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The Impact of Utilising Quizlet Flashcards to Enhance EFL Senior High School Students' Vocabulary Acquisition

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Abstract

This study investigated the effect of Quizlet Flashcards (QFs) on the lexical comprehension of English as a Foreign Language (EFL) secondary school students. Sixty tenth-grade pupils from two senior high schools in Banda Aceh were assigned to treatment and comparison groups using a non-probability sampling approach. A quasi-experimental design was applied, with both groups completing initial and subsequent assessments to measure vocabulary comprehension gains. Data were analysed using independent and paired sample t-tests, supplemented by descriptive statistics and percentage improvement scores. Findings revealed statistically significant improvements in both groups: treatment ($t=19.284$, $df=29$, $p<.05$) and comparison ($t=9.391$, $df=29$, $p<.05$). The treatment group's mean improvement was 12 points higher than that of the comparison group, indicating a stronger learning effect when QFs were integrated into vocabulary instruction. This enhanced retention is attributed to QFs' interactive and multimodal features, which facilitated repeated exposure and active recall. The results provide empirical support for incorporating QFs into EFL vocabulary teaching to achieve greater lexical comprehension gains. The study contributes to the growing body of evidence on QFs as an effective tool for improving vocabulary learning in secondary school contexts.

Keywords: Mobile-Based Lexical Acquisition, English for Non-Native Speakers, Quizlet Flashcards, Lexical Acquisition

Introduction

Learning vocabulary poses a considerable challenge for EFL senior high school students in Indonesia; a sentiment shared among learners in Banda Aceh's senior high schools. Particularly, students grapple with limited vocabulary, often relying on English dictionaries when encountering new words due to difficulties in remembering their meanings and correct pronunciation (Aisiyah et al., 2024). As an English teacher in high schools and a teaching assistant at a university in Aceh, one of the researchers noted that students' grasp of vocabulary remains at a relatively low level. According to Alwasilah (2001), Indonesian secondary school pupils are supposed to have absorbed between 3000-5000 English words

by the end of their studies, based on English curriculum. This guideline is derived from Nation (2006), who emphasises that to effectively use English, learners should grasp around 2,000-3,000 words. However, Mustafa (2019) indicates that senior high school students had only mastered 72% of the initial level (1,000) among the 14,000 word-families identified by Nation (2006). Given this shortfall in vocabulary size compared to curriculum expectations, it becomes imperative that Indonesian secondary school pupils should be skilled in all terms within the initial 3000 listed by Nation (2006) to comprehend texts in national examinations. Conversely, Komari, Suryanto, and Hanum (2022) disclose that the average English vocabulary size among first-semester university students was merely 1,226, meeting Nation's (2006) recommendation. Consequently, it can be inferred that Indonesian students still lack an adequate vocabulary size for effective English communication.

Another issue highlighted in vocabulary acquisition, as noted by Lauer (2003), involves learners' tendency to associate their English word comprehension with their ability to deduce meanings. Based on the researcher's teaching experience, learners often rely on guesswork to derive word meanings in many instances. Therefore, the objective of this study was (1) to examine the effectiveness of Quizlet Flashcards (QFs) as a vocabulary learning aid for English as a Foreign Language (EFL) students in Aceh. Specifically, it sought to measure the extent of vocabulary knowledge gains among senior high school learners following instruction supported by QFs. This study also aimed (2) to underscore the pedagogical value of QFs as a supplementary tool for enhancing vocabulary acquisition in EFL contexts. Accordingly, the research objective was formulated to assess the difference in vocabulary knowledge among EFL senior high school students after receiving vocabulary instruction using QFs. In addition, the scope of this study is limited to senior high school learners in Banda Aceh as a representative EFL context. It focuses specifically on the use of Quizlet Flashcards (QFs) as the main instructional tool and examines measurable changes in students' vocabulary knowledge, particularly recognition, recall, and usage without extending to other language skills such as grammar, reading, or speaking.

