vocabulary knowledge was measured in the aspect of receptively and productively.

RESULTS

First, the researchers explore whether the students who work with a Quizlet online digital tool achieve better vocabulary than students who learn only with regular class methods over six weeks. To answer this, 52 participants in two different groups were selected to take part in the study. The Quizlet group received treatment with an online flashcard tool that lasted eight weeks and the other group did not use any tool (no-tool group). Secondly, this section presents the findings on whether using an online language learning tool improves the success of Quizlet group students' learning a foreign language in English in terms of vocabulary. Finally, the chapter reports the findings of the opinions of the students who learn English as a foreign language on the effect of Quizlet on their vocabulary studies.

1. The Difference in the Vocabulary Tests according to the Groups

Research Question 1: What is the effect of Quizlet on the 9th -grade EFL students' vocabulary learning? To answer this question, an independent t-test was utilized to explore whether there were statistical differences in the pre and post-test scores of vocabulary tests according to the groups. Descriptive findings regarding pre and post-test differences were presented at first, and then inferential findings related to pre and post-test differences for 8 different vocabulary tests were introduced. Means and standard deviations for each set of scores received from the

experiment and regular class on all assessments were measured. For the aim of the study, a significance level of p<. 05 was used to make all determinations of statistical significance.

The Difference in the Mean Scores of the Orthography Receptive Test

Table 2: Difference between pre-post orthography receptive test

| | Group | N | Mean | SD | t-test | | | |
					t	df	p	Cohen's d
Pre-posttest Differences of Orthography Receptive	Quizlet	26	19.230	9.745	-0.342	50	0.734	-0.095
	Regular class	26	20.266	11.981				

When it comes to investigating the difference between Pre-Orthography Receptive and Post-Orthography Receptive test scores, the Quizlet group averaged 19.2. To be more specific, the difference between the pre and post-test for the Quizlet group was 19.2, which means the Quizlet group increased their vocabulary scores at the end of the study. On the other hand, the regular class group averaged slightly higher than (M= 20.266, SD= 11.981) for the Quizlet group and the difference between pre and post-test for the regular class group was 20.2 showing that their vocabulary scores increased at the end of the study. Even though the regular class increased their difference between pre and post-test more than the Quizlet group, post-test scores were in favor of the Quizlet group. Finally, according to the results of pre and post-test differences in Orthography Receptive between the Quizlet and regular class, the results produced non-significant results (t (50) =-0.342, p>0. 734, d=-0.095). This posits that they gained almost similar vocabulary scores, but as it can see in Table 5., the regular class group obtained more scores in terms of the Orthography Receptive test.

The Difference in the Mean Scores of the Orthography Productive Test

Table 3: Difference between pre-post orthography productive test

| | Group | N | Mean | SD | t-test | | | |
					t	df	p	Cohen's d
Pre-posttest Differences of Orthography Productive	Quizlet	26	29.142	15.120	-0.675	50	0.503	-0.187
	Regular class	26	31.953	14.896				

An independent samples t-test was performed to measure the difference between the Pre and Post- Orthography Productive tests for both the Quizlet and regular class. Both groups increased their post-test scores, however, the difference was in favor of the regular class group (M=31.953, SD=14.896). The Quizlet group produced a mean of 29.1, which means the group only increased their vocabulary score average by 29.1 from the beginning to the end of the study. Even though the Quizlet group gained higher scores in the Post-Orthography Productive test, the difference between mean scores decreased since the regular class increased their scores more in the post-test. There was not a statistically significant difference when investigating the significance of the difference between Pre and Post-Orthography Productive tests. (t (50) =-0.675, p>0.503, d= -0.187). The result of the comparison of the mean scores on tests for individual groups is presented in Table 3.

The Difference in the Mean Scores of the Passive Recall Test

Table 4: Pre-post differences of passive recall

| | Group | N | Mean | SD | t-test | | | |
					t	df	p	Cohen's d
Pre-posttest Differences of Passive Recall	Quizlet	26	52.440	16.919	-0.352	50	0.727	-0.1098
	Regular class	26	54.215	19.401				

As can be seen in Table 4., the difference between the Pre-and Post-Passive Recall test was in favor of the regular class (M= 54.215, SD= 19.401) still, the Quizlet group gained a higher score in the post-test and the difference between the Pre-and Post-Passive Recall test for Quizlet group was identified a mean of 52.4. The results indicated

that both groups made improvements in the vocabulary test as seen in the table, however, there was not a statistically significant difference between the groups. (t (50) =-0.352, p>0.727, d=-0.1098).

The Difference in the Mean Scores of Active Recall

Table 5: Differences between pre-post active recall

| | Group | N | Mean | SD | t-test | | | |
					t	df	p	Cohen's d
Pre-posttest Differences of Active Recall	Quizlet	26	42.012	23.216	-4.455	50	<.001	-1.236
	Regular class	26	68.860	20.132				

Although the Quizlet group had a higher post-test score, the difference between the pre and post-test was in favor of the regular class obtaining a mean of 68.8. The Quizlet group had a mean of 42.0. The fact that the measured central tendency of difference (M= 68.860, SD= 20.132) for both immediate and post-test in the regular class was higher than the Quizlet group's difference between the tests (M=42.012, SD= 23.216). When it came to comparing the mean scores of differences between the groups, there was a statistically significant difference between the Quizlet and the regular class (t (50) =-4.555, p<.001, d=-1.236) as shown in Table 5.

The Difference in the Mean Scores of Passive Recognition

Table 6: Differences between pre-post passive recognition test

| | Group | N | Mean | SD | t-test | | | |
					t	df	p	Cohen's d
Pre-posttest Differences of Passive Recognition	Quizlet	26	35.282	15.968	-1.455	50	0.152	-0.404
	Regular class	26	41.938	17.003				

When it comes to comparing the difference between the pre and post-test mean scores, there was no statistically significant difference between the groups. (t (50) =-1.455, p>0.152, d=-0.404). However, the difference was in favor of the regular class group. (M=41.9, SD= 17.0). The students made the highest improvement as pre-test scores rose from 48.2 to 90.1. On the other hand, the Quizlet only raised their scores by 35.2 points as displayed in Table 6.

