



Exploring the Conditions for the Gradual Development of Self-directed Learning through Learning Experiences with an Online Vocabulary Tool in a General TOEIC Course

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Received: 18 April 2026
Revised: 6 May 2026
Accepted: 5 June 2026

Cho, Hyunjun. (2026). Exploring the conditions for the gradual development of self-directed learning through learning experiences with an online vocabulary tool in a general TOEIC course. *Modern English Education*, 27, 336-349.

Keywords

Vocabulary learning, Quizlet, lower-proficiency learners, learner perceptions, self-directed learning
어휘 학습, 퀴즐렛, 저수준 학습자, 학습자 인식, 자기주도적 학습

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Abstract

This study investigates how Quizlet, an online vocabulary learning tool, affects learners' TOEIC scores and their perceptions of learning in a general English course. It also examines whether these effects differ based on learners' initial proficiency levels. A quasi-experimental design was used with 71 non-English major undergraduates at a regional university in Korea. The control group utilized a paper-based Vocabulary Learning Log (V-log), while the experimental group studied vocabulary using Quizlet. Data were collected through pre- and post-TOEIC mock tests and a learner perception survey. Paired-samples and independent-samples t-tests were conducted for analysis. The results indicated that both groups made statistically significant improvements in TOEIC scores; however, the experimental group showed greater enhancement with a larger effect size, especially among lower-proficiency learners. Regarding learner perceptions, the experimental group reported more positive feedback in terms of effectiveness, satisfaction, and ease of use, with a statistically significant difference noted in ease of use between the two groups. These findings imply that incorporating an online vocabulary learning tool into a general TOEIC course can enhance learners' achievements and positively influence their learning experiences. For lower-proficiency learners in particular, early performance improvements may boost engagement and foster a more self-directed approach to learning.

INTRODUCTION

In recent years, higher education in South Korea has undergone significant structural changes driven by a declining school-age population and persistently low birth rates. The shrinking pool of college-bound students has led to lower enrollment rates and increasing numbers of unfilled seats, with these challenges being particularly pronounced in regional universities and certain academic programs. J. Jung (2024) notes that as Korean higher education moves beyond the stage of massification into a period of demographic contraction, systems centered primarily on student selection are no longer

sufficient to sustain educational quality or institutional viability. Under these conditions, universities are increasingly called upon to move beyond reliance on incoming students' academic preparedness and to develop more effective ways of supporting learners with diverse academic backgrounds.

Analyses by domestic research institutions point to similar trends. Korean Educational Development Institute (2025) reports that the ongoing demographic shift has contributed to greater heterogeneity within incoming student cohorts, alongside a growing proportion of learners who enter university without fully developed foundational academic skills. In this context, the role of universities is expanding beyond that of degree-granting institutions to one that actively supports students' academic achievement and persistence. Teaching and learning support systems in higher education need to move beyond selection-oriented functions toward supporting student success, with general education serving as an important domain for implementing such changes.

In this regard, mobile-assisted learning environments offer possibilities for extending learning beyond the classroom while supporting more flexible and individualized engagement. Viberg et al. (2020) report that mobile learning environments can support learners' self-regulated learning processes and contribute to sustained learner engagement.

Within this context, online vocabulary learning tools such as Quizlet can be understood not merely as instructional aids but as means of expanding access to learning. For lower-proficiency learners, particularly non-English majors, such tools may help sustain engagement by providing opportunities for attainable success. Digital flashcard-based platforms support repeated exposure and offer immediate feedback, which can reduce cognitive load and reinforce learners' sense of progress. Research on smartphone-based vocabulary learning has reported increases in learner interest and satisfaction (S. Lee & Y. Koo, 2018), and studies on Quizlet have similarly documented gains in vocabulary achievement and learner satisfaction among university EFL students (Dizon, 2016).

Against this backdrop, the present study investigates the use of Quizlet in a general TOEIC course, with a focus on changes in TOEIC achievement and learner perceptions. Particular attention is given to lower-proficiency, non-English major learners, examining how experiences of achievement may relate to conditions that support the development of self-directed learning. In addition, this study considers the role of online vocabulary tools not only in terms of score improvement but also in relation to sustained engagement and learning transitions within the broader context of general education in an era of demographic decline. To this end, the following research questions are proposed.

- 1) To what extent is the use of an online vocabulary learning tool associated with improvements in learners' TOEIC achievement in a general English course?
- 2) How does the effect of the online vocabulary learning tool vary according to learners' initial TOEIC proficiency levels (higher- vs. lower-proficiency groups)?
- 3) What differences emerge in learners' perceptions of online vocabulary learning tools compared to traditional vocabulary learning methods in a general TOEIC course, and how are these perceptions related to conditions that may support the development of self-directed learning, particularly among lower-proficiency learners?

LITERATURE REVIEW

The Changing Role of General Education and Teaching–Learning Support in an Era of Demographic Decline

Demographic shifts driven by low birth rates and a declining school-age population are calling for a comprehensive reconsideration of the functions and roles of higher education. J. Jung (2024) argues that as Korean higher education moves beyond the stage of massification and enters a period of demographic decline, universities can no longer sustain educational quality and institutional viability through a selection-centered system alone. Accordingly, there is a growing need to move away from approaches that rely on the average level of incoming students' academic preparedness and to address how learners with diverse levels of readiness can be effectively supported.

