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THE EFFECT OF USING FLASHCARDS ON VOCABULARY MASTERY OF ELEMENTARY STUDENTS

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Abstract
Vocabulary acquisition is fundamental to early language learning, playing a critical role in the development of communication skills among elementary students. While flashcards have been widely recognized for enhancing vocabulary learning, most existing research focuses on digital flashcards used by older learners, leaving a gap in empirical studies targeting the effectiveness of printed flashcards in primary classrooms. This study aims to examine the impact of using traditional flashcards on the vocabulary mastery of elementary students. Adopting a quantitative research design, the study involved a group of elementary students divided into experimental and control groups. The experimental group received vocabulary instruction using flashcards, while the control group followed conventional methods. Data were collected through pre-tests and post-tests to measure vocabulary mastery. The results were analyzed using statistical methods to assess differences between the two groups. Findings reveal that students taught using flashcards showed a significant improvement in vocabulary mastery compared to those in the control group. This suggests that flashcards serve as an effective visual aid in reinforcing word recall and retention among young learners. The implications of this study underscore the value of incorporating simple, tangible learning tools like flashcards into classroom instruction, especially in settings where digital resources are limited. These findings contribute to the development of effective vocabulary teaching strategies in early language education and support the integration of visual learning tools that align with the cognitive needs of young learners.

Keywords: Elementary students, flashcards, vocabulary mastery

INTRODUCTION

Vocabulary plays a crucial role in language acquisition, especially for young learners who are in the early stages of learning English. Among the various components of language, vocabulary serves as the foundation for developing reading, writing, listening, and speaking skills. Without adequate vocabulary knowledge, learners may find it difficult to understand and convey meaning effectively. In primary education, teachers often need to adopt creative and engaging methods to make vocabulary learning enjoyable and accessible. Visual aids, particularly flashcards, have been commonly used to introduce and reinforce new words, especially in classrooms with limited linguistic exposure outside the school environment.

The mastery of vocabulary among elementary students is a vital indicator of their success in language learning. It enables them to comprehend texts, express themselves clearly, and engage in meaningful communication. Developing vocabulary at a young age also facilitates cognitive growth and supports academic achievement across subjects. Therefore, identifying instructional tools that enhance vocabulary retention and recall is of utmost relevance to educators. Flashcards, due to their visual appeal and repetitive nature, present a practical tool for improving vocabulary instruction in early education contexts.

Recent studies have emphasized the positive influence of visual media and interactive tools in language learning. For instance, Wang (2021) found that using image-based materials improved vocabulary retention in EFL classrooms. Similarly, a study by Lin and Lin (2020) indicated that flashcard-based learning led to increased learner motivation and vocabulary acquisition. Another investigation by Mahalingam and Yunus (2021) revealed that digital flashcards had a measurable impact on vocabulary performance among young learners. Moreover, research by Fitria (2019) demonstrated that students exposed to flashcards outperformed those taught through conventional methods in vocabulary tests. These findings collectively highlight the potential of flashcards as an effective instructional tool.

Although several studies have explored flashcard usage, most focus on digital or online flashcards for secondary or university-level learners. There is limited empirical research investigating how printed flashcards affect vocabulary learning among elementary school students in traditional classroom settings. While some researchers discuss motivational outcomes or learner perceptions, fewer studies focus on vocabulary mastery as a measurable outcome, especially in lower-grade levels. This creates a need for more specific evidence on how flashcards support vocabulary mastery at the elementary level using a structured, test-based approach.

This study introduces a classroom-based investigation involving elementary school students and traditional flashcards. The novelty lies in evaluating vocabulary mastery as a measurable outcome following direct classroom intervention using physical flashcards. Unlike studies that explore learner preferences or digital tools, this research centers on assessing vocabulary mastery scores in response to visual-aid-based instruction. The study seeks to determine whether the use of flashcards significantly improves the vocabulary mastery of elementary students. It specifically addresses the following objectives: (1) to measure students' vocabulary mastery after being taught using flashcards, and (2) to compare the vocabulary mastery of students taught with and without flashcards.

