QUIZLET IN THE EFL CLASSROOM:
ENHANCING ACADEMIC VOCABULARY ACQUISITION
OF JAPANESE UNIVERSITY STUDENTS

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Abstract

This study examined the efficacy of using Quizlet, a popular online study tool, to develop L2 English vocabulary. A total of 9 Japanese university EFL students participated in the study. The learners studied Coxhead's (2001) academic vocabulary list (AWL) via Quizlet over the course of 10 weeks. Results of the pre- and post-tests revealed that the learners were able to make statistically significant gains. Moreover, a questionnaire administered by the researcher indicated that the students had positive perceptions of Quizlet to study L2 vocabulary. Specifically, all three constructs studied – perceived usefulness, perceived ease of use, and behavioral intention to use Quizlet – had mean scores greater than 4 on a 5-point Likert scale, indicating a high-level of agreement. Based on these findings, the author supports the use of Quizlet in the EFL classroom.

Keywords: Computer-Assisted Language Learning; mobile-assisted language learning; vocabulary

1. Introduction

Second language (L2) vocabulary acquisition is an essential component of foreign language learning (Beglar & Hunt, 2005). Therefore, it is important for teachers to place emphasis on L2 vocabulary that will be beneficial to EFL students according to their abilities, interests, and goals. However, the myriad of ways to study vocabulary makes it difficult for teachers to choose the most appropriate method for their learners. Research on Computer-Assisted Language Learning (CALL) and Mobile-Assisted Language Learning (MALL) suggests that the use of technology to study vocabulary is an effective approach for foreign language students (Altiner, 2011; Azabdaftari & Mozaheb, 2012; McLean, Hogg, and Rush, 2013). In particular, as Godwin-Jones (2011) stated, the rise of smartphone ownership affords learners virtually limitless opportunities to study L2 vocabulary, "Clearly having such powerful devices available anytime, anyplace provides tremendous opportunities for educational use" (p. 3). Given this, numerous apps geared towards vocabulary learning have appeared on the

iTunes and the Google Play app stores, many of them freely available for users to download and use. However, compared with commercial online programs such as Anki and Word Engine, these types of vocabulary learning systems have received relatively less attention in L2 research, especially in the context of English teaching in Japan. Due to this gap in the literature, the primary aims of this study are to investigate whether using Quizlet supports L2 vocabulary development, examine Japanese learners' study habits of the online tool, and assess their opinions of its use in the EFL classroom.

2. Literature review

2.1. L2 vocabulary learning via CALL

Current literature indicates that studying L2 vocabulary in a CALL environment is an effective way to promote vocabulary acquisition (Al-Jarf, 2007; Kiliçkaya & Krajka, 2010; Stockwell, 2010; Thornton & Houser, 2005). McLean et al. (2013) investigated the efficacy of the online flashcard site Word Engine among Japanese university students and found that the site fostered L2 vocabulary development. While the students who used Word Engine made large gains on the vocabulary post-test, the control group which used extensive reading (ER) made little progress, illustrating the efficacy of computerized flashcards over ER to learn L2 vocabulary.

Altiner (2011) also looked at the usefulness of computer-based flashcards in her study involving university ESL students in the U.S. The participants were assessed based on Schmitt, Schmitt, and Clapham's (2001) Vocabulary Levels Test (VLT). The VLT measures learners' ability to understand English vocabulary at five different levels: the 2,000, 3,000, 5,000, 10,000, and the academic vocabulary word levels. The students used Anki, a vocabulary software based on space repetition. The mean score of all the participants who completed both the pre- and post-tests increased significantly, thus showing that the software had a positive impact on the learners' L2 vocabulary.

In another study involving CALL and vocabulary learning, Al-Jarf (2007) investigated the use of Nicenet, an online course management system, in conjunction with a wide range of vocabulary websites (e.g., OneLook, Cambridge Dictionary, & English Club). In her study the Saudi Arabian university students were able to make large, statistically significant, gains from the pre-test to the post-test. Al-Jarf (2007) also found that high-usage levels of Nicenet correlated with high achievement on the post-test, demonstrating that the online course helped support L2 vocabulary acquisition.