The Korean Educational Development Institute (KEDI, 2025) reports that heterogeneity among incoming university students has increased, along with a rise in the proportion of learners who lack sufficiently developed foundational academic skills. Under these conditions, teaching and learning support should be understood not as an optional function but as a core responsibility of higher education institutions. Recent discussions in higher education have emphasized the need for teaching

and learning support systems to move beyond selection-oriented functions and toward promoting student success and learner-centered education, particularly within general education contexts.

Achievement in Vocabulary-focused Instruction and General TOEIC Courses

Changes in the educational environment are particularly evident in general English education, especially in TOEIC-oriented courses. General TOEIC classes often include students from a wide range of academic majors, educational backgrounds, and levels of English proficiency, resulting in considerable variation in ability within a single classroom. In this context, TOEIC functions as an assessment system that presents learners' performance in a relatively clear and quantifiable manner through scores, allowing instructors to establish learning objectives and evaluation criteria. This characteristic contributes to the practical orientation of TOEIC-based general English instruction.

Within the TOEIC Reading (RC) section, Part 5 focuses on grammatical and lexical knowledge and is structured so that responses can be clearly judged as correct or incorrect at the item level. This format tends to reflect learning outcomes related to specific language elements in a relatively direct way, particularly in the case of vocabulary knowledge, where accumulated learning is more readily captured in test scores. Previous studies have reported that grammar- and vocabulary-focused instruction in university TOEIC courses is associated with improvements in learners' test performance (M. K. Lee, 2011). However, these studies have primarily examined whether such improvement occurs, with limited attention to differences based on learners' initial proficiency levels or to qualitative aspects of the learning experience.

Dizon (2016) highlighted the importance of learners' perceptions and experiences in digital vocabulary learning, suggesting that instructional effectiveness should be considered not only in terms of achievement outcomes but also in relation to learner engagement and satisfaction.

Achievement Experiences and the Development of Self-directed Learning among Lower-proficiency University Students

Self-Determination Theory provides a useful framework for understanding the relationship between achievement experiences and learning motivation. Ryan and Deci (2000) explain that experiences of success in the learning process can strengthen learners' sense of competence, and that this perception may lead to the internalization of motivation, which in turn supports sustained engagement and more autonomous learning behavior. This process highlights the role of motivational internalization and self-regulation in shaping learners' participation and achievement.

This perspective provides an important basis for understanding the role of achievement experiences in test-oriented teaching and learning contexts, and it has been further supported by empirical studies involving lower-proficiency university students. Zimmerman (2002) argued that self-directed and self-regulated learning abilities are gradually developed through sustained instructional support and repeated academic success experiences rather than through short-term strategy training alone. Similarly, Jo et al. (2021) report that in learning support programs structured around achievement experiences, improvements in academic performance were accompanied by changes in learners' attitudes toward self-directed learning.

Taken together, these findings suggest that in instructional design for lower-proficiency learners, it may be more effective to provide structured opportunities for achievement from the early stages of learning rather than directly requiring self-directed learning from the outset.

Digital Native Learners and Mobile-Assisted Language Learning (MALL)

In recent years, mobile and online learning tools based on smartphone applications have become widely adopted as major modes of teaching and learning in the field of foreign language education. Contemporary university students are often categorized as digital natives and have routinely used smartphones as primary tools for learning, communication, and information seeking. This background is closely associated with a high level of receptivity to digital learning environments (Prensky, 2001).

Similar patterns have been observed in empirical research. S. Lee and Y. Koo (2018) report that smartphone-based vocabulary learning increases learners' interest and satisfaction and supports a more autonomous perception of learning activities. Kondo et al. (2012) also note that mobile-assisted language learning (MALL) in university EFL contexts is associated with changes in learners' use of self-regulated learning strategies. Viberg et al. (2020) further show that mobile learning environments can support learners' regulatory processes and are linked to more active learning behaviors. In addition, Selwyn (2009) argues that university students frequently utilize social networking and digital platforms as part of

both formal and informal learning practices, suggesting that digital environments increasingly function as meaningful learning spaces in higher education. Zimmerman (2002) also emphasizes that self-regulated learning competence develops gradually through continuous instructional support and repeated academic success experiences, implying that digital learning tools may facilitate learners' autonomous engagement when appropriately integrated into instructional contexts.

Educational Effects of Online Vocabulary Learning Tools: The Case of Quizlet

Research on digital flashcard-based vocabulary learning tools such as Quizlet provides a more detailed account of vocabulary learning in mobile environments. Y. Cha and H. S. Kim (2016) show that vocabulary learning using Quizlet can serve as an effective alternative to traditional paper-based approaches, particularly in terms of accessibility and the facilitation of repeated practice. Boroughani (2023) further reports that digital flashcard-based vocabulary learning is associated not only with gains in vocabulary achievement but also with learners' self-regulated learning.

Dizon (2016) found that the use of Quizlet not only improves vocabulary achievement among university EFL learners but also increases learning satisfaction. Chien (2013, 2015) examined the relationship between learners' perceptions and their level of vocabulary knowledge in Quizlet-based learning, reporting that digital flashcard-based approaches can play a positive role in the process of vocabulary acquisition. These findings further support the educational potential of online vocabulary learning tools in EFL contexts.

Furthermore, studies addressing mobile-assisted language learning in TOEIC preparation contexts show that mobile learning environments can contribute to measurable improvements even in test-oriented settings (N. Y. Kim, 2022). E. Song (2013) found that smartphone-based TOEIC learning can have positive effects on both learners' test scores and their perceptions of learning. These findings align with the framework of Self-Determination Theory, which emphasizes the role of motivational internalization and self-regulation in shaping learners' engagement and achievement (Ryan & Deci, 2000, 2020).