Literature Review

The study integrates several interconnected theories: Sweller's CLT, Mayer's CTML, Bloom's Digital Taxonomy, and Technology Enhanced Language Learning. Cognitive Load Theory serves education by considering human cognitive functions when structuring instruction, acknowledging the limitations of working memory during information processing. Specifically, in this research, CLT differentiated between extraneous cognitive load, which is not conducive to learning, and germane load, crucial for constructing schemas and automating relevant information. Furthermore, Krashen's input and affective filter hypothesis become evident during vocabulary learning, with a low affective filter indicating successful vocabulary acquisition. Conversely, a high affective filter is observed when vocabulary acquisition is unsuccessful. However, according to the level of processing theory, when learners concentrate on the visual appearance of things, they engage in structural processing, operating at a superficial or shallow processing level. Conversely, if learners prioritise understanding the meaning, they delve into semantic processing, which represents a deeper level of processing.

From the conceptual framework as shown in Figure 1, it is hypothesised that when students utilize QFs to learn new words, they might encounter extraneous cognitive load. This load

refers to an overwhelming input or information that may exceed the participants' comprehension level. It happens during vocabulary instruction sessions that involve interactional or non-interactional practice activities, aligning with the theories. Consequently, participants might engage in a surface-level understanding (structural processing), leading to a high affective filter, potentially hindering their learning of the target words. Conversely, if students use QFs to learn new words, they could experience germane cognitive load. This load represents input that participants can comprehend effectively. It occurs during vocabulary instruction sessions comprising interactional or non-instructional practice activities, following theoretical principles. This engagement could prompt participants to focus on meaning (semantic processing), indicating a deeper level of understanding. Consequently, this might result in a low affective filter, enabling respondents effectively learning the lexical. Under the arrangement, this independent variable is QFs, which serves as the input, while dependent variable is the learning outcome of the target lexical, whether the vocabulary is acquired or not. Meanwhile, the intervention phase of the framework encompasses various practice activities (both interactional and non-interactional).

To ground this study, several theoretical perspectives are integrated to explain how learners acquire vocabulary through digital tools such as Quizlet Flashcards (QFs). These perspectives collectively form the conceptual lens of the research. At the core is Cognitive Load Theory (CLT), which explains how working memory constraints influence the effectiveness of instructional design (Sweller, 1994). Complementing this, Cognitive Theory of Multimedia Learning (CTML) (Mayer, 2009) highlights how learners process verbal and visual input simultaneously, an essential principle for technology-enhanced environments. Krashen's Input Hypothesis and Affective Filter Hypothesis (Krashen, 1982) provide insight into how comprehensible input and emotional states such as motivation and anxiety affect vocabulary acquisition. Meanwhile, the Levels of Processing Theory (Craik & Lockhart, 1972) clarifies the distinction between shallow structural processing and deeper semantic processing, offering a lens to interpret the quality of students' engagement with new vocabulary. Finally, Bloom's Digital Taxonomy and broader perspectives on Technology Enhanced Language Learning (TELL) provide a pedagogical scaffold for situating QFs within 21st-century language classrooms.

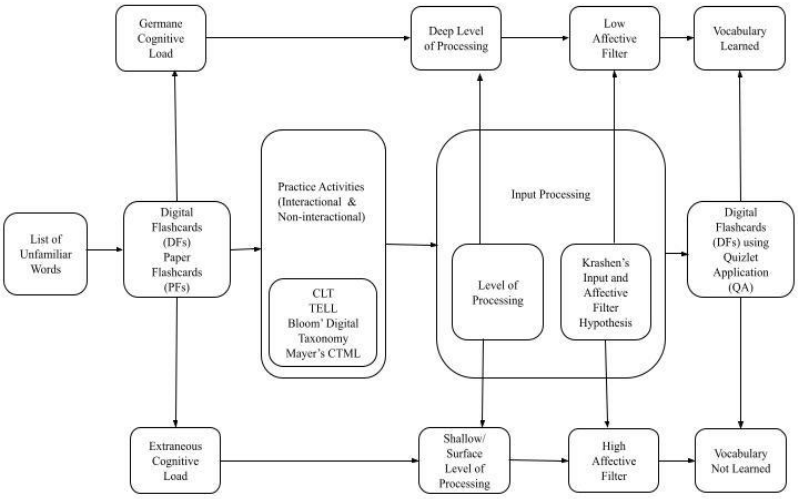

Fig. 1 Theoretical Framework adapted from Tahir, Shah, Shak, Albakri, and Adnan (2021)

