

Independent use of Quizlet Among Japanese EFL Students: Adoption Rates, Usage, and Predictors

Joseph Suzuki-Parker (torin2582@gmail.com)
Rissho University

Armando Duarte (mando.duarte@gmail.com)
Kwansei Gakuin University

Abstract

The aim of this study is to explore Quizlet usage among EFL learners and to identify factors that predict (i.e., anticipate or are correlated with) their adoption of Quizlet outside of class. A total of 224 university students participated in a cross-sectional questionnaire designed to measure four possible predictors: perceived usefulness and perceived ease-of-use of Quizlet, as well as students' motivation towards learning English, and English proficiency. A simple logistic regression analysis was performed to examine the relationship of each predictor variable regarding the probability of learners' out-of-class adoption of Quizlet. Partially confirming findings in prior studies, the results revealed that perceived usefulness is a significant predictor of learners' out-of-class adoption of Quizlet, while perceived ease-of-use, motivation, and proficiency are not. The implications of these results are discussed with recommendations for future research.

Keywords: Quizlet; perceived usefulness; perceived ease-of-use; proficiency; motivation

Introduction

As the rate of smartphone usage and the proliferation of wireless internet-equipped classrooms increase, software such as Quizlet gain popularity both as a classroom tool for student participation and vocabulary acquisition and as the subject of academic research. Previous research in the field of technology adoption in the workplace indicates workers are more likely to adopt new technology if it is perceived as useful and easy to use (Davis, 1989). The constructs of perceived usefulness and ease-of-use can also be applied to Quizlet usage by English language learners. While previous research (Dizon, 2016; Duarte, 2019) has attempted to synthesize the concepts of ease-of-use and perceived usefulness and apply them to the second-language classroom, the small sample sizes in these studies limit the generalizability of their findings. The current research attempts to apply the concepts of perceived usefulness and ease-of-use to the second-language classroom on a larger scale, as well as explores other variables that have been shown to influence technology adoption in the classroom.

Literature Review

Vocabulary acquisition is one of several important aspects of learning a new language (Nation, 2011, Schmitt, 2000). Recently, technology has played a major role in assisting students in learning new vocabulary. Two areas of research that have explored this recent trend are Computer-Assisted Language Learning (CALL) and more recently, Mobile-Assisted Language

Learning (MALL). Studies in these two fields have shown that second-language learners and instructors have benefited from adopting new technologies for use inside and outside the classroom (Macho, 2005; Ghavifekr & Rosdy, 2015; Zhang, 2003). One application that has gained recent popularity in both ESL and EFL contexts is Quizlet. Quizlet is a web-based flashcard application that allows users to create, share, and study information on a variety of subjects. One of the common uses of the application is for learning vocabulary in a foreign language. In addition to a flashcard study and quiz mode, the application features an interactive ‘Live mode’ where students compete in an instructor-hosted game-based activity in class. The increased adoption in language classrooms has prompted researchers to explore several aspects of Quizlet use both inside and outside of the classroom.

Quizlet research can be separated into three main areas: methodology studies, efficacy studies, and adoption studies. Methodology studies compare Quizlet to traditional vocabulary learning methods. Studies in this area have shown that in pre-post testing, students who used Quizlet outperformed students who used more traditional vocabulary learning methods (Andarab, 2017; Humphreys, 2017; Sonobe & Ogata, 2017; Sanosi, 2018). Efficacy studies have looked at whether Quizlet improves students’ vocabulary scores over time. Studies here have shown that Quizlet use results in significant increases in students’ test scores over time (Chaikovska & Zbaravska, 2020; Ozer & Kocoglu, 2017; Wolff, 2016). Although equally as important, the third major area of research, adoption, has received comparatively less attention. These studies explore possible factors that influence the adoption of Quizlet outside of class among language learning students. While several factors may influence Quizlet adoption, researchers have focused heavily on two factors that have been well-established in previous studies on technology adoption in the workplace (Davis, 1989), namely, perceived usefulness and perceived ease-of-use.

Usefulness & Ease-of-use

Davis (1989) defines perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her job performance” while ease-of-use is defined as “the degree to which a person believes that using a particular system would be free of effort” (p. 320). Davis (1989) used these concepts in research involving 120 office workers at a Canadian-based company. Respondents were asked about the frequency of their software usage. A higher frequency of use was correlated with positive ease-of-use and perceived usefulness. Davis (1989) reports that “[u]sage was significantly correlated with both perceived usefulness and perceived ease-of-use for both PROFS mail and XEDIT” (p. 329). The results of this research indicate that office workers are more likely to use the software if they perceive the software as both useful and simple. Based on these results, Davis (1989) developed a model to predict technology adoption in the workplace, known as the Technology Acceptance Model (TAM).

These concepts were central to Duarte’s (2019) and Dizon’s (2016) Quizlet research, which the current research seeks to replicate. Duarte’s (2019) study involved distributing a survey to second-language learners at a public university in Japan. Participants reported the frequency of their Quizlet usage and answered questions about Quizlet’s ease-of-use and perceived usefulness according to a 5-point Likert scale. While the results of the study are limited due to a very small sample size (n=27), Duarte’s (2019) analysis concluded that frequent Quizlet users, defined as independent Quizlet usage greater than once a week, “reported higher average scores on survey questions regarding Quizlet’s usefulness, ease-of-use, and engagement compared with infrequent users” (p. 13). Dizon’s (2016) research on vocabulary acquisition through Quizlet also utilized the concepts of perceived usefulness and ease-of-use. While this study was limited by its small sample

size (n=9), the study findings suggested that Quizlet was beneficial for vocabulary acquisition and that Quizlet users perceive Quizlet as having a high ease-of-use and usefulness value.

