



## The Effectiveness of Digital Flashcards in Improving Vocabulary Mastery of Seventh Grade Students of SMP Taruna Sakti Pekanbaru

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### Abstract

This study aims to investigate the effectiveness of digital flashcards in improving the vocabulary mastery of seventh-grade students of SMP Taruna Sakti Pekanbaru as measured through a vocabulary test. The study applied a pre-experimental design involving one group without a control group, in which measurements were conducted before and after the treatment. The data were obtained from a vocabulary test consisting of 30 multiple-choice items given as a Pre-Test and Post-Test. The mean score of the Pre-Test was 64, while the Post-Test mean increased to 86.23, indicating a notable improvement in students' vocabulary achievement. The results were analyzed using the Wilcoxon Signed-Rank Test, which produced an Asymp. Sig. (2-tailed) value of 0.000. This indicates that the null hypothesis ( $H_0$ ) is rejected and the alternative hypothesis ( $H_a$ ) is accepted. Consequently, it can be concluded that the use of digital flashcards has a positive and significant effect on students' vocabulary mastery.

**Keywords:** Digital Flashcards, Vocabulary Test, Vocabulary Mastery



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### INTRODUCTION

Vocabulary is a collection of words used or known by a particular person or group of people. Vocabulary is divided into several types, starting from verb, noun, adjective, pronoun and many others. Learning vocabulary is a very important part of learning a language. The more words you know, the greater your ability to understand what you hear and read and the higher your ability to say what you want to say or write. The importance of vocabulary in learning a new language cannot be avoided. Having a strong vocabulary will greatly help students learn English and its four main skills: listening, speaking, reading, and writing (Asyiah, 2017). Students will be more motivated in vocabulary learning, if they are taught using an interactive and enjoyable teaching method. Low interest and motivation in students will significantly affect their academic performance; therefore, it is necessary for teachers to innovate in creating learning media (Nissa & Renoningtyas, 2021). Based on this study, teachers should strive to find digital-based learning methods that can capture students' interest and motivate them to study more diligently. By using technology, teachers can create a more interesting and relevant learning environment for students in this digital era. One of the issues in vocabulary learning at the Junior High School level relates to the removal of English language subjects from the elementary school curriculum, which may reduce students' early exposure to the language. This can affect their ability to understand and develop English vocabulary effectively by the time they reach Junior High School. Based on the observations, the removal of English language subjects as local curriculum components has resulted in uncertainty regarding the role of English language education at the elementary school level, leading to issues such as the lack of adequate learning facility support for Junior High School students (Faridatuunnisa, 2020). Based on this study, the Junior High School students find it difficult to learn English because they did not learn English vocabulary during Elementary School.



The motivation of SMP Taruna Sakti Pekanbaru students in learning vocabulary tends to be low for several reasons. First, the monotonous and uninteresting teaching methods make students feel bored because they only focus on memorizing words without context. Second, students often feel that the vocabulary learned is irrelevant to their daily lives, so they feel useless and have difficulty seeing the direct benefits of learning it. Thirdly, low self-confidence in language skills, students are often afraid of making mistakes when using new words. and lastly, a less supportive learning environment and lack of variety in teaching materials make students lose their enthusiasm to learn vocabulary actively. For most seventh graders, learning English in Junior High School is their first experience with the language, making the process quite challenging. Their English vocabulary is still very limited, and when asked to memorize words, many of them have difficulty remembering the vocabulary in subsequent meetings. This condition requires teachers to make extra efforts to attract students' interest and help them learn effectively. In this context, technology plays a very important role in supporting the learning process. In the era of deep learning, education is expected to provide various forms of learning that are conscious, meaningful, and enjoyable, where students are actively engaged with the material and find personal relevance in what they are learning. Therefore, the use of appropriate learning media is very important not only to facilitate student understanding but also to increase their motivation, so that the learning process becomes more effective and enjoyable.