Synthesis of Previous Research and the Positioning of the Present Study

Taken together, previous studies have shown that mobile and online vocabulary learning tools influence not only the efficiency of vocabulary acquisition but also learners' affective responses, as well as processes related to self-regulation and self-directed learning. However, much of the existing research has focused on testing the effects of specific instructional methods or individual variables, with relatively limited attention given to how learners experience achievement within the context of general education in university settings.

In addition, many studies have treated learners as a relatively homogeneous group, with limited consideration of differences in learning outcomes based on initial proficiency levels. As a result, the educational significance of learning experiences among non-English major students, particularly those at lower proficiency levels, has not been fully addressed.

Given these limitations, there is a need to examine how digital flashcard-based vocabulary learning operates within the context of general TOEIC courses, and how achievement gains and learner perceptions may differ according to learners' initial proficiency levels.

In response, the present study implements Quizlet-based vocabulary learning in a general TOEIC course and examines how achievement experiences among lower-proficiency learners relate to conditions that may support the development of self-directed learning.

METHOD

Participants

The participants in this study were 71 non-English major undergraduate students enrolled in a general TOEIC course at a regional university in Korea. The course was conducted over one semester (15 weeks) with two hours of instruction per week, and included students from a range of academic disciplines, including the humanities, social sciences, and engineering. The study employed a quasi-experimental design with a non-equivalent control group, as random assignment was not feasible. The participants were organized into two pre-assigned classes by the university administration. Class A (n = 36) served as the control group and engaged in paper-based vocabulary learning activities using a Vocabulary Learning Log (V-log), while Class B (n = 35) served as the experimental group and used Quizlet, a digital flashcard-based online vocabulary

learning tool. Both groups were taught using the same textbook and received the same amount of instructional time.

To examine differences based on learners' initial TOEIC proficiency, participants were divided into higher- and lower-proficiency groups according to their pre-test scores. A cutoff score of 300 (300 and above vs. below 300) was used, based on the score distribution and prior research. The group composition is presented in Table 1.

Prior to the study, participants were informed of the purpose and procedures, and participation was voluntary. All collected data were anonymized and used solely for research purposes. As this study is based on a quasi-experimental design without random assignment, the results should be interpreted with appropriate caution.

TABLE 1

Participant Characteristics

Group	Class	Total(N)	Higher-Proficiency (≥ 300)	Lower-Proficiency (< 300)
Control Group	Class A	36	14	22
Experimental Group	Class B	35	12	23

Note. Participants were divided into higher- and lower-proficiency groups using a cutoff score of 300 on the pre-test TOEIC.

Instruments

TOEIC Achievement Test

To measure changes in students' TOEIC achievement, a 200-item mock TOEIC test provided by a domestic TOEIC preparation institution (YBM) was used. Although the test was not an official TOEIC exam, it was designed to reflect the format, section composition, and timing of the actual test, and was used to compare learners' performance levels.

The pre-test was administered in Week 4 of the semester, and the post-test was conducted in Week 14 after the completion of the vocabulary learning treatment. The post-test was designed as a parallel form of the pre-test to minimize differences in format and difficulty. Both tests were administered under the same conditions for 120 minutes, and scoring was carried out using the automated scoring system provided by YBM to ensure consistency.

Prior to the treatment, the homogeneity of TOEIC achievement between the two groups was examined using an independent-samples *t*-test based on the pre-test scores. The results indicated that the difference between the groups was not statistically significant ($t(69) = 0.27, p = .791$), suggesting that the initial proficiency levels of the two groups were comparable.

TABLE 2

Homogeneity Test of Pretest TOEIC Scores between the Experimental and Control Groups

Group	N	M	SD	<i>t</i> (df)	<i>p</i>
Experimental	35	285.43	60.49	0.27(69)	.791
Control	36	289.44	66.61		

Design of Vocabulary Learning Tools

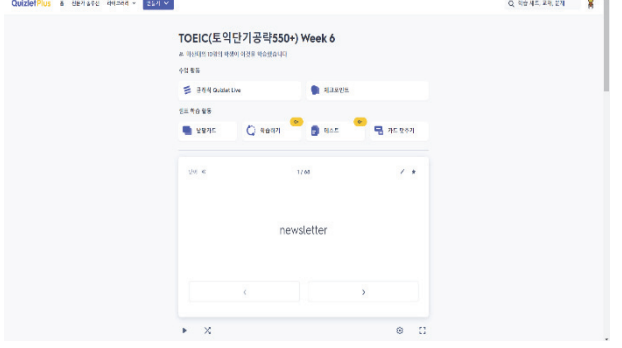
In this study, different instructional tools were applied to the control and experimental groups in order to compare the effects of vocabulary learning tools, while both groups shared the same vocabulary items and learning content, differing only in the mode of application.

The target vocabulary was selected from the core TOEIC Part 5 vocabulary presented in the common textbook, *ETS TOEIC Short-Term Strategy 550+*, and was organized in alignment with the weekly course schedule. This design ensured the equivalence of learning content between the two groups.

The control group (Class A) used a paper-based Vocabulary Learning Log (V-log). Students were required to record the meaning, part of speech, and example sentences for each target word, with an emphasis on use in context rather than simple memorization.

The experimental group (Class B) used Quizlet, a digital flashcard-based online vocabulary learning tool. The learning sets were developed based on the vocabulary covered in the textbook and classroom instruction, and features such as Flashcards, Learn, and Test were used to support repeated practice and self-assessment. Examples of the vocabulary learning tools used in this study are presented in Figure 1.