Although Davis (1989) and others have ascribed factors like perceived usefulness and ease-of-use to describe technology adoption, subsequent studies have demonstrated that other factors such as motivation and performance (i.e., proficiency as it relates to the classroom) may also explain why users decide to adopt technology (Leng et al., 2015; Venkatesh and Davis, 2000; Venkatesh et al., 2003).

Motivation & Proficiency

Dornyei (1994) outlines two types of motivation that may influence second-language learner outcomes. Extrinsic motivation is defined as “behaviors...that the individual performs to receive some extrinsic reward (e.g., good grades) or to avoid punishment” (Dornyei, 1994, p. 275). This type of motivation is contrasted with intrinsic motivation, where “the rewards are internal (e.g., the joy of doing a particular activity or satisfying one’s curiosity)” (Dornyei, 1994, p. 275). Applied to the foreign language classroom and the Quizlet context in which the current research is performed, students may be using Quizlet due to extrinsic factors, such as a final grade being dependent on Quizlet usage, or intrinsic factors, such as a student’s desire to acquire vocabulary through Quizlet, or simply to have the experience of using a new piece of software. Given that student performance and motivation can operate together, it is also possible that students’ proficiency can predict whether technology will be adopted. Research of these two variables on tech adoption in both educational and vocational contexts has so far suggested that this is the case. In a large-scale longitudinal study, Venkatesh and Davis (2000) found that, in addition to perceived usefulness and ease-of-use, motivation and performance were two additional factors that can influence technology adoption in the workplace. These findings led to the development of an updated Technology Adoption Model (TAM) known as TAM2 (Venkatesh & Davis, 2000). Applying the TAM2 model to the language classroom, Lang et al. (2015) interviewed English language learners of varying proficiencies on various aspects related to technology use and adoption. Although the sample is relatively small (n=6), the study found that students with the highest proficiency showed higher levels of technology awareness and adoption (Lang et al., 2015 p. 463). The above studies indicate that, in addition to perceived usefulness and ease-of-use, motivation and academic performance (i.e., proficiency) may also affect students’ adoption of Quizlet outside of class. Further clarification on the influence of these factors, particularly motivation and proficiency, may provide insight into the kinds of students and classroom contexts Quizlet would be most suitable for.

Finally, while the previously-mentioned studies establish that Quizlet has a positive effect on learning outcomes, what remains unclear is to what extent students are adopting the application, because these studies have been primarily concerned with users of Quizlet and ignored non-users. Thus, in addition to examining the predictors of Quizlet adoption, the current study will also report adoption rates and frequency of use.

Research Questions

The following research questions were formulated based on the above-mentioned literature:

RQ1. Are students using Quizlet outside of class, and to what extent?

RQ2. What are the predictors of out-of-class adoption of Quizlet?

To answer research question 1, the adoption rates and usage for adopters and non-adopters are presented and analyzed. Research question 2 is answered by first comparing the mean scores among adopters and non-adopters for each predictor variable. Subsequently, a regression analysis is performed to determine whether any differences in mean scores for all the variables across the two groups are statistically significant.

Methodology

Participants

A total of 226 first- and second-year university students (157 males, 66 females, and 1 undisclosed) across four different academic institutions in Japan voluntarily participated in the anonymous questionnaire. Two of the 226 submissions received were removed due to one or more unanswered or incorrectly answered questions. Therefore, a total of 224 unique submissions were used in the final analysis. At the time of testing, the median age was 19 years old. All participants were attending a university-level required or elective English course. Additionally, none of the participants had previously studied or lived abroad in an English-speaking country and thus were all considered to be EFL learners at the time of the study. To ensure a wide range of English language learning motivation and proficiency within the cohort, participants from both low and high-level mandatory and elective courses were sampled. Most of the participants were first- and second-year students at the time of testing and had taken TOEIC either as a prerequisite to entering the university or after their first year of study. As such, it can be assumed that a majority of the participants' reported TOEIC scores were within a 12-month window.

Instrument

A cross-sectional questionnaire (see Appendix 1) was used to measure the relationship between the independent predictor variables, perceived usefulness (PU), perceived ease-of-use (PEOU), motivation, and proficiency with the dependent outcome variable (out-of-class adoption of Quizlet) for each participant. The questionnaire is a combination of binary (yes or no), six-point Likert (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree), and multiple-choice items for a total of 31 items (see Appendix 1). All the items contain both the English and Japanese translation, which was cross-checked by a native speaker of Japanese. Out of the 31 items, 19 core items were dedicated to measuring the predictor variables (n=18) and the outcome variable (n=1). To test for internal consistency Cronbach's alpha was calculated for each predictor variable. Motivation (.88) demonstrated a high degree of internal reliability, while PEOU (.75) and PU (.65) both showed moderate internal reliability. The remaining items on the questionnaire include questions asking participants' ages and sex (n=2) as well as questions examining participants' frequency of use and possible reasons for not adopting the application (n=10).

