



THE UTILIZATION OF DIGITAL FLASHCARD IN ENGLISH VOCABULARY LEARNING AT ELEMENTARY SCHOOL

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ABSTRACT

In Indonesia's elementary education, English vocabulary acquisition remains challenging due to limited exposure and traditional methods. Digital flashcards, recognized for their interactivity and accessibility, offer a potential solution, yet their efficacy in low-resource settings is underexplored. This study investigates the effectiveness of Canva-based digital flashcards in enhancing vocabulary comprehension among Grade I students at SD Negeri 50 Kendari, a school with minimal English proficiency. A pre-experimental one-group pretest-posttest design was employed with 24 students. Pretest and posttest data (10 multiple-choice questions) were analyzed using SPSS 16.0, including paired samples t-tests ($\alpha = 0.05$). Results showed a significant increase in mean scores from 21.25 (pretest) to 46.25 (posttest) ($p = 0.000$), confirming digital flashcards' effectiveness. However, external factors (e.g., motivation) were noted as limitations. The study underscores digital flashcards' utility in resource-constrained contexts and advocates for further research on long-term retention, multimodal integration, and adaptive technologies. Practical contributions include a replicable model for teachers using Canva to create low-cost, engaging materials.

INTRODUCTION

Since English is an international language and is used for both oral and written communication, it is one of the languages that must be mastered in the current globalization era. Language plays a crucial role, particularly as a tool for communication. Communication is a process of exchanging information, ideas, and feelings between individuals or groups. It is a fundamental aspect of human interaction and plays a crucial role in various aspects of life, including personal relationships, education, business, and politics (Littlejohn, 2017). The ability to communicate in a complete sense is the ability to discourse, namely the ability to understand and produce oral or written texts that are realized in The four skills that must be mastered in English consist of four basic skills: reading, listening, writing, and speaking Hamer A. (2018); (Sharma S., 2020). Previous research mentions there is a better way to teach a language than grammar Kusuma (2019), The most effective method for learning a foreign language, especially English is by using direct intuition, which is representation through existing images related to unfamiliar words. In social situations, these four abilities are employed to either initiate or reply to conversation. As a result, English courses aim to cultivate these abilities so that graduates can converse and interact in English at a particular level of literacy.

All elementary school students are required to take English as a local content. The

goal of teaching English in elementary schools is to help children become more proficient communicators and to raise their understanding of the language's value and nature in order to increase the competitiveness of the country in a global economy. Students must become accustomed to using English in order to accomplish these aims Guswita R. (2020); (Juriana, 2017). Learning vocabulary is one way that students who are accustomed to and attached to English should get ready for life in a global society (Putranti, 2019). Vocabulary, as a fundamental component of language acquisition holds significant significance for students, particularly children. Enhancing learners' lexicon is a crucial component of their linguistic advancement (Zuhriyah A. R. et al. 2024). To do this, instruction must be engaging, entertaining, and interactive, bolstered by media that encourages students to take an active role in their education.

Digital flashcards are electronic equivalents of conventional study cards. They can be fluid and interactive, appearing on an electronic device as text, photos, audio, or video. Card creation, editing, and organization are simple for users, and they can benefit from features like online sharing, interactive quizzes, and intermittent repetition. Research indicates that through systematic repetition and active learning, digital flashcards enhance recall and comprehension of the content (Abdulwahed et al., 2021); (Chen et al., 2022); (Smith & Jones, 2023). In addition, creating a digital flash card on Canva is quite easy. This daring graphic design platform offers a variety of templates that can be customized with text, images, and other design elements. Additionally, users can use the media itself. After purchase, the design of the card can be saved as a PDF or a picture (JPEG, PNG). To share by email, upload a PDF to an employee's Dropbox or Google Drive account. Alternatively, if each designed card is an image, use a third service to create a gallery of images that can be compared Brown (2022) ; (Williams, 2022). Finally, Collaborating and accessing study materials without downloading is made simple by sharing digital flashcard URLs. This is helpful for sharing with peers or for distant study (Littlejohn, 2017). Digital flashcards are easily accessible with the integration of external content via links, which is supported by some online learning platforms (LMS). Since updates to flashcards stored in cloud storage are automatically viewable through the same link, material updates are also more convenient (Kim & Park, 2022; Davis, 2023; Martinez et al., 2024).

From the opinions of some experts above, Digital flashcards have a number of advantages that make them an effective and popular learning tool. Firstly, digital flashcards are very portable, allowing users to study anytime and anywhere. According to research by Smith (2020) stated that the use of digital flashcards allows students to access learning materials without time and space constraints, thus increasing the frequency of learning. In addition, digital flashcards are also practical and efficient. Johnson (2021) states that "With the organizational and grouping features of the flashcard app, students can easily find and focus on the topics they need to learn." Finally, digital flashcards are not only memorable, but also fun. Brown (2022) found that the use of interactive and gamification elements in digital flashcards makes learning more engaging and improves information retention. With these advantages, digital flashcards are a great choice for many learners.