Although both tools were based on the same content, they differed in terms of how learning was carried out and how records were maintained. The V-log required students to submit their written work through the learning management system (LMS), whereas Quizlet-based learning took place within the platform without separate written submission. These differences may have influenced the ease of task completion and the nature of the learning experience.

(a) Vocabulary Learning Log (V-log)	(b) Quizlet																																			
<p style="text-align: right;">Name: </p> <p style="text-align: center;">Vocabulary Learning Log</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Week: ?</th> <th style="width: 20%;">Date: 8/10</th> <th style="width: 70%;">Topic: LC, RC</th> </tr> </thead> <tbody> <tr> <th>#</th> <th>Words</th> <th>Meaning</th> <th>Example</th> </tr> <tr> <td></td> <td>estimate</td> <td>추산하다</td> <td>We estimated the budget for this project.</td> </tr> <tr> <td></td> <td>selection</td> <td>선발</td> <td>We selected most excellent player.</td> </tr> <tr> <td></td> <td>collection</td> <td>수집</td> <td>He collected many stones.</td> </tr> <tr> <td></td> <td>reception</td> <td>접견처</td> <td>First, we went the hotel's reception.</td> </tr> <tr> <td></td> <td>reference</td> <td>추천서</td> <td>I received a college reference.</td> </tr> <tr> <td></td> <td>reputation</td> <td>명성</td> <td>She has built up a reputation.</td> </tr> <tr> <td></td> <td>replacement</td> <td>교체</td> <td>He replacements old parts.</td> </tr> </tbody> </table>	Week: ?	Date: 8/10	Topic: LC, RC	#	Words	Meaning	Example		estimate	추산하다	We estimated the budget for this project.		selection	선발	We selected most excellent player.		collection	수집	He collected many stones.		reception	접견처	First, we went the hotel's reception.		reference	추천서	I received a college reference.		reputation	명성	She has built up a reputation.		replacement	교체	He replacements old parts.	
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Note. (a) Paper-based Vocabulary Learning Log (V-log); (b) Quizlet-based digital vocabulary learning interface.

FIGURE 1

Examples of the Vocabulary Learning Tools Used in This Study

Learner Perception Questionnaire

A survey was administered to examine learners' perceptions of online vocabulary learning tools and traditional vocabulary learning methods. The questionnaire items were developed based on previous studies on vocabulary learning and mobile-assisted language learning (Dizon, 2016; S. Lee & Y. Koo, 2018; Viberg et al., 2020) and were adapted to fit the instructional context of this study. The survey consisted of a total of 18 items.

The survey was administered in Week 14, after both the vocabulary learning treatment and the post-TOEIC test had been completed, with a focus on learners' perceptions of their learning experiences over the semester.

The questionnaire was composed of two sections. Items 1–2 were background questions designed to examine learners' prior vocabulary learning experiences, while Items 3–18 measured perceptions of the vocabulary learning methods used in each group. These items were organized into four subdomains: perceived effectiveness (4 items), learning satisfaction (4 items), perceived self-directed learning tendency (4 items), and perceived ease of use (4 items).

All items were measured using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree), with higher scores indicating more positive perceptions of the learning method. Item 18 was reverse-coded, and recoding was conducted prior to analysis. The survey was administered in a paper-based format.

To assess the internal consistency of the instrument, Cronbach's alpha coefficients were calculated. The overall reliability of the questionnaire was high ($\alpha = .97$), and the reliability coefficients for all subdomains exceeded .80, indicating that the instrument demonstrated acceptable internal consistency for measuring learner perceptions in this study.

Procedure

This study was conducted over one semester in a general TOEIC course designed for first-year non-English major students, with two hours of instruction per week. The participants were organized into two pre-assigned classes by the university and were designated as the control group (Class A) and the experimental group (Class B). Both groups used the same textbook and were given the same amount of instructional time to minimize differences in the learning environment.

The study followed the procedure outlined below. A mock TOEIC test was administered in Week 4 to determine learners' initial proficiency levels, after which different vocabulary learning methods were applied for approximately 10 weeks. The target vocabulary was selected from frequently tested items in TOEIC Reading Part 5 and was organized by reflecting parts of speech, function words, and commonly tested lexical categories on a weekly basis. For example, weekly instruction focused on grammatical categories such as verbs and prepositions, as well as high-frequency TOEIC collocations and

functional expressions. Each week, approximately 20 to 30 vocabulary items were introduced, along with example sentences to support understanding in context. During class, brief review activities were conducted to check learning progress, and outside of class, repeated practice tasks were assigned to encourage continued learning.

The control group used a paper-based Vocabulary Learning Log (V-log) to organize and review vocabulary, while the experimental group engaged in vocabulary learning in a digital environment using Quizlet.

After the treatment period, a parallel form of the mock TOEIC test was administered in Week 14 to examine changes in achievement. A survey was then conducted to investigate learners' perceptions of the two learning methods, and the collected responses were used to analyze their experiences and reactions over the course of the semester.

Data Collection and Analysis

Data Collection

To examine changes in TOEIC achievement associated with the use of an online vocabulary learning tool, pre- and post-tests were conducted using mock TOEIC exams. The pre-test was administered in Week 4 of the semester, followed by approximately 10 weeks of vocabulary learning using different methods for each group. The post-test was conducted in Week 14 after the completion of the treatment.

The pre- and post-tests were constructed using mock TOEIC items provided by YBM, a TOEIC test provider in Korea, and were designed to maintain the format, timing, and section composition of the actual TOEIC exam. The post-test was developed as a parallel form of the pre-test, with items selected to ensure a balanced representation of grammar, vocabulary, and reading sections. To ensure comparability between the two tests, item difficulty levels were aligned based on the classification criteria provided by YBM.