The core items measuring PU, PEOU, and motivation were all taken from peer-reviewed studies and adapted for use in the current study. Items measuring PU (n=5) and PEOU (n=3) were adapted from Duarte's 2019 study investigating the same predictors on Quizlet adoption. Learner motivation items (n=10) were adapted from a questionnaire used in prior studies exploring English language learner motivation in Japan and China. The items on the questionnaire are based on

Dornyei's definition of motivation (Mori & Gobel, 2006; Wang, 2008). Proficiency was measured by asking students to report their most recent TOEIC score. Finally, the outcome variable was determined by participants answering either 'yes' or 'no' to having adopted Quizlet outside of class during the respective term. In this study, "adoption" is defined as independent Quizlet usage outside of class. The reason for such a broad definition is twofold. First, the number of hours of Quizlet use and/or frequency of use that results in maximum learning benefits cannot be ascertained from the software. Second, the purpose of this study is to investigate factors that influence adoption, and thus, hours and frequency of use, while informative, are not necessary for understanding what predicts adoption. Participants did, however, provide their "perceived" frequency and duration of use which is reported below.

Procedure

To ensure experimental consistency and minimize the impact of confounding variables, several conditions were implemented. Periodic vocabulary quizzes were assigned to all participating students, which could be studied using either the prepared study sets in Quizlet or an alternative self-selected method. These quizzes were scheduled well in advance and participants were informed that scores would factor into final grades. Explicit instructions were provided on how to utilize Quizlet, including downloading the application, accessing class study sets, and employing various study tools. Furthermore, instructors periodically utilized Quizlet during class to reinforce its relevance to the study material.

At the conclusion of each academic term (fall 2021 to spring 2022), an anonymous digital questionnaire was administered to participants across 14 separate English courses at four universities. Responses were collected over a two-week period for each term. An adopter group and a non-adopter group were identified, and adoption rates and mean scores for each predictor variable were subsequently compared across the two groups.

Table 1
Scoring Chart for Likert Items

Likert Scale	Points Awarded
6 - Strongly agree	6
5 - Agree	5
4 - Somewhat agree	4
3 - Somewhat disagree	3
2 - Disagree	2
1 - Strongly disagree	1

The scoring scale for each Likert item is from one to six points with one representing "Strongly disagree" and six representing "Strongly agree". Points were awarded for each Likert item for all students using the above chart. The sum of all points for items related to a predictor variable represents a student's score for that given variable. Taking motivation as an example, the sum of all points for each of the 10 motivation-related items constitutes a student's motivation score: the higher the score, the higher the motivation. This same principle applies to PU and PEOU.

Results and Analysis

RQ1: Are students using Quizlet outside of class, and to what extent?

Out of a total of 224 participants, 118 (52.68%) reported adopting the application outside of class, while 106 (47.32%) participants reported not adopting the application. The significance of the proportion of adopters here is not well understood because of the lack of precedence in prior studies. Regardless, it is notable that adopters make up the majority of the total sample. Table 2 below shows the proportion of users for both number of sessions per week and session duration. The proportions for sessions per week demonstrate a negative relationship between frequency of use and number of users, i.e., as the frequency tier increases, the number of users decreases.

Table 2
Proportions For Sessions Per Week Among Adopters

Sessions per week	n	%
Every day	0	0%
5 or 6	2	1.69%
3 or 4	9	7.63%
1 or 2	107	90.68%
Totals	118	100%

The overwhelming majority of the 118 adopters (90.68%) used the application at the lowest frequency tier of “1 to 2 times” per week, while the remaining adopters used it “3 to 4 times” (7.63%) or “5 to 6 times” (1.69%) a week during the term. Table 3 shows the duration of each session in minutes.

Table 3
Proportions For Session Duration Per Week Among Adopters

Session duration (minutes)	n	%
60 or more	2	1.69%
30 to 45	6	5.08%
15 to 30	28	23.73%
5 to 15	51	43.22%
Totals	118	100%

As seen in table 3, session duration is much more varied compared to the number of sessions. The most common session duration for Quizlet is from “5 to 15 minutes” (47.22%). The next most common is “less than 5 minutes” (26.27%) and “15 to 30 minutes” (23.73%). The least popular sessions are “30 to 45 minutes” (5.08%) and “60 or more minutes” (1.69%). The broad conclusion from the user data in Tables 2 and 3 is that most adopters use the application one to two times a week from a few minutes to 30 minutes per study session.

Deleted: is

RQ2: What are the predictors of out-of-class adoption of Quizlet?

Comparison of Means for Perceived Usefulness

Table 4 compares the mean scores of adopters and non-adopters for each Perceived Usefulness (PU) item and the total mean score for all PU items.

Table 4
PU Item Mean Scores for Adopters and Non-adopters

# Item	Group Mean Scores		Diff
	Adopter	Non-adopter	
1 In class use of Quizlet made me want to use it outside of class.	4.22	3.43	0.79
2 Quizlet is useful for learning vocabulary.	4.91	4.59	0.31
3 I prefer using Quizlet to study vocabulary over other methods.	4.47	3.80	0.67
4 I want to use Quizlet to study English in the future.	4.60	3.91	0.70
5 Quizlet helped me improve my English vocabulary.	4.82	4.39	0.44
Totals	4.61	4.02	0.58

Note. Cronbach alpha = .65

As mentioned in the Methodology section, '6' is the highest possible score for a given item. Table 3 shows that all five PU items resulted in higher mean scores for adopters with a difference in the total mean scores for both groups of .58. Despite this difference, total mean scores for both adopter (4.61) and non-adopter (4.02) groups suggest that both groups perceive Quizlet to be a relatively useful application for studying vocabulary. The item with the largest difference (.79) is item 1, "In class use of Quizlet made me want to use it outside of class". This is not surprising as students who adopted Quizlet were likely positively influenced through in-class use, while non-adopters were simply not, resulting in a clear difference between the two groups. Overall, the differences in means for all the items are all relatively high, suggesting PU may predict adoption of Quizlet outside of class.