According to the opinions of the several experts mentioned, digital flashcards are an effective tool for increasing student motivation and learning outcomes, and they can be used in conjunction with technology to improve learning (Biological, 2021). As the newest technology, digital flashcards give educators great chances to develop efficient teaching methods, particularly to pique students' interest in reading on smartphones (Mewoh A. H. et al. 2022). In addition, many researchers have conducted research on the use of flashcards as media in learning English. According to Arsana N. W. (2021), the use of flashcards in language learning offers teachers an efficient way to train and learn, and they can also be a useful teaching tool for students to learn and comprehend terminology. Flashcards can encourage children to learn language, claims (Chotimah, 2021). In the

meantime, research results from the use of flashcard media were 3.5, which was classified as "Very Good" (Hasibuan, 2020). The efficiency of using digital flashcards for learning English vocabulary has not been extensively studied, despite the fact that flashcards have been the subject of numerous researches. Although existing research supports the effectiveness of digital flashcards for memory and ease of use. However, there is no specific research on the impact of the collaboration and URL sharing features of Canva digital flashcards on elementary school students' self-efficacy and learning motivation in online learning. Based on observations conducted at SD Negeri 50 Kendari, it was determined that grade I students' vocabulary in English still needs a lot of work and improvement. Therefore, the goal of this study is to determine the efficacy of digital flashcards in enhancing students' command of English vocabulary during Teaching Assistance Program.

This study investigates the effectiveness of Canva-based digital flashcards in enhancing vocabulary comprehension among Grade I students at SD Negeri 50 Kendari, a school with minimal English proficiency. Compared to prior studies on digital flashcards (e.g., Smith et al., 2020; Brown, 2022; Arsana N. W. (2021), this research uniquely focuses on elementary students with limited prior English exposure in a low-resource setting (SD Negeri 50 Kendari), addressing a gap in context-specific efficacy. While existing studies highlight general benefits (e.g., portability, gamification), this study empirically validates digital flashcards' impact on vocabulary comprehension through a pre-experimental design with rigorous SPSS analysis, revealing a statistically significant improvement ($p = 0.000$). Additionally, it leverages Canva-based flashcards, emphasizing ease of creation and accessibility, a practical innovation not extensively explored in earlier works (Lee et al., 2020); (Garcia & Brown, 2021). The study also identifies external confounding variables (e.g., motivation, home environment), adding nuance to the interpretation of results—a limitation seldom addressed in similar research (Sugiyono, 2018).

METHODS

The study employed a pre-experimental design to investigate the impact of interactive learning applications (X) on students' understanding of English vocabulary (Y). However, post-test results (Y2) may also be influenced by external factors like motivation, home environment, or teacher differences, highlighting the limitations of this design due to uncontrolled variables.

Experimental research, common in education and social sciences, involves manipulating independent variables to measure effects on dependent variables. This study used a single-group pre-test/post-test design, where one class underwent a pre-test (Y1), received the experimental treatment (X), and then took a post-test (Y2). Since external variables were not controlled, the findings should be interpreted cautiously.

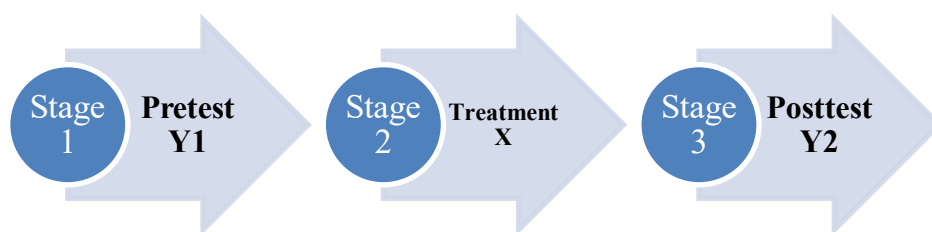


Figure 1. One Class Pretest-Posttest Design

The sample in this study was grade I students of SDN 50 Kendari in the 2023/2024 school year involving 24 students, consisting of 15 males and 9 females each aged 10-11 years old. The students in this school have very limited English language skills especially vocabulary skill. Based on a preliminary study conducted through interviews and observations at SD Negeri 50 Kendari during the seventh batch of the teaching campus program, the researchers found that students' vocabulary was still poor, even though they

had learned English from the previous teaching campus program. They have low interest and motivation to learn vocabulary, and the methods used in teaching vocabulary do not support students to improve their vocabulary. Challenges in English as they fail to succeed in their studies while having access to other resources, like non-technological media. For this reason, teachers and students are exposed to technology-based media (Maulina and Ignacio L. A. C. et al. 2022).

