



The Effectiveness of Flashcard-Based Learning Media in Enhancing Vocabulary Skills for High School Students

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Article Info

Article History:

Received: 27.08.2025

Revised: 29.08.2025

Accepted: 11.09.2025

Keywords:

Flashcard

Vocabulary Acquisition

Quasy-Experimental

Media

English Education

ABSTRACT

The challenge of low student engagement and academic achievement in English vocabulary is a common issue in language education. This study aimed to investigate the effectiveness of flashcard media in improving students' vocabulary scores at State Senior High School 3 Sampit. Adopting a quasi-experimental design, the research employed purposive sampling to select two tenth-grade social science classes: Class X Social Sciences 4 as the experimental group and Class X Social Sciences 2 as the control group. Data were collected through pre-test and post-test and analyzed using an independent samples t-test. The findings revealed a significant difference in vocabulary scores between the two groups. With a t-statistic of 4.735 ($p < 0.05$), the results showed that the experimental class, which was taught using flashcards, had a significantly higher vocabulary score than the control class. This study concludes that flashcards are an effective and innovative tool for enhancing vocabulary acquisition, suggesting they can serve as a viable solution for increasing student motivation and improving learning outcomes in English language teaching.

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1. Introduction

The ability to master English is strongly linked to a robust vocabulary, which is widely considered the foundation of all four language skills: listening, speaking, reading, and writing (Fathoni et al., 2024; Han et al., 2023). However, a significant number of students in Indonesia often perceive learning vocabulary as a tedious and uninteresting task (Andayani et al., 2024). This challenge is often rooted in the reliance on conventional, teacher-centered teaching methods, which can lead to low student motivation and suboptimal learning outcomes (Adnan et al., 2024; Cahyono & Aditomo, 2023).

To address this issue, educators are continually seeking innovative and effective teaching media that can foster students' interest and enhance their learning experiences (Zainuddin et al., 2024). One such tool is the use of flashcards, which are recognized for their potential to make the learning process more

interactive and enjoyable (Salsabila & Susanto, 2023). Flashcards provide a tangible link between words and images, which can significantly aid in memorization and comprehension, thereby transforming the classroom from a passive to an active learning environment (Pratama & Fitriyani, 2022; Yuliyanto & Suwartono, 2021). The visual and kinesthetic elements of flashcards can cater to different learning styles and make the learning process more engaging and fun (Bungin & Mulyana, 2022; Utami & Lestari, 2020).

Despite the general recognition of flashcards' benefits, there remains a gap in the literature regarding their specific effectiveness in the Indonesian context, particularly within high school settings. Most existing studies on this topic are often limited to elementary or junior high school levels (Hidayat et al., 2022; Jatmiko et al., 2021). Furthermore, research that provides a direct, quasi-

How to cite this article:

Saputra A. (2025). The Effectiveness of Flashcard-Based Learning Media in Enhancing Vocabulary Skills for High School Students. *Journal of Educational Innovation and Research*, 1(1): 36-41

experimental comparison of the use of flashcards versus conventional methods in a specific school environment remains scarce. Therefore, this study aims to fill this research gap by providing empirical evidence on the effectiveness of flashcard media as an instructional tool for vocabulary acquisition.

The study was conducted at State Senior High School 3 Sampit, a well-known school in Kotawaringin Timur. Preliminary observations and teacher reports indicated that students in the tenth-grade social science class faced significant challenges with vocabulary, as reflected in their low motivation and test scores. This research seeks to answer the primary question: Is there a significant difference in students' vocabulary scores between the group taught using flashcards and the group taught without flashcards at State Senior High School 3 Sampit? The findings are expected to contribute valuable insights for educators and school administrators, providing an evidence-based instructional alternative to improve the quality of English language teaching.

2. Methods

This research was conducted at State Senior High School 3 Sampit during the 2021 academic year. It utilized a quasi-experimental research design with a non-equivalent control group, which is appropriate for studying the cause-and-effect relationship between two variables when random assignment of participants is not feasible (Sugiyono, 2022). The study involved two intact tenth-grade classes from the social science major, each consisting of 36 students. The population for this study was all tenth-grade social science students at State Senior High School 3 Sampit. Through purposive sampling, two classes were selected to serve as the research sample: Class X Social Sciences 4 was designated as the experimental group, which received treatment using flashcards, while Class X Social Sciences 2 served as the control group, which received conventional instruction. Additionally, Class X Social Sciences 1 was used for the instrument try-out to ensure the validity and reliability of the research tool before the main experiment.

Data were collected using a pre-test and a post-test, which were administered to both the experimental and control groups. These tests were designed to measure the students' vocabulary scores before and after the treatment. The validity of the test instrument was confirmed using the Pearson Product Moment correlation formula, while its reliability was measured using the Alpha Cronbach formula, with results from the try-out class. The operational definitions for the key variables were as follows:

1. Flashcard Media: Refers to a set of small, rectangular cards with an English word on one side and a corresponding picture or Indonesian

translation on the other. This media was used by the teacher in the experimental class for vocabulary instruction and reinforcement exercises. A total of 50 flashcards were created, containing vocabulary words selected from the tenth-grade English curriculum focusing on the topic of descriptive text. The flashcards were used in various activities, including group drills, vocabulary games (e.g., memory games and matching), and as a visual aid during the teacher's.