The Difference in the Mean Scores of Active Recognition

Table 7: Differences between pre-post active recognition test

| | Group | N | Mean | SD | t-test | | | |
					t	df	p	Cohen's d
Pre-posttest Differences of Active Recognition	Quizlet	26	30.695	13.127	-1.898	50	0.063	-0.526
	Regular class	26	39.940	21.083				

The results of the post-test that were carried out throughout the treatment period showed the expected progress for both groups. The difference between the pre-and post-test difference for the Quizlet group was 30.6 whereas the regular class had a mean of 39.9. The difference was in favor of the regular class however the results yielded that there was not a statistically significant difference between the groups (t (50) =-1.898, p>0.063, d=-0.526).

The Difference in the Mean Scores of Receptive Knowledge of Grammatical Functions

Table 8: Differences between pre-post receptive knowledge of grammatical functions

	Group	N	Mean	SD	t-test			
					t	df	p	Cohen's d
Pre-posttest Differences of Receptive Knowledge of Grammatical Functions	Quizlet	26	19.157	11.518				
	Regular class	26	8.875	12.334	3.107	50	0.003	0.862

When it comes to analyzing the difference between the tests for both groups as shown in Table 17, the Quizlet group made the highest improvement by gaining a 19.1 mean score. On the other hand, the regular class group only increased their mean score by 8.8 points between Pre and Post Receptive Knowledge of Grammatical Functions.

The Difference in the Mean Scores of Productive Knowledge of Grammatical Functions

Table 9: Differences between pre-post productive knowledge of grammatical functions

	Group	N	Mean	SD	t-test			
					t	df	p	Cohen's d
Pre-posttest Differences of Productive Knowledge of Grammatical Functions	Quizlet	26	44.230	19.985				
	Regular class	26	25.667	16.895	3.617	50	<.001	1.003

When it came to their Pre and Post-Productive Knowledge of Grammatical Functions tests differences according to the Quizlet group and regular class, as a result of the analysis, there was a statistically significant difference (t (50) =3.617, p<.001, d=1.003). The difference was in favor of the Quizlet group students engaged in a digital app (M=44.230, SD=19.985) when compared to the students in the regular class group (M=25.667, SD=16.895).

2. **A Brief Summary of the Results of Quizlet Group**

The results of the comparisons of mean scores based on pre-post vocabulary tests over time using one-way repeated measures of ANOVA were presented as follows:

Table 10: Tests of within-subjects effects for the Quizlet group

Cases	Sum of Squares	df	Mean Square	F	p
Time	15360.148	1	15360.148	387.220	< .001
Residuals	991.694	25	39.668		

Note. Type III Sum of Squares

As displayed in Table 10. there was a statistically significant difference between the pre-test (and post-test regarding vocabulary test scores in time (F=387.220, p<.001).

Table 11. Findings of the averages of mean scores with respect to pre-post-test mean scores of participants in the Quizlet group

Time	Mean	SD	N
pretest	44.545	14.030	26
posttest	78.919	13.299	26

According to the findings, the mean vocabulary scores were M=44.5, (SD= 14.03) in the pretest. In the post-test, the mean vocabulary scores were computed to be M= 78.9 (SD= 13.2). The mean scores of pre and post-test scores seemed to indicate an increasing trend over time.

To summarize all the findings by given representation to figure out the impact of Quizlet on learners' vocabulary development, based on the results of pre and post-test scores of the Quizlet group, a Raincloud Plot was presented to explore how the Quizlet group improved their scores in terms of pre and post vocabulary tests.
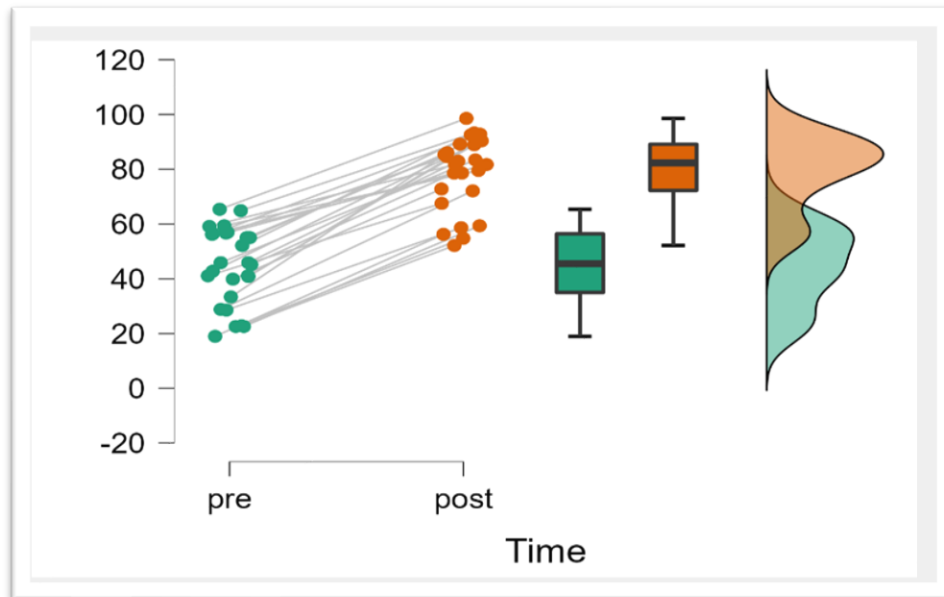

Figure 1: Raincloud plot for pre-post test scores of the Quizlet group

When the pre-test and post-test scores ranges were examined, it was observed that the students' scores increased over time. The scores from the pre-test range from 20 to 60 while the scores from the post-test range from 52 to 100. In the pre-test, the distribution of scores in the bar plot was wide, on the other hand, the bar plots of the post-test were narrowed revealing that the vast majority of students had approximately the same scores.

As seen in Figure 4.1. Raincloud Plot, although all students increased their scores on the post-test at almost the same rate, some students whose scores range from 20 to 30 were unable to increase their scores as much as others on the post-test. In addition, the pre-test average was also found to be relatively low for these participants. Scores of the students who scored slightly lower on the pre-test were compared with scores obtained from their post-test and these students were detected and possible reasons were analyzed in the results of the qualitative data section.