The removal of English language subjects from the elementary school curriculum may prompt demands for Junior High School teachers to utilize digital learning media to enhance students' initial understanding of English. One digital learning media that can improve students' vocabulary is digital flashcards. According to Fitriyani & Nulanda (2017), flashcards are highly practical media because one indication that visual imagery could provide effective memory cues is that students typically find it easier to recognize images than text. Flashcards are a very useful medium in the learning process because they utilize the power of visual images as a tool for remembering information. This study shows that the human brain tends to recognize images more quickly and effectively than text, so flashcards that display images have the advantage of helping students understand and remember concepts better. In addition, the use of flashcards allows students to make stronger connections between words or concepts and visualizations, which ultimately makes it easier for them to remember the material in the long term. With this method, learning becomes more interactive and interesting, helping to increase student motivation and involvement. In this study, the researcher is interested in investigating the effectiveness of using digital flashcards in improving Junior High School students' vocabulary. The researcher will only focus on seventh grade students of SMP Taruna Sakti Pekanbaru.

### **Digital flashcards**

Digital flashcards, which incorporate interactive elements such as audio, visuals, animations, and spaced repetition, extend the traditional use of flashcards and contribute to more effective vocabulary learning (Hermansyah et al., 2023). These technological features reinforce the fundamental principles of teaching vocabulary through flashcards, which emphasize repetition, active recall, and visual association to improve word retention (Aba, 2019). While traditional flashcards offer visual support in learning new words, digital flashcards enhance this function by providing multisensory input and immediate feedback, enabling students to practice independently both in and outside the classroom. Consequently, the use of digital flashcards in vocabulary instruction not only updates conventional flashcard methods but also boosts students' engagement and motivation through technology-supported learning.

## RESEARCH METHODS

### Research Design

This study used a quantitative research design because it aimed to measure the effectiveness of digital flashcards in improving the vocabulary mastery of seventh-grade students at SMP Taruna Sakti Pekanbaru. Quantitative research focuses on the collection and analysis of numerical data and, according to Sugiyono in Abdullah (2022), is based on positivism through the use of random sampling, research instruments, and statistical analysis to test hypotheses. In line with this objective, this study applied a pre-experimental design. Pre-experiment design is a new method used to find the effects of a treatment on a subject under controlled conditions. (Wahyuningrum et al., 2021). Specifically, this study employed a one-group pre-test-post-test design, in which one experimental group from the Siliwangi class—identified through a preliminary survey as having low vocabulary mastery—was given treatment using digital flashcards. The students' pre-test and post-test scores were then compared to determine whether there was a significant improvement after the treatment was administered.

**One Group Pre-Test Post-Test Design**

Pre-test	Treatment	Post-test
O <sub>1</sub>	X	O <sub>2</sub>

Source (Sugiyono, 2013)

### Population and Sample

#### Population

According to Sugiyono (2013), population is a generalization area consisting of objects or subjects that have certain qualities and characteristics determined by researchers to be studied and concluded, and in this study the population was the seventh-grade students of SMP Taruna Sakti Pekanbaru in the academic year 2024/2025 with a total of 60 students.

**Population of The Research**

No	Class	Number of Students
1	Siliwangi 1 (VII.1)	30
2	Siliwangi 2 (VII.2)	30
	<b>Total: 2 Classes</b>	<b>60</b>

(Source: Administration Office of SMP Taruna Sakti Pekanbaru 2024/2025)

#### Sample

According to Sugiyono (2013), a sample is a part of the population that reflects its size and characteristics, and when the population is too large to be fully studied due to limited resources, a representative sample is used; therefore, this study used only one class as the sample without a control class, applying cluster random sampling as described by Sugiyono (2013), and selecting class VII.1 as the sample, consisting of 30 students.

#### Data and Instrument

This study used the questions test based on the aspect of vocabulary mastery by Lado in Herdianty & Sherly (2024). Before applying flashcards media, the researcher conducted a pre-test containing 30 test questions, then carried out an experiment using digital flashcards media, and afterwards conducted a post-test to determine the effectiveness of digital flashcards media.



### Data Collection Techniques

Data in this study were collected through a pre-test, treatment, and post-test. The pre-test was administered prior to the treatment to identify the students' initial level of vocabulary mastery. The treatment was carried out over six sessions using digital flashcards via the Quizlet application, during which students studied vocabulary related to classroom objects, school locations, extracurricular activities, and prepositions of place. Once the treatment concluded, the post-test was given to evaluate students' vocabulary improvement. The post-test results were then compared with the pre-test scores to determine the effectiveness of the digital flashcards.