Comparison of Means for Perceived Ease-of-Use

Table 5 compares the mean scores for PEOU among adopters and non-adopters.

Table 5
PEOU Item Mean Scores for Adopters and Non-Adopters

# Item	Group Mean Scores		Diff
	Adopter	Non-adopter	
1 It was easy for me to make a Quizlet account.	4.87	4.63	0.24
2 Quizlet is easy to use.	4.82	4.39	0.44

3 I can teach my friend how to use Quizlet.	4.41	3.80	0.60
Totals	4.70	4.27	0.43

Note. Cronbach alpha .75

Similar to PU, all the items for PEOU show higher mean scores for adopters than non-adopters. However, these differences are generally smaller, as demonstrated by the difference in total mean scores for adopters and non-adopters of .43 compared to .58 for PU. Also of interest are the total mean scores of 4.70 for adopters and 4.27 for non-adopters, which demonstrate an even higher degree of PEOU over PU.

Comparison of Means for Motivation

Table 6 shows a comparison of mean scores between adopters and non-adopters.

Table 6
Motivation Item Mean Scores for Adopters and Non-Adopters

# Item	Group Mean Scores		Diff
	Adopter	Non-adopter	
1 I persist when facing difficulties in English learning.	4.17	4.31	-0.14
2 I like the challenge of difficult tasks related to learning English.	3.78	3.84	-0.06
3 I am excited when I have accomplished a difficult task in English learning.	4.81	4.63	0.18
4 I work on my English assignments (quizzes and homework) according to a planned schedule.	3.86	3.63	0.22
5 I study English diligently for potential development in the future.	4.92	4.63	0.28
6 I like listening to English speech.	3.87	3.52	0.35
7 I like speaking English.	4.00	3.92	0.08
8 I like writing in English.	3.75	3.54	0.21
9 I like reading English.	3.83	3.69	0.14
10 I like learning English.	4.48	4.27	0.21
Totals	4.15	4.00	0.15

Note. Cronbach alpha .85

A comparison of total mean scores for adopter (4.15) and non-adopter (4.00) groups reveals a relatively small difference of .15. This small difference is reflected quite evenly across each item with a few extremes (item 6: .35 [“I like speaking English”]; item 2: -.06 [“I like the challenge of difficult tasks related to learning English”]). Unlike PEOU and PU, motivation contains two items where the non-adopter group achieved a higher mean score than the adopter group. These are items 1, “I persist when facing difficulties in English learning”, and item 2, “I like the challenge of

difficult tasks related to learning English”. Furthermore, motivation contains the item with the highest mean score of all the core measurement items; item 5, “I study English diligently for potential development in the future”.

Comparison of descriptive statistics for proficiency

Table 7 compares the minimum, maximum and median values for adopter and non-adopter groups.

Table 7
Descriptive Statistics for Proficiency (TOEIC Scores) among Adopter and Non-adopter groups

	Group Scores (TOEIC)	
	Adopter	Non-adopter
Min	150	150
Max	800	845
Median	317.5	400

Similar to motivation, an examination of the descriptive statistics for students’ TOEIC scores in table 7 reveals small differences between the two groups. The minimum and maximum for both groups (adopter: Min = 150, Max = 800; non-adopter: Min = 150, Max = 845) demonstrates a similar range of TOEIC scores. A comparison of medians for both groups, however, indicates a slight skew in distribution towards lower proficiencies for adopters. The following section presents the results of a regression analysis used to determine if the above mean scores are statistically significant.

Regression Analysis

Simple logistic regression was used to analyze the relationship between learners’ PU and PEOU of Quizlet, as well as the relationship between their English language learning motivation and proficiency on the probability of adopting Quizlet outside of class. As seen in Table 8 below, PU ($p = .007$) is the only statistically significant predictor for Quizlet usage outside of class with a p -value less than .05. A more informative statistic in a logistic regression analysis is the odds ratio, which reveals the increase or decrease in the odds of a certain outcome as a given variable changes. As it relates to the current study, the odds ratio shows the odds of adoption as PU, PEOU, motivation, and proficiency scores increase.

Table 8
Regression Analysis of Predictor Variables

Predictors	Coefficients	Std E	Odds Ratio	95% CI		p
				LL	UL	
Intercept	-2.670	0.993	0.069	0.010	0.485	.007
Usefulness	0.138	0.046	1.148	1.049	1.256	*.003

EOU Score	0.093	0.056	1.098	0.984	1.225	.096
Motivation	-0.036	0.020	0.965	0.928	1.003	.071
Proficiency	-0.001	0.001	0.999	0.997	1.001	.375

Note. $p < .05$; Std E = Standard Error; *LL* = lower limit; *UL* = upper limit

The odds ratio in Table 8 for scores measuring PU shows an increase in the odds of adoption by a factor of 1.14, or 14% (95% CI [1.049, 1.256]). This means that for each 1-point increase in a learner's PU score, they are 14% more likely to adopt Quizlet outside of class, which indicates PU is a significant predictor of Quizlet out-of-class adoption. A 1-point increase in a score measuring PEOU (95% CI [0.984, 1.225]) resulted in a 9.77% (OR = 1.098) increase in the odds of adoption. The odds ratio for motivation (OR = 0.965; 95% CI [0.928, 1.003]) and proficiency (OR = 0.999; 95% CI [0.997, 1.001]) both demonstrate a negative relationship between score increases and the likelihood of adoption. In other words, students were 3.52% less likely to adopt Quizlet for every 1-point increase in their motivation score, and .09% less likely to adopt it for every 5-point increase in their TOEIC score, which is measured in 5-point increments.