Results of Qualitative Data: Interview for the Quizlet Group
In this section, the data obtained from 26 participants from the Quizlet group employing the semi-structured interview were analyzed via content analysis. The second research question asking, *"What are the viewpoints of 9th-grade EFL learners about the impact of Quizlet?"* was answered from data gathered from Quizlet group participants' responses to the interviews at the end of the study.

To begin with, to investigate the learners' perceptions of using the Quizlet tool, interview questions were designed based on the related sources in the literature. While preparing interview questions, two English instructors examined the questions and provided feedback.

In the second place, the transcription of the conversations was translated into English and checked by an ELT expert. Thirdly, for the content analysis of the interviews, the coding method was applied. Categories and codes were determined by the researcher and another research assistant based on common patterns and counted. Among 81 codes, interrater reliability was 91.7% between the raters. The percentage agreement between the researchers was calculated. Finally, the analysis of the interview data revealed two themes: positive findings and negative findings.

In order to investigate the impact of Quizlet on students' vocabulary learning, the first question was asked 'What is the effect of Quizlet on learning new words?' The summary of the responses is given in Table 12.

Table 12: Learners' overall opinions on the effects of the Quizlet on their vocabulary and pronunciation studies

Categories of Positive Findings	(n)
Effectiveness of using Quizlet	10
Satisfaction with using Quizlet	6
Appropriateness of the Quizlet on vocabulary learning	5
Memorability of the words	5
The success of the Learners	3

THEME 1: Positive Findings of the Semi-Structured Interview

Effectiveness of the Quizlet:
With respect to Table 12. 10 students out of 26 participants (38.4%), of all applications they have used so far to learn English, Quizlet was the first app they did not give up so easily. They stressed that more or less other apps could also help them to learn the words, however, they had not been monitored by the teacher until now. They indicated that they were more eager to try study and game modes because they knew that the teacher could check their progress and give feedback weekly on what they did or not. They suggested that even if they could download the application on their phones and work on it individually, they got the most out of it when they were working in the lab with their teacher and friends. Student 21 stated that "*Though whiteboards are crucial for classrooms, these tools should also be integrated into lessons, especially in English and German classes.*"

Since English is not written as it is read, 6 of the participants also agreed that the 'Spell' mode of the app, helped them especially improve pronunciation and how to write a word correctly. Student 17 responded "*I have always struggled to hear and write an English word. My middle school English teacher always practiced dictation activities in English lessons, and I always failed. I did not believe that I could spell a term fully correct. At the end of the test, I could see what I missed and correctly spelled. I got used to the app in time and now I can feel self-confident to study English again.*"

Satisfaction with using Quizlet:
Creating study sets was another most frequently reported effect of the Quizlet by six participants out of 26 participants (23%). It was reported that when they were given homework on using words in a sentence, they were asked to create study sets and write sentences through the 'Create Study Set' feature increased their attention. Student 2 also briefly elaborated on the relationship between creating study sets and the effectiveness of doing tasks through Quizlet "*If I was asked to write the same sentences in a notebook, I would get bored and I would not, but I knew my friends would see my study sets and maybe study my own sets. I was creating them carefully and was making the changes immediately with the corrections of my teacher, which I think I never do for usual homework.*"

E9 put forward that they always kept vocabulary notebooks when they were studying for the LGS but never be able to remember those words even though they encountered them in the 9th -grade English coursebook. However, Quizlet increased their vocabulary gain and motivation to learn the vocabulary in the reading passages.

Student 9: "*I was always motivated to improve my English, but I always got stuck on remembering new words. Even I was so frustrated that I did not even remember the word I have encountered before. Now I understood that using the digital application and using technology in the class affected my vocabulary learning process.*"

Another reported element as to the effect of Quizlet on vocabulary learning was seeing study sets on the games. Three students emphasized that for some sets, the instructor created sets not only by providing L1 or L2 meanings but used in a sentence for practicing. Seeing these sets playing the Gravity game was perceived as having a positive effect on vocabulary learning. Student 14 explained as follows:

"*In the gravity game, you have to be quick, and your score depends on how fast you act. Playing the Gravity game with Turkish or English definition sets did not help me recall the words but reading sentences with target words and deducing the meaning as fast as I might be the only thing for me to give my attention to the target words and helped my vocabulary learning.*"

Appropriateness of the Quizlet on vocabulary learning
Five participants out of 26 participants (19%) considered that using Quizlet digital application was appropriate for the way they learn English outside of the classroom. Hence, using a digital tool and integrating the English class appealed to them. Four of them stressed that when the Covid-19 pandemic came into their lives, it led them to have

more motivation toward learning through technology. In addition, a student asserted that English is a world language, and learners cannot be separable from the digital era. On account of being good at and into computer games made it easier to learn vocabulary and keep up with studies in the Quizlet application. Some comments of participants about the appropriateness of the Quizlet in their vocabulary learning process are as follows:
Student 4: *"I am very into computer games. I wish we could have studied other courses through Quizlet."*

Memorability of the words:
Five students out of 26 (19%) in the Quizlet group unanimously agreed that they had numerous flashcards with different topics set and clicking on the 'Audio on' button and the chance to see the picture of the word made it possible for them to remember the words. They stated that 'flip and flow' enabled them to recall words covered in the class. One of them is attributed to the efficiency of Quizlet in timesaving during vocabulary learning. Some comments of participants about the memorability of the words through flashcards modes are as follows:

Student 15: *"I was always checking different dictionaries to check meaning and pronunciation and I was getting bored, but it was more fun through Quizlet. It was so organized that I could reach everything whenever I wanted. It was really helpful to have access to everything through an application."*

Moreover, participants pointed out that they remembered the words well when they saw the words in any other texts because they encountered definitions, synonyms, antonyms, and thanks to prerecorded pronunciations and visuals. Student 2 emphasized that *"I was so surprised to see my improvement in vocabulary and pronunciation while I was reading a passage after the third week. I was so determined to follow everything on Quizlet, and I believe it worked well for me."*

The success of the Learners:
Another common thought shared by the three students (11%) was their success in vocabulary and pronunciation. They put forward that Quizlet digital application tool facilitated their vocabulary learning process to gain more vocabulary. Some comments of the learners about the benefits of Quizlet in their English language are as follows:
Student 24: *"I noticed that whenever I finished a word set, I actually learned more than that word. I have learned possible synonyms, antonyms, and how to use that word correctly in a sentence. For some sets, our teacher did not give the meaning of the words but used that word in a sentence in the flashcards. It really improved my English."*

In order to investigate the participants' comments on their favorite features of the Quizlet app, the participants were asked 'What is your favorite feature of Quizlet to study vocabulary?' The summary of the responses is given in Table 13. below.