Table 1. List of Sample

No	Class V	Number
1	Male	15
2	Female	9
Total		24

The researchers used simple random sampling to select one class for the study. A pretest was administered to assess participants' initial vocabulary comprehension before the intervention. After applying the treatment systematically, a posttest (identical to the pretest) was conducted to measure its effectiveness. Both tests consisted of 10 multiple-choice questions and were attended by the same 24 participants.

Data from the pretest (May 13, 2024) and posttest (May 17, 2024) were analyzed quantitatively using SPSS 16.0. Employing the same instrument for both tests allowed tracking of individual changes, aligning with pre-experimental design practices (Gravetter & Wallnau, 2017).

RESULTS AND DISCUSSION

This study was obtained from the analysis of pre-test and post-test data conducted before and after treatment, in accordance with the procedures that have been determined as follows.

Pre-test

The pre-test lasted for 30 minutes and consisted of 10 questions focusing on noun recognition in English. The result analysis of students' vocabulary comprehension of pre-test in the Figure 2.

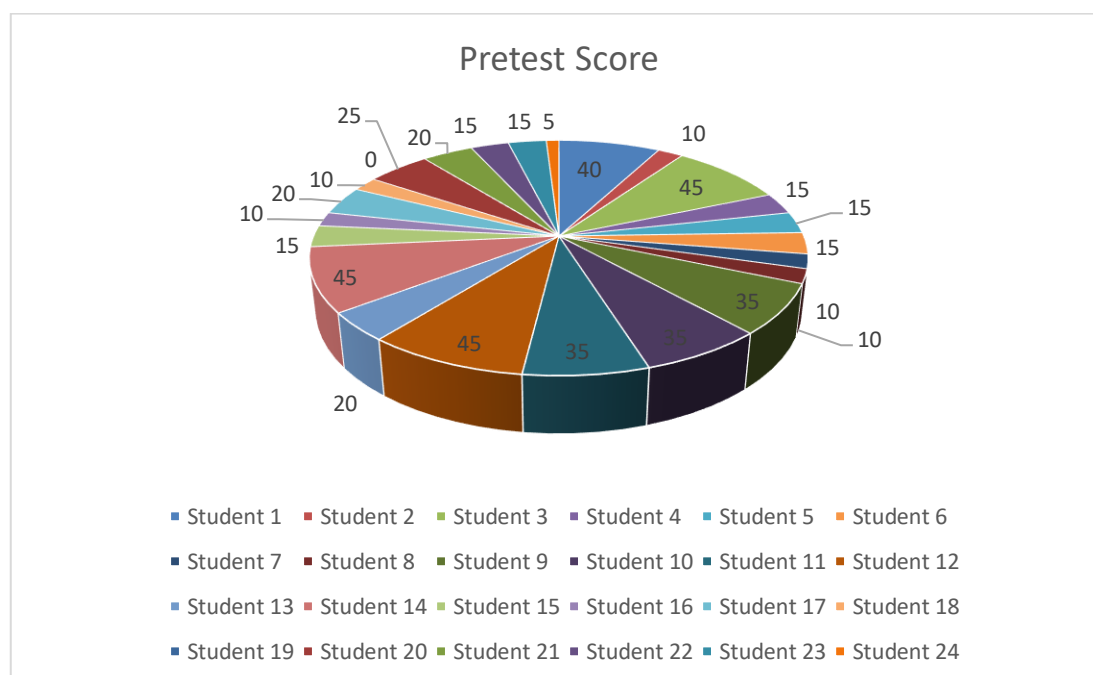


Figure 2. One Class Pretest-Posttest Design

Based on the table 2 of pre-test results above, the score minimum was 0, and score maximum was 45.

Treatment

The treatment procedure can be seen in the table 2 below:

Table 2. Lesson Plan of Digital Flashcards

Day	Topic	Learning Stage	Teacher Activities	Student Activities	Time Allocation
1	Introduction to the English Alphabets A-I.	Opening	Greet students in a friendly manner, take attendance, and convey today's learning objectives.	Responding to teacher's greetings, listening to the explanation of learning objectives.	5 Minutes
		Core Activities	- Display digital flashcards of capital and lowercase letters A-I one by one. Pronounce each letter clearly. Ask students to imitate. - Display flashcards of objects that start with the letter being studied (example: A for apple, B for ball, etc.). Name the objects clearly. - Repeating the pronunciation of letters and names of objects together. Inviting students to mention examples of other objects that begin with the letter.	- Observe the digital flashcards, listen to the teacher's pronunciation of letters, and imitate them together and individually - Observing pictures of objects, listening to the names of objects mentioned by the teacher. - Repeats pronunciation of letters and names of objects. Attempts to name examples of other objects that begin with the same letter.	30 Minutes
		Closing	Summarize the material that has been studied today. Give praise for student participation. Informing the material for the next meeting (letters J-R). Giving simple tasks (for example, finding an object in	Responding to the teacher's praise. Listening to information for the next meeting and taking notes on assignments.	5 Minutes

