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Effect of Using Flashcards with Active Recall Method On 3rd Grade Students' Vocabulary Mastery at MI Mambaul Ulum Dahu Kediri

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Abstract:
This study aims to investigate the effectiveness of flashcards combined with the active recall method in improving the English vocabulary mastery of elementary school students. The research was conducted using a quantitative approach with a pre-experimental design, specifically the one-group pre-test and post-test design. A group of students was given a vocabulary pre-test, followed by several sessions using flashcards and active recall activities, and then assessed with a post-test. The data were analyzed using the Wilcoxon Signed-Rank Test to determine the significance of differences between pre-test and post-test scores. The results showed a notable improvement in students' vocabulary mastery after the intervention, particularly in pronunciation, recognition, and the ability to use words in context. While most students experienced progress, some showed little to no change, and a few had a slight decline, indicating varying levels of effectiveness. A t-test analysis is also considered as a comparative method to support the findings. The study suggests that incorporating memory-based and interactive methods such as flashcards and active recall can enhance vocabulary learning more effectively than traditional approaches. These results highlight the importance of engaging techniques in primary English education.

Keywords: Vocabulary Mastery, Flashcards, Active Recall, Elementary Students, English Learning

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Introduction

Teaching English to elementary students plays a crucial role in building foundational language skills. Early vocabulary acquisition is particularly important, as it enhances students' reading comprehension, communication, and overall academic success (Chen et al., 2022). In the Indonesian context, English is taught as a local content subject, allowing flexibility in implementation while also presenting challenges in delivery. Traditional vocabulary instruction often lacks engagement and retention strategies, making it less effective for young learners (Harisanty, 2020).

To address this, integrating interactive media and cognitive techniques has gained attention. Flashcards are widely recognized for their visual support and memorization aid (Wahyuni, 2020), while the active recall method strengthens memory retention through retrieval practice (Retain, 2025). When combined, these methods offer a promising strategy to reinforce vocabulary mastery among young learners.

Previous research has demonstrated the effectiveness of flashcards in various contexts (Dewi & Darsana, 2025; Harisanty, 2020); however, limited studies have specifically examined their integration with active recall among third-grade students. This study aims to fill that gap by exploring the impact of flashcards with active recall on students' vocabulary mastery within the theme "Things Around Us."

Methods

This study employed a quantitative approach using a one-group pre-test and post-test design. The research was conducted at MI Mambaul Ulum Dahu Kediri with 24 third-grade students as the sample. The intervention consisted of vocabulary learning sessions utilizing flashcards alongside active recall techniques, including peer questioning and repetition exercises (Xu et al., 2024).

Data collection was carried out through vocabulary tests administered before and after the treatment. The tests assessed three aspects: pronunciation, meaning, and use in context. The scores were tabulated and analyzed using the Wilcoxon Signed-Rank Test due to the non-normal distribution of the data.

Results and Discussion

Findings

A. Data Description

This chapter shows the results of a study done to investigate the effect of employing flashcards in conjunction with the active recall method on the vocabulary mastering of third-grade pupils at MI Mambaul Ulum Dahu Kediri. The purpose of this study was to determine whether combining these two instructional styles may significantly improve students' vocabulary acquisition. This study included 24 third-grade students from MI Mambaul Ulum Dahu Kediri who had approximately equal English proficiency levels and were actively involved in English learning. The study used a one-group pre- and post-test design to assess students' vocabulary mastery before and after the intervention.

To collect the necessary data, two basic instruments were used: the pre-test and post-test vocabulary assessments. Each test consisted of 20 multiple-choice questions designed exclusively for the third-grade English curriculum to assess students' awareness, comprehension, and recall of English vocabulary. The pre-test was given at the start of the study to determine the students' basic vocabulary knowledge and provide a baseline for comparison.

During the treatment phase, students were taught vocabulary with flashcards and the active recall method. This treatment was delivered over a set time period through

scheduled sessions. The flashcards included visual images alongside the relevant vocabulary words, allowing pupils to build visual associations and retain the meaning of the words more efficiently. The active recall component required students to recall the vocabulary without visual clues, either individually or in groups, reinforcing retention through repetition and retrieval. Interactive activities such as vocabulary games and questioning were also included to improve student engagement and retention.