Table 13: Learners' overall opinions of the features of the Quizlet

Categories of Positive Findings	(n)
Focus	11
Game elements	7
Fun & Enjoyment	6
Frequency	3

THEME 1: Positive Findings of the Semi-Structured Interview

Focus:
With respect to Table 13., 11 students out of 26 in the Quizlet group (42 %) agreed that typing words after they heard was their favorite feature among all others, which was consistent with the Orthography Receptive and Productive test results that they had increased their scores in both tests. They reported that the *'Spell'* mode made enabled them to get progress reports and see the total number of words they learned fully, partially learned, and yet-to-be-learned words. They also said that it was the most needed skill because they wanted to pronounce the words correctly and be skillful when spelling words if they wanted to be proficient users of English.

When they were asked which of the options from dictation, matching, or games options were useful for them, the most common answers are Spell and Write modes. Student 1 mentioned she realized that learning a word's meaning is not sufficient alone. She was so sure of the meaning of the word, but she could not type it correctly or pronounce it. She was also asked to what extent she got the most out of the Quizlet. She reported that hearing the pre-recorded audio with visuals at the same time and then working on Spell mode helped her progress a lot.
Student 1: *"I was quite focused on how to say and write the words correctly. I realized that I was following the wrong routine to learn the meaning of the words. I always tried memorizing them at first. However, when my*

teacher said even the exact word, I couldn't recognize it or when I needed to pronounce it, my pronunciation did not satisfy me at all. I could learn the meaning of the word anywhere on the Internet; however, I quite enjoyed how the Spell and Write section progressed my improvement for the specific word set."

Game Elements:
Game elements appeared to be another most common answer to this question. Seven out of twenty-six students in the Quizlet group (26%) answered they always played some popular games but not for the purpose of learning a language. Racing against time and one another was something new for them. One student points out that competitiveness encouraged him to learn all the words. Another student pointed out that Quizlet Live was the game he realized what he knew or did not know. Since it created a rivalry between classmates, Quizlet Live made vocabulary learning more fun. Moreover, the Gravity game became one of the outstanding modes among the others for the participants. Based on their progress on Quizlet and their attributions to the game, it was observed during the data collection procedure that the majority of the learners engaged mostly in this game. Some comments of the participants about games of the Quizlet are as follows:

Student 15: "*Whenever I see my name on the leaderboard after playing Gravity many times to become a winner of the week, I never felt bored."*

Fun & Enjoyment:
Six students out of 26 in the Quizlet group (23%) also emphasized that they did not want to engage in English class most of the time. They were not fully concentrated on the words in the reading passages. However, when it added fun and excitement to exercises, which they were doing on paper before, they increased their engagement and helped them to be more self-confident in answering questions in a text. Student3: emphasized that *"I think using a digital applicant can make even a tedious class more fun."*

Student 14: "*Normally I play games even in English without fully comprehending the situation. However, this time I knew what I was doing. I was so eager to finish other study modes and then move on to Gravity. I really liked the usability of Quizlet. Even if you move in the direction of the games, it is nearly impossible to be a winner without completing other modes."*

Frequency:
Regarding Table 13 the students were then asked how often they used features they interacted with most in the Quizlet. Three participants (11%) replied that they knew the teacher had the chance to follow their progress. For this reason, they always completed every study section to achieve better scores on the *Test* and *Games of the Quizlet.* Another student described the reason that it would not make any sense to skip a study mode because they were all connected and the more you fully mastered studying online flashcards, the more you would be successful in *Test* mode or *Write and Spell.* Student 13 highlighted that "*Even though I did not have any Quizlet assignment for that week, I regularly checked my Study Flashcard sets to brush up on my previous knowledge of the vocabulary sets."*

In order to investigate the participants' comments on how Quizlet digital tool can be improved, the participants were asked 'How can we improve Quizlet? What is your opinion?' The summary of the responses is given below.

Table 14: Learners' overall opinions on the improvements in the Quizlet

Categories of Negative Findings	(n)
Recording voice	9
Infrastructural-Incompetence	8
Inappropriateness	5
Unfamiliarity	4
Satisfaction	5

THEME 2: Negative Findings of Semi-Structured Interview
Recording voice option:
Table 14. represents the overall responses of the learners on the difficulties they had using Quizlet. The majority of the answers were about the recording of their voice. 9 students out of 26 in the Quizlet group (34.6%) preferred to be recorded after they listened to the audio especially when they worked on flashcards. They suggested that Quizlet always showed their progress and that kept them updated. It would be more useful if it recorded their voices and rated them. Moreover, 3 students added that when they worked individually after school, they were not sure whether they pronounced correctly or not. Two of them responded that they were monitored by the teacher in the class, however, it was problematic not to record each word set. Student 10 expressed his concern by saying

that: *"I don't feel self-confident when I need to read a passage after the teacher or in fact, I have concerns about how I pronounce a word. I feel insecure and have the feeling my friends will make fun of me. Before we used the Quizlet application, I already started using Cake, which has voice recording options. When your recording did not satisfy the expectations, you need to practice again until you are done. However, Cake does not have what Quizlet has at the same time. I wish we could combine all beneficial features in one app."*

This technical drawback of Quizlet was mentioned by the other three participants saying that there should be a feedback scoring system regarding their mistakes. Additionally, two students complained about the loudness in the classroom caused by the ineffectiveness of understanding the pronunciation of the words in the Spell mode. Student 15 and Student 19 put forth that: *"We did not have enough headphones. I think we should study this tool as an individual work because using Quizlet and audio option in a crowded classroom where the sound effect is noisy caused us not to receive voice accurately."*

Infrastructural-Incompetence:

8 out of twenty-six students (30%) shared that they were more disadvantageous than their peers in terms of their technology use. When the scores pre and post-tests of these participants were tracked, it was seen that they were the ones who had relatively lower scores than others. It was observed that even though they increased their scores in the post-test, that increase was not as much as other participants. Those eight students expressed a variety of reasons for their development of the Quizlet app. They commented that they could only have access to the Quizlet application in the school during or after class, or if they needed, the teacher provided her devices for revision. However, their peers had access to the internet constantly and at least had a technological device. Their technological device opportunities and internet habits were asked these eight learners to find out how this affected their overall success in vocabulary tests. It was noted that five of them did not have any computers, phones, or tablets. When they were asked how often they reviewed the words, they addressed that they completed their sets in the school lab since they did not have internet access or any technological devices at their home. One of the comments of participants about using Quizlet for English studies at school is as follows:

Student 4: *"I believe this is not fair. My friends were racing one another at home all the time in the Gravity game to become the winner. I cannot even check previous weeks' study sets because I needed to complete weekly sets."* Another opinion discussed by participants was about the internet connection of the school. 3 of them reported that sometimes the Wi-Fi connection provided by the school was low. They needed to race against time for Gravity and Match games. Even if the teacher sometimes provided her internet connection hotspot Wi-Fi from time to time, it affected their performance and motivation. Student 13: *"Even if it did not affect my overall progress, it affected the Quizlet Live game in the lessons. I was feeling frustrated when the internet connection affects my game score on the Match and Gravity."*

Satisfaction:

Another technical drawback of the Quizlet app was that the mobile application of Quizlet did not support the Gravity game. Considering that the vast majority of the learners downloaded the mobile app version of Quizlet and attributed that Gravity was one of the modes they liked and motivated them to learn words, this drawback reveals an imperative infrastructural shortcoming of the Quizlet app. Five participants out of 26 in the Quizlet group (19.2%) shared their unpleasant feelings about being reluctant to study other study modes when they needed to study via mobile phone. One participant complained about how this shortcoming affected his overall satisfaction to learn the words through Quizlet. One of the student's comments was presented as follows:

Student 1: *"I was so reluctant to study other modes without playing the Gravity game. It was the only feature I practiced the words, however, if we are not in the school lab, studying words through Quizlet did not satisfy me at all."*

Another participant also commented that seeing only the definitions was not enough to recall the words. Besides, he reported that seeing a variety of examples would increase memorability. The participant emphasized that he forgot the words when there was no example sentence which made him reluctant to study through Quizlet. Some remarks made by one participant are as follows:

Student 17: *"If my teacher had not provided an example sentence for each word, I would not have remembered many of the words. I forgot so easily when only definitions were given. However, Quizlet did not provide extra sentences and made me so reluctant to study words."*

Other than that, three of them commented that the target words did not appeal to them and were challenging for them to acquire. They indicated that they would prefer to study the words they decided on. One of the remarks made by one participant is as follows:

Student 4: *"I felt so bored when I had to learn the words in a specific order. I would prefer being more independent*."

Inappropriateness:
When asked whether they would use Quizlet in their future studies, they expressed their beliefs by indicating that they were willing to use Quizlet software in their future studies. However, it appeared that 5 of the participants (19.2%) were uncertain that learning and practicing vocabulary with an online application tool was appropriate for their way of learning. When they were asked which ways, they like most when they practice vocabulary, they responded that digital applications were not like regular class methods. Student 7 added on by saying that: "*I also never attended any Zoom or EBA lessons during the pandemic. It seemed so artificial to keep up with everything on screen.*" They would prefer to write in their notebooks and take notes. Moreover, two of them indicated that they never left keeping notebooks with given target words on the Flashcard mode. One of the participants stated that: Student 2: *"I cannot deny that Quizlet was useful, but I feel more secure when I write everything in my notebook.*

Four of them put forward that they could easily forget the words if they did not review them daily. Additionally, two of them mentioned another digital flashcard tool they interacted with before. Unlike Quizlet, Anki gives options for the learners to categorize the words in terms of difficulty levels. If you choose a word as a difficult one, you encounter that more often, which Quizlet does not offer for the users. Since the users could not review the words at increasingly spaced intervals to get benefit from the application in long term, spaced repetition was identified as another drawback of the Quizlet application. Regarding that Student 3 stated that: *"I know it was our responsibility to review previous weeks' words, but even if my teacher kept track of my progress, I did not review them again. I was so sure I have learned them; however, I could not recall some of the words on the test."*

Unfamiliarity:
Four of the participants (15.3%) indicated that they were not sure they would use Quizlet in the future in their self-studies since they never engaged in any digital tools before. They did not feel they could keep up the work regularly.

Student 12: *"I never used any teaching tools before, and I was not familiar with how to work on English efficiently through an application. I would stick to my exercises in the coursebook. I think they are safer for me."*

To sum up, it can be seen from the students' statements the socioeconomic status of the students, readiness level, technology use opportunities, and learning style preferences shaped their experiences with the Quizlet application.

DISCUSSION
The primary aim of this current research was to explore the effect of integrating a digital web tool (Quizlet) into the EFL high school classroom to investigate whether it had any effects on learners' vocabulary and pronunciation achievement. To achieve this aim, an experimental mixed-methods research design was run to provide triangulation through a combination of both qualitative and quantitative methods to obtain more in-depth insight and a better portrayal of the links between the findings.

1. **Discussion of findings for RQ1: the overall vocabulary performance of the Quizlet group comparing the regular class**

The present study attempted to answer whether the students who work with the Quizlet web tool achieve better vocabulary than the students who work with regular class methods. To answer the first question, an independent t-test was run to explore whether there were statistical differences in the pre and post-test scores of vocabulary tests according to the groups. The findings of the analyses of students' vocabulary test scores before and after Quizlet were introduced, and pre and post-test scores for all test groups indicated significant improvement for the Quizlet group. The same improvement was verified for the regular class as an expected outcome due to the effect of instruction. Both the Quizlet group and the regular class made improvements at different rates. The vocabulary gains obtained within each group yielded significant differences in terms of Orthography Productive, Passive Recall, Receptive Knowledge of Grammatical Functions, and Productive Knowledge of Grammatical Knowledge post-test scores were compared. Furthermore, when analyzing the difference between pre and post-test scores of each test, Active Recall, Receptive Knowledge of Grammatical Functions, and Productive Knowledge of Grammatical Knowledge test scores significantly differed.