2. Conventional Instruction: The control group was taught using a traditional, teacher-centered method. This approach primarily involved a lecture and question-and-answer session, with the teacher using the textbook and a whiteboard to explain new vocabulary words. Students were instructed to copy down the words and their meanings, and practice was limited to reading aloud and simple comprehension checks from the textbook exercises.
3. Students' Vocabulary Score: Refers to the students' scores obtained from the pre-test and post-test. The test consisted of multiple-choice questions and matching exercises to assess the students' comprehension of word meanings, spellings, and usage.

The collected data were then analyzed using the independent samples t-test to determine if there was a statistically significant difference between the mean scores of the two groups. This analysis aimed to provide empirical evidence on the effectiveness of flashcard media in enhancing students' vocabulary acquisition.

3. Results

3.1 Research Findings

This section presents the results of the quasi-experimental study, including descriptive statistics from the pre-test and post-test, as well as the inferential statistical analysis to test the research hypothesis.

Students' Vocabulary Levels

The pre-test results for both the experimental and control classes showed a similar initial vocabulary proficiency level. In the experimental class, the mean pre-test score was 57.64, with the majority of students (54%) falling into the "Less" score category (40-55). Similarly, the control class had a mean pre-test score of 57.78, with 54% of students also categorized as "Less." This indicates that both groups began the study with a comparable vocabulary level, validating the use of these classes for a quasi-experimental design.

Table 1. Pre-Test Scores for Both Classes

Classification	Score Range	Experimental Class (n=36)	Control Class (n=36)
Very Good	80 - 100	1 (2%)	2 (5%)
Good	66 - 79	5 (14%)	3 (8%)
Fair	56 - 65	11 (30%)	12 (33%)
Less	40 - 55	19 (54%)	19 (54%)
Fail	≤ 39	0 (0%)	0 (0%)
Mean		57.64	57.78
St. Dev.		10.453	11.859

Following the intervention, a notable improvement was observed in the experimental class's post-test results. The mean score for this group increased significantly to 78.06, a substantial gain of 20.42 points. This improvement was reflected in a major shift in student classification, with 50% of students now achieving "Very Good" scores (80-100) and a total of 83% reaching the "Good" or "Very Good" categories. Conversely, the control class showed a more modest improvement, with a mean post-test score of 66.11, and only 11% of students reaching the "Very Good" category. This comparison provides preliminary evidence of the flashcard media's positive impact.

Table 2. Post-Test Scores for Both Classes

Classification	Score Range	Experimental Class (n=36)	Control Class (n=36)
Very Good	80 - 100	18 (50%)	4 (11%)
Good	66 - 79	12 (33%)	13 (36%)
Fair	56 - 65	6 (17%)	11 (30%)
Less	40 - 55	0 (0%)	8 (22%)
Fail	≤ 39	0 (0%)	0 (0%)
Mean		78.06	66.11
St. Dev.		10.439	10.962

Statistical Analysis

Before performing the hypothesis test, a series of statistical assumptions were checked to ensure the data were suitable for an independent samples t-test.

Normality Test

A normality test was conducted using the Kolmogorov-Smirnov method to verify if the data were normally distributed. As shown in Table 1.3, the significance values (Sig.) for all four data sets (pre-test and post-test for both classes) were greater than 0.05. This indicates that the data were normally distributed, thus meeting the assumption for the t-test.

Table 3. Normality Test Results (Kolmogorov-Smirnov)

Test	Class	Statistic	df	Sig.
Pre-test	Experimental	.127	36	.148
	Control	.132	36	.113
Post-test	Experimental	.115	36	.200
	Control	.126	36	.158

Homogeneity Test

The homogeneity of variances was assessed using Levene's Test. As per Table 1.4, the significance value for both the pre-test (.510) and post-test (.966) were greater than 0.05. This confirms that the

variance of the data in both the experimental and control groups was homogeneous, further validating the use of the independent samples t-test.

Table 4. Homogeneity Test Results

Test	F	Sig.
Pre-test	.439	.510
Post-test	.002	.966

Hypothesis Test

The independent samples t-test was performed on the post-test scores to determine if there was a statistically significant difference between the two groups. The results, presented in Table 1.5, show that the t-statistic was 4.735, which is considerably higher than the t-table value of 1.994 (at a significance level of 0.05). The p-value (Sig. 2-tailed) was .000, which is far below the threshold of 0.05. Therefore, the null hypothesis, which states there is no significant difference between the two groups, is rejected. This result confirms that there was a statistically significant difference in the vocabulary scores of students taught with flashcards compared to those who were not.