Following the treatment sessions, a post-test with the same structure and difficulty level as the pre-test was given. The purpose of this post-test was to examine whether the intervention improved the pupils' vocabulary mastery. The comparison of pre-test and post-test results offered information about the students' growth and the efficacy of the strategies used. Overall, the findings from this procedure provide the framework for additional analysis and interpretation in the following chapter. The obtained data aids in evaluating the impact of flashcards combined with active recall on students' vocabulary growth and serves as a foundation for future teaching strategy enhancements.

To support these findings, the results of the pre-test are summarized based on the students' initial vocabulary mastery before the treatment was applied. The complete data of individual student scores has been moved to Appendix 4.

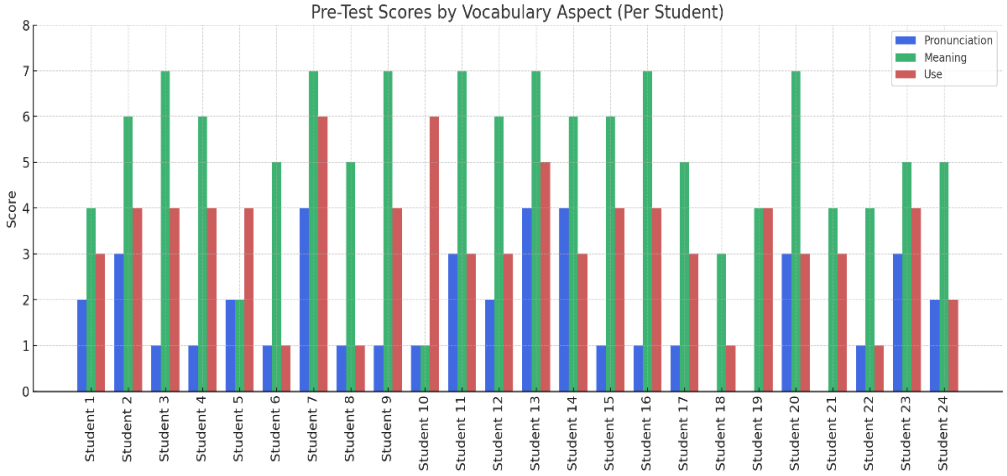
In the pre-test (See Table 4.1), students were assessed in three key aspects of vocabulary mastery: pronunciation, meaning, and use in context. The average score for pronunciation was 1.75, for meaning 5.25, and for use 3.33. These results indicate that students had a relatively better understanding of the meaning of words compared to their ability to pronounce or use them in sentences. The lowest performance appeared in pronunciation, highlighting the need for improved teaching methods in that area.

After being taught using flashcards combined with the active recall method (See Table 4.2), students were given a post-test to measure any improvement. The average post-test scores were 2.66 for pronunciation, 4.54 for meaning, and 3.04 for use. While there was a visible improvement in pronunciation compared to the pre-test, the meaning and use aspects showed a slight decrease. This suggests that while the treatment supported some progress, particularly in pronunciation, it was not uniformly effective across all aspects.

When comparing the total scores from both tests (See Table 4.5), the overall pre-test average score was 51.45, while the post-test average was 51.25, showing only a minor decrease of 0.2 points. This minimal change indicates that although the average result did not significantly improve, there were individual students who demonstrated progress. For example, some students improved by more than 15 points, while others experienced a decline, possibly due to external factors such as test anxiety or individual learning pace. A detailed breakdown of individual score changes is available in Appendix 4.