In the OP test, the learners were asked to listen to the words pronounced and then write them correctly. The Quizlet group with a mean score of 84.2 outperformed the regular class and scored an overall mean of 73.8, however, the

fact remains that the regular class gained slightly higher scores in the post-test. The difference between mean scores decreased. Regarding the Passive Recall test, the participants provided the Turkish meaning of English words. Quizlet scored higher than the regular class when post-Passive Recall test scores were compared. The difference between the pre-and post-Passive Recall test for each group did not significantly differ as in the same case on the OP test which means that the groups had almost the same knowledge of vocabulary. Lastly, when post-test scores were compared with respect to RKGF and PKGF, an investigation of the significance of mean scores revealed significant differences between the regular class and the Quizlet group. The findings revealed that Quizlet facilitated the Quizlet groups' recognition and production of the L2 words with grammatical accuracy because there was a statistically significant difference between the Quizlet and the regular class.

Regarding the differences between pre and post-test scores, significant differences were observed in the Active Recall, Receptive Knowledge of Grammatical Functions, and Productive Knowledge of Grammatical Knowledge tests. When the participant's vocabulary recall was measured whether they would provide the L2 words given Turkish words, the Quizlet group obtained more scores. Interestingly, the difference was in favor of the regular class even though the Quizlet had higher scores in the post-Active Recall test. The regular class increased its Active Recall post-test scores more. On the other hand, the difference between RKGF and PKGF pre and post-test scores was in favor of the Quizlet group. This finding confirms that Quizlet provides more PV tasks for users (Dizon and Tang, 2017). It can be concluded that the Quizlet group made progress during the Quizlet implementation.

Finally, according to the analysis of pre-and post-Passive Recognition test results, it can be deduced that although all the participants increased their scores in the post-test and there was a slight difference between the post-test means scores. The regular class managed to give the most correct answers in the post-test. Regarding the Active Recognition test, it can be concluded that both groups had almost similar scores on the post-test. Whereas the Quizlet group had higher scores in the post-test, non-significant results were obtained between the pre and post-test.

Similar to this research, Dizon and Tang (2017) compared the impact of digital flashcards and paper-based flashcards to enhance receptive and productive L2 vocabulary. Furthermore, they found that the vocabulary gains compared to digital tools and a regular class method did not significantly differ. Account of the fact that the striking findings of the regular class are attributable to using the same materials, activities, and course books they are used to. Contrary to similar research studies which compare the efficacy of digital and paper-based flashcards confirm that regular class forms of vocabulary learning were not as efficient as DFs (Azabdaftari and Mozaheb, 2012; Başoğlu and Akdemir, 2010; Kiliçkaya and Krajka, 2010). Even though paper-based flashcards were not implemented in the study, the effect of instruction was observed in the vocabulary scores of the regular class. It is evident to indicate that it is likely that regular class methods can improve vocabulary acquisition as well as online vocabulary learning tools.

Quizlet learners' vocabulary gain on each post-test score indicated a vocabulary recall. This coincides with the claims of Laufer, Meara, and Nation (2005) that integrating flashcards in vocabulary learning was an efficient way for learners to improve their vocabulary size. To illustrate, Bilcan's research study (2019) yielded significant differences in the immediate and post-test scores of the learners. Furthermore, the learners engaged with the Quizlet tool by practicing words with flashcards, retyping tasks, matching, true-false, multiple-choice, and games. It is attributable to the increase in the scores in the post-test, which was also stated by Mayer (2005) that "People learn better from words and pictures than from words alone" (p.31). Mayer (2005) claimed in the generative theory of multimedia learning that encoding verbal and visual information simultaneously increases the possibility of recalling the information. This theory is parallel with the results of the current study since the Quizlet group practiced the target words in both verbal and imagery coding systems.

To sum up, some external variables such as individual differences, motivation, learner preferences and strategies, and attitudes to learning the language might play an important role in the study (Brown, 2000; Gardner and Lambert 1972; Lombaard, 2006; Saville-Troike, 2006). External factors that might have affected the results are discussed under research question three.

2. Discussion of findings for R2: the perceptions of the quizlet group learners on the Quizlet

Twenty-six students' perceptions of the effects of Quizlet on their overall vocabulary and pronunciation improvements were gathered through semi-structured interviews. According to the similar responses of the participants, given responses were categorized under various sub-heading, and positive and negative viewpoints of the students were determined as themes of the interview and listed in the current study. While the negative theme was categorized as satisfaction, recording of the voice, inappropriateness, unfamiliarity, and infrastructural incompetence, the positive theme was categorized as focus, the effectiveness of using Quizlet, memorability of the

words, appropriateness of the Quizlet on the vocabulary learning, fun, frequency, satisfaction, game elements, the success of the learners.

The participants were asked about the effect of Quizlet on learning new words, their favorite features of Quizlet, and how we could improve Quizlet. Taking the results of the participants' responses, it may be deduced that the participants in the Quizlet group benefitted from the Quizlet tool to learn vocabulary. Five participants asserted that using Quizlet increased the memorability of the words (See Table 12). Inserting visuals and audio into the flashcards and being able to 'Flip and flop' the cards as their preference order increased the effectiveness of the tool. Some participants (n=5) attributed that they could recall the words when they see them in other contexts. Even though keeping vocabulary notebooks used to be a method for their previous vocabulary studies, they recalled the words more after using Quizlet. There were still two participants who prefer using vocabulary notebooks for their future studies. Besides, some participants (n=5) stated that they were familiar with using digital tools since they were already engaged in technological tools and any digital technology tool. Hence, the teaching method was appropriate way they learn (See Table 12). Hence it was easier for them to use Quizlet to learn vocabulary. The results of this study along with the previous studies suggest that Quizlet facilitated vocabulary learning and retention (Bilcan, 2019; Çınar and Arı, 2019; Dizon, 2016; Ho and Kawaguchi, 2021; Kalecky, 2016; Wright, 2016).

As the participants worked on Quizlet modes, they indicated that their success in vocabulary and pronunciation increased. The vocabulary success was in line with aforementioned studies nevertheless there were not many studies addressing pronunciation teaching. Ho and Kawaguchi (2021) suggested that a new Quizlet mode giving diagnostic feedback like other study modes would be useful for L2 learners. Kalecky (2016) found out that learners indicated that Quizlet supported their spelling and pronunciation. Additionally, this result was in line with the current study. When the learners were asked their favorite feature in the Quizlet app, they put forward that they enjoyed working with Spell and Write mode. Most of them (n=11) agreed that prerecorded audio and visuals improved their vocabulary learning and spelling as indicated in Table 13.