Besides investigating the learners' L2 growth, Altiner (2011) also examined their perceptions of computerized flashcards. A questionnaire was administered in addition to interviews to gain a comprehensive understanding of the students' views. Overall, the learners' attitudes were quite favorable, particularly when it came to perceived usefulness and ease of use. However, there were a few downsides as well. The learners stated that it would have been better if Anki included more information on the target words such as pronunciation, pictures, or L1 definitions. As noted by the researcher, some students regularly used electronic or online dictionaries for clarification in their L1. In addition, other learners expressed that a "typing" feature would have helped them better remember the spelling of new words as opposed to simply reading the flashcards.

Learner attitudes towards CALL were explored in Al-Jarf's (2007) study as well. According to post-treatment questionnaires, all of the participants found Nicenet to be useful and fun. In addition, the online medium was found to have increased motivation and improved the rapport between the teachers and students and among the students themselves.

2.2. L2 vocabulary learning via MALL

While CALL and MALL environments both utilize technology to enhance language learning, the ubiquity of mobile learning sets it apart from traditional computing. As a result, MALL has the potential to afford learners much more flexibility compared with CALL (Ballance, 2012). This was confirmed by Lu (2008) in a study which looked into vocabulary learning via mobile phones and short message service (SMS) with Taiwanese high school EFL students. According to the results of the closed- and open-ended questionnaires, students' views of MALL were positive, with the learners viewing the method as convenient and interesting. In their comments to the open-ended section of the survey, nearly one-third of the students remarked positively on the ubiquity of the method.

Similarly to Lu (2008), Azabdaftari and Mozaheb's (2012) study of mobile-based flashcards with Iranian university students resulted in positive findings. The researchers determined two positive themes based on the interviews with the participants, namely, the convenience of the flashcards in allowing the students to study anytime and anywhere as well as the entertainment factor of using the cards. In addition, over a quarter of them commented on the novelty of studying with mobile devices. In the context of Japan, Stockwell (2010) investigated the usage patterns and perceptions of students using computers and mobile devices to learn L2 English vocabulary. The 3-year study focused on a vocabulary activity system called *VocabTutor* which was integrated into Moodle. The university students involved

had the choice of using the online tool on a PC or their own mobile devices. While all but one of the learners used computers more often, the one that preferred using a mobile device did so because of its ubiquity.

Although mobile devices provide distinct advantages, they also come with their own downsides. One-third of the students in Lu's (2008) research stated that studying L2 vocabulary via MALL was troublesome. For instance, some of the participants complained about having to open messages one at a time. The learners in Azabdaftari and Mozaheb's (2012) study stated a few negatives as well. To be specific, small screen size was an issue for some of the students as was the high cost of the Internet when using mobile devices. Similar disadvantages were detailed in Stockwell's (2010) study, in which the majority of the learners did not make use of their mobile phones to learn English vocabulary. Stockwell (2010) concluded that this was partly due to the perceived costs associated with owning a mobile phone as well as the inconvenience of mobile interfaces. However, as Ballance (2012) noted, Stockwell (2010) collected data prior to the widespread proliferation of smartphones; thus, many of the issues related to mobile phone use in his study have largely been resolved (Martinez & Schmitt, 2010).

MALL has been found to be a successful way to learn L2 vocabulary. In their 2012 study, Azabdaftari and Mozaheb found that mobile devices could be used to improve students' L2 English vocabulary. The researchers compared the efficacy of mobile devices versus traditional paper flashcards to enhance L2 vocabulary development. The mean score of the group which studied vocabulary via mobile devices was much higher than that of the paper flashcard group, thereby demonstrating the effectiveness of mobile learning. Lu's 2008 study also examined the potential of MALL to enhance L2 vocabulary among Taiwanese EFL learners. During the first week of her study, a group of students reviewed the target vocabulary using their mobile phones while the second group used print materials. In the following week, the groups switched methods. The results of the study revealed that the MALL and print groups both made statistically significant progress; however, the mobile phone group was able to make greater gains on the post- and delayed post-tests.

