VELES JOURNAL

Vol. 9, No. 3; December 2025
E-ISSN 2579-7484
Pages 638-652
DOI: http://dx.doi.org/10.29408/veles.v9i3.31555

Using a Digital Flashcard Application to Improve Vocabulary Mastery among Elementary EFL Learners

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Submission History:
Submitted: July 12, 2025
Revised: December 19, 2025
Accepted: December 29, 2025

Abstract

Vocabulary instruction at the elementary level in Indonesia often remains decontextualized and insufficiently aligned with learners' cognitive and affective needs, resulting in low engagement and limited vocabulary comprehension. To address this issue, this study investigated the effectiveness of the Englishcard digital flashcard application in enhancing fourth-grade students' vocabulary mastery. It explored students' perspectives on its use in vocabulary learning at a private primary school. This study employed a quasi-experimental design with a mixed-methods approach. Forty-four fourth-grade students were selected through purposive sampling and divided into an experimental group (n = 20) that received vocabulary instruction using the Englishcard application and a control group (n = 20) that received conventional instruction using English textbooks. The treatment was conducted over eight instructional meetings. Quantitative data were collected through pre- and post-tests and analyzed using SPSS 26, including tests of normality, homogeneity, and independent-samples t-tests. Qualitative data were obtained through open-ended interviews with students in the experimental group and analyzed using content analysis to examine perceived opportunities and challenges of the application. The quantitative findings revealed a significant improvement in vocabulary mastery among students taught using the Englishcard application, with a Sig. (2-tailed) value of 0.000 (< 0.05), indicating that the application was practical in improving students' vocabulary achievement. Qualitative findings further showed that students perceived Englishcard as supporting personalized learning, engagement, flexible access, and diverse learning styles. Nevertheless, challenges related to repetitive activities, motivation, and technical barriers, such as internet connectivity, were also identified. the findings suggest that the Englishcard application is an effective supplementary tool for vocabulary instruction when supported by appropriate teacher guidance and infrastructure, offering pedagogical implications for elementary EFL vocabulary learning in similar contexts.

Keywords: EnglishCard, digital flashcard, vocabulary mastery, English for young learners.

INTRODUCTION

Vocabulary mastery constitutes a foundational element in English as a Foreign Language learning, particularly for early-stage learners, because it underpins comprehension and production across listening, speaking, reading, and writing (Cheng & Matthews, 2018; Kılıç, 2019; Masrai, 2019). For elementary learners, vocabulary often serves as the main entry point to meaning-making by enabling learners to recognize meanings, interpret messages, and begin to express ideas, and its development is closely related to the quality and intensity of learning context and exposure (Heras & Lasagabaster, 2014; Lázaro-Ibarrola, 2024; Castellano-Risco et al., 2020). Theoretically, vocabulary knowledge includes receptive vocabulary that supports listening and reading comprehension, and productive vocabulary that supports speaking and writing, with receptive vocabulary development commonly providing a foundation for later, more confident language production (González-Fernández & Schmitt, 2018; Jafarigohar et al., 2022; Geoghegan, 2023). When vocabulary knowledge is insufficient, learners tend to experience difficulties in processing input, participating in classroom interaction, and producing meaningful output, even when some grammatical awareness is present, because limited lexical access becomes a significant constraint on comprehension and communication (Lange & Matthews, 2020; Ratnasari, 2020). Effective vocabulary learning at this level, therefore, requires contextualized and meaningful exposure in which word meanings are supported through explanation, multimodal input, and engaging contexts that facilitate noticing and retention (Zhao & Macaro, 2014; Teng, 2022; Tsai & Tsai, 2018). When vocabulary instruction fails to meet these conditions, comprehension difficulties may undermine learners' motivation, engagement, and confidence, reinforce avoidance behaviors and limit long-term communicative development. Consequently, vocabulary mastery should be treated as a central rather than peripheral component of elementary EFL instruction (Tanaka, 2017; Ebadi & Bashiri, 2018; Dubiner, 2017).