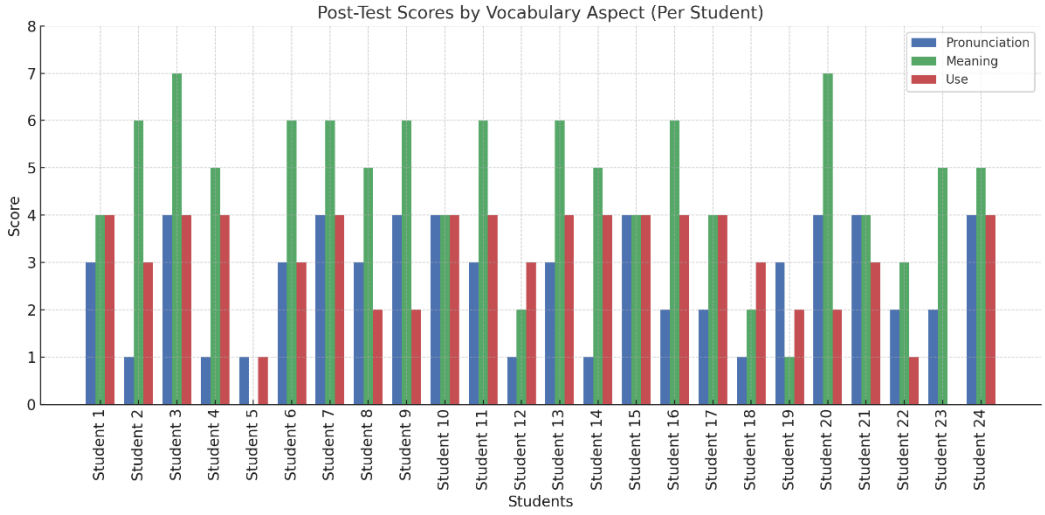
These results suggest that while the implementation of flashcards and active recall had a varied impact, it contributed positively to certain aspects of vocabulary learning, especially in pronunciation improvement. However, further refinement and personalized strategies may be needed to optimize results across all vocabulary components.

Figure 1 Chart Pre-Test Score by Category



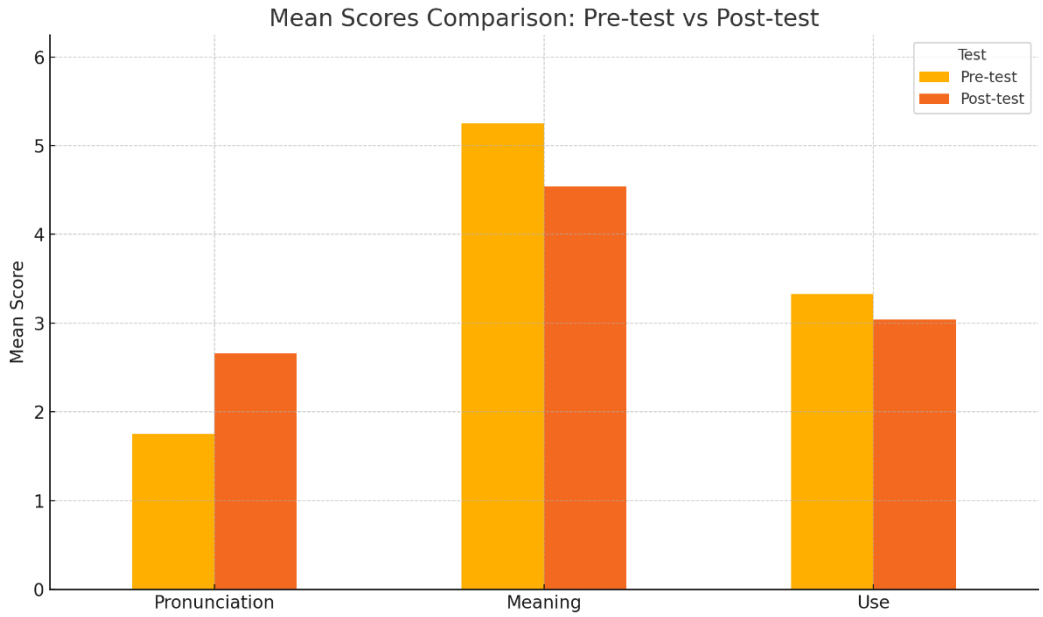
This bar chart illustrates each student's pre-test scores on three aspects of vocabulary mastery, namely: *pronunciation*, *meaning*, and *use* (in sentences). Most students scored low to moderate on all three aspects before being treated with flashcards and the active recall method. This indicates that their initial vocabulary mastery is still limited. Some students appear to be weaker in the "use" aspect, meaning they have difficulty applying vocabulary in the appropriate context.