2.3. Quizlet in the EFL classroom

With over 100 million user-created study sets and 40 million users every month (Quizlet, 2016), Quizlet is one of the most widely used flashcard systems available. While teachers and students can use the software on a PC, it also offers a free mobile app for use on both the

Apple iOS and Google Android mobile platforms. Quizlet offers several ways to study vocabulary, which are detailed in the following table.

Table 1. Features of Quizlet website and mobile app.

Feature	Website	Mobile app
Word lists	+	+
Flashcards	+	+
Speller	+	
Learn	+	+
Test	+	
Scatter game	+	+
Gravity game	+	

It is important to note that some of the features on the website are not available on the mobile app. Specifically, the spelling, the test and the gravity game features are not included. Moreover, the app offers students less information about their progress and performance on each vocabulary list compared with the website.

In a recent study, Jackson III (2015) found that Quizlet was favored over Educreations, a mobile application that lets teachers create and share instructional videos, by university students in the United Arab Emirates. In his study, Quizlet was used in conjunction with Educreations to help promote vocabulary learning while using both L1 and L2. Three reasons were cited for the preference for Quizlet: 1) receiving a mark/grade after each study session, 2) the availability of L1 translations, and 3) the games. In addition to studying the learners' perceptions, Jackson III (2015) looked into their study habits outside of class. He found that the majority of them studied the target vocabulary with Quizlet for the recommended amount of time, i.e., 10-15 minutes each night, indicating that most of students took advantage of the additional opportunities to study L2 with the online tool. This is significant because learners often exhibit a high level of unpredictability and variability in online environments (Fischer, 2012; Taylor, 2006).

Chien (2015) also found that EFL students had positive views towards Quizlet. In her study the Taiwanese university students used one of the three online programs: Quizlet, Study Stack and Flashcard Exchange (currently Cram.com). Group interviews were then conducted

with the participants to gauge their views towards the programs. According to her findings, the students enjoyed using Quizlet over the other two programs due to the activities it offered, specifically, Speller (Figure 1), Test, and Space Race (currently named Gravity). Given the favorable perceptions of Quizlet in the studies by Jackson III (2015) and Chien (2015), and because the mobile app is freely available to download and use as opposed to Anki and Word Engine, Quizlet was chosen as the program for this study.
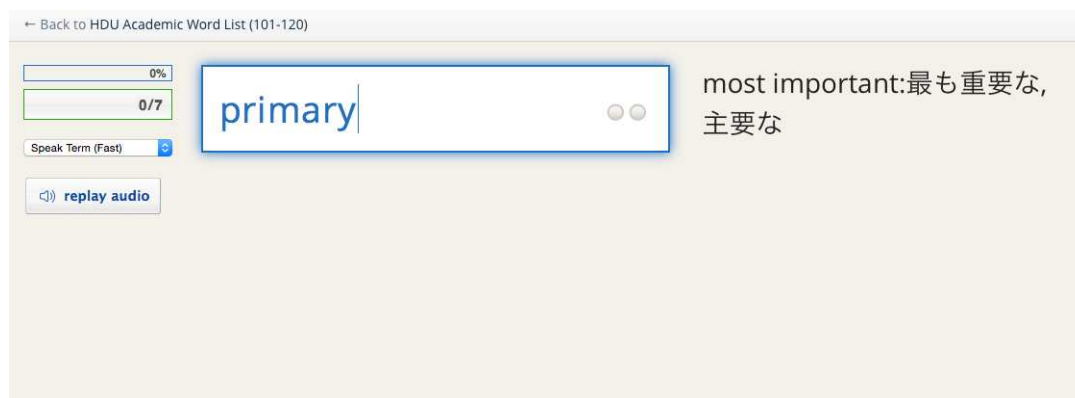

Figure 1. Speller program on the Quizlet website.