Table 5. Independent Samples T-Test Results

	t	df	Sig. (2-tailed)	Mean Difference
Post-test	4.735	70	.000	11.944

(Equal variances assumed)

4. Discussion

The findings of this study provide strong empirical evidence for the effectiveness of flashcard media in enhancing students' English vocabulary acquisition. The significant difference in mean post-test scores between the experimental and control groups, supported by the independent samples t-test ($t=4.735, p<.001$), firmly supports the hypothesis that flashcard-based instruction is superior to conventional methods for improving vocabulary.

The success of flashcard media can be attributed to several pedagogical factors. First, the use of visual cues aligns with the Dual Coding Theory, which suggests that learning is most effective when information is processed both visually and verbally (Paivio, 2021; Jones & Bartlett, 2022). By presenting a word alongside a corresponding image, flashcards create a stronger and more durable memory trace, making it easier for students to recall and retain new vocabulary (Richards & Rodgers, 2022). This visual-verbal association directly counters the challenge of monotonous rote memorization, which was identified as a major factor contributing to low student engagement (Celik, 2021).

Second, flashcards foster a student-centered, interactive learning environment. Unlike traditional lecture-based methods, flashcards can be used in a variety of engaging activities and games, turning vocabulary learning into a fun and dynamic process (Lee & Kim, 2023). This interactive element

addresses the problem of student boredom and lack of motivation, as confirmed by the study's results showing a substantial improvement in the experimental group's scores (Thompson, 2023). The findings align with research by Williams (2021), who found that interactive learning tools significantly boost student engagement and collaborative learning. Furthermore, the substantial improvement in the experimental class's mean score (from 57.64 to 78.06) demonstrates that flashcards can cater to diverse learning styles, including visual and kinesthetic learners (Chen & Wang, 2022). This contrasts sharply with the limited progress seen in the control group, which relied on conventional instruction. This outcome underscores the limitations of traditional methods that fail to adapt to students' individual learning needs, a point highlighted by Ahmad & Khan (2023). The findings thus contribute to the body of knowledge by providing empirical support for the shift from teacher-centered to student-centered approaches.

This study provides a unique contribution to the existing literature by focusing on the effectiveness of flashcards at the high school level. While flashcards are often associated with elementary or middle school education, our findings demonstrate their continued relevance and efficacy for a more mature student audience. The results indicate that flashcards are a valuable tool not only for initial vocabulary acquisition but also for reinforcing and expanding vocabulary at a more advanced level, addressing a gap in research focused on this specific age group.

While this study offers valuable insights, it is not without limitations. The quasi-experimental design meant that participants were not randomly assigned to groups, which may introduce confounding variables. Although the pre-test results indicated a similar starting point, unmeasured factors such as teacher-student rapport or group dynamics could have influenced the outcomes. Therefore, the generalizability of these findings to other contexts may be limited (Thompson, 2023).

For future research, it would be beneficial to replicate this study using a randomized controlled trial (RCT) design to establish a more definitive causal link. Furthermore, adopting a mixed-methods approach could provide a deeper understanding of students' perceptions and experiences with flashcards through qualitative data such as interviews or focus groups (Brown & Smith, 2024).

5. Conclusion

This study concludes that flashcard media is a highly effective tool for improving students' vocabulary scores in a high school setting. The empirical evidence from the quasi-experimental design revealed a statistically significant difference between

the group taught with flashcards and the control group taught with conventional methods. The substantial increase in the mean post-test score of the experimental class provides concrete proof of the media's positive impact on vocabulary acquisition.

The findings underscore the limitations of traditional, rote-based learning and highlight the pedagogical value of innovative, student-centered media. The use of flashcards not only facilitated better memorization through visual and verbal association but also enhanced student engagement by making the learning process more interactive and enjoyable.

In conclusion, this research provides strong support for integrating flashcards as a key component of English language instruction. It offers a practical and evidence-based solution for educators aiming to boost student motivation and achieve better learning outcomes in vocabulary mastery.

Article Information Form

Acknowledgments

The authors would like to express their sincere gratitude to Universitas Muhammadiyah Sampit for their institutional support in this research. We are also deeply thankful to the principal, teachers, and students of State Senior High School 3 Sampit for their valuable cooperation and participation, which made this study possible.

Authors' Contribution

Ajah Saputra was responsible for the conceptualization and writing of the original draft, conducted the data collection and statistical analysis. Authors contributed to the methodology, data interpretation, and review of the final manuscript.

Declaration of Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

Artificial Intelligence Statement

The authors confirm that Artificial Intelligence (AI) tools were used solely to assist with grammar, syntax, and refining the clarity and academic tone of the manuscript. AI was not used for critical processes such as data collection, data analysis, or the interpretation of results. The authors assume full responsibility for the content and validity of the paper.

Ethical Approval

This study was conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethical approval for this research was obtained from the Research and Community Service Institution (LPPM) of Universitas Muhammadiyah Sampit, with approval number 375/23/UMSA/2024. Informed consent was obtained from the school and participating students' guardians before the study began.

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