Despite the recognized importance of vocabulary mastery, vocabulary instruction in many elementary EFL classrooms remains constrained by limited instructional media and a heavy reliance on textbook-centered approaches, in which teachers often treat textbooks as the primary source of classroom language input and activities (Guerrettaz et al., 2022; Rathert & Cabaroğlu, 2022; Criado, 2023; Li & Li, 2021). Vocabulary is frequently introduced through isolated explanation and decontextualized practice that is insufficiently connected to learners' experiences, cognitive readiness, and proficiency levels. When the lexical demands of instructional materials exceed learners' existing resources, comprehension becomes difficult unless vocabulary items are supported through meaningful contexts and multimodal aids such as visual support and other developmentally appropriate media for young learners (Van Parys et al., 2024; Yakubu & Obafemi, 2023; Rofiq, 2023; Tembe & Reed, 2016). As a consequence, learners who repeatedly encounter comprehension difficulties without adequate instructional support may participate less actively, hesitate to use newly learned words, and gradually disengage from classroom activities. These patterns of reduced participation and withdrawal emerge as affective responses shaped by how materials are used and how engaging or intimidating the learning environment is perceived to be, ultimately constraining sustained vocabulary development (Maher & King, 2023; Guerrettaz et al., 2021; Toohey et al., 2015).

One pedagogical approach that has gained increasing attention in elementary EFL vocabulary instruction is the use of digital flashcards, which have been widely examined as technology-supported tools for building vocabulary knowledge and supporting learners' practice beyond conventional paper-based techniques (Dizon & Tang, 2017; Yowaboot & Sukying, 2022; Halamish & Elias, 2022). Digital flashcards typically present vocabulary items through integrated visual, textual, and auditory representations, enabling learners to connect meanings with forms and pronunciations while reducing cognitive load through supportive multimodal input (Lin & Yu, 2016; Chen & Chan, 2019; Takacs et al., 2015). For elementary learners, digital flashcards are particularly effective because vocabulary growth depends strongly on repeated encounters and well-timed review. When practice is spaced rather than massed, learners tend to demonstrate stronger recall and retention over time, thereby supporting receptive vocabulary development as a foundation for later language production (Nakata, 2015; Nakata & Elgort, 2020; Namaziandost et al., 2020). In addition, digital flashcards can enhance learner engagement and motivation because interactive and gamified practice makes vocabulary learning more participatory and less monotonous, a condition that has been consistently linked to improved learning outcomes in mobile and digital language learning contexts (Sung et al., 2015; Setiawan & Wiedarti, 2020; Waluyo & Bucol, 2021). Furthermore, mobile access to digital flashcards allows learners to review vocabulary flexibly across different learning settings, encouraging more independent practice. Accordingly, in this study, the Englishcard application is positioned not as a replacement for teacher instruction but as a supplementary tool that reinforces classroom learning through additional exposure, guided practice, and structured follow-up review (Wu, 2015; Khan, 2022; Fadhilawati, 2022).

Previous research has consistently demonstrated the pedagogical value of flashcards, particularly digital flashcards, in supporting EFL learners' vocabulary development across educational levels and learning contexts. For instance, Chen and Chan (2019) found that both augmented reality flashcards and paper flashcards significantly improved young learners' vocabulary acquisition in early childhood education, with no significant difference in learning outcomes between the two formats, while teachers highlighted increased learner enjoyment alongside practical implementation challenges. This finding suggests that technological enhancement alone does not guarantee superior outcomes but may influence affective engagement. Similarly, Dizon and Tang (2017) reported that both digital and paper flashcards supported significant gains in receptive and productive vocabulary among university-level EFL learners when appropriate vocabulary-learning strategies were incorporated, underscoring the importance of instructional support rather than tool modality alone. In contrast, studies conducted in more interactive or digitally enriched learning environments have reported more substantial advantages for digital flashcards. Andriani et al. (2024) demonstrated that gamification-based digital flashcards significantly improved junior high school students' vocabulary mastery and learning enthusiasm, with students benefiting from increased exposure, attention, and motivation through interactive design elements. Khan (2022) further showed that flashcards were particularly effective in online learning contexts, where they provided structured vocabulary input and practice during periods of limited face-to-face instruction. Evidence from primary education also supports the effectiveness of digital flashcards, as Yowaboot and Sukying (2022) found that Thai primary school EFL learners who used digital flashcards

outperformed those receiving conventional instruction in both receptive and productive vocabulary knowledge and reported highly positive attitudes toward their use.

