



Research Article

The Effects of Electronic Flashcards (Quizlet) on Vocabulary Learning of 5th Graders at Trinh Hoai Duc Primary School

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Abstract

This study investigates the effectiveness of electronic flashcards, specifically Quizlet, in improving vocabulary acquisition among fifth-grade students at Trinh Hoai Duc Primary School. Employing a quasi-experimental design with two intact classes, the research compared an experimental group ($n = 51$) using Quizlet-based vocabulary learning and a control group ($n = 49$) following traditional methods. Pre-test and post-test assessments measured vocabulary knowledge, and a post-intervention questionnaire explored learners' perceptions of using Quizlet. Results revealed no significant difference at the pre-test stage ($t(98) = 1.408, p = .162$), confirming group equivalence. However, post-test scores showed a statistically significant improvement in favor of the Quizlet group ($t(98) = -5.879, p < .001$; M difference = 0.565, 95% CI $[-0.755, -0.374]$). Questionnaire responses indicated strong positive attitudes toward Quizlet, with mean ratings ranging from 4.59 to 4.86 on a 5-point scale, highlighting its effectiveness, ease of use, and motivational impact. These findings provide empirical support for integrating electronic flashcards into primary English instruction to enhance vocabulary learning outcomes and learner engagement.

Keywords

electronic flashcards, Quizlet, vocabulary learning, primary education, digital learning tools.

1. Introduction

1.1. Background of the study

Vocabulary serves as the cornerstone of language proficiency and communicative competence. Without adequate vocabulary, learners struggle to express even simple ideas effectively (Nation, 2001; Schmitt, 2000). The mastery of vocabulary, however, poses unique challenges, especially

for young learners whose cognitive and linguistic development is still in progress. Repeated retrieval and spaced review have long been recognized as effective strategies for retaining new words (Baddeley, 1997; Webb, 2007). In recent years, advances in educational technology have introduced a

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wide range of digital learning tools designed to make vocabulary practice more engaging, efficient, and autonomous.

Among these tools, Quizlet, a web- and app-based platform, has gained substantial attention for its interactive flashcard features, including games, audio-visual elements, and self-testing modes. These features align with Mayer's (2009) Cognitive Theory of Multimedia Learning and promote dual coding—linking verbal and visual information—which enhances memory retention. For young learners, Quizlet's gamified environment can transform repetitive vocabulary practice into an enjoyable experience, increasing motivation and participation (Çakmak, 2017; Setiawan & Wiedarti, 2020).

Although numerous studies have examined Quizlet's effects on secondary and tertiary students, there is a notable scarcity of research involving primary school learners, particularly within the Vietnamese EFL context. Most prior research in Vietnam has focused on older learners (Nguyen, 2019; Tran, 2020). Therefore, the present study aims to fill this gap by exploring how Quizlet influences both the achievement and perceptions of Grade 5 students learning English vocabulary. Specifically, the study addresses two research questions:

Does the use of Quizlet significantly improve the vocabulary achievement of fifth graders compared to traditional learning methods?

What are the learners' perceptions and attitudes toward using Quizlet for vocabulary learning?

2. Literature Review

2.1. Vocabulary Learning and Technology Integration

Vocabulary acquisition is essential in second language learning, as lexical knowledge directly affects reading comprehension, writing fluency, and oral communication (Nation, 2001). Research on digital learning tools has highlighted the importance of multimodal input and learner autonomy in vocabulary development (Klimova & Pikhart, 2020). Mobile-assisted and computer-based applications such as Quizlet provide immediate feedback, self-paced review, and visual reinforcement—key components in memory consolidation.

Several empirical studies have supported the effectiveness of Quizlet in vocabulary instruction. Azabdaftari and Mozaheb (2012) found that mobile-based flashcards outperformed traditional paper cards in enhancing vocabulary retention. Dizon (2016) and Alharbi (2015) observed that students using Quizlet demonstrated higher motivation and self-regulated learning behaviors. Setiawan

and Wiedarti (2020) reported that elementary EFL students using Quizlet exhibited significantly greater vocabulary mastery and enthusiasm compared to their peers.