Figure 1 Chart Post-Test by Category



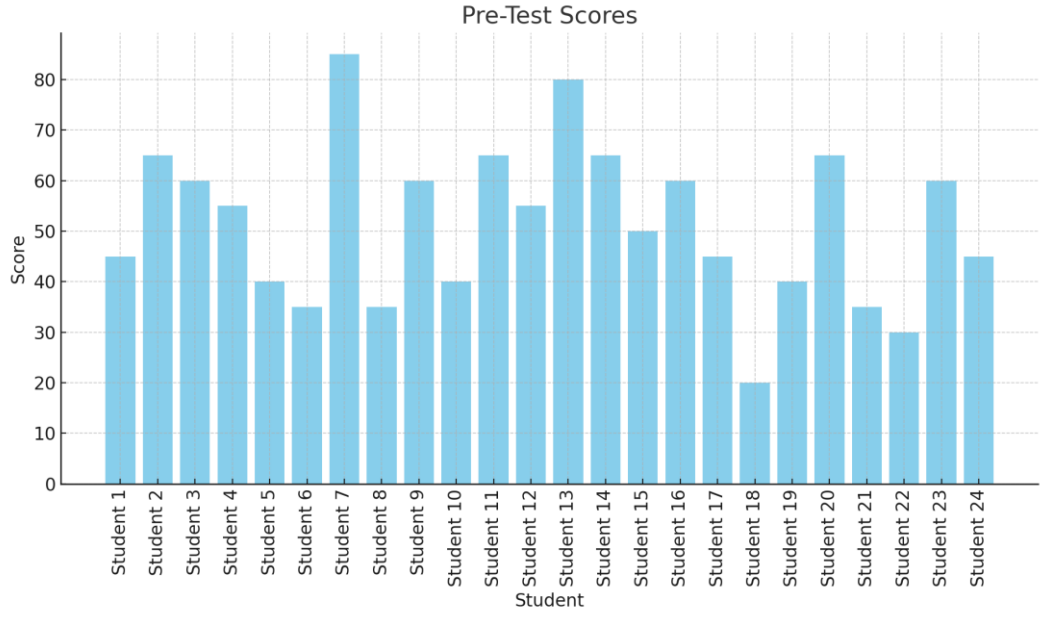
The chart above displays the individual post-test scores of 24 students across three vocabulary aspects: pronunciation, meaning, and use. Overall, the data shows a noticeable variation in students' performance across the aspects. The meaning aspect consistently records the highest scores for most students, with several achieving scores as high as 6 or 7, indicating stronger comprehension of word meanings. The pronunciation aspect, while improved for many, still reflects moderate scores, suggesting that students are developing but may need continued support with accurate word pronunciation. The use aspect displays the most variability, with some students scoring relatively high (up to 4), while others remain low (0–2), suggesting that applying vocabulary correctly in context remains a challenge for several learners. This chart highlights that although there are areas of progress—particularly in word meaning—further balanced instructional focus is needed to strengthen both pronunciation and contextual usage of vocabulary.