To sum up, learning L2 vocabulary via CALL and MALL has been shown to be successful, with learners having favorable views towards their incorporation in the EFL classroom. Such programs as Anki, Word Engine, and VocabTutor have been shown to empirically improve learners' ability to acquire new vocabulary. In this regard, Quizlet seems to be another promising online tool. However, little is known about its effectiveness in the EFL classroom to support L2 vocabulary development. The only exception is Lees' (2014) comparison study of Quizlet versus paper flashcards where he found that the methods were comparable in terms of efficacy. However, the data in the study was taken from a single 90-minute class, thereby minimizing the relevance of the results. Thus, this study seeks to determine whether Quizlet can promote L2 vocabulary acquisition, understand Japanese students' study habits of the tool, and measure their opinions of its use.

3. The study

3.1. Research questions
Given the aforementioned literature, the following research questions were examined in this study:

1)   Did Quizlet promote L2 vocabulary development?
2)   To what extent did the students make use of Quizlet outside of class?
3)   Did the students prefer using Quizlet via computer or smartphone?
4)   What were the students' perceptions of Quizlet to learn L2 vocabulary?

3.2. Participants

Convenience sampling was used in this study. A total of nine second-year students participated. Initially, ten students began the treatment but one of them stopped attending the class halfway through the semester. All of the learners belonged to the Faculty of Foreign Studies at a university in Japan. They were among the highest level of English learners within the faculty based on their TOEIC exam scores in the previous academic year. All of the students were enrolled in a course taught by the researcher which met three times a week during the 15-week spring semester of 2015.

3.3. Target vocabulary

Coxhead's (2001) Academic Word List (AWL) was chosen as the target vocabulary for several reasons. As aforementioned, the students in the study were among the most highly proficient L2 English learners in the faculty. Therefore, a sufficiently challenging list had to be selected. In addition, most of the students had already studied the words at the 2,000-level during their 1st year at university; thus, as many researchers have recommended (Coxhead, 2000; Nation & Hwang, 1995; Read, 2004), it was appropriate for them to learn more advanced words beyond the General Service List (GSL) or the 2,000 most frequent English words based on a written corpus (West, 1953). Lastly, a few of the students expressed interest in studying abroad, with two of them registered to take the TOEFL exam at the time. As a result, the study of the AWL would support these academically-oriented learners in their desire to get a high score on the exam or other standardized English assessments such as IELTS and study at a foreign university. As opposed to Altiner's (2011) study in which only 200 words from the AWL were introduced, all 570 terms were covered during the study.

3.4. Procedure

Version 1 of the 30-item Vocabulary Levels Test (VLT) was administered at the academic vocabulary level as a pre-test. Following the assessment, the ten-week study began, with the students receiving a brief explanation and demonstration of Quizlet's features to increase familiarity. With the exception of the last two classes in which a total of 30 words were