Furthermore, with respect to Table 13. most of them (n=10) have already tried other language learning applications, however, they gave up so easily since they were not monitored by the teacher. They were aware that the teachers kept track of their progress to give feedback, which kept them focused and motivated. According to the results of interviews, having positive and negative instant feedback on the words learned fully, partially learned, and yet to be learned kept them updated. This finding seems to be along with the current literature (Ashcroft and Imrie, 2014). The study administered by Ashcroft and Imrie (2014) yielded that Quizlet supports learners with its immediate feedback feature and improves their performance.

Another common response repeated by the participants was the game elements as displayed in Table 13. (n=7). The gravity game was liked most and found enjoyable and competitive among the learners. Learners' perceptions and attitudes toward vocabulary learning through the sense of achievement changed positively. Similar to this finding, the learners in Çınar and Arı's study (2019) found the English lessons more fun, and their interest and motivation increased. However, the game elements category was listed under the negative findings of the interview as well.

They were also asked what kind of improvements were needed for Quizlet. The voice recording option and space repetition were outstanding responses. Four students put forward that they should have encountered previous words more often in study modes so that they could review the words at increasingly spaced intervals.

In conclusion, the reasons for not having the same results in line with some Quizlet studies in the literature in terms of not having a significant difference between the regular class and Quizlet group except for OP, PR, RKGF, and PKGF test scores might include the individual differences of learners and inappropriateness of the learning material that is Quizlet for this current study. The individual differences of the learners are an important element in ICT-supported activities. Although all the participants were A2 level during the study, it was noted that eight students identified in the study had slightly lower scores in the pre-test and could not increase their scores as much as other participants. Some learners stated that they could not attend any of the English classes during the COVID-19 pandemic because of the lack of technical infrastructure. Therefore, the results might have been affected by these language level differences. It was also confirmed that five students were uncertain to study English with any digital tools as displayed in Table 14. They asserted that they would prefer regular class methods like keeping notebooks. Different learning styles of the learners might have affected their motivation during the implementation. Another reason might be related to the unfamiliarity with any instructional technology. Eight out of twenty-six students attributed that they were more disadvantageous than other participants in terms of their opportunities in technology use and readiness to learn through instructional technology since they were not into using any

technological tools and never engaged them before. (See Table 14). Dreyer (2014) uncovered that the learners gained more vocabulary scores when they spent more time practicing words on Quizlet. The use of Quizlet requires different experiences and needs compared to the regular class group, the impact of socioeconomic background and technology opportunities have been important factors that may affect the result of the findings. Hence, it can be postulated that the aforementioned reasons might have affected the overall findings.

CONCLUSION

1. Quizlet group versus regular class group

The current study asked whether learners in the Quizlet group achieved better vocabulary than students who learn only with regular class teaching methods. According to statistical analyses, both groups had vocabulary gains regardless of the intervention. The effect of instruction on the regular class and the Quizlet digital tool on the Quizlet group had positive effects on the vocabulary acquisition of L2 learners. There might be concerns about the Quizlet application does not improve productive knowledge of a word since it does not provide example sentences in a context, however, there was a significant difference between the two groups for the Receptive and Productive Knowledge of Grammatical Knowledge tests. Even though this digital flashcard might be more appropriate for receptive knowledge of a word with its features (Crandell, 2017), the teacher can design study sets with example sentences containing contexts as appeared in the present study. Moreover, the participants were encouraged to practice L2 definitions first in Flashcard mode, and the 'Spell' mode was repeated more than other modes by the participants, which contributed to their OP test which yielded a significant result between pre and post-test.

2. The attitudes of the Quizlet group on the Quizlet digital tool

Students' perceptions of the effects of Quizlet on their vocabulary and pronunciation were also investigated and responses were analyzed according to positive and negative themes in the study. The findings revealed that a great number of students took advantage of the Quizlet app within the bounds of opportunities. Designing a vocabulary learning instruction through Quizlet transformed learning into a playful context with Quizlet Live and Gravity game and the learners created study sets that scaffolded learner autonomy. Except for a few students, they found the interactive Quizlet digital flashcard tool beneficial and appealing for their vocabulary and pronunciation. As appeared from the findings, the Quizlet digital flashcard tool has established a positive impact and promoted collaborative learning for more than half of the participants in the Quizlet group and most of them agreed that they would use Quizlet in the future. Only a few participants indicated that digital tools do not impact their language improvement in particular.

In the case of low-level students, a monitoring system is needed. Due to the flexibility and varieties of digital flashcards over paper-based flashcards (Waluyo and Bucol, 2021), those with low proficiency levels can be allowed to work at their own self-paced. Program developers and designers of Quizlet, and foreign language teachers, in general, could benefit from these findings to improve and increase the impact of Quizlet on English courses.

IMPLICATIONS

After the results of the study and the related research on the impact of Quizlet on vocabulary and pronunciation improvement, the following implications were drawn up for English language teaching and learning.

Ever since technology manifested itself in the education field, it has been a crucial issue for teachers to meet the needs of digital natives and immigrants who are inclined to lose their motivation and may have a negative perception of the vocabulary learning process. In that sense, gamified student response applications and other digital tools can be adopted as learning resources for today's learners as digital natives and digital immigrants. The teachers first need to understand and acquire some skills to integrate technology into the classroom. It is a serious issue for effective vocabulary teaching to know how to engage and integrate with the tool. The teachers need to introduce the tool on using and practicing vocabulary items in terms of the skills used, spaced repetition, and recycling of the difficult words (Stroud, 2014).

First, one of the notable results of the current study is that the Quizlet group made a significant difference between pre and post-tests. This demonstrates that the Quizlet tool as a digital flashcard tool is sufficient to expand vocabulary knowledge. On the other hand, there was not a significant difference between the regular class group and the Quizlet group for some tests and some of the interviewees from the Quizlet group indicated that the software did not meet their expectations with the way it works. Other digital tools that build vocabulary along with engaging learners with customizable vocabulary learning activities especially to build productive vocabulary knowledge by using words in a correct sentence structure should be analyzed with certain criteria before any implementations. At this juncture, Kahoot!, Socrative, Quizizz, Quiz Game, and Anki have been one of the tools studied in much research (Çakır, 2019; Kayseroglu and Samur, 2018; Ciaramella, 2017; Yapıcı and Karakoyun,

2017). The teachers can evaluate and try these tools as to the needs of their learners. For Digital Flashcard tools, Nakata's Digital Flashcard Criteria (2011) can be utilized for evaluating any instructional tool.