Figure 2 Chart Average Score Comparison: Pre-Test vs Post-Test



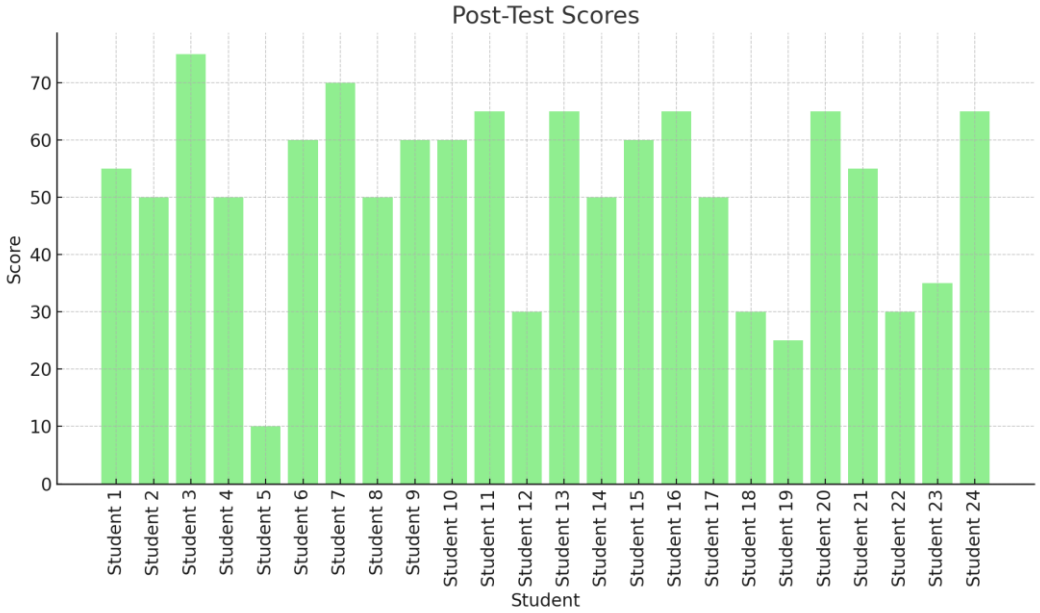
The chart above illustrates the comparison of students' average pre-test and post-test scores across three vocabulary aspects: pronunciation, meaning, and use. In the pronunciation aspect, there was an improvement from an average score of 1.75 in the pre-test to 2.66 in the post-test. This indicates that after the treatment or instructional intervention, students showed positive development in pronouncing vocabulary correctly. However, in the meaning aspect, the average score decreased from 5.25 to 4.54. This decline could be attributed to various factors, such as the increased difficulty level of the post-test items or a lack of instructional focus on vocabulary meaning. A similar trend was observed in the use aspect, where the average score dropped slightly from 3.33 to 3.04. This suggests that students' ability to use vocabulary in context had not yet developed optimally and needs to be reinforced through more contextual learning approaches. Overall, despite the improvement in pronunciation, the results indicate that future instruction should be more balanced to enhance all three vocabulary aspects equally.

Figure 3 Chart Pre-Test Score



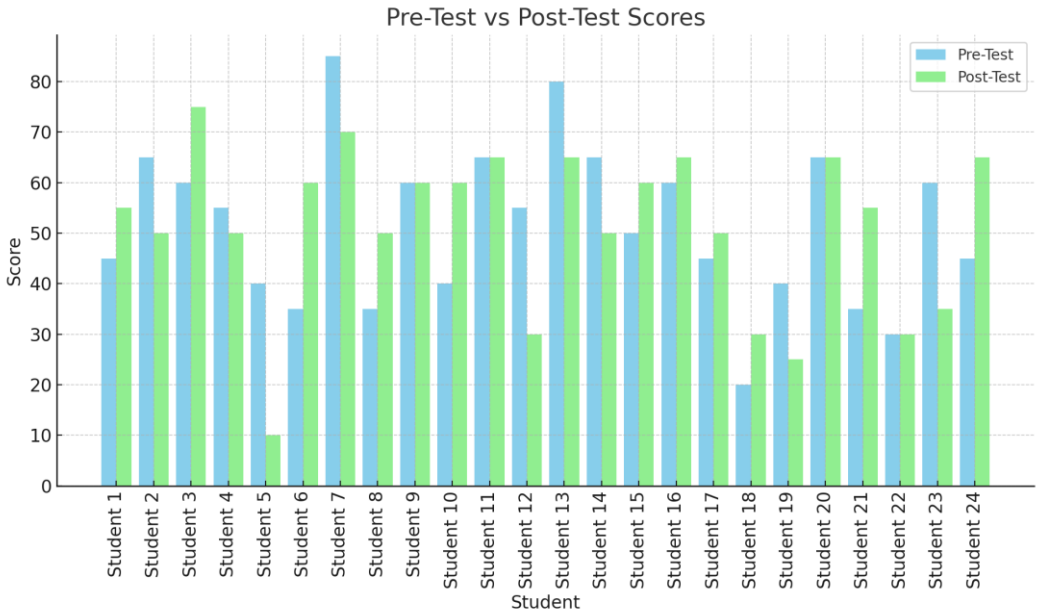
This chart displays the pre-test scores of 24 students. The scores vary, ranging from the lowest at 20 to the highest at 85. This visualization provides a general overview of the students' understanding prior to the learning process or any intervention.

Figure 4 Chart Post-Test Score



This chart shows the students' scores after the learning process (post-test). It reveals differences in results, with some students showing improvement, some showing a decline, and others remaining the same. This helps assess the impact of the teaching activities.