Existing research has offered valuable insights into the use of flashcards and digital tools for vocabulary learning across a range of educational contexts. Much of this evidence, however, has been generated from online instruction, gamified platforms, augmented reality environments, or studies involving older learner populations, with comparatively less attention given to structured digital flashcard applications implemented within regular primary school classrooms. Previous investigations have tended to prioritize vocabulary learning outcomes, while learners' experiences, perceptions, and challenges in using digital flashcards have often been treated as secondary or examined separately. In addition, differences in instructional design, learner age, and classroom integration suggest that the effectiveness of digital flashcards may vary across learning contexts. In primary school settings, where learners are still developing foundational vocabulary knowledge and learning autonomy, the manner in which digital flashcards are integrated into face-to-face instruction and how learners perceive them becomes particularly salient. Consequently, empirical evidence that simultaneously examines vocabulary mastery and learners' perspectives in a primary EFL classroom context, using a classroom-based digital flashcard application, remains limited. Examining both dimensions provides a more comprehensive understanding of how digital flashcards function not only as instructional tools but also as meaningful learning experiences for young EFL learners.

METHOD

In this study, a quantitative approach was employed to test the research hypotheses by measuring variables numerically and applying inferential statistical procedures to evaluate the effectiveness of the proposed intervention (Lakens et al., 2018; Benjamin et al., 2018). Data collection and statistical analysis were conducted systematically using IBM SPSS version 26 to manage the dataset and perform the required descriptive and inferential analyses. The study adopted a quasi-experimental nonequivalent control group design to examine the treatment effect in a real classroom context where random assignment is typically impractical, comparing outcomes between an experimental group using Englishcard and a control group receiving conventional textbook-based instruction (Gopalan et al., 2020; Adelson et al., 2017). Purposive sampling was applied because the participants were drawn from intact pre-existing classes at the same grade level, allowing the study to preserve natural instructional conditions while ensuring that the sample aligned with the study's practical constraints (Etikan et al., 2016; Gentles et al., 2015). In addition to quantitative outcomes, qualitative data were collected to capture students' perspectives, and these written responses were analyzed using content analysis to identify patterns that could help explain or contextualize the statistical results (McKim, 2017; Nicmanis, 2024).

The study population consisted of fourth-grade students at a private primary school. It involved two intact classes retained as naturally occurring groups, with one serving as the experimental group and the other as the control group. This approach is commonly used in school-based quasi-experimental research when random assignment is infeasible. Purposive sampling was employed because the study intentionally selected participants who matched the research purpose, including participants with the same grade level, a comparable instructional context, and feasible access. This sampling strategy is considered appropriate

when researchers require information-rich or criterion-aligned groups and must transparently acknowledge issues of representativeness and inference (Cornesse et al., 2020; Wiśniowski et al., 2020). Fourth-grade learners were considered suitable participants because they are developmentally ready to engage with structured digital learning media while continuing to expand foundational language skills, making this level appropriate for examining technology-supported vocabulary learning in a primary EFL context. In addition, using two classes with similar academic backgrounds and the same curriculum, including familiar everyday themes, supports the interpretability of treatment effects by reducing instructional context differences and strengthening baseline comparability in quasi-experimental evaluations (Cham et al., 2024).

To collect data, vocabulary tests were administered to both the experimental and control groups in the form of pretests and posttests. The test instruments were examined for validity, reliability, and appropriate scoring procedures prior to data analysis. In addition to the vocabulary tests, open-ended interviews were conducted with 20 students from the experimental group to explore their perspectives on the Englishcard application, focusing on the opportunities and challenges they encountered. This open-ended format allowed participants to describe their experiences in their own words and provided rich qualitative data to complement the quantitative findings (Castillo Montoya, 2016; McKim, 2023). Finally, students' interview transcripts and written responses were analyzed using qualitative content analysis procedures to systematically organize, categorize, and interpret recurring meanings relevant to the research focus (Gläser Zikuda et al., 2019; Nicmanis, 2024).

Quantitative data analysis began with screening the dataset to examine distributional assumptions, including normality, and to assess the equality of variances across groups. After these assumptions were evaluated, posttest scores of the experimental and control groups were compared using an independent-samples t-test, with appropriate adjustments when the variance assumptions were not fully met (Hanusz & Tarasińska, 2015; Şimşek, 2023). Following the quantitative phase, qualitative interviews were conducted with 20 students from the experimental group to explore their perceived opportunities and challenges with the Englishcard application. This sequential explanatory approach allowed qualitative evidence to contextualize and clarify quantitative patterns, thereby strengthening the overall interpretation of the findings (Matović & Ovesni, 2023). The interview data were analyzed using inductive qualitative content analysis, which involved transcribing the recordings, reading the transcripts repeatedly to build familiarity, coding meaningful units of data, and grouping similar codes into broader categories or themes that represented recurring patterns while preserving participants' perspectives (Özden, 2024).