covered, individual sub-lists consisting of 20 words were then introduced to the learners each class (see Figure 2 for example). Sub-lists were introduced based on frequency, with the most frequent words studied first and the least frequent words studied in the later stages of the treatment. The learners were given ten minutes during the beginning of class to study each sub-list. Students were told they could use the desktop computers in the classrooms, their own smartphones, or a combination of the two. They were not pushed to use one platform over the other. Subsequently, other learning activities were conducted, unrelated to AWL. The learners were encouraged to study the vocabulary outside of class but were not required to do so. After the treatment was complete, version 2 of VLT was taken by the students to measure Quizlet's impact on the learners. According to Schmitt et al. (2001), versions 1 and 2 of VLT provide valid results and produce similar assessment scores, thereby making them effective as pre- and post-test measures.
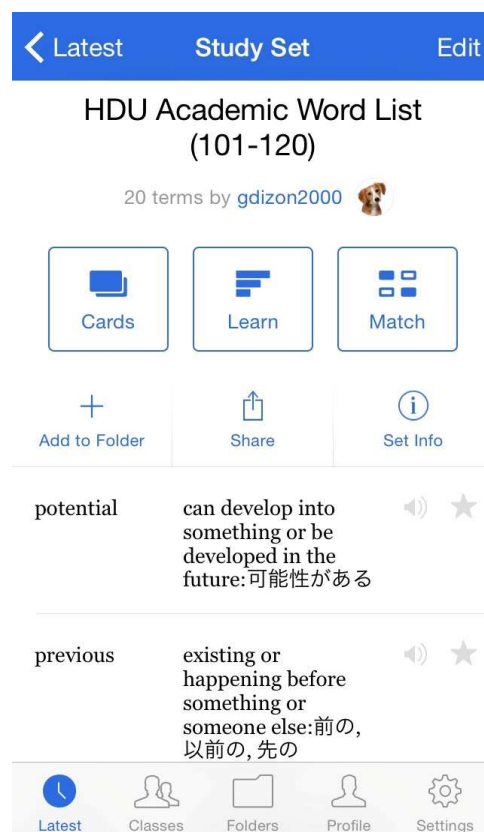

Figure 2. Sample AWL sub-list on the mobile app.

3.5. Questionnaire

A 12-item internet-based questionnaire was created by the researcher in order to learn the students' views of Quizlet (see survey at https://surveymonkey.com/r/G8GFD7X). The first two items of the questionnaire pertained to the students' study preferences as well as their study habits outside of class. The subsequent ten items were based on the technology acceptance model (TAM), a research framework by Davis (1989), which aims at measuring a user's behavioral intention (BI) to use a given technology according to two primary factors: perceived usefulness (PU) and perceived ease of use (PEOU). According to Davis (1989), PU is "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320), while PEOU is defined as "the degree to which a person believes that using a particular system would be free of effort" (p. 320). PU and PEOU work together to determine a user's BI, with other external variables sometimes also considered (Figure 2).
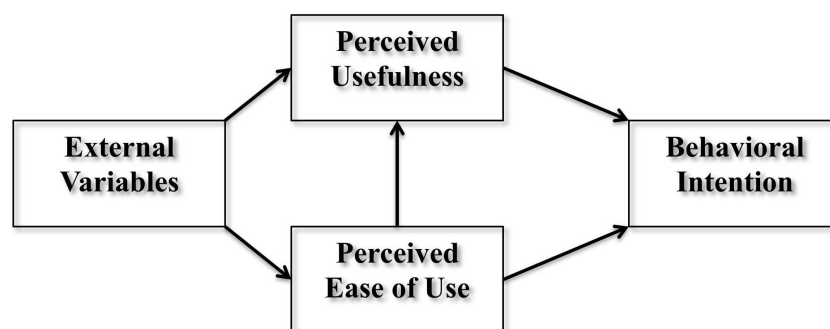

Figure 3. Technology acceptance model (Davis, 1989).

The items were based on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The reliability of the ten items was verified with Cronbach's alpha (α) using SPSS. Each variable or sub-scale had a value greater than 0.7 (PU, α= .750; PEOU: α= .793; BI, α= .923), indicating an acceptable level of internal consistency. Furthermore, the correlational relationships between the three variables were analyzed using Pearson's correlation coefficient (r), with all three of the relationships having a high positive correlation (Table 2).

Table 2. Pearson's correlation matrix for PU, PEOU, and BI.

	PU	PEOU	BI
PU	1		
PEOU	.843**	1	
BI	.809**	.852**	1

Note. ** p<.01, two-tailed.

The online survey was administered via SurveyMonkey after the post-test was completed. Students were informed by the researcher that their participation was voluntary and that completion of the questionnaire or lack thereof would have zero effect on their grades. They were also told the results would remain anonymous, i.e., their names and IP addresses would not be recorded. The surveys were completed outside of class and as a result did not interfere with instruction whatsoever.