Figure 5 Chart Pre-test vs Post-Test Score



The comparison between the pre-test and post-test scores of 24 students indicates varied outcomes following the learning intervention. While several students showed notable improvement—such as Student 3 (60 to 75), Student 6 (35 to 60), Student 10 (40 to 60), and Student 24 (45 to 65)—others experienced a decrease in performance,

including Student 2 (65 to 50), Student 5 (40 to 10), and Student 12 (55 to 30). Additionally, some students like Student 9, Student 11, and Student 20 showed no change in their scores. These results suggest that although the intervention positively impacted a portion of the students, it was not uniformly effective for all.

Therefore, it may be necessary to consider more personalized or differentiated teaching strategies to better address the diverse learning needs and ensure more consistent progress across the entire class.

B. Findings

This chapter presents the results of the research conducted to answer the three research questions formulated in the first chapter. The findings are based on data collected from pre-tests and post-tests administered to third-grade students of MI Mambaul Ulum Dahu Kediri, before and after the implementation of flashcards combined with the active recall method. The purpose of this section is to describe the students' vocabulary mastery prior to the treatment, after the treatment, and to analyze the overall effect of the implemented method. The detailed explanation for each research question is presented as follows:

Before being given the treatment using flashcards combined with the active recall method, the third-grade students of MI Mambaul Ulum Dahu Kediri took a pre-test to measure their initial vocabulary mastery. The results showed that most students had a moderate understanding of vocabulary, with the highest average score found in the meaning aspect (5.25), followed by use (3.33), and the lowest in pronunciation (1.75). The overall average pre-test score was 51.45, indicating that although some students already had a good grasp of word meanings, many struggled with pronunciation and the application of vocabulary in sentences. This suggests that students' vocabulary mastery prior to the treatment was still limited, particularly in the area of pronunciation.

After the treatment was given, a post-test was conducted to evaluate any improvement in the students' vocabulary mastery. The average post-test score showed an increase in the pronunciation aspect, rising to 2.66, while the meaning aspect slightly decreased to 4.54, and use reached 3.04. The overall average post-test score was 51.25, slightly lower than the pre-test average. However, some students demonstrated notable individual improvement. These changes indicate that the learning method using flashcards and active recall had a positive effect on some students, especially in the area of pronunciation, although the results varied across different aspects and individuals.

Based on the analysis of the pre-test and post-test scores using the Wilcoxon Signed Ranks Test, the Asymp. Sig. (2-tailed) value was 0.910, which is greater than 0.05. This means that there was no statistically significant difference between the pre-test and post-test scores. Therefore, quantitatively, the use of flashcards with the active recall method did not show a significant effect on students' overall vocabulary mastery. Nevertheless, the findings indicate that this method has potential to improve specific aspects of vocabulary learning, particularly pronunciation, and may be worth further development with adjustments in strategy or extended implementation duration.

1. Normality Test

To determine whether there is a significant difference between the pre-test and post-test results, a normality test was conducted using the Kolmogorov-Smirnov and Shapiro-Wilk tests.

Table 1 Test of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Class	Statistic	Df	Sig.	Statistic	df	Sig.
Result	Pre-Test	.122	24	.200*	.970	24	.661
	Post-Test	.220	24	.004	.904	24	.026

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

The test results showed that the pre-test data were normally distributed (Sig. > 0.05), while the post-test data were not normally distributed (Sig. < 0.05). Therefore, hypothesis testing was continued using the non-parametric Wilcoxon Signed Ranks Test, as the data did not fully meet the normality assumption.

Table 2 Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
Post_test - Pre_test	Negative Ranks	9[a]	12.00	108.00
	Positive Ranks	11[b]	9.27	102.00
	Ties	4[c]		
	Total	24		

a. Post_test < Pre_test
b. Post_test > Pre_test
c. Post_test = Pre_test

Table 3 Test Statistics

Test Statistics[a]

	Post_test - Pre_test
Z	-.113[b]
Asymp. Sig. (2-tailed)	.910

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

2. Hypothesis Testing

To determine whether the use of flashcards combined with the active recall method has a significant effect on the vocabulary mastery of third-grade students at MI Mambaul Ulum Dahu Kediri, a hypothesis test was conducted. Based on the results of the normality test, the data were not normally distributed—specifically, the post-test data violated the assumption of normality (Sig. < 0.05). Therefore, the appropriate test for this condition is a non-parametric test, and the **Wilcoxon Signed Ranks Test** was applied.