### Data Analysis Techniques

The aim of this study was to determine whether the use of digital flashcards through the Quizlet application had a significant impact on improving students' vocabulary mastery. In this study, data were obtained by assessing students' vocabulary understanding, and the data were processed using the SPSS 20 software to analyze, predict, and draw conclusions. Thus, all tests conducted in this study were performed using the SPSS 20 program.

## RESEARCH RESULTS AND DISCUSSION

### Validity Test

According to Ghozali (2018), the validity test is used to assess whether a questionnaire is accurate or valid. Before giving the test to the sample, the researcher first tested the validity and reliability of the vocabulary test to ensure that the pre-test and post-test instruments accurately measured students' mastery. The items were tested using SPSS 20 at SMP Taruna Sakti Pekanbaru in class VII-1, and the analysis was conducted using IBM SPSS 20. Based on Pearson correlation analysis, all 30 items were declared valid because each item's correlation coefficient exceeded the R table value of 0.361 and had a significance level below 0.05, indicating that all items showed a significant positive correlation.

### Reliability Test

According to Livingston (2018), the reliability of a test score indicates the extent to which the score remains consistent when tested at different times, using different versions of the test, or scored by different raters. A test or measurement is considered reliable if it produces the same results when repeated under similar conditions. The results of the reliability test are below:

Reliability Statistics	
Cronbach's Alpha	N of Items
.924	30

Based on the table of the reliability test results on 30 questions used to measure the variables in this study.

### Normality Test

Normality test is carried out to assess whether the data collected has a normal distribution pattern or not (Khan, 2022). Normality tests can be performed in various ways, and each method can produce varying outputs. The Shapiro-Wilk test was used in this study as it is recommended for small samples, i.e. below 50.

Test of Normality Shapiro-Wilk						
Tests of Normality						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest Vocabulary	.174	30	.022	.920	30	.026
Posttest Vocabulary	.256	30	.000	.891	30	.005

Based on table, the results of the normality test using Shapiro-Wilk with a Sig. value in the pre-test of 0.026 which is above 0.05, the research data is normally distributed. And the Sig. value in the post-test of 0.005 is smaller than 0.05, the research data is not normally distributed. This study uses a non-parametric test, namely the Wilcoxon signed test.

### Descriptive Statistics

According to (Franzese & Iuliano, 2019), descriptive statistics are used as a preliminary stage in applied scientific research to summarize and explain voluminous data in an easy-to-understand manner based on experimental results. Descriptive data in the table below:

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Pretest Vocabulary	30	30	89	64.00	18.428
Posttest Vocabulary	30	63	100	86.23	8.862
Valid N (listwise)	30				

The table presents the pre-test and post-test results of the vocabulary assessment administered to 30 students. In the pre-test, scores ranged from 30 to 89, with a mean score of 64 and a standard deviation of 18.428. Following the treatment, students' performance improved, as shown in the post-test scores, which ranged from 66 to 100, with a higher mean of 86.23 and a reduced standard deviation of 8.862. Table 3.4 indicates that the average pre-test score of 64 falls into the "average" category, while the post-test mean score of 86.23 is categorized as "very good." Therefore, it can be concluded that students' vocabulary mastery has increased.

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Based on the table, the normality test results obtained through the Shapiro-Wilk analysis show that the pre-test score has a Sig. value of 0.174, which is higher than 0.05, indicating that the data are normally distributed. Meanwhile, the post-test score has a Sig. value of 0.000, which is below 0.05, meaning that the data are not normally distributed. Therefore, this study employed a non-parametric statistical test, specifically the Wilcoxon signed-rank test.