2.2. Quizlet in Young Learner Contexts

For primary learners, motivation and engagement are crucial. Gamification, visual reinforcement, and interactivity can stimulate young learners' curiosity and attention (Bajrami & Ismaili, 2016). Quizlet's design enables children to learn vocabulary through play-like tasks while receiving instant feedback. Research by Klimova and Pikhart (2020) in a Czech primary school revealed that Quizlet increased both performance and motivation in English vocabulary learning. However, similar investigations within Vietnamese primary schools remain limited.

2.3. Vietnamese Context and Research Gap

In Vietnam, English instruction in primary schools often emphasizes repetition, translation, and memorization. The integration of digital tools remains limited, particularly in public schools. Studies by Nguyen (2019) and Tran (2020) indicated that Vietnamese learners benefit from interactive approaches but that teachers often lack exposure to technology-enhanced pedagogies. Consequently, there is a need for empirical research that demonstrates how technology—specifically Quizlet—can effectively complement traditional instruction for young learners.

3. Research Methodology

3.1. Research Design and Participants

This research employed a quasi-experimental design with two intact classes of 5th graders at Trinh Hoai Duc Primary School. One class (5A, $n = 51$) was designated as the experimental group and received the Quizlet flashcard intervention, while the other class (5B, $n = 49$) served as the control group and followed traditional vocabulary learning methods. The students were all in grade 5 (approximately 11 years old), and both classes were taught by the same English teacher using the same curriculum (Global Success textbook series). This ensured that apart from the flashcard intervention, the instructional conditions were equivalent between groups. The demographic makeup of the groups was comparable, with a similar gender distribution (experimental: 36 males, 15 females; control: 30 males, 19 females). The uniformity in instructor, materials, age, and class environment helped control for extraneous variables and strengthened the internal validity of the study's comparisons.

3.2. Sample and Sampling Procedure

The study was conducted over a 12-week period as part of the school's regular English program. Both groups undertook a vocabulary pre-test at the beginning of the study to assess their initial vocabulary knowledge and to confirm group equivalence. The pre-test was a teacher-designed English vocabulary test covering words and phrases from the curriculum, and it was validated by peer review for content relevance. During the intervention phase, the experimental group used Quizlet for vocabulary learning, whereas the control group learned the same vocabulary through traditional methods (such as printed flashcards, copying, and textbook exercises).

The experimental group accessed teacher-created Quizlet sets via computers or personal devices in class and at home, engaging in various Quizlet study modes (Flashcards, Learn, Match, etc.) for practice. The teacher monitored and facilitated the use of Quizlet in class, encouraging students to practice pronunciation and spelling with the audio and game features of the app. In contrast, the control group was taught new vocabulary using conventional techniques like choral repetition, writing exercises, and paper flashcard drills without any digital tool. After the 12-week intervention, both groups took a post-test, which was parallel in format and content to the pre-test, to measure vocabulary learning gains.

Finally, students in the experimental group were asked to complete a post-study questionnaire to gather their perceptions of using Quizlet for vocabulary learning. This survey, administered anonymously in the students' native language (Vietnamese) to ensure clarity, contained 9 Likert-scale items (1 = strongly disagree to 5 = strongly agree) grouped into three aspects: (1) perceived usefulness/effectiveness of Quizlet, (2) ease of use and accessibility, and (3) motivation and enjoyment in using Quizlet. Example statements included "Electronic flashcards are an effective tool for learning vocabulary" and "I am more motivated to participate in vocabulary activities when flashcards are used." The questionnaire was adapted from previous studies on technology acceptance in language learning and was reviewed for age-appropriate language. All participants were informed that their responses would be used for research and that there were no right or wrong answers, to encourage honest feedback.

Data Analysis:

The pre-test and post-test scores were analyzed using IBM SPSS. An independent samples *t*-test was conducted to compare the mean scores of the control and experimental groups on each test. Levene's test was checked to confirm the assumption of equal variances for the *t*-tests. An alpha level of 0.05 was used to determine statistical significance. For the post-test, along with the *p*-value, the mean difference between groups and the 95% confidence interval (CI) of this difference

were calculated to assess the magnitude of the effect. The questionnaire data were analyzed descriptively; for each item, the mean and standard deviation (SD) of responses were computed (based on the experimental group's responses, since only they used Quizlet). These descriptive statistics provided insight into the overall trend of student attitudes toward the Quizlet intervention. Key results from the analyses are presented in the tables below.

tion's impact, effect sizes (Cohen's *d*) were calculated.