Previous Studies Regarding Implementation of Vocabulary Tools: QFs and DFs in Teaching and Learning

Sukying (2020) finds that intentional engagement in morphological learning contributes to enhanced vocabulary proficiency by acquainting students with word structures, thereby facilitating easier memorization of words. Furthermore, understanding word families supports vocabulary development, particularly in terms of grasping affixes (Sukying, 2018). In the realm of English as a Foreign Language/English as a Second Language vocabulary studies, research demonstrates that flashcards exhibit greater potential compared to other learning methods, regardless of their format of delivery (Yüksel et al., 2022; Dizon & Tang, 2017). These investigations suggest that flashcards enable learners to simultaneously focus on both form and meaning, aiding in the repeated retrieval of vocabulary items. Dizon and Tang (2017) note the comparative Quizlet Flashcards (QFs) along with Digital Flashcards (DFs) effectiveness as well as the integration of Computer-Assisted Language Learning (CALL), holds promise for EFL/ESL vocabulary acquisition in the sense of students' productive and receptive vocabulary knowledge. Similarly, Ho (2019) references several studies that compared the effectiveness of QFs and DFs in English words learning (Ashcroft, Cvitkovic, & Praver, 2018; Dizon & Tang, 2017; Lees & Mcnee, 2015). The investigation by Lees and Mcnee (2015) involved splitting 81 EFL students at an intermediate level into Groups A and B for learning a total of 30 English words. The words from the study existed in two different lists. Participants in Group A used Quizlet for list 1 while DFs served as the tool for list 2. The researchers organised the participants into two groups to receive equivalent tool exposure which reduce any order-related impact in the study. Assessments following the study allowed researchers to determine which method between QFs and DFs proved most effective in teaching vocabulary.

In contrast to earlier studies, this research involved two schools selected based on varying quality criteria, resulting in a larger participant pool for the treatment and comparison groups. Unlike most studies that focus on a single dependent variable, this study incorporated two such as motivation and vocabulary achievement. This comprehensive approach aims to convince educators of QFs effectiveness in both motivating students and enhancing their vocabulary during classroom learning activities. However, the study did not examine participants' perceptions of the tools used. Unlike the reviewed studies, individual learner performance was not investigated despite its crucial role in assessing ICT-supported learning activities. Additionally, the studies failed to explore the cognitive contexts provided by Quizlet or DFs which have a substantial impact on language development in learners. While some research has looked at the use of Quizlet and Digital for vocabulary acquisition, there is still a lack of understanding about their influence on learning motivation, learners' views, and cognitive contexts learners produce. As a result, the purpose of this study is to analyse these elements of QFs as vocabulary learning tools, with the goal of identifying factors that contribute to their efficacy.

Methods

Research Sample

This study focuses on two groups of Form One students, each consisting of 60 students from different schools in Banda Aceh, Indonesia. The students were selected based on their English skills, which were measured by an entry examination. The examination results showed they had low English competence. Each group was in a different school and had a different English teacher. This study used snowball sampling to randomly choose schools for both the

treatment and comparison groups and to determine the membership of these groups in the study. Snowball is a technique used in research to attract people by recommendations from previous respondents (Leighton, Kardong-Edgren, Schneidereith, & Foisy-Doll, 2021). Each group consisted of 30 students, a statistically significant number supported by Cohen and Manion (1994), a single group population of 30 respondents has been deemed acceptable for statistical analysis.

According to Tahir et al. (2021) and Saputra et al. (2023), students who struggle with analysing words, possess weak decoding skills, and face challenges in syntactic processing, comprehension, and vocabulary are significantly more prone to experiencing academic setbacks. Only a single teacher is tasked with instructing each group, totalling two teachers. These educators are specialised in English language instruction and possess over a decade of experience teaching English in the chosen schools. Therefore, they are professionally qualified English language instructors with at least a degree in education, capable of fulfilling the responsibilities assigned to them for the purposes of this study. From a pool of 390 Tenth Grade students, 15 were chosen for the pilot test, constituting approximately 10% to 20% of the total sample size, as recommended by previous studies (Tahir et al., 2021; Baker, 1994). The pilot study aimed to assess the evaluation dependability items created by the investigators. Additionally, Cronbach's Alpha internal consistency investigation was employed to gauge the research item's ability to maintain consistent values across repeated testing, as suggested by previous research (Tahir et al., 2021; Chua, 2012).