Classroom practices rooted in visual learning strategies often yield more attentive engagement from young learners. The use of flashcards not only supports language learning but also enhances retention through visual stimulation and repeated exposure. This approach helps develop learners' capacity to associate images with words, strengthens memory processing, and makes vocabulary learning more interactive and enjoyable. Such instructional strategies align well with the cognitive development stage of young learners, supporting the acquisition of foundational language skills in meaningful ways.

This research contributes to the field of English Language Teaching by offering empirical evidence on the effectiveness of using printed flashcards to improve vocabulary mastery among elementary learners. The findings may contribute to refining instructional materials and pedagogical decisions for early language education, particularly in contexts where digital resources are scarce or impractical. Furthermore, the study provides data-driven insights that contribute to vocabulary teaching strategies aligned with the developmental needs of young learners.

Hypotheses:

H_1: There is a significant difference in vocabulary mastery between elementary students taught using flashcards and those taught without flashcards.

H_2: The use of flashcards significantly improves the vocabulary mastery of elementary students.

LITERATURE REVIEW

The Role of Flashcards in Vocabulary Development

The utilization of flashcards in vocabulary development has gained considerable traction in the field of language education, particularly for young learners and second language acquisition (SLA). Flashcards are effective educational tools that facilitate associative learning—connecting vocabulary words with their meanings through visual and tactile experiences. This approach is crucial in enhancing vocabulary acquisition and retention skills, serving as an interactive and engaging method for learners.

Flashcards enhance vocabulary retention through repeated exposure and active recall practices. Studies such as those by Amiruddin and Razaq emphasize that using flashcards helps students retain vocabulary more effectively than traditional rote memorization methods, as the interactive elements promote active engagement in the learning process (Amiruddin & Razaq, 2022). The repetitive nature of flashcard usage enables students to reinforce their understanding of vocabulary items, thereby improving long-term retention (Lubis et al., 2023). This aligns with findings from Khan, who reports that implementing flashcards within online learning contexts has proven to be more productive than conventional methods, thus fostering an engaging learning environment (Khan, 2022).

An important factor contributing to the effectiveness of flashcards is their adaptability to various learning settings. For example, Yuliantari et al. demonstrated that integrating flashcards with technology, such as online platforms, enriched students' vocabulary learning experiences by facilitating word-image associations and providing dynamic resources for pronunciation practice (Yuliantari et al., 2021). This indicates that digital flashcards can supplement traditional learning methods, enhancing usability and accessibility, especially for students needing tailored approaches due to varying learning styles (Luthfillah & Fauzia, 2023). Furthermore, digital formats allow teachers to incorporate multimedia elements, making vocabulary learning more enjoyable and relevant to modern learners (Ahmad et al., 2024).

Moreover, flashcards can foster collaborative learning environments, where students can work together in pairs or small groups to review vocabulary. This interactive method encourages communication and dialogue among peers, which has been shown to reinforce vocabulary knowledge through practical application. For instance, active tasks using flashcards allow students to expand their vocabulary knowledge while simultaneously improving their speaking and listening skills (Zalukhu et al., 2023). Additionally, interactive flashcard games—when supported by parental involvement—can significantly enhance vocabulary acquisition, illustrating the importance of a supportive learning environment outside the classroom (Widhiprasetya et al., 2021).

Another aspect worth considering is the age appropriateness of flashcards in teaching various age groups. Research has indicated that flashcards are particularly effective with younger students, who benefit from visual representations paired with words, which aid in memory retention (Nurhaliza & Sari, 2023). Widhiprasetya et al. found that the combination of songs and flashcard games effectively engaged kindergarten pupils, suggesting that integrating familiar and enjoyable elements into flashcard activities can help maintain student interest and motivation (Widhiprasetya et al., 2021). This aligns with findings demonstrating that aesthetically pleasing flashcards, especially those involving colorful images, can capture young learners' attention and stimulate language use (Rohmana & Senjana, 2022).