### Wilcoxon Signed Test

The Wilcoxon signed-rank test is a non-parametric statistical procedure used to examine differences in central tendency when the data do not meet the assumption of normality. As stated by Rosner et al. (2006), this test evaluates paired observations—such as pre- and post-treatment measurements—without requiring normally distributed data. The procedure involves computing the differences between each pair of scores, ranking the absolute values of these differences, and then accounting for their positive or negative signs. Because of this process, the Wilcoxon test is appropriate for ordinal data as well as interval or ratio data that violate normality assumptions, making it a practical alternative to the paired t-test.

Wilcoxon Signed Test				
Ranks				
		N	Mean Rank	Sum of Ranks
Posttest Vocabulary - Pretest Vocabulary	Negative Ranks	0 <sup>a</sup>	.00	.00
	Positive Ranks	30 <sup>b</sup>	15.50	465.00
	Ties	0 <sup>c</sup>		
	Total	30		

The analysis of the pre-test and post-test results revealed that all 30 participants demonstrated score improvements following the intervention, with every case classified under Positive Ranks and none falling into Negative Ranks or Ties. This indicates that each participant achieved a higher score on the post-test compared to the pre-test, showing that the intervention had a positive and effective impact on their learning outcomes. The Wilcoxon test was subsequently applied to examine whether the differences between the pre-test and post-test scores were statistically meaningful, enabling the researcher to draw conclusions related to the study's hypothesis.

Test Statistics	
Test Statistics	
	Post-Test – Pre-Test
Z	-4.787 <sup>b</sup>
Asymp. Sig. (2-tailed)	.000

Based on the Wilcoxon test output, the Asymp. Sig. (2-tailed) value obtained was 0.000, which is less than 0.05, indicating a statistically significant difference in students' reading comprehension before and after using Digital Flashcards. Because the Sig. value is smaller than 0.05, the null hypothesis ( $H_0$ ), which states that digital flashcards do not have a significant effect, is rejected. Thus, the alternative hypothesis ( $H_a$ ) is accepted, meaning that the use of digital flashcards has a significant positive effect on students' vocabulary mastery.

### Discussion

This study aims to investigate the effectiveness of digital flashcards in improving the vocabulary mastery of seventh-grade students of SMP Taruna Sakti Pekanbaru. The findings indicate that digital flashcards contribute positively to students' vocabulary development. The experimental group's pre-test mean score was 64.00, which increased to 86.23 in the post-test, reflecting a gain of 22.23 points or approximately 34.7%. Hypothesis testing using the paired sample t-test yielded a significance value of  $0.000 < 0.05$ , demonstrating a statistically significant improvement following the intervention. Regarding the research instrument, all 30 items were validated, with item correlation coefficients ranging from 0.361 to 0.783, and were found to be reliable, as indicated by a Cronbach's Alpha value of 0.924, which signifies excellent



internal consistency. These findings show that the results are supported not only by the improvement in student scores but also by the strong quality of the measurement instrument. This study is related to previous studies that show a consistent pattern that flashcards are very effective in improving students' vocabulary mastery, but this study makes a new contribution by emphasizing that digital flashcards offer additional advantages over conventional flashcards. These advantages lie in their interactivity, ease of access, and multimedia features that can increase student motivation to learn. Thus, the implication of this study's results is that teachers need to utilize innovative digital media such as digital flashcards in the vocabulary learning process to overcome low learning interest, lack of motivation, and students' difficulties in understanding the meaning of words. For students, the use of this interactive media should be maximized because it can make the learning process more enjoyable and effective. Meanwhile, for future researchers, these findings open up opportunities to conduct broader studies on the effectiveness of other digital media, or to test the long-term impact of using digital flashcards on English language skills more comprehensively.

## **CONCLUSION**

The results of this study demonstrate that the use of digital flashcards significantly enhanced the vocabulary mastery of seventh-grade students at SMP Taruna Sakti Pekanbaru. Analysis of the pre-test and post-test scores from the single experimental group using the Wilcoxon test produced an Asymp. Sig. (2-tailed) value of 0.000, which is below the 0.05 significance threshold. This outcome led to the rejection of  $H_0$  and the acceptance of  $H_a$ . Therefore, it can be concluded that digital flashcards positively influence students' vocabulary development. As a result, digital learning tools such as digital flashcards can be regarded as effective alternative media for teaching vocabulary mastery.

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