4. Results and discussion

4.1. RQ#1

Table 3 shows the students' mean scores from versions 1 and 2 of the VLT, i.e., their pre- and post-test results. The average score of the students increased by more than three points from the pre-test to the post-test, demonstrating a moderate gain. A paired t-test was performed to determine whether the improvement was significant. The results revealed a significant difference between the pre-test and the post-test means at the 0.05 level, suggesting that the students' vocabulary scores significantly improved due to the Quizlet treatment (t(8)= -2.64, p= 0.03).

Table 3. Results of the pre- and post-tests.

	Pre-test	Post-test	Gain
Mean	20.33	23.56	3.23
SD	5.55	5.34	3.67

These findings indicate that using Quizlet did in fact support L2 vocabulary enhancement. Previous studies by McLean et al. (2013) and Altiner (2011) have found similar positive results when incorporating commercial computer- and mobile-based programs such Word Engine and Anki. However, these applications are not completely without cost. Anki charges a fee to download the mobile app and Word Engine requires a paid subscription beyond the 7-

day trial. This is an important factor to consider as teachers and students may not have the financial resources to purchase software or subscriptions.
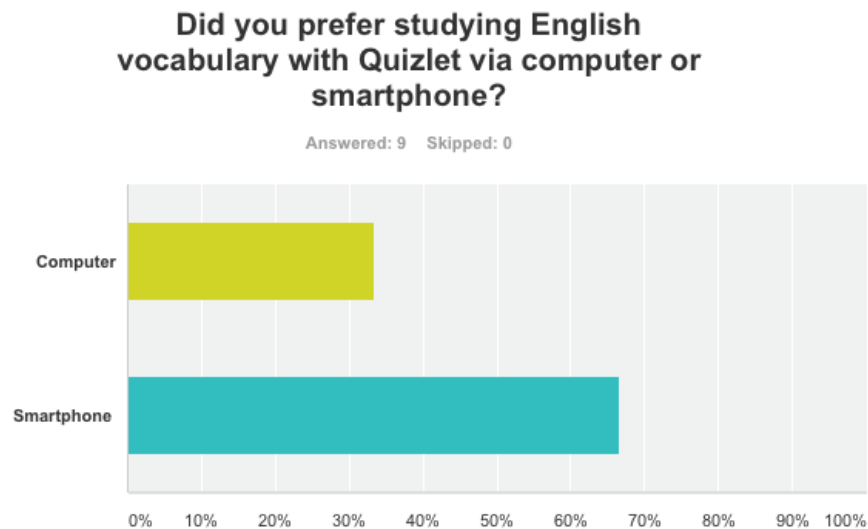
4.2. RQ#2

Figure 3. Quizlet study preferences.

Figure 3 illustrates the learners' preferences when using Quizlet. Six out of the nine students liked using their smartphones instead of desktop computers in the classroom. This is despite the fact that the website version of Quizlet offered students more features and information about their progress. Walters (2012) asserts that this preference for mobile technology epitomizes the changing way in which users access the web and other online services:

> The transition from a PC or notebook to the 'always on' smart phone or tablet is not primarily about the smaller, more portable, mobile device. It is rather about the fact that computing services are now available virtually wherever and whenever the user desires them (p. 2).