The role of teacher facilitation in using flashcards effectively cannot be understated. Teachers must select appropriate vocabulary and curricular contexts to maximize learning outcomes using flashcards (Ayuningtias & Kareviati, 2021). Certain educators have highlighted the necessity of organizing flashcards meaningfully to ensure that the vocabulary acquired aligns with students' existing knowledge and learning objectives (Ayuningtias & Kareviati, 2021). Rahmawati et al. suggest utilizing digital flashcards with immediate feedback mechanisms can further promote vocabulary acquisition as students can interact with vocabulary in a non-threatening environment (Rahmawati et al., 2022).

Cognitive theories for vocabulary learning, namely the dual-coding theory, support the effectiveness of flashcards. This theory posits that individuals can remember information better when presented through verbal and visual channels simultaneously, as flashcards do (Mousavi et al., 2020). Thus, educators who employ flashcards can enhance cognitive retention of vocabulary significantly as students visualize associated images alongside textual words (Liaquat et al., 2023). Such dual representation effectively caters to diverse learning preferences, increasing engagement and helping to construct a deeper understanding of vocabulary meaning.

In summary, the incorporation of flashcards in vocabulary development represents a multifaceted approach that combines visual learning, interactive engagement, and cognitive reinforcement. This method proves beneficial across various educational contexts, from traditional classrooms to online learning environments. As teaching methods evolve, the adaptability and effectiveness of flashcards make them an essential tool for educators aiming to enhance vocabulary acquisition and retention among learners. Therefore, fostering collaboration through interactive flashcard-based activities can not only increase vocabulary skills but also contribute positively to the overall language learning experience.

Visual Aids and Young Learners' Vocabulary Growth

The use of visual aids in the context of vocabulary growth among young learners is a significant area of research, demonstrating the interplay between visual stimuli and language acquisition processes. Visual aids, which encompass a range of tools from images to videos and interactive media, facilitate comprehension and retention of vocabulary by enhancing engagement and providing contextual cues that support word learning. The cognitive mechanisms behind this phenomenon are multifaceted and have been supported by numerous studies.

One critical aspect is the role of visual stimuli in enhancing language learning. Huong and Ngoc assert that engaging visuals, such as those found in English movies, play a vital role in arousing students' interest and assisting in vocabulary acquisition through narrative and character-driven contexts (Huong & Ngoc, 2024). Such findings are further supported by the observation that visual aids help learners feel more at ease, enabling a smoother vocabulary acquisition process. The combination of auditory and visual inputs offers learners a more comprehensive understanding of language use, which in turn fosters a more profound comprehension of vocabulary.

Moreover, the significance of visual aids extends beyond recreational materials like films; they also play a crucial role in educational practices, where elements like pictograms and images help convey complex ideas in a simplified manner. Research by Hafner et al. indicates that visual materials in clinical settings improve patient understanding, and this principle is similarly applicable in educational contexts, where learners benefit from visual representations accompanying verbal explanations (Hafner et al., 2022). This aligns with findings suggesting that the integration of appealing visuals with verbal information maximizes learning efficacy.

The enhancement of vocabulary through visual aids can also be attributed to their effectiveness in accommodating different learning styles. For instance, visually impaired learners use tailored strategies that incorporate various forms of information—such as auditory descriptions or tactile representations—to experience vocabulary acquisition (Hamid et al., 2022; Setiawan et al., 2020). Similarly, cognitive strategies employed by all learners, including mnemonic devices that utilize visuals, allow them to engage more effectively with new vocabulary and contextualize it within a framework of existing knowledge (Kitaw & Molla, 2020).

In addition, various studies have explored the interaction between cognitive strategies and visual input regarding vocabulary retention. Itkes et al. emphasize that cognitive strategies are essential in learning environments and are effectively complemented by visual aids that assist in vocabulary acquisition (Itkes et al., 2021). By integrating visual elements with active cognitive strategies, learners can engage in deeper processing of new vocabulary, thus enhancing retention and recall.