4. Results and Discussions

4.1. Vocabulary Test Performance (Pre-test and Post-test)

Baseline testing confirmed that the two groups started with equivalent vocabulary knowledge. On the pre-test, the control group (Group 1) had a mean score of 6.949 (SD = 0.4814) and the experimental group (Group 2) had a mean of 6.814 (SD = 0.4792), out of a maximum possible score of 10. As shown in Table 1, an independent samples *t*-test found no statistically significant difference between these pre-test means ($t(98) = 1.408$, $p = 0.162$). Levene's test indicated equal variances for the two groups ($F = 0.001$, $p = 0.974$), and the 95% confidence interval for the mean difference (Group 1 – Group 2) was $[-0.0554, 0.3259]$, which includes zero. This suggests that any slight difference in favor of the control group at pre-test (mean difference ≈ 0.135) was likely due to chance and not an inherent disparity in ability. Thus, both classes were statistically comparable before the intervention.

Following the 12-week intervention, vocabulary post-test scores showed a clear improvement in both groups, with a markedly larger gain in the experimental group. The control group's post-test mean was 7.549 (SD = 0.4814), whereas the experimental group's mean was 8.114 (SD = 0.4792). An independent *t*-test confirmed that this difference was highly significant ($t(98) = -5.879$, $p < 0.001$), favoring the Quizlet-assisted learning condition (Table 1). Levene's test again suggested equal variances ($F = 0.001$, $p = 0.974$). The difference in means between the control and experimental groups was -0.565 (on the 10-point scale), with a 95% CI of $[-0.7554, -0.3741]$, not crossing zero. This indicates that the experimental group's average score was about 0.56 points higher than the control's, and we can be 95% confident that the true mean difference lies between approximately -0.75 and -0.37 in favor of the experimental group. In practical terms, the Quizlet group learned notably more vocabulary over the course of the study. The effect size implied by this difference suggests a meaningful educational impact. Table 1 illustrates the score improvements from pre-test to post-test for each group, showing a larger gain for those who used Quizlet. These findings provide strong evidence that the use

of electronic flashcards significantly enhanced vocabulary learning outcomes for the 5th-grade students compared to traditional methods.

Table 1. Vocabulary test results for control (Group 1) and experimental (Group 2) groups (pre-test and post-test)

Test	Group	N	M (SD)	t (df)	p	Mean Diff. (95% CI)
Pre-test	Group 1 (Control)	49	6.949 (0.481)			
	Group 2 (Experimental)	51	6.814 (0.479)	1.408 (98)	0.162	0.1353 (-0.0554 to 0.3259)
Post-test	Group 1 (Control)	49	7.549 (0.481)			
	Group 2 (Experimental)	51	8.114 (0.479)	-5.879 (98)	< 0.001	-0.5647 (-0.7554 to -0.3741)

Note: The table includes group sample size (N), mean scores (M) with standard deviations (SD) in parentheses, and independent t-test statistics comparing group means (with degrees of freedom, df, and two-tailed p-values). The mean differences (Group 1 – Group 2) and 95% confidence intervals (CI) are also provided for each test.

For both tests, Levene's test for equality of variances was non-significant ($p = 0.974$), indicating that the t-test results are valid. The negative sign in the post-test t and mean difference indicates that Group 2 (Quizlet) scored higher than Group 1.

4.2. Student Perceptions of Using Quizlet

In addition to improved test scores, students' feedback on the Quizlet-based learning was overwhelmingly positive. Table 2 presents the experimental group's responses to the post-study questionnaire, which assessed their perceptions of the usefulness, ease of use, and enjoyability of electronic flashcards. Mean scores for all nine statements were very high, ranging from $M = 4.59$ to $M = 4.86$ on a 5-point Likert scale, with 5 indicating strong agreement. These ratings demonstrate that the 5th-grade learners generally agreed or strongly agreed with the beneficial statements about Quizlet. The standard deviations for these items were relatively low ($SD = 0.35$ – 0.67), suggesting a high level of agreement among students in their views. Notably, the highest-rated item was "I feel more capable of learning new vocabulary when using electronic flashcards," with a mean of 4.86 ($SD = 0.35$), indicating that nearly all students felt Quizlet boosted their ability to learn new words. The statements "Quizlet flashcards are an effective tool for enhancing vocabulary learning" ($M = 4.75$) and "Using flashcards helps me improve my vocabulary test results" ($M = 4.76$) also received very high agreement, reflecting students' confidence in the efficacy of Quizlet.