Discussion and Limitations

Part I of the above analysis addressing RQ1 revealed that just over 50% of all participants adopted Quizlet outside of class to assist them in their vocabulary learning. Most of the adopters used the application one to two times a week with sessions that lasted from a few minutes to 30 minutes in length. This study represents an initial exploration into adoption rates for Quizlet, so it is not clear whether these rates are relatively high or low; however, 118 of 224 students decided to use the application outside of class, which represents a majority of the sample.

Part II of the analysis examining the predictors of Quizlet adoption showed that among the four variables explored, PU, PEOU, motivation, and proficiency, PU was a significant predictor of adoption. It is not surprising that PU is a significant predictor not only because previous Quizlet adoption research had similar findings (Davis, 1989; Dizon, 2016; Venkatesh & Davis, 2000), but it also maps on to reality: the more a student finds the application to be useful, the higher the chances of adoption. It is possible that in-class-use of Quizlet heavily contributed to students' perceptions of its usefulness. Item 1 in the PU section of the questionnaire (In class use of Quizlet made me want to use it outside of class) appears to support this assumption with a relatively high mean score of 4.22 out of 6 for adopters. Additionally, a separate item from the survey asked students whether they used Quizlet for class-related vocabulary or unrelated vocabulary. Of the 118 adopters, 112 (95%) answered that they used Quizlet to study class-related vocabulary. Together, these findings suggest that among adopters, Quizlet was perceived to be a useful tool for studying class-related vocabulary.

The other three predictor variables, PEOU, motivation, and proficiency were not found to be significant predictors, which is contrary to previous research (Davis, 1989; Venkatesh & Davis, 2000). One possible explanation for PEOU is the difference in user base. Prior studies looking at PEOU and technology were carried out nearly 34 years ago. This decades-long gap in adoption research represents a large difference in user experience of technology in general and educational (especially mobile) technology. University students today are much more technologically proficient compared with the office workers in these prior studies. At the time of Davis' influential 1989 study, which popularized the concepts of PU and PEOU in technology adoption, mobile

phone technology was still in its infancy, and far fewer people owned desktop computers. In the late 80s, investigation of both PU and PEOU as factors of technology adoption was necessary because technology itself was not as widespread as it is today, in all its forms, and laypeople with little or no computer experience might have given up on using software if it was not both useful and easy to use. For most people nowadays, technology is much more a part of daily life at a much earlier stage of life. It is possible that ease-of-use is simply not a factor for most students in the current study because they are highly proficient in using technology in general. Not to mention that technology has improved a lot over the last 33 years.

Motivation may not have been a significant predictor of Quizlet adoption in this research because the technology explored in the current study and those in prior studies are fundamentally different in purpose and design. The purpose of Quizlet is to increase knowledge, not workflow or productivity like the technology in the previous workplace studies, which implies a difference in design as well. Perhaps the biggest difference in design is related to a concept known as gamification, a rather new development in e-learning software. Gamification is the application of a game format to a learning activity or software. It is possible that language learning motivation was not a factor in this study because the gamification element of Quizlet (live mode; see Literature section) provided students of all language learning motivations an alternative motivation to use the application: it was fun. In other words, the fun of using Quizlet was itself a type of motivation apart from motivation related to language acquisition. The data from this study appears to support this assumption as the questionnaire item with the highest average score among both adopters and non-adopters asked students whether they agreed or disagreed with the statement, "I enjoyed using Quizlet in class". The mean score for both groups was 5.9 out of 6. This could account for why both low and high language-learning motivated students adopted Quizlet, and thus, language motivation was not a significant predictor.

Finally, proficiency was also shown to be insignificant. Based on the literature review, one would expect that low-proficiency students would not adopt the application and that high-proficiency would, as proficiency is partly a reflection of their interest in studying English (Lang et al., 2015). However, the data show that students with low-proficiency (TOEIC = 100~395, n=70 of 118) had the highest adoption rate at 59% compared with 42% for intermediate (TOEIC = 400~595, n=33 of 76) and 50% for high-proficiency (TOEIC = 600+, n=15 of 30). Further analysis into why students chose not to adopt Quizlet revealed that several of the higher proficiency students chose not to adopt Quizlet because they had a pre-existing method for studying vocabulary. Just over 16% (n=17 of 106) of both intermediate and high-proficiency non-adopters reported using another method or application compared to 5% (n=6 of 118) among low-proficiency non-adopters who did not have an existing method. This could partly explain the negative relationship between proficiency and Quizlet adoption as well as its non-significance as a predictor of adoption.

Implications for the Language Learning Classroom

The analysis and discussion presented above have important implications for language learning classrooms. First and foremost, the study found that usefulness is the most significant predictor of independent Quizlet usage among Japanese EFL students. Teachers can leverage this finding by taking the time to onboard students and demonstrating all the features of Quizlet when introducing it to the class. While there are many flashcard software options available to teachers, the data from this study and previous research highlights that Quizlet is generally well-received by

English language learners in a variety of contexts. By showing students how Quizlet can meet their individual needs, teachers can increase Quizlet's perceived usefulness and potentially encourage more independent usage outside of class.