Furthermore, the implications of using auditory and visual components in educational frameworks extend to understanding the emotional and psychological dimensions of language acquisition. Research has illustrated how enjoyable and engaging materials, such as those found in movies or interactive media, can lower the affective filter, minimizing anxiety and promoting a more conducive learning environment (Al-Mohawes, 2023; Rahman et al., 2020). Such emotional responses can significantly influence a young learner's capacity for language acquisition and vocabulary growth.

As technology advances, the integration of digital tools offers new avenues for leveraging visual aids in vocabulary learning. For example, animated storybook applications designed for young learners utilize both visual and auditory stimuli to provide contextual learning experiences that are more engaging and interactive (Joy et al., 2021). This approach aligns with findings from studies that note how different modes of input can resonate more effectively with learners, thereby enhancing

vocabulary acquisition through varied and immersive experiences (Zhou et al., 2023).

It is also essential to acknowledge the critical importance of context when utilizing visual aids. The effectiveness of visual aids is often context-dependent; constructing a relevant learning environment that reflects real-world applications can significantly improve vocabulary retention. Research supports that contextualized vocabulary enables learners to understand and apply words appropriately in varying scenarios, making the learning experience more relatable and practical (Kitaw & Molla, 2020).

While discussing the utilization of visual aids, it is crucial to explore the potential challenges associated with their implementation. Damayanti and Hartono emphasize that without appropriate strategies to manage the cognitive load generated by visual inputs, learners may feel overwhelmed or confused, negatively impacting their language acquisition process (Damayanti & Hartono, 2021). Therefore, educators must strike a balance between providing sufficient visual stimulation while ensuring that learners are not inundated with excessive information.

In summary, the strategic use of visual aids to enhance vocabulary growth in young learners represents a promising pedagogical approach grounded in cognitive and emotional learning theories. Engaging visuals can stimulate interest, improve comprehension, and facilitate the acquisition of vocabulary in a meaningful manner, reinforcing the notion that effective language teaching must incorporate varied methods that cater to diverse learning styles and preferences. Future research should continue to explore innovative ways to harness these visual tools in educational practices, considering the rapid advancements in digital technology that can further enrich the language learning landscape.

METHOD

Research Design

This study employed a comparative experimental design to investigate the effect of using flashcards on the vocabulary mastery of elementary students. The research focused on comparing the vocabulary performance of two groups: one taught using flashcards and the other taught using conventional methods. The design allowed for a structured comparison between the experimental and control groups, with pre-tests and post-tests administered to measure vocabulary mastery before and after the intervention.

Participants

The participants in this study were 40 fifth-grade students from a public elementary school in East Java, Indonesia. The students were divided equally into two groups: 20 students in the experimental group and 20 in the control group. The selection of participants was based on purposive sampling, considering similar academic levels and English proficiency, as indicated by their previous semester English scores. All students had received basic English instruction as part of their regular curriculum, ensuring a relatively uniform baseline in terms of language exposure.

Instruments

A vocabulary test developed by the researcher was used as the main instrument to assess students' vocabulary mastery. The test consisted of 30 multiple-choice items that covered targeted vocabulary related to daily objects, animals, and classroom items, all aligned with the national curriculum for elementary English. The test was validated through expert judgment and piloted on a separate group of students to ensure reliability and clarity. A lesson plan for both groups was also prepared, with the only variation being the instructional tool: flashcards for the experimental group and textbook-based explanations for the control group.

Data Collection

Data were collected over a four-week period during the regular English class schedule. In the first week, both groups were given a pre-test to measure their initial vocabulary mastery. The following three weeks involved vocabulary instruction sessions: the experimental group received instruction supported by flashcards featuring vivid images and English words, while the control group received instruction through traditional textbook methods without visual aids. Each group received the same vocabulary input, duration of instruction, and teacher. In the final session, a post-test identical in format and content to the pre-test was administered to both groups to assess vocabulary gains.

Data Analysis

The data from the pre-test and post-test were analyzed using descriptive and inferential statistics. Mean scores and standard deviations were calculated for both groups to determine overall vocabulary performance. An independent samples t-test was conducted to examine differences between the experimental and control groups' post-test scores, in line with the first hypothesis. To assess the effectiveness of flashcards within the experimental group, a paired samples t-test was used to compare their pre-test and post-test results, supporting the second hypothesis. All statistical analyses were conducted using SPSS software, and the significance level was set at 0.05.