Prior to the treatment, an independent-samples *t*-test confirmed that there was no statistically significant difference between the two groups in pre-test scores ($t(69) = 0.27, p = .791$), indicating comparable starting levels. Scoring was conducted using the same system to ensure consistency.

Following the post-test, a survey was administered to both groups to examine learners' perceptions of the two vocabulary learning methods. The collected data were used to compare differences in learning experiences.

Data Analysis

The collected mock TOEIC scores and survey data were analyzed using IBM SPSS Statistics 29.0. Prior to the treatment, the homogeneity of the two groups was examined using an independent-samples *t*-test based on pre-test scores. Changes in TOEIC achievement within each group were analyzed using paired-samples *t*-tests, and differences between the groups in post-test scores were examined using independent-samples *t*-tests.

To examine differences based on learners' initial TOEIC proficiency, participants were divided into higher- and lower-proficiency groups using a cutoff score of 300 on the pre-test, and additional comparisons were conducted within and between these groups. The survey data were also analyzed using independent-samples *t*-tests to identify differences in learners' perceptions of the two vocabulary learning methods.

Given the sample size and the quasi-experimental nature of the design, *t*-test-based analyses were used to maintain consistency and clarity in the interpretation of the results.

FINDINGS

This section presents the findings on the effects of the online vocabulary learning tool Quizlet and the traditional vocabulary learning method (V-log) on learners' TOEIC achievement and learner perceptions in a general TOEIC course.

The results are organized into two parts. First, changes in TOEIC achievement following the vocabulary learning treatment are examined, focusing on within-group improvement and between-group differences. Second, the survey results comparing learners' perceptions of the two learning methods are presented.

Changes in TOEIC Achievement Following Vocabulary Learning Treatment

Pre–Post TOEIC Achievement Changes in the Control Group

Changes in TOEIC achievement in the control group were analyzed by initial proficiency level. The control group used the traditional paper-based vocabulary learning method (V-log), and the results are presented in Table 3.

TABLE 3
Pre–Post TOEIC Changes by Proficiency Level (Control Group)

Proficiency Level	N	Mean	SD	Mean Difference	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d^z</i>
Higher Proficiency (Pre)	14	355.36	49.13	11.78	4.05	13	.001	0.82
Higher Proficiency (Post)	14	367.14	41.69					
Lower Proficiency (Pre)	22	247.50	30.59	5.00	3.46	21	.002	0.76
Lower Proficiency (Post)	22	252.50	33.54					

Table 3 presents the pre–post changes in TOEIC achievement for the control group using the traditional paper-based Vocabulary Learning Log (V-log), analyzed by proficiency level. Both higher- and lower-proficiency groups showed statistically significant increases in post-test scores compared to the pre-test.

For the higher-proficiency group ($N = 14$), the mean score increased from 355.36 ($SD = 49.13$) to 367.14 ($SD = 41.69$), representing a mean gain of 11.78 points, which was statistically significant ($t(13) = 4.05, p = .001$). The lower-proficiency group ($N = 22$) also showed an increase, from 247.50 ($SD = 30.59$) to 252.50 ($SD = 33.54$), with a mean gain of 5.00 points, which was likewise statistically significant ($t(21) = 3.46, p = .002$).

Effect sizes were in the medium-to-large range for both the higher-proficiency group ($d^z = 0.82$) and the lower-proficiency group ($d^z = 0.76$).

Pre–Post Changes in TOEIC Achievement in the Experimental Group

Changes in TOEIC achievement in the experimental group (Class B), which used the online vocabulary learning tool Quizlet, were analyzed by initial proficiency level. The results are presented in Table 4. Both the higher- and lower-proficiency groups showed statistically significant increases in post-test scores compared to the pre-test, with larger gains observed in the lower-proficiency group.

As shown in Table 4, the experimental group (Class B), which used Quizlet, demonstrated statistically significant improvements in TOEIC scores at both proficiency levels.

In the higher-proficiency group ($N = 12$), mean scores increased from 351.25 ($SD = 46.72$) to 374.17 ($SD = 49.81$), yielding a mean gain of 22.92 points ($t(11) = 7.24, p < .001$). The effect size was large ($d^z = 2.09$).

The lower-proficiency group ($N = 23$) showed a greater increase, with mean scores rising from 251.09 ($SD = 30.17$) to 279.78 ($SD = 34.58$), corresponding to a gain of 28.69 points ($t(22) = 9.03, p < .001$). The effect size was also large ($d^z = 1.88$).

TABLE 4
Pre–Post TOEIC Changes by Proficiency Level (Experimental Group)

Proficiency Level	N	Mean	SD	Mean Difference	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d^z</i>
Higher Proficiency (Pre)	12	351.25	46.72	22.92	7.24	11	< .001	2.09
Higher Proficiency (Post)	12	374.17	49.81					
Lower Proficiency (Pre)	23	251.09	30.17	28.69	9.03	22	< .001	1.88
Lower Proficiency (Post)	23	279.78	34.58					

Comparison of TOEIC Achievement Gains Between the Control and Experimental Groups

A comparison of pre–post TOEIC achievement gains between the control and experimental groups showed differences in both the magnitude of improvement and effect sizes across the two vocabulary learning methods. These differences were more pronounced in the lower-proficiency group. While the lower-proficiency group in the control condition showed a mean increase of 5.00 points, the corresponding group in the experimental condition demonstrated a substantially larger gain of 28.69 points.