FINDING AND DISCUSSION

The effectiveness of the Englishcard digital flashcard application was examined by comparing vocabulary mastery among fourth-grade students who received instruction with the application with those taught through conventional textbook-based methods. Vocabulary performance between the experimental and control groups was analyzed using descriptive and inferential statistics to determine whether the instructional intervention produced a significant difference in learning outcomes.

Table 1. Descriptive statistics output

	N	Range	Min	Max	Mean		Std Dev	Var	Skewness		Kurtosis	
					Sta	Std Er		Sta	Sta	Std Er	Sta	Std Er
Control class	20	40.0	46.6	86.67	66.6	2.16	9.6	93.5	-.115	.512	.047	.992
Ex Class	20	33.3	66.67	100	80.6	1.98	8.89	79.0	0.95	.512	-107	.992
Valid N	20											

The descriptive analysis of students' vocabulary post-test scores shows apparent differences between the control and experimental groups. The control group, consisting of 20 students, achieved scores ranging from 46.67 to 86.67, with an average of 66.67, indicating moderate vocabulary mastery following conventional instruction. In comparison, the experimental group demonstrated higher overall performance, with scores ranging from 66.67 to 100.00 and a higher mean score of 80.67. This pattern suggests that students who received vocabulary instruction through the Englishcard application achieved better learning outcomes than those taught using textbook-based methods. In terms of score distribution, both groups displayed relatively low variability, as indicated by their standard deviation values, with the experimental group showing slightly more consistent performance. The skewness and kurtosis values for both groups were within acceptable limits, indicating that the data were approximately normally distributed.

Table 2. Normality Test Result

	Kologorov-Smirnov			Shapiro-Wilk		
Class	**Statistic**	**df**	**Sig.**	**Sta**	**df**	**Sig.**
Control class	.155	20	.200	.958	20	.499
Ex Class	.170	20	.132	.933	20	.174

The normality of the data was examined using both the Kolmogorov–Smirnov and Shapiro–Wilk tests for the control and experimental groups. The results showed that the significance values for both tests were greater than the 0.05 threshold in each group. Specifically, the control group demonstrated p-values of 0.200 in the Kolmogorov–Smirnov test and 0.499 in the Shapiro–Wilk test, while the experimental group showed p-values of 0.132 and 0.174, respectively. These findings indicate that the vocabulary post-test scores in both groups were normally distributed. Consequently, the assumption of normality required for subsequent inferential statistical analysis was satisfied, allowing parametric tests to be appropriately applied.

Table 3. Homogeneity Test Result

	Levene Statistic	**df1**	**df1**	**Sig.**
Based on Mean	.253	1	38	.618
Based on Median	.298	1	38	.588
Based on Median and with adjusted df	.298	1	37.985	.588
Based on the trimmed mean	.285	1	38	.596

The homogeneity of variance between the control and experimental groups was examined using Levene's test. The results showed that the significance values obtained from

the test were all greater than the established threshold of 0.05, with the mean value reaching 0.618. These findings indicate that there was no significant difference in variance between the two groups. Therefore, the assumption of homogeneity of variance was met, confirming that the data from both groups were comparable. As a result, an independent-samples t-test to compare post-test scores between the control and experimental groups was considered appropriate.

Table 4. T-test

				95% Confidence interval of the difference				
	Mean	Std.Dev	Std Error Mean	Lower	Upper	t	df	Sig.(2-tailed)
Control Class	-200	8.94	1.99	-6.18	2.18	-1.00	19	.330
Ex Class	-18.00	10.83	2.42	-23.07	-12.92	-7.42	19	.000

The results of the independent samples t-test reveal different patterns of vocabulary improvement between the control and experimental groups. In the control group, the mean difference between pre-test and post-test scores was slight and not statistically significant, as indicated by a t value of −1.000 and a Sig. (2-tailed) value of 0.330, which exceeds the significance level of 0.05. This finding suggests that conventional textbook-based instruction did not lead to a meaningful improvement in students' vocabulary mastery. In contrast, the experimental group demonstrated a substantial increase in vocabulary scores after receiving instruction using the Englishcard application. The mean difference between pre-test and post-test scores was −18.00, with a t value of −7.428 and a Sig. (2-tailed) value of 0.000, which is well below the 0.05 threshold. This result indicates a statistically significant improvement in vocabulary mastery among students in the experimental group. The confidence interval for the experimental group did not cross zero, further confirming the reliability of the observed effect.