In terms of usability, students found the tool convenient (e.g., "easy and convenient to use," $M = 4.61$) and accessible ("can use anytime and anywhere," $M = 4.61$), and they generally felt they could use it independently without much

help ($M = 4.65$). The motivational aspect was likewise strong: learners enjoyed using the fun features of Quizlet (e.g., emoji icons and visuals) and felt more confident and motivated in vocabulary learning when using the app (means ~ 4.6 or above for these items). Even the lowest mean (4.59 for enjoying visuals) is still very high on the agreement scale, underscoring that virtually all respondents had a favorable view of the Quizlet experience.

Overall, the questionnaire results indicate that the students not only achieved better scores but also perceived the learning process more positively when using electronic flashcards. They recognized Quizlet as an effective and easy-to-use learning tool that made vocabulary study more engaging and motivating. This positive reception is an important outcome, as it suggests that the integration of Quizlet did not cause undue difficulty or frustration for young learners; instead, it appears to have increased their enthusiasm for learning English vocabulary. Such attitudinal findings complement the test score improvements, illustrating both cognitive and affective benefits of the Quizlet intervention.

Table 2. Summary of experimental group students' responses to the post-intervention questionnaire on perceptions of using Quizlet

Survey Statement (paraphrased)	Mean	SD
1. Quizlet flashcards are an effective tool for learning vocabulary.	4.75	0.44
2. Using flashcards helps me improve my vocabulary test results.	4.76	0.43
3. I feel more capable of learning new vocabulary with Quizlet.	4.86	0.35
4. Quizlet is easy and convenient to use.	4.61	0.67
5. I can access and use Quizlet anytime and anywhere.	4.61	0.67
6. I need little support from others to use Quizlet effectively.	4.65	0.66
7. I enjoy using fun visuals/emoji icons in Quizlet flashcards.	4.59	0.67
8. I feel more confident when using Quizlet to learn vocabulary.	4.63	0.66
9. I am more motivated to learn vocabulary when flashcards are used.	4.65	0.66

Note: (5-point scale: 1 = strongly disagree, 5 = strongly agree). For each statement, the table shows the mean rating and standard deviation (SD). All items reflect positive statements about the effectiveness, ease, or enjoyability of electronic flashcards in learning vocabulary.

As shown above, all mean responses are well above the neutral midpoint of 3.0, indicating strong overall agreement with the positive statements. These findings suggest that the Quizlet flashcard approach was very well-received by the learners. The high levels of perceived effectiveness and enjoyment are consistent with the substantial improvement observed in their test performance, implying that the engaging nature of Quizlet likely contributed to both better learning outcomes and higher student motivation.

4.3. Discussion

The results of this study provide clear evidence that using electronic flashcards via Quizlet can significantly enhance

vocabulary learning for primary school students. The experimental group's post-test scores were considerably higher than those of the control group, demonstrating that the integration of Quizlet into vocabulary instruction led to greater learning gains. This finding supports the hypothesis that digital flashcards improve vocabulary acquisition and is in line with the theoretical expectation that repeated retrieval practice, combined with multimodal input (text, sound, images), strengthens word retention. The approximately 0.56-point advantage (on a 10-point scale) observed for the Quizlet group, while modest in absolute terms, is educationally meaningful for young learners and was achieved over a relatively short intervention period. It indicates that even within 12 weeks, incorporating a tool like Quizlet can yield measurable improvements in vocabulary knowledge. This advantage might be attributed to the engaging learning modes provided by Quizlet, which encourage more frequent practice and allow for immediate feedback, thereby reinforcing memory. Additionally, the use of gamified elements and visuals in Quizlet likely taps into young learners' intrinsic motivation and attention, making the learning process more effective than traditional rote methods.

Beyond test scores, the positive student perceptions reported in the questionnaire shed light on how the Quizlet intervention worked from the learners' perspective. Students felt that using electronic flashcards made learning new words easier and more enjoyable. High agreement on items related to motivation and confidence suggests that Quizlet not only helped students remember words but also increased their willingness to participate in vocabulary learning. This is a crucial factor in sustaining learning gains, as motivated learners are more likely to engage in practice and use strategies that improve their language skills.