In the present study, the target words they studied through the Quizlet application were not determined by the participants. Instead, the researcher chose the words they would practice. Some of the students shed light on how they felt bored and were not autonomous enough, which made the vocabulary learning process boring and challenging for them. Furthermore, some of the interviewees from the Quizlet group indicated that target words were challenging and did not appeal to them. McCarthy (1990) and Schmitt and Schmitt (1995) advocated that when the learners structure their notebooks, the words they prefer to study should be decided by them. That notion can be applied to digital flashcard tools that the learners might decide what words they include and what information they want to note down in their self-studies. In that sense, learner autonomy can be promoted as Quizlet offers with its Flashcard creation feature. The teachers can give extra vocabulary tasks or projects for learners to create flashcard sets based on themes they study. Accordingly, Kalecky (2016) put forward that Quizlet could be an effective tool to improve learner autonomy since learners can study in their self-paced self-study by creating their sets, searching for ready-made sets and they can go through the difficult items determined by them. For instance, the teachers can assign the learners to create flashcards with unit words at the beginning of the units to make a presentation in the classroom. With other Web 2.0 tools, students can prepare content with scheduled themes for a longer period of time, and the prepared content can be collected in the form of assignments, projects and portfolios. Quizlet is an appropriate digital tool to incorporate inside and outside the classroom so that the teachers can create authentic in-class vocabulary activities within an authentic context for both vocabulary growth and pronunciation practice. Instead of using Quizlet in isolation from content and curriculum, the teachers can integrate it inside the classroom once a week.

Different digital gamified applications with their game elements such as badges, points, and leaderboards might be part of the examination system and the curriculum as they can boost students' motivation and engagement. The importance of feedback and feeling of competency may be supported by these game elements, however, it is less likely that individuals' high value is maintained over time. Intrinsic motivation should be increased with some rewards including real objects (Zichermann and Cunningham, 2001).

All in all, it is, therefore, governments need to take action to facilitate educational technologies in and outside the classrooms and to enhance innovative learning opportunities for learners. During COVID-19, providing tablets for students became one of the first actions taken by the Ministry of Education. Through this implementation, more commercially available language teaching software, programs, and tools need to be allowed for free for the learners.

FOR FURTHER RESEARCH
To start with, it may be useful to employ different gamified student response applications to have more accurate and generalizable results about CALL and digital learning.

As for the second suggestion, there is a need for some concrete results to compare and interpret participants' interview comments more comprehensively and thoroughly so that the implementation of the Intrinsic Motivation survey helps prospective practitioners in their research. For further research, the intrinsic motivation of the Quizlet group can be investigated since their inner feelings have a link to the way they engage with a task or activity. Under self-determination theory, three intrinsic needs that are autonomy, relatedness and competence can be searched for as crucial factors of motivation (Rigby and Ryan, 2018).

Furthermore, similar research can be carried out with a larger population of participants from different proficiency levels. In the shed of this idea, it might give better results to carry out the study with higher-level students. Lastly, it is likely to be the case that there might be other factors that cause the progress of the learners in the Quizlet group such as the practice effect. For further studies, the design of the study can be implemented with the same participants and can be attributed to the improvement of digital web tools.

LIMITATIONS
To begin with, this study is only limited to two classes (26 were in the Quizlet group, and 26 were in the regular class.) Because of its limited number of students, the results cannot be generalized to a larger student population. In the second stage, in the present study, a delayed posttest was not administered to observe any possible effects on retention and vocabulary learning due to time considerations. A longitudinal study that investigates retention over a long period would present more reasonable results on the validity of the web tool. Additionally, the present study only covered the 52 vocabulary items selected from three units in the coursebooks and skills books that the

Ministry of Education recommended on the EBA platform over 6 weeks. The target words selected from coursebooks with a certain number and variety might not be overgeneralized.

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APPENDICES
Appendix 1: Example Questions of Vocabulary Tests
1) Orthography Receptive
Circle the correctly spelled words. (10 min.)

Tower	Centurie	Acrhitecture	Haeght
Towwer	Centuury	architecture	height
Trowere	Cantury	architekture	heightt
Towwerr	Century	architecteru	heitght

2) Orthography Productive
Listen to the words pronounced twice and then write it correctly. (10 min.)
   1. --------------------
   2. --------------------
B) Knowledge of Meaning:
1) Active Recall (10 min.)
Please Write English Meaning of Turkish

Turkish	English	Turkish	English
1. Mimari	a	27. Meşrubat	s
2. Şaheser	m	28. Uygarlık	c

2) Passive Recall (10 min.)
Please write Turkish meaning of English words.

	English	Turkish	English	Turkish
1	Height:		27 Entertain:	

3) Passive Recognition (15min.)
Look at the English words given. Choose its meaning from four Turkish options.

1. Century			
a) gelecek	b) ülke	c) milliyet	d) yüzyıl
2. Architecture			
a) gökdelen	b) mimari	c) doktor	d) meslek

4) Active Recognition (15 min.)
Look at the Turkish words given. Choose its meaning from four English options.

1 Yükseklik			
a) ruler	b) length	c) slope	d) height
2 Miras			
a) Doctor	b) architecture	c) vision	d) job

C) Grammatical Functions:

1) Receptive Knowledge of Grammatical Functions (15 min.)
Please choose the grammatically correct answer.

1. Height
   a) Jane is a woman of average height.
   b) I heighted this trousers.
   c) They are height same.

2. Heritage
   a) This tower is heritagely beautiful.
   b) It heritage this castle.
   c) Turkey has a rich heritage

Appendix 2: Vocabulary Familiarity Test

VOCABULARY FAMILIARITY TEST

Write Turkish meanings of the words below. You have 40 minutes to complete it.

ENGLISH   TURKISH

1. The news
2. Weather forecast
3. Talent show
4. Documentary
5. Cartoon