In the higher-proficiency groups, both conditions showed statistically significant pre–post gains, but the difference in the magnitude of improvement between the two groups was smaller than that observed in the lower-proficiency groups.

Learners' Perceptions of Online and Traditional Vocabulary Learning Methods

To complement the TOEIC achievement results presented above, this section reports the findings from the learner perception survey on online and traditional vocabulary learning methods. In addition to achievement outcomes, the analysis focuses on learners' experiences during the learning process, examining perceived effectiveness, learning satisfaction, and perceptions of self-directed learning. By comparing perceptions across the two learning methods, this section explores how each approach was experienced in terms of the learning process and learner engagement.

Perceptions of Vocabulary Learning in the Control Group

Items 1 and 2 of the 18-item questionnaire were designed to examine learners' prior vocabulary learning experiences. Responses from the control group (Class A) indicated that traditional approaches, such as maintaining vocabulary notebooks, were the predominant learning method, along with textbook- and explanation-based study and the use of vocabulary lists.

Items 3–18 measured learners' perceptions of the V-log-based vocabulary learning activities, and the results are presented in Table 5. Overall, the item means were centered around the midpoint of the five-point Likert scale (3), with only a few items showing mean values above this level.

Across subdomains, relatively higher mean scores were observed for items related to vocabulary organization and memorization. In particular, the item “It helps me memorize more vocabulary” showed a mean of 3.75. Items such as “It is easy to understand” and “I would recommend it” also received responses above the midpoint.

In contrast, items related to learning interest, satisfaction, and self-directed participation showed relatively lower mean scores. For Item 18, which was reverse-coded, responses indicating a preference for teacher-centered vocabulary explanations were relatively high.

Overall, the control group showed relatively positive perceptions in terms of vocabulary organization, repeated practice, and ease of use, whereas perceptions related to learning interest and self-directed engagement tended to remain at a moderate level.

TABLE 5

Students' Perceptions of V-log-based Vocabulary Learning (5-Point Likert Scale, N = 36)

Subscale	No.	Item	M	SD
Learning Effectiveness	3	V-log is useful and helpful for TOEIC vocabulary learning.	3.53	0.84
	5	I think learning through V-log helps improve TOEIC scores.	3.44	0.77
	11	V-log helps achieve learning goals in TOEIC vocabulary learning.	3.42	0.80
	17	V-log helps me memorize more vocabulary.	3.75	0.84
Learning Satisfaction	7	V-log provides motivation for TOEIC vocabulary learning.	3.31	0.82
	9	V-log increases my interest in TOEIC vocabulary learning.	3.11	0.95
	13	V-log is an enjoyable and interesting method for learning TOEIC vocabulary.	3.28	1.00
	14	Learning through V-log provides a positive learning experience in TOEIC vocabulary learning.	3.44	0.96
Perceived Self-directed Learning	4	V-log provides opportunities for learners to study TOEIC vocabulary independently.	3.64	0.96
	10	Learning through V-log makes me feel that I am engaging in self-directed learning in TOEIC vocabulary study.	3.56	0.77
	15	I would like to use the V-log learning method in future English learning.	3.36	0.89
Perceived Ease of Use	18	I prefer a class format in which the instructor explains each vocabulary item one by one rather than using V-log. (reverse-coded item)	2.78	0.89
	6	V-log reduces the burden of learning TOEIC vocabulary.	3.31	0.88
	8	V-log increases my confidence in TOEIC vocabulary learning.	3.28	0.88
	12	V-log is easy to understand as a method for learning TOEIC vocabulary.	3.72	0.84
	16	I would recommend the V-log learning method to others.	3.61	0.96

Perceptions of Vocabulary Learning in the Experimental Group

Survey responses indicated that learners in the experimental group (Class B) had experience using a range of digital tools for vocabulary learning, with a substantial proportion reporting prior use of Quizlet. Some participants also reported combining Quizlet with other resources such as vocabulary notebooks, textbooks, and video materials. In addition, a large proportion of respondents indicated prior experience using smartphones for English learning.

Perceptions of Quizlet-based vocabulary learning were measured using Items 3–18, and the results are presented in Table 6. Overall, the mean scores for all items tended to be above the midpoint of the five-point Likert scale.

Across subdomains, relatively high mean scores were observed in the area of perceived effectiveness, particularly for items related to vocabulary memorization and the achievement of learning goals. In the domain of learning satisfaction, responses were generally above the midpoint and were higher overall than those of the control group.

In the domain of perceived self-directed learning, most items showed mean values above the midpoint, and similarly high mean scores were observed in perceived ease of use.

Overall, the experimental group demonstrated relatively positive perceptions in terms of effectiveness, satisfaction, and ease of use, and showed a tendency toward higher perceptions of self-directed learning compared to the control group.