Second, the study found that proficiency and motivation do not significantly influence independent Quizlet usage. This means that Quizlet can be effectively used by students of all levels of proficiency and motivation, making it a valuable tool for both required and elective English courses.

Lastly, the study revealed that lower-proficiency students have a higher likelihood of adopting Quizlet as an independent study tool. This finding suggests that teachers should take a differentiated approach to in-class use of Quizlet, tailoring instruction to meet the needs of different proficiency levels. For instance, advanced students can be assigned more challenging Quizlet activities, such as completing the Test mode to 100% or playing the "Gravity" game mode at higher levels, as graded assignments. By providing advanced students with opportunities to further their vocabulary study through Quizlet, teachers can encourage more independent usage of the application.

Limitations and Future Research

Although the current study provides valuable insights into Quizlet usage among Japanese EFL students, there are opportunities for improvement in future research. For instance, the findings of Research Question 1 serve as a starting point for investigating independent-usage rates of Quizlet, but further research is necessary to establish whether the adoption rates identified in this study are substantial. Additionally, given the significant correlation between in-class use and perceived usefulness of Quizlet, future studies should investigate the specific features and in-class use techniques (such as live mode or relative vocabulary quizzes) that have the greatest positive impact on students' perceptions of Quizlet's usefulness. By exploring these areas further, future research can provide more targeted recommendations to educators seeking to promote independent use of Quizlet among their students.

Conclusion

The current research investigated factors that may be correlated with independent Quizlet usage. Data from this study was used to answer two research questions - about general Quizlet usage outside of the classroom and about why students may use, or not use, Quizlet outside of required class usage. Data relevant to the first question indicates that about half of all students surveyed are "adopters" - independent Quizlet users. For the second question, analysis of student survey responses indicates that perceived usefulness was the only significant factor in determining whether or not students would become Quizlet adopters. The findings of the second research question were contrasted with previous research, given that Quizlet and mobile learning software is a newer form of technology compared to the technology used in previous technology adoption studies. The researchers provided several classroom strategies to maximize independent use of Quizlet, including increasing student knowledge of how Quizlet can be useful to them and offering differentiated instruction for advanced students.

References

- Andarab, M. S. (2017). The effect of using Quizlet flashcards on learning English Vocabulary. In M. Vihar (Ed.), *Proceedings of 113th IIER International Conference* (pp. 37–41). Frankfurt, Germany. <https://doi.org/10.24203/ajeel.v6i4.5446>
- Chaikovska, O., & Zbaravska, L. (2020). The efficiency of quizlet-based EFL vocabulary learning in preparing undergraduates for state English exam. *Advanced Education*, 14, 84–90. <https://doi.org/10.20535/2410-8286.197808>
- Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Dizon, G. (2016). Quizlet in the EFL classroom: Enhancing academic vocabulary acquisition of Japanese university students. *Teaching English with Technology*, 16(2), 40–56.
- Dörnyei, Z. (1994). Motivation and Motivating in the Foreign Language Classroom. *The Modern Language Journal*, 78(3), 273–284. <https://doi.org/10.2307/330107>
- Duarte, A. (2019). Factors affecting Quizlet usage among students. In A. B. Gallagher, D. Jarrell & G. MacLean (Eds.), *AI and Machine Learning in Education* (pp. 10–17).
- Dunn, K., & Iwaniec, J. (2021). Exploring the Relationship Between Second Language Learning Motivation and Proficiency: A Latent Profiling Approach. *Studies in Second Language Acquisition*, 1-31. <http://doi.org/10.1017/S0272263121000759>
- Gardner, R., Tremblay, P., & Masgoret, A. (1997). Towards a full model of second language learning: An empirical investigation. *The Modern Language Journal*, 81, 344–362. <https://doi.org/10.2307/329310>
- Ghavifekr, S., & Rosdy, W.A.W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International Journal of Research in Education and Science*, 1(2), 175–191. <https://doi.org/10.21890/IJRES.23596>
- Humphreys, B. (2017). An investigation into the effectiveness of using ICT vs. word cards to study and learn English vocabulary. *Journal of Research and Pedagogy of Otemae University Institute of International Education*, 3, 45–59. <http://id.nii.ac.jp/1160/00001412/>
- Leng, J., Gu, X., & Dalte, O. (2015). Understanding Learners' Technology Adoption Behavior for English language learning in Ubiquitous Environments. *Proceedings of the 23rd International Conference on Computers in Education*. China: Asia-Pacific Society for Computers in Education. 2015.
- Macho, S. (2005). Differences among standardized test scores due to factors of internet access at home and family affluence. *Graduate Theses, Dissertations, and Problem Reports*. 2667, United States: West Virginia University.
- Mori, S., & Gobel, P. (2006). Motivation and gender in the Japanese EFL classroom. *System*, 34, 194–210. <https://doi.org/10.1016/j.system.2005.11.002>
- Nation, I. (2011). Research into practice: Vocabulary. *Language Teaching*, 44(4), 529–539.
- Özer, Y., & Koçoğlu, Z. (2017). The use of quizlet flashcard software and its effects on vocabulary learning. *Dil Dergisi*, 168(1), 61–82. https://doi.org/10.1501/DILDER_0000000238
- Papi, M., & Khajavy, G. (2021). Motivational mechanisms underlying second language achievement: A regulatory focus perspective. *Language Learning*, 71, 537–572. <https://doi.org/10.1111/lang.12443>
- Sanosi, A. (2018). The Effect of Quizlet on Vocabulary Acquisition. *Asian Journal of Education and e-Learning*, 6(4), 71–77. <https://doi.org/10.24203/ajeel.v6i4.5446>
- Schmitt, N. (2000) *Vocabulary in Language Teaching*. Cambridge University Press, Cambridge.