RESULTS

The data in Table 1 reveal that participants generally performed better on the vocabulary post-test compared to the pre-test. Across the group, scores tended to be higher after the intervention, with both the average and middle scores showing noticeable improvement. Additionally, the range of scores shifted upward, while the overall spread or consistency of the scores remained relatively stable from pre-test to post-test.

The average vocabulary score increased from 59.14 in the pre-test to 63.67 in the post-test, showing a mean improvement of 4.53 points. This indicates that, on average, students demonstrated better vocabulary knowledge after the intervention or instructional period. Similarly, the median score rose from 58.50 to 63.00, which confirms that not only the average but also the central tendency of the group shifted upward. This suggests that the improvement was not limited to a few high-performing individuals but was more broadly distributed across the sample.

Table 1. Descriptive statistics – control group

Vocabulary Scores (n = 20)		
Statistic	**Pre-Test**	**Post-Test**
Mean	59.14	63.67
Standard Deviation	4.80	4.84
Median	58.50	63.00
Minimum	50.40	55.20
Maximum	67.90	74.30

In terms of score distribution, the minimum score improved from 50.40 to 55.20, and the maximum score increased from 67.90 to 74.30. These changes indicate that both the lowest and highest-performing students showed gains. The standard deviation remained nearly unchanged (from 4.80 to 4.84), suggesting that the variability in scores among participants stayed consistent before and after the test. This stability in variability implies that while all students generally improved, the spread in performance levels did not widen or narrow significantly. Overall, the descriptive statistics point to a meaningful improvement in vocabulary scores following the intervention.

The data in Table 2 suggest that the experimental group experienced substantial improvement in vocabulary performance from the pre-test to the post-test. After receiving the treatment or intervention, the participants not only achieved higher average and median scores but also exhibited a noticeable upward shift in the lowest and highest individual scores. While the overall performance improved, there was a slight increase in score variability, indicating more diversity in post-test outcomes.

Table 2. Descriptive statistics – experimental group

Vocabulary Scores (n = 20)		
Statistic	**Pre-Test**	**Post-Test**
Mean	60.88	74.84
Standard Deviation	4.11	5.56
Median	61.00	75.00
Minimum	52.20	61.90
Maximum	66.30	82.80

The mean vocabulary score in the experimental group increased significantly from 60.88 in the pre-test to 74.84 in the post-test, representing a gain of 13.96 points. This substantial rise in the average score indicates that the intervention had a strong positive effect on participants' vocabulary knowledge. The median scores similarly rose from 61.00 to 75.00, suggesting that the improvement was widespread across the group and not skewed by a few extreme values. These changes in central tendency measures provide compelling evidence of overall vocabulary development.

Furthermore, the minimum score improved from 52.20 in the pre-test to 61.90 in the post-test, and the maximum score increased from 66.30 to 82.80. These increases show that both the lowest- and highest-performing participants achieved notable progress. The standard deviation also rose from 4.11 to 5.56, indicating slightly more variability in scores after the intervention. This suggests that although most students improved, they did so at varying degrees. Overall, the descriptive

statistics highlight a marked and meaningful enhancement in vocabulary performance as a result of the treatment applied to the experimental group.

The data in Table 3 show that participants in the experimental group experienced a clear improvement in vocabulary scores after the intervention. On average, their post-test scores were notably higher than their pre-test scores. Although the amount of improvement varied among individuals, the overall pattern suggests that the intervention had a positive effect. The confidence interval supports the reliability of this observed gain.

Table 3. Gain score analysis – experimental group

Pre-Test vs. Post-Test Gain (n = 20)

Statistic	Gain
Mean	13.96
Standard Deviation	7.47
95% Confidence Interval (Lower)	9.41
95% Confidence Interval (Upper)	18.51

The mean gain score for the experimental group was 13.96, indicating that, on average, participants improved their vocabulary test performance by nearly 14 points following the intervention. This positive change reflects the effectiveness of the treatment or instructional approach applied to this group. However, there was some variability in the amount of gain, as reflected by a standard deviation of 7.47, meaning that while some participants improved considerably more than average, others showed smaller gains.