Research Procedure

Figure 2 presents the research procedure followed in this study. Before the intervention session, each respondent sits for New Word Assessment, which identified 60 target terms from the experiment. The vocabulary list for the New Word Assessment was based on the National Curriculum 2013 (K-13). Following the identification of 60 target terms by the researcher, respondents take vocabulary examination which the writer also used as the initial assessment in the official experiment. Initial assessment solely examined targeted terms specified by the New Word Assessment. Participants from treatment group were given vocabulary training using QFs. The target terms were presented to the participants starting from the first meeting until the meeting in week twelve. The learning activities were divided into five stages, including warming up, presentation, practice, and production. Following every word instruction, the survey has been sent for the participants in the treatment group for their perceptions about the utilisation of lexical acquisition with QFs tool. Contrarily, the comparison group received twelve regular English classes which learners learned the target terms using DFs. Following the last English class, each respondent has completed subsequent assessment included sixty target terms provided by the researcher. Participants from treatment group were then given follow-up assessments such as to fill in the feedback form. The purpose of those assessments was to assess the students' overall views of the QFs as a vocabulary learning tool which were utilised during the formal experiment.

In order to analyse quantitative data, SPSS version 24 was utilised. The study examined the impact of using QFs on learning new vocabulary. By the end of the study, the researchers assessed whether there were significant improvements in vocabulary learning (Tahir et al., 2021). For a clearer understanding of the results, the researcher used basic statistical methods and performed both independent-samples t-test and paired-samples t-tests. These

tools helped to analyse vocabulary scores from both the initial and subsequent assessments. To evaluate participants' performance on vocabulary achievement examinations, the researchers calculated the average scores, standard deviations, and overall improvement percentages. Additionally, the researchers analysed the Student's Feedback Form data by counting how often each feedback item appeared, determining their percentages, and calculating both their average ratings and standard deviations.

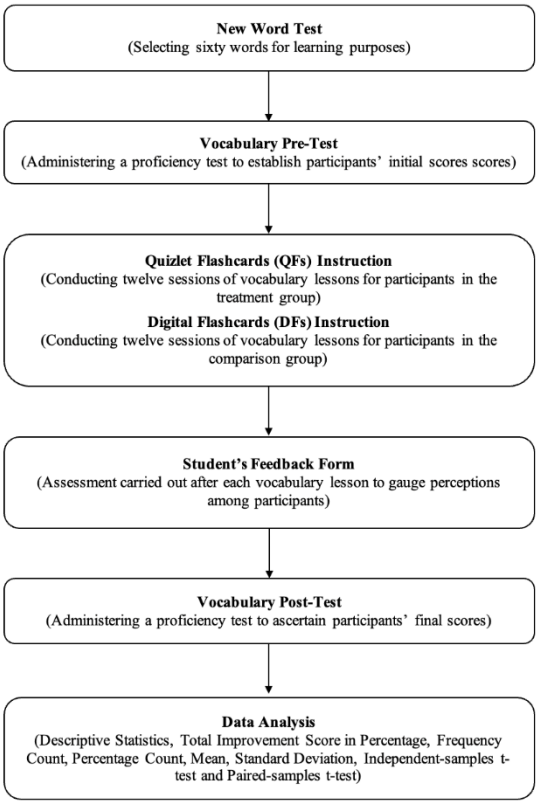

Fig. 2 Research Procedure

Results

The research objective sought to assess the difference on EFL secondary school pupils' lexical comprehension after receiving the learning instruction using QFs. The data supplied by the researcher is presented from current research. Pupils' lexical understanding information has been gathered utilising the initial and subsequent assessments. Scores from the initial assessment and subsequent assessment were acquired from both the treatment and comparison groups. A t-test was conducted to analyse and compare the initial assessment results of two groups: the treatment group and the comparison group. The outcomes of this test are shown in Table 1 for more comprehensive understanding and comparison.