- Sonobe, N., & Ogata, T. (2017). Methods of Target Vocabulary Previewing: The Relationship between Preferences and Academic Scores. *Journal of Health and Nutrition Science in Nishikyusyu University*, 3, 9–15.
- Venkatesh, V., & Davis, F. (2000) A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186–204. <https://doi.org/10.1287/mnsc.46.2.186.11926>
- Wang, F. (2008) Motivation and English Achievement: An Exploratory and Confirmatory Factor Analysis of a New Measure for Chinese Students of English Learning. *North American Journal of Psychology*, 10(3), 633–646. <https://doi.org/10.1007/s10763-010-9255-y>
- Wolff, G. (2016). Quizlet Live: The classroom game now taking the world by storm. *The Language Teacher*, 40(6), 25–27.
- Zhang, L.J. (2003). Research Into Chinese Efl Learner Strategies: Methods, Findings, and Instructional Issues. *Relc Journal*, 34, 284–322. <https://doi.org/10.1177/003368820303400303>

Appendix 1

Quizlet Research

We are Researcher 1 (email@email.com) and Researcher 2 (email@email.ac.jp). Our research is focused on independent Quizlet usage by students. We appreciate your cooperation in filling out this survey.

All survey responses are anonymous. The researchers will not be able to identify any individual student based on a survey response. All survey responses are confidential and will not be seen by anyone other than the two researchers. The purpose of this survey is strictly academic in nature. By participating in this survey, you agree to let the researchers use the results of this survey in a research project which will be published in an academic journal. Your participation in this survey has no effect on your course grade.

Questions or comments about this survey can be directed to the researchers. Thank you for your time and cooperation.

こちらは Researcher 1 (email@email.com) と Researcher 2 (email@email.ac.jp) による研究プロジェクトのアンケートです。この研究では、学生による独立した Quizlet の使用に焦点を当てています。以下のアンケートへのご協力をお願いします。

アンケートの回答はすべて匿名です。研究者はアンケートの回答に基づいて個々の学生を特定することはできません。アンケートの回答はすべて機密事項であり研究者 2 名以外が見ることはありません。この調査の目的は厳密には学術的なものです。この調査に参加することによって、あなたは研究者がこの調査結果を学術雑誌に掲載される研究プロジェクトで使用することに同意することになります。このアンケートへの参加があなたの授業の成績に影響を与えることは、一切ありません。

この調査に関するご質問やご意見は、上記の研究者 2 名までお寄せください。お忙しい中ご協力ありがとうございました。

1. How old are you? - あなたは何歳ですか？

18 19 20 21 22 23 24 or above

2. What is your gender? - あなたの性別を教えてください。

Male - 男性 Female - 女性 Decline to state - 答えたくない

3. What is your most recent TOEIC score. If you do not know exactly, give an estimate? *enter only a number (10-990) - 直近の TOEIC のスコアを教えてください。正確に分からない場合は、大体で構いません。*数字のみお願いします(10~990)

Quizlet Use I

Please answer the following questions about your use of Quizlet.

Quizlet の利用について、以下の質問にお答えください。

4. Did you download the Quizlet application on your smartphone or computer? - スマートフォンやパソコンで Quizlet のアプリケーションをダウンロードしましたか?

No - いいえ Yes - はい

5. Do you still have the Quizlet application on your device? - お使いの端末に Quizlet アプリはまだ入っていますか?

No - いいえ Yes - はい

6. Did you use Quizlet outside of class? - 授業以外で Quizlet を利用しましたか?

No - いいえ Skip to question 7 Yes - はい Skip to question 10

Quizlet (non-use)

Please answer the following questions about Quizlet.

Quizlet について、以下の質問にお答えください。

7. Why don't you use Quizlet outside of class? - 授業以外で Quizlet を使ってない理由はなんですか? Choose all that apply.

I don't think it helps me learn - 学習に役立たないと思う

I'm not interested in studying vocabulary - 単語の勉強に興味はない

I use another app - 他のアプリを使っている

Quizlet is too difficult to use - Quizlet の使い方が難しすぎる

Other - その他

8. If you selected the answer option 'Other' for the previous question, please specify below in Japanese or English. - 前問で「その他」を選択された方は、以下にその内容を日本語または英語で書いてください。

9. If you use another vocabulary app, what do you use? - もし他の単語アプリを使っているなら、それは何のアプリですか?

Quizlet Use II

Please answer the following questions about your use of Quizlet. Quizlet の利用について、以下の質問にお答えください。

10. How many times a week did you use Quizlet outside of class this semester? - 今学期、授業以外で週に何回 Quizlet を利用しましたか?

Every day - 毎日 5 or 6 times per week - 週 5~6 回

3 or 4 times per week - 週 3~4 回 1 or 2 times per week - 週 1~2 回

11. On average, how many minutes did you spend using Quizlet each time outside of class? - 授業以外で Quizlet を利用した時間は、平均して 1 回何分くらいでしたか?