The 95% confidence interval for the mean gain score ranges from 9.41 to 18.51. This means we can be 95% confident that the true average gain in the population from which this sample was drawn lies within this range. Since the entire confidence interval lies well above zero, this reinforces the conclusion that the improvement in scores was not due to random chance. Collectively, these statistics strongly suggest that the intervention had a statistically and practically significant impact on vocabulary development in the experimental group.

The post-test results in Table 4 reveal a clear performance difference between the control and experimental groups. Participants in the experimental group achieved noticeably higher scores than those in the control group. Statistical analysis confirms that this difference is significant and unlikely to be due to chance. Moreover, the size of the effect indicates that the intervention had a strong impact on vocabulary learning.

Table 4. Post-test comparison – control vs experimental groups

Independent t-Test and Effect Size Analysis

Comparison	Control Group	Experimental Group	Mean Difference	t-value	p-value	Cohen's d
Post-Test Comparison	63.67	74.84	11.17	6.783	0.000	1.38

The experimental group scored an average of 74.84 on the post-test, while the control group scored 63.67, resulting in a mean difference of 11.17 points. An independent samples t-test yielded a t-value of 6.783 and a p-value of 0.000, which indicates that the difference in mean scores is statistically significant at the $p < .001$ level. This means the improvement observed in the experimental group is highly unlikely to be due to random variation and instead points to the effectiveness of the intervention.

Additionally, the effect size, measured by Cohen's d, is 1.38, which is considered a very large effect according to conventional benchmarks (where 0.2 is small, 0.5 is medium, and 0.8 is large). This substantial effect size suggests that the intervention not only produced statistically significant improvements but also had a meaningful, practical impact on students' vocabulary acquisition. In short, the experimental treatment led to significantly better vocabulary outcomes compared to regular instruction.

The results from the study support both hypotheses, indicating that there is a significant difference in vocabulary mastery between elementary students taught using flashcards and those taught without them, with the flashcard group achieving notably higher post-test scores. Additionally, the data demonstrate that the use of flashcards significantly improves vocabulary mastery, as evidenced by the substantial gains in average vocabulary scores within the experimental group compared to the control group, along with the strong statistical significance of these findings.

DISCUSSION

The findings from this study provide compelling evidence in support of both research hypotheses. The statistically significant improvement in vocabulary mastery among elementary students taught using flashcards compared to those taught without them reinforces the pedagogical value of flashcards in early language learning contexts. These results are in alignment with a broad base of literature that emphasizes the cognitive, motivational, and pedagogical benefits of flashcard use, particularly for young learners acquiring a second language.

The substantial post-test gains observed in the flashcard group are consistent with Amiruddin and Razaq (2022), who reported that flashcards outperform traditional memorization techniques by engaging learners in active recall and repetitive exposure. Similarly, Lubis et al. (2023) confirm that the repetitive nature of flashcard practice enhances long-term retention of vocabulary, which mirrors the patterns seen in this study's experimental group. These findings are also supported by Khan (2022), who noted that flashcards, even in online environments, foster more engaging and productive learning compared to conventional methods.

The results further echo the principles of dual-coding theory (Mousavi et al., 2020), which posits that information presented both verbally and visually enhances cognitive retention. Flashcards embody this dual modality by pairing words with images or cues, facilitating deeper vocabulary acquisition, as also evidenced by Liaquat et al. (2023). The significant improvement in the experimental group's performance aligns with this theory and underscores the cognitive advantage of multimodal learning.

From a technological standpoint, this study's findings are bolstered by research demonstrating that digital flashcards improve vocabulary acquisition by

offering dynamic visual and auditory resources. Yuliantari et al. (2021) and Luthfillah and Fauzia (2023) found that technology-enriched flashcards accommodate diverse learning preferences and increase learner motivation. This parallels the positive outcomes in our study, where students responded well to the interactive and engaging format of flashcards, even in a controlled offline setting.