Students' Perspectives on the Englishcard Application

The qualitative findings explore students' perspectives on the use of the Englishcard application in vocabulary learning, focusing on perceived opportunities and challenges. Data were obtained through interviews with twenty students from the experimental group who used the application during the instructional period. Overall, students' responses reinforced the quantitative findings by illustrating how the Englishcard application supported vocabulary learning while also revealing practical and motivational challenges encountered during its use.

Many students perceived the Englishcard application as supporting personalized and self-paced learning. They reported that the application allowed them to adjust the difficulty of vocabulary items according to their own ability, enabling them to begin with simpler words before progressing to more challenging ones. This flexibility helped students focus on vocabulary items that were relevant to their interests and learning goals. One student explained, *"We learn a lot with the application because it has easy words and also difficult words. We can start from the easy ones first and move to the harder ones when we feel ready."*

Another student added, *"I like that I can choose the topic I want to learn, such as animals or places, so I feel more excited to remember the words."* Students also highlighted the value of the application's instant feedback, which helped them understand word meanings and usage without relying heavily on dictionaries. As one participant noted, *"When I answer the practice, I can see directly if it is correct or not, and I understand why the word is used in that sentence."* This immediate feedback supported students' confidence and encouraged repeated practice, contributing to stronger vocabulary retention.

The application was also widely perceived as an attractive and engaging digital tool. Students found the visual design, animations, images, and interactive tasks enjoyable and motivating, making vocabulary learning less monotonous than with traditional methods. Several students emphasized that the interactive features helped them remember words more easily. One student stated, *"The Englishcard application makes learning vocabulary fun because there are pictures and games, so it does not feel boring like just reading from a book."* Another commented, *"I remember the words better when I see pictures and hear the pronunciation at the same time."* These responses suggest that the application's multimodal features supported memory retention and encouraged active involvement in learning.

Students also appreciated the flexibility and accessibility of the Englishcard application, particularly its mobile-based format. They reported that the application could be accessed anytime, anywhere on smartphones, tablets, or laptops, allowing them to review vocabulary outside the classroom. One student explained, *"I can open the application at home or when I have free time, so I can practice even when there is no class."* Another added, *"Sometimes I review the words before going to school or when I am not busy, and it helps me remember more."* This flexibility encouraged frequent review and helped students build learning habits without feeling pressured or anxious. Several students mentioned that regular short reviews made it easier to recall vocabulary during classroom activities.

In addition, students perceived that the Englishcard application supported diverse learning styles. Visual learners benefited from images and animations, auditory learners from pronunciation and audio features, and kinesthetic learners from interactive quizzes and tasks. One student remarked, *"The application has pictures, sound, and quizzes so that everyone can learn in their own way."* Another student noted, *"Some of my friends like listening to the pronunciation, and others like reading the text or playing the quiz. The application helps all of us."* These responses indicate that the application accommodated individual differences in learning preferences, which students viewed as beneficial for vocabulary development.

Despite these positive perceptions, students also identified several challenges associated with using the Englishcard application. One commonly reported issue was decreased motivation due to repetitive activities. While repetition initially supported learning, some students felt that repeated flashcards and similar tasks eventually became monotonous. As one student explained, *"At first it was very fun, but after doing the same flashcards many times, I felt a little bored."* Another student shared, *"The games are nice, but sometimes the questions feel the same, so I lose interest."* Students also noted that limited teacher or parental guidance reduced opportunities to apply newly learned vocabulary in real contexts, which sometimes led to passive learning and quick forgetting.

Technical barriers were another major challenge reported by students. Issues such as unstable internet connections, slow loading times, and limited access to suitable devices disrupted learning activities. One student stated, *"I like the application, but sometimes the*

internet is slow, so I cannot open the activities quickly." Another student added, *"Some of us have old phones, so the application does not work well, and we have to share with friends."* These technical constraints occasionally affected students' concentration and motivation, particularly when learning was interrupted or delayed.

DISCUSSION

This study investigated the effectiveness of the Englishcard digital flashcard application in improving fourth-grade EFL learners' vocabulary mastery. It examined students' perspectives on its use in a primary school context. The quantitative findings demonstrated that students who learned vocabulary through Englishcard achieved significantly higher post-test scores than those who received conventional textbook-based instruction, indicating that the application contributed positively to vocabulary development. This finding aligns with previous research showing that digital flashcards enhance vocabulary learning by supporting repeated exposure, form–meaning mapping, and multimodal input, which are particularly beneficial for young EFL learners (Dizon & Tang, 2017; Halamish & Elias, 2022; Yowaboot & Sukying, 2022). The results further corroborate studies emphasizing that vocabulary mastery is foundational to language proficiency and that improved lexical knowledge facilitates comprehension and production across language skills (Cheng & Matthews, 2016; Kilic, 2019; Masrai, 2019).