Table 1
Independent-samples t-test for the initial of the treatment and comparison groups

Initial Assessment	Mean Score (M)	Standard Deviation (SD)	t	df	Sig. (2-Tailed)
Treatment Group (N=30)	62.5	8.38	.703	58	0.484
Comparison group (N=30)	61.17	6.11			

The mean difference (M difference) between the treatment and comparison groups is 1.33, with the treatment group's average score being M=62.5 and the comparison group's average being M=61.17. There is no discernible difference between the comparison and treatment groups' initial assessment results, according to the statistical analysis from the independent-samples t-test (t=0.703, df=58, p>.05). Consequently, the initial assessment findings indicate that participants in both groups had almost the same level of proficient with regard to their target word knowledge before the experimental treatment.

Next, the study evaluated the Tenth-Grade students' performances from both groups by assessing the results from initial and subsequent assessments, aiming to gauge their treatment's effectiveness. In the treatment group, learners studied target words using QFs across ten English sessions, while those in the comparison group utilised DFs during standard English lessons. Preceding the experimental intervention, respondents underwent vocabulary initial assessment to establish baseline scores, followed by a following test to measure any score changes compared to the initial assessment. Transforming initial and subsequent assessments scores into mean values enhanced score reliability and validity. Furthermore, the overall percentage gain was calculated from treatment and comparison groups, facilitating a comparison of score enhancements. Table 2 and Table 3 present Descriptive Statistics including learners' mean scores, total improvement percentages, and standard deviations for the initial and subsequent assessments from the treatment and comparison groups.

Table 2
Descriptive Statistics for initial and subsequent assessments of the treatment group

Treatment Group	Mean Score (M)	Standard Deviation (SD)	M Difference	Total Improvement Score (%)
Initial Assessment	62.5	8.38	31.33	50.1
Subsequent Assessment	93.83	4.68		

Table 2 exhibits that descriptive statistics portraying initial and subsequent assessments outcomes from the treatment group. Initially, initial assessment mean score for this group stood at M = 62.5. Following the group's learning of target words through QFs in vocabulary lessons, their subsequent assessment mean score was determined to be 93.83, reflecting an enhancement (M difference) from initial to subsequent assessments of 31.33. Furthermore, the total improvement score in percentage amounted to 50.1%.

Table 3
Descriptive Statistics for initial and subsequent assessments of the comparison group

Comparison Group	Mean Score (M)	Standard Deviation (SD)	M Difference	Total Improvement Score (%)
Initial Assessment	61.17	6.11	19.33	31.6
Subsequent Assessment	80.50	10.70		

In contrast, the descriptive statistics is displayed regarding the initial and subsequent assessments of the comparison group. Initially, initial assessment mean result for the comparison group was recorded as M = 61.17. This group acquired the specific terms through standard English classes before undertaking the subsequent assessment. Upon assessment, their subsequent assessment mean score was calculated at M = 80.50. Analysis revealed that the score is enhanced (M difference) from the initial to subsequent assessments for the comparison group, amounting to 19.33, with an overall percentage gain in percentage of 31.6%. Furthermore, a comparison of scores between the initial and subsequent assessment for both treatment and comparison groups are detailed in Table 4, showcasing learners' score changes (improvement, decline, or remaining the same) for each group.

Table 4
Score Comparison between initial and subsequent assessments of the treatment and comparison groups

Group	Learners with Improved Score (%)	Learners with Declined Score (%)	Learners with Same Score (%)
Treatment	100 (30 learners)	0 (0 learner)	0 (0 learner)
Comparison	90 (27 learners)	0 (0 learner)	10 (3 learners)

Table 4 illustrates the comparison of scores (improved, declined, or remained the same) between the initial and subsequent assessments within treatment group. All 30 learners (100%) in this group showcased improvements after utilising QFs during vocabulary lessons. This complete improvement among learners from treatment group emphasizes the QFs efficacy for enhancing vocabulary acquisition. Conversely, within the comparison group, 27 learners (90%) obtained improved subsequent assessment result, while 3 pupils (10%) maintained the same scores as the initial assessment. This group acquired the selected terms from standard English instruction before the subsequent assessment. Despite the majority (90%) showing improved scores, the 3 learners (10%) who did not improve suggest inconsistent outcomes for learners relying solely on standard English lessons. This inconsistency signifies that DFs might not be universally effective for every learner in enhancing subsequent assessment scores contrasted with initial assessment. Outcomes from paired-sample t-test for both treatment and comparison groups are presented in Tables 5 and 6.