60 minutes or more - 60分以上 30 to 45 minutes - 30～45分
 15 to 30 minutes - 15～30分 5 to 15 minutes - 5～15分
 less than 5 minutes - 5分以内

12. For what purpose did you use Quizlet outside of class? - 授業以外では、どのような目的で Quizlet を利用しましたか?

to study vocabulary unrelated to my English class. - 英語の授業とは関係ない単語を勉強するため。

to study vocabulary related to my English class. - 英語の授業に関連ある単語の勉強をするため。

Quizlet Usefulness

Please tell us exactly how much you agree or disagree with the following statements about Quizlet. Quizlet に関しては以下の記述にどのくらい同意するか（あてはまるか）／しないか（あてはまらないか）を正確に答えて下さい。

Strongly agree 強く同意する（あてはまる）= 6

Agree 同意する（あてはまる）= 5

Slightly agree 少し同意する（あてはまる）= 4

Slightly disagree 少し同意しない（当てはまらない）= 3

Disagree 同意しない（当てはまらない）= 2

Strongly disagree まったく同意しない（当てはまらない）= 1

13. Quizlet is useful for learning vocabulary. - Quizlet は語彙を学ぶのに便利だ。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する

4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない

2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

14. Quizlet helped me improve my English vocabulary. - Quizlet を使用することで、英単語を増やすことができた。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する

4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない

2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

15. In class use of Quizlet made me want to use it outside of class. - 授業で Quizlet を使ったことで、授業外でも使いたくなった

6 - Strongly agree - 強く同意する 5 - Agree - 同意する

4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない

2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

16. I want to use Quizlet to study English in the future. - 今後、Quizlet を使ってもっと英単語の勉強をしたい。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する

- 4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない
2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

17. I prefer using Quizlet to study vocabulary over other methods. - 他の方法よりも Quizlet を使って語彙を勉強するのが好きだ。

- 6 - Strongly agree - 強く同意する 5 - Agree - 同意する
4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない
2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

Quizlet Use III

Please tell us exactly how much you agree or disagree with the following statements about Quizlet. Quizlet に関しては以下の記述にどのくらい同意するか（あてはまるか）／しないか（あてはまらないか）を正確に答えて下さい。

- Strongly agree 強く同意する（あてはまる） = 6
Agree 同意する（あてはまる） = 5
Slightly agree 少し同意する（あてはまる） = 4
Slightly disagree 少し同意しない（当てはまらない） = 3
Disagree 同意しない（当てはまらない） = 2
Strongly disagree まったく同意しない（当てはまらない） = 1

18. It was easy for me to make a Quizlet account. - Quizlet のアカウントを作るのは簡単だった。

- 6 - Strongly agree - 強く同意する 5 - Agree - 同意する
4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない
2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

19. I can teach my friend how to use Quizlet. - Quizlet の使い方を友達に教えられる。

- 6 - Strongly agree - 強く同意する 5 - Agree - 同意する
4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない
2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

20. Quizlet is easy to use. - Quizlet は使いやすい。

- 6 - Strongly agree - 強く同意する 5 - Agree - 同意する
4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない
2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

21. I enjoyed using Quizlet to study English in class. - 授業で Quizlet を使って英語の勉強をするのは楽しかった。

- 6 - Strongly agree - 強く同意する 5 - Agree - 同意する
4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない
2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

English Ability & Motivation

Please tell us exactly how much you agree or disagree with the following statements about your English ability. 自分の英語力に関して、以下の記述にどのくらい同意するか（あてはまるか）／しないか（あてはまらないか）を正確に答えて下さい。

Strongly agree 強く同意する（あてはまる）= 6

Agree 同意する（あてはまる）= 5

Slightly agree 少し同意する（あてはまる）= 4

Slightly disagree 少し同意しない（当てはまらない）= 3

Disagree 同意しない（当てはまらない）= 2

Strongly disagree まったく同意しない（当てはまらない）= 1

22. I persist when facing difficulties in English learning. - 英語学習において難しさに直面しても、勉強をやり通すことができます。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する

4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない

2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

23. like the challenge of difficult tasks related to learning English. 英語学習に関して、難しいことに挑戦するのが好きです。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する

4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない

2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

24. I work on my English assignments (quizzes and homework) according to a planned schedule. - 計画性を持って、英語の課題（クイズと宿題など）に取り組んでいます。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する

4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない

2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

25. I am excited when I have accomplished a difficult task in English learning. - 英語学習において、難しいことを成し遂げたときには気分が高揚します。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する

4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない

2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

26. I like learning English. - 英語を学ぶのが好きです。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する

4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない

2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

27. I like listening to English speech. - 英語でのスピーチを聞くのが好きです。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する

4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない
 2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

28. I like writing in English. - 英語で書くのが好きです。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する
 4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない
 2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

29. I like speaking English. - 英語を話すのが好きです。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する
 4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない
 2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

30. I study English diligently for potential development in the future. - 私が英語を一生懸命勉強しているのは、将来の可能性を広げるためです。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する
 4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない
 2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない

31. I like reading English. - 英語で読むのが好きです。

6 - Strongly agree - 強く同意する 5 - Agree - 同意する
 4 - Somewhat agree - 少し同意する 3 - Somewhat disagree - 少し同意しない
 2 - Disagree - 同意しない 1 - Strongly disagree - まったく同意しない