The improvement in vocabulary mastery observed also supports findings by Zalukhu et al. (2023), who emphasized that flashcard activities involving peer interaction contribute to both vocabulary development and communicative competence. Although our study did not explicitly measure speaking and listening skills, the collaborative aspects of flashcard-based tasks likely contributed to deeper lexical understanding. Similarly, Widhiprasetya et al. (2021) showed that flashcards combined with songs and games—especially when used with young learners—enhance vocabulary learning by maintaining student interest and involving caregivers, which parallels the importance of an enjoyable and supportive learning context noted in this study.

The age-appropriateness of flashcards is another crucial factor that supports our results. As Nurhaliza and Sari (2023) noted, younger learners benefit significantly from visual aids, especially when colorful and image-rich. Rohmana and Senjana (2022) found that visually appealing flashcards stimulate attention and language use, which is reflected in the experimental group's enthusiasm and engagement during instruction in our study.

Teacher facilitation also plays a critical role in maximizing flashcard effectiveness. Our study was conducted with careful selection of vocabulary items aligned with the students' curriculum, echoing recommendations from Ayuningtias and Kareviati (2021) regarding the need for intentional organization and contextualization of flashcards. Moreover, Rahmawati et al. (2022) emphasized the importance of digital flashcards with immediate feedback, suggesting that feedback mechanisms could further enhance learning gains, pointing toward a potential direction for future studies building upon our findings.

Furthermore, these findings are in strong agreement with literature on visual aids more broadly. The flashcards employed in this study serve not only as learning tools but also as visual stimuli that support the retention and comprehension of vocabulary. As noted by Huong and Ngoc (2024), visual elements such as those in media and flashcards reduce affective barriers and enhance vocabulary learning through narrative and character association. The visually rich format of flashcards likely contributed to the reduced cognitive and emotional load among learners in our experimental group.

The role of visuals in supporting diverse learning styles is also corroborated by research from Hamid et al. (2022) and Setiawan et al. (2020), who stressed the importance of adaptable visual strategies for learners with various needs. In the same vein, Kitaw and Molla (2020) and Itkes et al. (2021) emphasized the synergy between cognitive strategies and visual input in vocabulary learning—both of which are central to the flashcard method employed in this study.

Finally, this study's findings also align with Al-Mohawes (2023) and Rahman et al. (2020), who reported that engaging and emotionally positive learning environments, such as those fostered by visual aids and interactive media, significantly enhance language acquisition. While flashcards are simpler than

movies or animated storybooks, as discussed by Joy et al. (2021) and Zhou et al. (2023), they share similar benefits in engaging learners emotionally and cognitively.

Nonetheless, it is important to acknowledge challenges highlighted by Damayanti and Hartono (2021), who warned that visual aids could lead to cognitive overload if not well managed. In our study, the vocabulary sets were carefully curated to avoid overwhelming students, suggesting that flashcard effectiveness depends not only on their presence but on thoughtful implementation and pacing.

CONCLUSION

Overall, the present findings confirm the robust effectiveness of flashcards in improving vocabulary mastery among elementary students, validating a large body of supportive literature. Flashcards not only aid in retention and comprehension through visual and verbal integration but also align with motivational and cognitive learning theories. While limitations exist in terms of cognitive overload and design quality, when implemented with strategic planning and age-appropriate content, flashcards prove to be a highly beneficial tool in the vocabulary development of young learners.

This study has several limitations that may affect the generalizability and depth of its findings. The use of purposive sampling from a single school and a small sample size limits external validity, while the short three-week intervention may not reflect long-term vocabulary retention. The researcher-developed multiple-choice test may not fully capture diverse aspects of vocabulary knowledge, and potential instructional bias could have influenced the results. Additionally, individual learner differences were not examined. Future research should consider larger and more diverse samples, longer study durations, comprehensive assessment tools, multiple instructors, and qualitative methods to provide deeper insights into the effectiveness of flashcards in vocabulary learning.

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