As Lu (2008) found in her study of mobile devices and L2 vocabulary, ubiquity is one the most important advantages that smartphones have over traditional study methods. Therefore, teachers must take this into account when choosing between activities that incorporate CALL and MALL versus paper-based tasks. In particular, mobile-based activities afford students more opportunities to study the L2 practically anywhere outside of class, thus giving them more control over their own learning (Ballance, 2012).
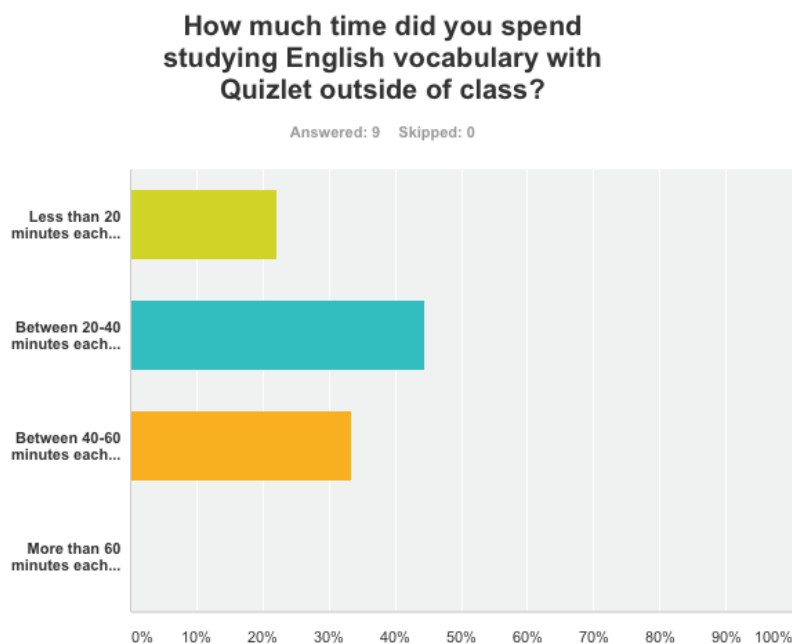
4.3. RQ#3

Figure 4. Amount of time studied outside of class.

Figure 4 shows the amount of time the students spent outside of class using Quizlet to study vocabulary. The majority of them (n= 7) spent a considerable amount of time in order to study AWL, i.e., between twenty minutes to one hour each week. None of the learners used more than one hour a week to study the target vocabulary. These results demonstrate that most of the learners in this study made a concerted effort to take advantage of the additional opportunities to study the L2, which is similar to the results found by Jackson III (2015). This is not always the case, as Taylor (2006) asserts that students learning in MALL environments are "becoming more independent, more assured, and consequently more unpredictable" (p. 27). Similarly, CALL tasks often result in variability between learners, especially when it comes to internet-based activities (Fischer, 2012). As a result, it is essential for teachers to constantly provide guidance throughout the learning process in order for students to effectively leverage the advantages of computer- and mobile-based environments.

4.4 RQ#4

The mean and SD of the three TAM variables are shown above in Table 4. All three of the constructs had means higher than 4, suggesting that the learners had favorable views towards the use of Quizlet in the EFL classroom, which is in line with the findings of Jackson III (2015) and Chien (2015). In particular, PU was seen as a distinctive benefit. Out of the ten

items, statement two, "Using Quizlet improved my English vocabulary," had the highest level of agreement (M= 4.67). Item one, "I was able to learn English vocabulary more quickly with Quizlet," and item four, "I think Quizlet was useful in my class," also scored highly with the exact same mean (4.56). According to the results of the survey, it is clear that the students perceived Quizlet to be beneficial in terms of their L2 development. These findings reinforce previous studies which have investigated learner perceptions of computerized and mobile flashcard systems (Al-Jarf, 2007; Altiner, 2011; Azabdaftari & Mozaheb, 2012; Lu, 2008).

Table 4. Mean and SD values of PU, PEOU, and BI.

Construct	Mean	SD
PU	4.5	0.7
PEOU	4.4	0.8
BI	4.4	0.6

5. Conclusion

In short, Quizlet was found to be a useful approach to studying L2 vocabulary as shown by the significant gains the students were able to make on their VLT scores. Equally as important, the learners in the study viewed the program as a useful and easy to use method for studying vocabulary and indicated that they would like to continue using it in the future. Also, the results revealed that the students preferred using their smartphones, illustrating the shift towards mobile technology. Lastly, the majority of the students spent a significant amount of time using Quizlet outside of class, further demonstrating its value as a L2 tool.

Based on these findings, the author strongly supports the use of Quizlet to learn vocabulary in the EFL classroom. Teachers should be aware of the benefits of using Quizlet and other internet-based study tools and examine whether incorporating CALL or MALL is appropriate for one's teaching context.