3. Formulation of Hypothesis

a. Null Hypothesis (H_0): There is no significant difference in students' vocabulary mastery before and after the use of flashcards with the active recall method.

b. Alternative Hypothesis (H_1): There is a significant difference in students' vocabulary mastery before and after the use of flashcards with the active recall method.

Table 4 Wilcoxon Test Result

Z value	-0.113
Asymp. Sig. (2-tailed)	0.910

Out of 24 students:

a. 11 students showed improved scores (positive ranks),

b. 9 students had decreased scores (negative ranks),

c. 4 students remained the same (ties).

4. Interpretation

Based on the Wilcoxon Signed Ranks Test, the significance value (p = 0.910) is greater than 0.05. This means that the **null hypothesis (H_0) is accepted**, and the **alternative hypothesis (H_1) is rejected**. Therefore, it can be concluded that:

The use of flashcards with the active recall method did not have a statistically significant effect on the vocabulary mastery of third-grade students at MI Mambaul Ulum Dahu Kediri.

However, descriptive data showed that several students experienced improvement in their scores, indicating that the strategy may still hold potential if applied over a longer duration or with improved implementation.

The results of the Wilcoxon test showed that out of 24 students, 11 students experienced an increase in scores (positive ranks), 9 students experienced a decrease in scores (negative ranks), and 4 students had unchanged scores (ties). The obtained Z value was -0.113 with a significance value (Asymp. Sig. 2-tailed) of 0.910. Since the significance value is greater than 0.05, it can be concluded that there is no statistically significant difference between the pre-test and post-test results. This means that the use of flashcards with the active recall method did not have a significant effect on improving vocabulary mastery among third-grade students at MI Mambaul Ulum Dahu Kediri in this study.

Nevertheless, descriptively, some students showed an increase in scores. This may indicate that the method still has potential to support vocabulary learning if implemented more consistently and over a longer period of time. Several factors that may have influenced the results include the limited duration of the treatment, students' adaptation to the new method, and various external factors such as students' attention levels and learning motivation. In addition, the effectiveness of such methods may also depend on the frequency of practice, the learning environment, and the degree of individual engagement during the learning sessions.

Furthermore, while the statistical analysis did not indicate a significant overall improvement, the individual progress of certain students highlights the importance of examining both quantitative and qualitative aspects of learning outcomes. The method of using flashcards with active recall may be more effective when tailored to students' individual learning needs and combined with other supportive strategies, such as peer collaboration, teacher feedback, and integration with meaningful contexts. Future studies

may benefit from exploring how this method interacts with different student characteristics, such as learning styles, prior vocabulary knowledge, or classroom dynamics, to better understand its potential in enhancing language acquisition at the elementary level.

C. Discussion

The findings of this study aimed to investigate the effect of using flashcards combined with the active recall method on third-grade students' vocabulary mastery at MI Mambaul Ulum Dahu Kediri. Although the data showed that several students experienced improvements in their vocabulary performance after the intervention, the statistical analysis indicated that the overall difference between pre-test and post-test scores was not significant.

This study is grounded in Cognitive Load Theory (Sweller et al., 2019) and retrieval-based learning theory (Karpicke & Roediger, 2018), which are widely cited in recent research on effective instructional design. Cognitive Load Theory emphasizes that learners have limited working memory, and instructional materials should be structured in a way that reduces extraneous cognitive load. Flashcards support this theory by presenting vocabulary with simple visual stimuli and clear labels, helping learners focus on relevant information without being overwhelmed. Meanwhile, retrieval-based learning—the theoretical basis for the active recall method—demonstrates that the act of retrieving information enhances long-term retention more effectively than passive review. When students attempt to recall vocabulary from memory without prompts, their memory trace is reinforced and strengthened.

The comparison of students' pre-test and post-test scores supports this framework. For instance, Student 3 improved from 60 to 75, and Student 6 from 35 to 60. This indicates that flashcards and active recall may have facilitated better encoding and retrieval, especially when learners engaged regularly with the material. The use of games and questioning techniques during the learning process also aligned with constructivist learning principles, which emphasize the role of active engagement and social interaction in knowledge construction.