Table 5
Paired-samples t-test for initial and subsequent of the treatment group

Treatment Group	Mean Score (M)	Standard Deviation (SD)	t	df	Sig (2-Tailed)
Initial Assessment (N=30)	62.5	8.38	19.284	29	.000
Subsequent Assessment (N=30)	93.83	4.68			

Table 5 outlines the outcomes derived from the paired-samples t-test conducted for the initial and subsequent assessments within the treatment group. The learners achieved a mean score of M = 62.5 in the initial assessment and M = 93.83 in the subsequent assessment, reflecting a mean difference (M difference) of 31.33 between the two. The statistical analysis from the paired-samples t-test indicates a notable distinction (t=19.284, df=29, p<.05). This statistically significant result underscores a substantial increase in scores among participants within the treatment group following the experimental treatment.

Table 6
Paired-samples t-test for initial and subsequent of the comparison group

Comparison Group	Mean Score (M)	Standard Deviation (SD)	t	df	Sig (2-Tailed)
Initial Assessment (N=30)	61.17	6.11	9.391	29	.000
Subsequent Assessment (N=30)	80.50	10.70			

In contrast, Table 6 showcases the outcomes yielded by the paired-samples t-test conducted for the initial and subsequent assessments within the comparison group. The learners attained a mean score of M = 61.17 in the initial assessment and M = 80.50 in the subsequent assessment, marking a mean difference (M difference) of 19.33 between the two. The statistical evaluation from the paired-samples t-test highlights a significant distinction (t=9.391, df=29, p<.05). Consequently, there was a noteworthy increase in scores among participants in the comparison group following the treatment group. However, the score enhancement (M difference) in the treatment group surpassed that of the comparison group by 13.34. Given that participants in the treatment group learnt more target words in the same amount of time as those in the comparison group, this shows that the intervention in the treatment group was more significantly successful that that in the comparison group.

Table 7
Independent-samples t-test for the initial and subsequent of the treatment and comparison groups

Group	Mean Score (M)	Standard Deviation (SD)	t	df	Sig (2-Tailed)
Treatment	93.83	4.68	6.256	58	.000
Comparison	80.5	10.70			

Table 7 outlines the outcomes derived from the independent-sample t-test conducted for the subsequent assessments scores of the treatment group. The learners in the treatment group achieved a mean score of M = 93.83, while the comparison group attained a mean score of M

= 80.50. The standard deviation for the subsequent assessment in the treatment and comparison groups stands at SD = 4.68 and SD = 10.70, respectively. Calculations based on the data yielded a t score of 6.256 with df = 58 and a significance level of $p<.05$.

Discussion

Looking at the research objectives about senior high school students learning English as a Foreign Language (EFL) and their vocabulary progress after using QFs, both groups of students improved in the following assessment. Although both groups showed progress, the treatment group showed significantly better results. Their total improvement score was 93.83% higher than the other group's score. Additionally, the treatment group had a 12-point higher score improvement than the comparison group, indication a stronger enhancement in vocabulary knowledge. Not all participants in the comparison group improved their scores in the next assessments compared to the first ones. This difference highlights how effective QFs are as a toll for learning and mastering target words for the participants in this study.