Despite the positive results that were revealed through this study, it is not without its shortcomings. First, the small sample size limits the generalizations that can be made about the efficacy and perceptions of Quizlet. Also, a delayed post-test was not administered to the students. Therefore, it is not known whether they were able to retain the vocabulary they had learned after the treatment was completed. Lastly, a control group was not implemented; consequently, it would be worthwhile if a future study compared the efficacy of Quizlet to paper-based vocabulary learning methods and/or other online study tools.

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Appendix 1

Version 1 of the Vocabulary Levels Test – Academic Vocabulary

1 benefit
2 labor   _____ work
3 percent   _____ part of 100
4 principle   _____ general idea used to
5 source   guide one's actions
6 survey

1 achieve
2 conceive   _____ change
3 grant   _____ connect together
4 link   _____ finish successfully
5 modify
6 offset

1 element   _____ money for a special
2 fund   purpose
3 layer   _____ skilled way of doing
4 philosophy   something
5 proportion   _____ study of the meaning
6 technique   of life

1 convert
2 design   _____ keep out
3 exclude   _____ stay alive
4 facilitate   _____ change from one thing
5 indicate   into another
6 survive

1 consent
2 enforcement   _____ total
3 investigation   _____ agreement or permission
4 parameter   _____ trying to find
5 sum   information about
6 trend   something

1 anticipate
2 compile   _____ control something
3 convince   skillfully
4 denote   _____ expect something will
5 manipulate   happen
6 publish   _____ produce books and
                        newspapers

1 decade
2 fee   _____ 10 years
3 file   _____ subject of a discussion
4 incidence   _____ money paid for services
5 perspective
6 topic

1 equivalent
2 financial   _____ most important
3 forthcoming   _____ concerning sight
4 primary   _____ concerning money
5 random
6 visual

1 colleague
2 erosion   _____ action against the law
3 format   _____ wearing away gradually
4 inclination   _____ shape or size of
5 panel   something
6 violation

1 alternative
2 ambiguous   _____ last or most important
3 empirical   _____ something different that
4 ethnic   can be chosen
5 mutual   _____ concerning people from
6 ultimate   a certain nation

Appendix 2

Version 2 of the Vocabulary Levels Test – Academic Vocabulary

1 area
2 contract   _____ written agreement
3 definition   _____ way of doing
4 evidence   something
5 method   _____ reason for believing
6 role   something is or is not
                         true

1 debate
2 exposure   _____ plan
3 integration   _____ choice
4 option   _____ joining something
5 scheme   into a whole
6 stability

1 access
2 gender   _____ male or female
3 implementation _____ study of the mind
4 license   _____ entrance or way in
5 orientation
6 psychology

1 accumulation
2 edition   _____ collecting things
3 guarantee   over time
4 media   _____ promise to repair
5 motivation   a broken product
6 phenomenon   _____ feeling a strong
                         reason or need to do
                         something

1 adult
2 exploitation   _____ end
3 infrastructure _____ machine used to
4 schedule   move people or
5 termination   goods
6 vehicle   _____ list of things to do at
                         certain times

1 alter
2 coincide   _____ change
3 deny   _____ say something is not
4 devote   true
5 release   _____ describe clearly
6 specify   and exactly

1 correspond
2 diminish   _____ keep
3 emerge   _____ match or be in
4 highlight   agreement with
5 invoke   _____ give special attention
6 retain   to something

1 bond
2 channel   _____ make smaller
3 estimate   _____ guess the number or
4 identify   size of something
5 mediate   _____ recognizing and
6 minimize   naming a person or
                         thing

1 explicit
2 final   _____ last
3 negative   _____ stiff
4 professional   _____ meaning `no' or `not'
5 rigid
6 sole

1 abstract
2 adjacent   _____ next to
3 controversial   _____ added to
4 global   _____ concerning the whole world
5 neutral
6 supplementary