TABLE 6

Students' Perceptions of Quizlet-based Vocabulary Learning (5-Point Likert Scale, N = 35)

Subscale	No.	Item	M	SD
Learning Effectiveness	3	Quizlet is useful and helpful for learning TOEIC vocabulary.	3.80	0.96
	5	I believe that learning with Quizlet helps improve TOEIC scores.	3.54	0.91
	11	Quizlet helps me achieve learning goals in TOEIC vocabulary study.	3.57	0.94
	17	Quizlet helps me memorize more vocabulary.	3.94	0.83
Learning Satisfaction	7	Quizlet provides motivation for learning TOEIC vocabulary.	3.63	0.94
	9	Quizlet stimulates interest in learning TOEIC vocabulary.	3.51	1.06
	13	Quizlet is an enjoyable and interesting method for learning TOEIC vocabulary.	3.83	0.98
	14	Learning with Quizlet provides positive experience in TOEIC vocabulary study.	3.86	0.94
Perceived Self-directed Learning	4	Quizlet provides opportunities for learners to study TOEIC vocabulary independently.	3.86	0.94
	10	Learning with Quizlet makes me feel that I am studying TOEIC vocabulary in a self-directed manner.	4.03	0.95
	15	I would like to use Quizlet for learning English in the future.	3.83	0.98
	18	I prefer having the instructor explain vocabulary one by one in each class rather than using Quizlet. (reverse-coded item)	2.31	0.83
Perceived Ease of Use	6	Quizlet reduces the burden of learning TOEIC vocabulary.	3.69	1.07
	8	Quizlet increases my confidence in learning TOEIC vocabulary.	3.71	0.92
	12	Quizlet is easy to understand as a method for learning TOEIC vocabulary.	3.69	0.86
	16	I would recommend using Quizlet for vocabulary learning to others.	3.97	1.04

TABLE 7

Students' Perceptions of Quizlet-based Vocabulary Learning (5-Point Likert Scale, N = 35)

Subscale	Group	M	SD	t(df)	p
Effectiveness	V-log	3.42	0.70	-1.18 (69)	.243
	Quizlet	3.64	0.81		
Satisfaction	V-log	3.54	0.76	-1.84 (69)	.070
	Quizlet	3.90	0.88		
Self-directed Learning	V-log	3.42	0.62	0.21 (69)	.834
	Quizlet	3.39	0.61		
Ease of Use	V-log	3.35	0.80	-2.01 (69)	.048*
	Quizlet	3.76	0.91		

Note. * $p < .05$

An independent-samples *t*-test was conducted to examine differences in learner perceptions between the two vocabulary learning methods based on mean scores for each subscale. The results are presented in Table 7.

In the domain of perceived ease of use, the experimental group showed significantly higher scores than the control group ($t(69) = -2.01, p < .05$). In contrast, although the experimental group showed higher mean scores in perceived effectiveness, learning satisfaction, and perceived self-directed learning, these differences were not statistically significant ($p > .05$).

DISCUSSION

This section discusses the educational implications of vocabulary learning methods in a general TOEIC course based on the findings presented above. The discussion focuses on patterns of improvement in achievement and differences in learner perceptions, with particular attention to how achievement experiences among lower-proficiency learners relate to conditions that may support the development of self-directed learning.

Patterns of TOEIC Achievement Gains by Vocabulary Learning Method

Taken together, the achievement results show that the traditional paper-based Vocabulary Learning Log (V-log) and the online vocabulary learning tool Quizlet produced different patterns of learning outcomes depending on learners' initial proficiency levels.

V-log-based learning led to statistically significant score gains in both higher- and lower-proficiency groups. However, the magnitude of improvement and effect sizes remained in the moderate range, suggesting some limitations in producing substantial short-term gains. This pattern reflects the role of structured organization and repeated practice in supporting steady, incremental improvement.

In contrast, vocabulary learning using Quizlet was associated with larger gains in achievement. The experimental group showed greater score increases and larger effect sizes across both proficiency levels, with the difference being more pronounced among lower-proficiency learners. This pattern is consistent with the idea that a digital learning environment can facilitate repeated practice and self-checking, which may support more active engagement in learning.

At the same time, because this study employed a quasi-experimental design without random assignment, the results should be interpreted with caution, rather than as evidence of a direct causal effect of a particular instructional method.

The present findings are generally consistent with previous studies reporting positive effects of Quizlet and mobile-assisted vocabulary learning on learners' vocabulary achievement and TOEIC-related performance (Dizon, 2016; E. Song, 2013). In particular, the larger gains observed in the Quizlet group support earlier findings that repeated exposure and immediate feedback in digital flashcard environments can facilitate vocabulary retention and test performance.

However, the present study differs from previous research in that the achievement gains were especially pronounced among lower-proficiency learners. While earlier studies primarily examined overall achievement effects, the current study suggests that online vocabulary tools may provide a more accessible learning environment for learners with limited English proficiency. One possible explanation is that lower-proficiency learners tend to experience greater anxiety and disengagement in traditional TOEIC classrooms, whereas Quizlet may reduce cognitive burden through repeated self-paced practice and immediate self-checking opportunities.

Differences in Learner Perceptions of Vocabulary Learning Methods

The results of the achievement analysis generally align with the findings from the learner perception survey. In the control group, V-log-based vocabulary learning was evaluated relatively positively in terms of perceived effectiveness and ease of understanding, whereas perceptions of learning satisfaction and self-directedness remained at a moderate level. In addition, the observed preference for teacher-centered vocabulary explanation suggests that V-log was viewed less as an independent learning approach and more as a supplementary activity supporting classroom instruction.

In contrast, the experimental group showed consistently positive evaluations of Quizlet-based vocabulary learning. Favorable responses were observed across perceived effectiveness, learning satisfaction, and ease of use, along with strong recognition of convenience and accessibility in the learning process. These differences reflect the distinct nature of the learning experiences provided by the two methods.

The learner perception results also align with previous studies on mobile-assisted vocabulary learning. S. Lee and Y. Koo (2018) and Dizon (2016) reported that smartphone-based vocabulary learning increased learners' interest, satisfaction, and

perceived convenience, which is consistent with the relatively positive evaluations observed in the Quizlet group in the present study.