Setiawan and Wiedarti (2020) discovered that both QFs and DFs were helpful in significantly improving participants' scores on subsequent assessments. In the current study, however, the group using QFs showed greater improvement compared to the group using DFs when looking at the improvement scores by percentage. This suggests that QFs, as a toll for learning vocabulary, work better for helping participants remember and learn target words than DFs. As a result, students can improve their learning using QFs to build their vocabulary. They have the flexibility to use it with teachers in class or on their own when they are not in the classroom. This approach helps them to strengthen their vocabulary skills effectively. It is advisable for teachers to incorporate QFs into lessons involving activities such as Learn, Write, Test, Match, and others, given its proven effectiveness and favourable reception among learners based on this study's outcomes. Using different learning methods can greatly help students increase their vocabulary, so they can understand and use more English words. As their vocabulary grows, it becomes easier for them to speak, write, listen and read in English. This increase in vocabulary is essential to improve their overall skills the English language. Previous research by Tahir et al. (2021) and Saputra et al. (2023) highlights significant variations in EFL learners' vocabulary retention across different exercise types. Similarly, Waluyo and Bucol (2021) demonstrate substantial improvement in students' vocabulary scores following the introduction of Quizlet, surpassing the comparison group in enhancing vocabulary retention. Skulmowski and Xu (2022) emphasise the need for appropriate assessment methods to facilitate specific forms of effective processing in learning. They cautioned that without aligning design factors with learners' cognitive processing and suitable test types, the benefits of digital learning might not be fully realised, and only cognitive costs might become apparent (Churches, 2008). Consequently, it is recommended to present vocabulary items through diverse methods to facilitate their storage in long-term memory, aiding easy retention and recall. Teachers are encouraged to design various vocabulary activities and offer sufficient practice opportunities for learners using QFs as a learning tool (Dooly & O'Dowd, 2018).

Conclusion

The research indicates that students learn vocabulary more effectively with QFs that with DFs. Students using QFs not only understand vocabulary better but also feel more motivated during their learning process. In contrast, students taught using traditional methods, without

QFs, only show slight improvements. Thus, difference is clear when comparing test scores from before and after the vocabulary lessons, showing that the quick responses and engagement from QFs make a significant impact. Students who used QFs improved their vocabulary more effectively than those who did not use the QFs. In addition, students who studies with DFs specifically designed for vocabulary learning showed significant progress. This was clear from the differences in their scores from the first test to later ones. However, it was observed that the vocabulary skills of students using in-focused DFs were not as strong as those of students using QFs.

These findings are based on the ideas explored in this study. In an Aceh senior high school, tent-grade students were introduced to QFs. This approach first with how today's technology is becoming part of language education. Using technology in teaching languages, including adult education, offers more tools to help people learn languages (Muhamad & Kiely, 2018; Zulkepli et al., 2018). It also supports students in learning independently. The study showcases how different flashcards help people learn and remember words. In one group, DFs were used, while another group used QFs. The findings are in line with theories which state that students will better with both words and pictures. These theories as well-known as dual coding theory and multimedia learning theory. The current study found that the group using question flashcards did better especially in the subsequent assessment with higher scores and improved recall of vocabulary. This means that QFs help the learners to learn and remember new words more effectively than DFs. The assignments given to the treatment group were designed to make learning vocabulary both fun and effective. They included activities such as finding words that the same meaning or the opposite, as well as true or false questions. These tasks not only made learning more enjoyable but also helped students to remember new vocabulary.

Limitation of the Study and Suggestions for Future Research

Like any study, there are limitations to the generalizability of these findings. Firstly, the investigation is limited to only two high schools in Aceh, which could constrain the comprehensive understanding of the topic. To enhance the credibility of the outcomes, it would be beneficial to compare these findings with those from diverse high schools across different regions in Aceh. Additionally, the relatively small sample size, consisting solely of tenth grade participants from Senior High School 1 and Islamic Senior High School 1 in Banda Aceh, might limit the representativeness of the conclusions. Thus, the results may not wholly reflect the broader high school population. Consequently, future research with a larger and more diverse sample size is recommended to fortify the generalizability of the current study's outcomes. Given the limitations of this study, future research could involve a larger sample size to explore the effectiveness of employing QFs for vocabulary instruction among EFL learners. Consideration of learners from different grades or age groups could be beneficial for future research. Given the varying cognitive levels among high school students, researchers could explore the impact of QFs on vocabulary learning among students in different grades, such as the second and third grades of senior high schools.

Conflicts of Interest

The authors declare no conflicts of interest associated with this manuscript.

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