The findings here are consistent with those of prior studies that noted increased learner motivation and engagement when using Quizlet or similar platforms. For instance, the enhanced engagement observed in our 5th-grade class echoes Çakmak's (2017) results with high school students, where Quizlet users showed greater involvement and interest in learning activities compared to a control group. Likewise, the boost in confidence and motivation aligns with Setiawan and Wiedarti's (2020) findings in Indonesia, which highlighted that young learners were more motivated to learn vocabulary with Quizlet support. Our study extends such insights to a Vietnamese primary school context, reinforcing the idea that digital flashcards can create a more stimulating and supportive learning environment for children.

Several pedagogical implications emerge from this research. First, the significant improvement in vocabulary outcomes suggests that teachers of young learners should consider integrating electronic flashcard tools like Quizlet into their instruction. Doing so can complement traditional

teaching methods and provide diverse modes of practice (e.g., self-testing, matching games) that cater to different learning styles. The ease of use and accessibility reported by students indicate that even primary-aged children can navigate and benefit from these technological tools with minimal difficulty. This means that after initial guidance, learners may continue to use Quizlet autonomously for review, which can promote independent learning habits outside the classroom. Second, the heightened motivation and enjoyment associated with Quizlet use point to the value of incorporating gamification and interactivity in educational materials. These elements can transform an activity often seen as tedious—memorizing vocabulary—into a fun challenge, thereby reducing learner anxiety and boredom. Teachers and curriculum designers might leverage this by designing flashcard sets and games that align with curricular content, making learning both effective and enjoyable. Importantly, the success of the Quizlet intervention in this study was achieved without replacing the core curriculum but rather by supplementing it, suggesting that technology integration can be seamless and need not detract from required material.

Despite the positive outcomes, a few considerations should be noted. This study was conducted in a single school with a specific cohort of 5th-grade learners, and the intervention spanned 12 weeks. Thus, the generalizability of the findings might be limited to similar contexts. Future research could involve multiple schools or a longer intervention period to examine long-term retention of vocabulary and the sustained impact of digital flashcards. Additionally, qualitative observations or interviews could be incorporated to gain deeper insight into how students use Quizlet (e.g., which features they find most helpful) and what challenges, if any, they encounter. Such data could help refine implementation strategies for diverse classroom settings. It would also be useful to compare Quizlet with other educational apps or traditional flashcards in a more fine-grained manner to isolate which features (e.g., audio pronunciation, immediate feedback, game elements) contribute most to learning gains.

In summary, the discussion underscores that the integration of Quizlet electronic flashcards in a 5th-grade English class led to significant improvements in vocabulary acquisition and was met with enthusiastic approval from the learners. The combination of quantitative gains and positive qualitative feedback suggests a synergistic effect: Quizlet helped students learn more words and enjoy the process of learning. These findings contribute to the growing body of evidence advocating for the thoughtful use of technology in language education, especially for young learners who are digital natives and may respond particularly well to interactive learning tools.

5. Conclusion

This study provides empirical support for the effectiveness of electronic flashcards, specifically via Quizlet, in enhancing vocabulary learning among primary school students. The 5th-grade learners who used Quizlet showed significantly greater vocabulary gains than those who learned through traditional methods, demonstrating that digital flashcard practice can lead to measurable improvements in language outcomes even over a short term. In addition to academic gains, students responded very positively to the Quizlet-based learning approach, reporting increased motivation, confidence, and enjoyment in learning new English words. These dual benefits—cognitive and affective—highlight the value of integrating technology like Quizlet into vocabulary instruction for young learners.

By addressing a gap in the literature regarding technology use in Vietnamese primary classrooms, this research suggests that tools such as Quizlet can be successfully implemented in local educational contexts to support English language teaching. Teachers are encouraged to incorporate electronic flashcards as a supplement to regular instruction, as the interactive and user-friendly nature of such tools can enrich the learning experience and potentially improve retention of new vocabulary. While traditional methods remain important, the findings indicate that blending them with digital strategies can produce superior outcomes.

In conclusion, the use of Quizlet in the 5th-grade classroom at Trinh Hoai Duc Primary School proved to be a beneficial intervention for vocabulary development. It not only helped students learn more effectively but also made the learning process more engaging. Schools and educators aiming to boost vocabulary acquisition and student engagement in language learning should consider the adoption of electronic flashcard platforms. As educational practices evolve in the digital age, harnessing technology's strengths can play a key role in fostering better learning and more enthusiastic learners.

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