Nevertheless, unlike some previous studies emphasizing strong improvements in self-directed learning, the current study did not find statistically significant differences in perceived self-directed learning between the two groups. One possible explanation for this difference is that self-directed learning may require a longer period of development and may not be fully captured through self-reported perception data alone. In addition, lower-proficiency learners may still have relied on teacher guidance even while they engaged positively with the digital learning environment.

Conditions Supporting Achievement Experiences and the Development of Self-directed Learning among Lower-proficiency Learners

A notable finding of this study is that, in the Quizlet-based group, lower-proficiency learners showed both substantial gains in achievement and positive learner perceptions. Lower-proficiency learners often exhibit anxiety or avoidance in the process of learning English; however, an environment that supports repeated practice and immediate self-checking can provide meaningful opportunities for success.

This pattern can be interpreted considering Self-Determination Theory. Experiences of success can strengthen learners' sense of competence, which may lead to motivational internalization and more autonomous engagement in learning.

However, it would be difficult to conclude that self-directed learning has been fully developed based on results from a single semester. Rather than claiming a direct effect, it is more appropriate to interpret these findings as indicating that conditions supportive of self-directed learning were present.

From this perspective, the study highlights the role of achievement experiences within a structured instructional context in supporting the gradual development of learner autonomy.

This interpretation is partially consistent with Jo et al. (2021), who argued that self-directed learning develops gradually through accumulated experiences of academic success rather than through short-term strategy instruction alone. The present findings extend this perspective by suggesting that digital vocabulary learning environments may provide lower-proficiency learners with more accessible opportunities for repeated success experiences in test-oriented contexts such as TOEIC courses.

At the same time, the present study differs from prior intervention studies in that self-directed learning was not directly measured through behavioral changes or longitudinal observation. Therefore, rather than claiming the development of self-directed learning itself, the findings should be interpreted as indicating the presence of conditions that may support its gradual development.

Pedagogical Implications for General TOEIC Courses

The findings of this study show that the choice of vocabulary learning methods in general TOEIC courses can influence not only instructional practices but also learners' achievement experiences and overall perceptions. In particular, the use of Quizlet as an online vocabulary learning tool was associated with meaningful gains in achievement among lower-proficiency learners. This result supports the need for differentiated vocabulary instruction that takes learners' proficiency levels into account.

In a higher education context characterized by widening gaps among learners and ongoing demographic changes, more flexible approaches to teaching and learning are required. Within this context, online vocabulary learning tools can serve as a viable option in general English courses, particularly as a means of helping lower-proficiency learners accumulate achievement experiences and sustain their engagement in learning.

CONCLUSION

This study examined the effects of vocabulary learning using the online tool Quizlet on learners' TOEIC achievement and learner perceptions in a general TOEIC course, with particular attention to how these effects vary according to learners' initial proficiency levels. To this end, a control group using a paper-based Vocabulary Learning Log (V-log) was compared with an experimental group using Quizlet.

The results showed that the group using the online vocabulary learning tool demonstrated greater gains in achievement. The pre-post comparisons revealed statistically significant improvements along with large effect sizes, and this pattern was especially pronounced among lower-proficiency learners. These findings indicate that digital vocabulary learning can

support learner engagement and contribute to the expansion of achievement experiences.

Similar patterns were observed in learner perceptions. The control group showed relatively positive responses in terms of vocabulary organization and comprehension, whereas perceptions of learning satisfaction and self-directedness remained at a moderate level. In contrast, the experimental group reported higher evaluations across perceived effectiveness, satisfaction, and ease of use, along with relatively stronger perceptions of self-directed learning. These differences reflect the distinct nature of the learning experiences provided by the two approaches.

A particularly noteworthy finding is that lower-proficiency learners showed both substantial gains in achievement and positive perceptions. Learners who struggle with English often exhibit anxiety or avoidance; however, environments that support repeated practice and self-checking can provide opportunities for meaningful achievement. Such experiences may strengthen learners' sense of competence and support continued engagement in learning. At the same time, rather than interpreting these changes as direct evidence of the development of self-directed learning, it is more appropriate to view them as indicating that conditions supportive of self-directed learning were present. In addition, since this study did not directly measure self-directed learning through behavioral indicators, the findings should be understood in terms of potential rather than as definitive evidence of its development.

The findings of this study indicate that the choice of vocabulary learning method in general TOEIC courses can influence learners' achievement experiences and perceptions beyond the level of instructional tools. Online vocabulary learning environments that support repeated practice and self-checking can provide a basis for lower-proficiency learners to sustain their engagement in learning. In addition, in a higher education context characterized by increasing learner heterogeneity, these results highlight the need for vocabulary instruction that takes learners' proficiency levels into account. At the same time, online vocabulary learning tools may serve as complementary resources that extend learning beyond the classroom.

This study has several limitations. Given that it was conducted over a single semester at one university with a relatively small sample, caution is needed in generalizing the findings. In addition, self-directed learning was examined indirectly through perception-based survey data, and changes at the behavioral level were not directly measured. Furthermore, because the study employed a quasi-experimental design without random assignment, the observed effects—particularly the large gains in the experimental group—should not be interpreted as definitive evidence of a causal relationship attributable to a specific instructional method.

Future research should examine the applicability of these findings across a wider range of university contexts and with larger samples. In addition, longitudinal studies using learning logs or performance data are needed to analyze changes in learners' actual behaviors. Extending the scope beyond vocabulary to include grammar, listening, and reading would also allow for a more comprehensive understanding of the role of online learning tools in general TOEIC courses.

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