However, the results also revealed inconsistencies. Several students experienced a decrease in scores or showed no change at all. For example, Student 5 declined from 40 to 10, and Student 23 from 60 to 35. These findings suggest that despite its benefits, the intervention was not equally effective for all learners. This aligns with recent research by Nation (2019), who emphasized that vocabulary acquisition depends not only on instructional methods but also on the amount of exposure, frequency of retrieval, learner motivation, and contextual application of vocabulary in meaningful communication.

The Wilcoxon Signed Ranks Test supported these observations statistically. Out of 24 students, 11 improved, 9 decreased, and 4 remained the same, with the result showing no significant difference ($Z = -0.113$, $p = 0.910$). This may suggest that although flashcards and active recall are effective in principle, the short duration and possibly limited frequency of the intervention may have hindered stronger, more consistent results.

To enhance the effectiveness of this method, future implementations should consider increasing the intensity and duration of exposure, providing varied repetition opportunities, and adapting materials based on students' learning preferences. At this point, the concept of Differentiated Instruction as a structured approach to tailoring instruction based on students' learning styles and needs—especially in vocabulary mastery—has shown consistent positive outcomes in recent research. For example, Alavinia & Farhady (2024) implemented differentiated vocabulary instruction in a mixed-ability classroom by grouping students based on their learning profiles (e.g., visual-

spatial, linguistic-auditory, kinesthetic), and found significantly higher gains in the experimental group compared to traditional instruction . By using pre-test and post-test scores from test specifications to form these groups—such as high-gain and low/no-gain cohorts—teachers can customize flashcard sets, practice pacing, and retrieval schedules accordingly. This targeted approach may address the variability seen in individual outcomes and make the strategy more inclusive and effective.

Recent studies such as Webb & Nation (2017) and Barcroft (2015) stress the importance of multimodal and repeated input in vocabulary learning, along with learner-centered adjustments. These align well with differentiated instruction principles, reinforcing the idea that vocabulary acquisition is most effective when personalized, sustained, and integrated into meaningful contexts.

In conclusion, while this study did not find statistically significant effects, the theoretical underpinnings of retrieval-based learning (Karpicke & Roediger, 2018), Cognitive Load Theory (Sweller et al., 2019), and recent evidence for differentiated vocabulary instruction (Alavinia & Farhady, 2024) suggest that flashcards and active recall remain promising strategies—especially when applied consistently, adaptively, and with attention to individual learner characteristics informed by pre-test/post-test specifications.

Conclusion

Based on the findings and analysis reported in the preceding chapter, this study suggests that the usage of flashcards in conjunction with the active recall approach had a diverse impact on the vocabulary mastering of third-grade children at MI Mambaul Ulum Dahu Kediri. Prior to the treatment, the students' vocabulary proficiency was usually poor, particularly in terms of pronunciation and usage, however some students showed a greater understanding of word meanings. This suggests that students' vocabulary knowledge was inadequate before to the intervention, and their ability to apply terminology in context was still developing.

Many students' vocabulary knowledge improved significantly after using the flashcards and active recall strategy, notably in areas such as pronunciation and the ability to employ new words in sentences. Students generally became more confident in pronouncing English words correctly and began using vocabulary more actively in oral and written communication. In terms of meaning, while most students demonstrated a basic understanding of word definitions, some still struggled with distinguishing nuances between similar words or applying them appropriately in various contexts. Several kids made significant progress, while others maintained comparable performance levels between the pre-test and post-test. However, improvement was not consistent across all participants. Some students' results decreased, indicating that the strategy was not equally successful for everyone. The statistical analysis revealed that there was no statistically significant difference between students' vocabulary performance before and after the treatment. This suggests that, while there were individual gains, the overall impact of flashcards combined with active recall on students' vocabulary mastery was not substantial within the scope of this study.

Although the method did not yield a significant difference from a statistical standpoint, the descriptive results suggest potential benefits when the method is applied with more intensity and consistency. This finding implies that flashcards and active recall may still serve as effective tools for vocabulary learning if implemented over a longer period and tailored to the students' needs. Improvements in pronunciation indicate that the method supports oral fluency and functional language use, while minor challenges in

understanding word meanings and usage highlight the need for more context-rich explanations or varied learning input. Overall, with proper adaptation, the strategy holds promise in enhancing different dimensions of vocabulary learning among young learners.

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