The observed gains in the experimental group suggest that Englishcard supported both receptive and emerging productive vocabulary development. This outcome is consistent with research indicating that receptive vocabulary growth typically precedes productive use and serves as a critical foundation for later language output in primary EFL contexts (González-Fernández & Schmitt, 2018; Jafarigohar et al., 2022; Geoghegan, 2023). The multimodal features of Englishcard, including visual representations and audio pronunciation, likely strengthened learners' form–meaning connections and reduced cognitive load, thereby facilitating more efficient vocabulary acquisition (Lin & Yu, 2016; Takacs et al., 2015; Teng, 2022). Such findings reinforce evidence that vocabulary learning is most effective when learners receive contextualized and multimodal support rather than relying solely on decontextualized word lists or textbook explanations (Zhao & Macaro, 2014; Van Parys et al., 2024).

Students' perspectives further illuminate why the Englishcard application was practical. Learners perceived the application as supporting personalized and self-paced learning, allowing them to adjust difficulty levels and select topics aligned with their interests. This sense of autonomy is vital in primary EFL classrooms, where motivation and affective engagement strongly influence learning outcomes (Tanaka, 2017; Heras & Lasagabaster, 2014; Maher & King, 2023). The availability of immediate feedback was also reported to enhance understanding and confidence, enabling students to verify their responses and refine their vocabulary knowledge without excessive dependence on translation. Such feedback mechanisms are known to support noticing and deeper lexical processing, which contribute to stronger retention (González-Fernández & Schmitt, 2018; Teng, 2022).

The flexibility of mobile access emerged as another key affordance of the Englishcard application. Students reported engaging in vocabulary review beyond classroom time, which encouraged repeated exposure and habit formation. This finding supports prior research

demonstrating that mobile-assisted vocabulary learning extends learning opportunities and strengthens retention through frequent, spaced encounters with target words (Nakata, 2015; Sung et al., 2015; Wu, 2015). In EFL contexts where exposure to English outside school is limited, such flexibility can play a crucial role in supporting sustained vocabulary growth (Lázaro-Ibarrola, 2024; Castellano-Risco et al., 2020).

At the same time, students identified challenges that contextualize the application's effectiveness. Repetitive activities were perceived as potentially demotivating over time, suggesting that while repetition is essential for vocabulary learning, insufficient variation may reduce engagement if not complemented by meaningful application (Namaziandost et al., 2020; Tsai & Tsai, 2018). Students also reported technical barriers, such as unstable internet connections and limited device access, which occasionally disrupted learning. These constraints echo previous findings that the success of digital learning tools depends not only on pedagogical design but also on infrastructural support and material conditions (Li & Li, 2021; Guerrettaz et al., 2022). Furthermore, the need for teacher guidance emerged as critical in helping students apply newly learned vocabulary in communicative contexts, reinforcing the view that digital flashcards are most effective when integrated into instructional practices rather than used in isolation (Criado, 2023; Rathert & Cağaroğlu, 2022).

CONCLUSION

This study examined the effectiveness of the Englishcard digital flashcard application in enhancing vocabulary mastery among fourth-grade EFL learners in a private primary school. It explored students' perspectives on its use in vocabulary learning. The findings demonstrate that Englishcard had a significant positive effect on students' vocabulary achievement compared to conventional textbook-based instruction, indicating that digital flashcards can function as an effective supplementary tool in primary EFL classrooms. The improvement in vocabulary mastery suggests that repeated exposure, multimodal input, and structured practice provided through the application supported learners' lexical development at a foundational stage of language learning.

In addition to measurable learning gains, students' perspectives revealed that Englishcard fostered engagement, flexibility, and learner autonomy by allowing self-paced learning, immediate feedback, and access beyond classroom time. These affordances contributed to positive learning experiences and reinforced vocabulary retention, although challenges related to repetition, technical constraints, and the need for teacher guidance were also identified. Taken together, the findings indicate that the pedagogical value of digital flashcard applications lies not only in their technological features but also in their integration into classroom instruction and in teacher support. This study contributes context-specific evidence on the use of digital flashcards in primary EFL settings. It highlights the importance of combining digital tools with instructional mediation to maximize vocabulary learning outcomes.

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