			the house whose name begins with one of the letters studied).		
2	Introduction to the English Alphabets J-R.	Opening	Greet students in a friendly manner, take attendance, quickly review a little of the previous day's material (A-I). Convey today's learning objectives.	Responding to teacher's greetings, remembering letters A-I, listening to explanations of learning objectives.	5 Minutes
		Core Activities	- Continue to display digital flashcards of capital and lowercase letters J-R one by one. Pronounce each letter clearly. Ask students to imitate. - Display flashcards of objects that start with the letter being studied. Name the objects clearly. - Repeating the pronunciation of letters and names of objects together. Inviting students to mention examples of other objects (if any) that begin with the letter.	- Observe the flashcards, listen to the teacher's pronunciation of letters, and imitate them together and individually. - Observing pictures of objects, listening to the names of objects mentioned by the teacher. - Repeats pronunciation of letters and names of objects. Attempts to name examples of other objects that begin with the same letter.	30 Minutes
		Closing	Summarizing the material that has been studied today. Provide positive feedback to students. Inform material for next meeting (letters S-Z and review).	Listening to the summary from the teacher.	5 Minutes
3	Introduction to the English	Opening	Greet students in a friendly manner, take attendance,	Responding to teacher's greetings, remembering the	5 Minutes

Alphabets S-Z.		quickly review a little of the previous day's material (J-R). Convey today's learning objectives.	letters J-R, listening to the explanation of learning objectives.	
	Core Activities	Complete letter recognition by displaying digital flashcards of capital and lowercase letters S-Z one by one. Pronounce each letter clearly. Ask students to imitate. Display flashcards of pictures of objects that begin with the letter being studied. Pronounce the names of objects clearly.	Observing flashcards, listening to the pronunciation of letters from the teacher, and imitating them together and individually. Observing pictures of objects, listening to the names of objects mentioned by the teacher.	30 Minutes
	Closing	Summarize all the A-Z letters and objects that have been learned for 3 days. Give praise and motivation to students for their participation and progress.	Listening to the summary from the teacher. Receiving praise and motivation.	5 Minutes

Based on the lesson plan above, the subject of English For Beginner, unit 1 on letter recognition (alphabet), with the main material “Objects that begin with the letters of the alphabet” for grade 1 semester 2 of the 2023/2024 school year, the treatment for students for 3 days will focus on fun and interactive activities to stimulate letter recognition through objects around them using digital flashcards. Enhancing students' memory-related skills helps them retain the information both before and after they begin learning (Khair M. and Nasrullah R., 2022). In addition, the goal of the lesson is to visually recognize and pronounce the letters of the alphabet (A-Z). The focus is on recognizing capital and lowercase letter shapes. Visually identifying the relationship between letters and simple objects around them. Students learn to associate letter shapes with pictures of objects that begin with that letter. Building an initial understanding of letter sounds through teacher pronunciation and student imitation. Although there is no audio from the flashcards, the teacher plays an important role in modeling the correct pronunciation. Increases students' active participation in learning through visual and interactive activities.

At the product implementation stage, pre-test and post-test are given. Pre-test is given before implementing digital-based flashcard products to students, and post-test activities was carried out after implementing digital-based flashcard products in the learning process. The implementation of the pre-test and post-test was carried out. Totalling 24 students. The implementation stage can be seen in Figure 3.



Figure 3. Introduction to the English Alphabet

The classroom environment is depicted in Figure 1 above. The instructor is teaching the letters to the students while positioned at the front of the room. The kids, on the other hand, are seated on their benches and seem to be listening to the teacher, which suggests that they are learning how to pronounce the letters. Students will have the chance to mimic and practice pronouncing the letters once the instructor introduces and pronounces them. The treatment in the picture was conducted on May 15, 2025.



Figure 4. Using Digital Flashcards with Alphabet-Initial Pictures

These digital flashcards show images of items or creatures that start with each letter of the alphabet, as shown in figure 2. These cards are used by teachers to introduce pupils to letters and first sounds. Students then work on matching the initial letter of the object or animal's name to each picture. For instance, pupils will identify the letter "Gg" on the card with the image of "Guitar." Students' early literacy on the correspondence between letters and sounds in reading is enhanced by this activity. Here is the link for using digital flashcards in learning vocabulary during the 7th batch of teaching campus program at SD Negeri 50 Kendari.

Post-test

The test was given using the same questions as the Pre-test. This test lasted for 30 minutes. A total of 24 students served as respondents or subjects in this study. Data regarding students' scores after vocabulary teaching using flashcards can be seen in the following table.

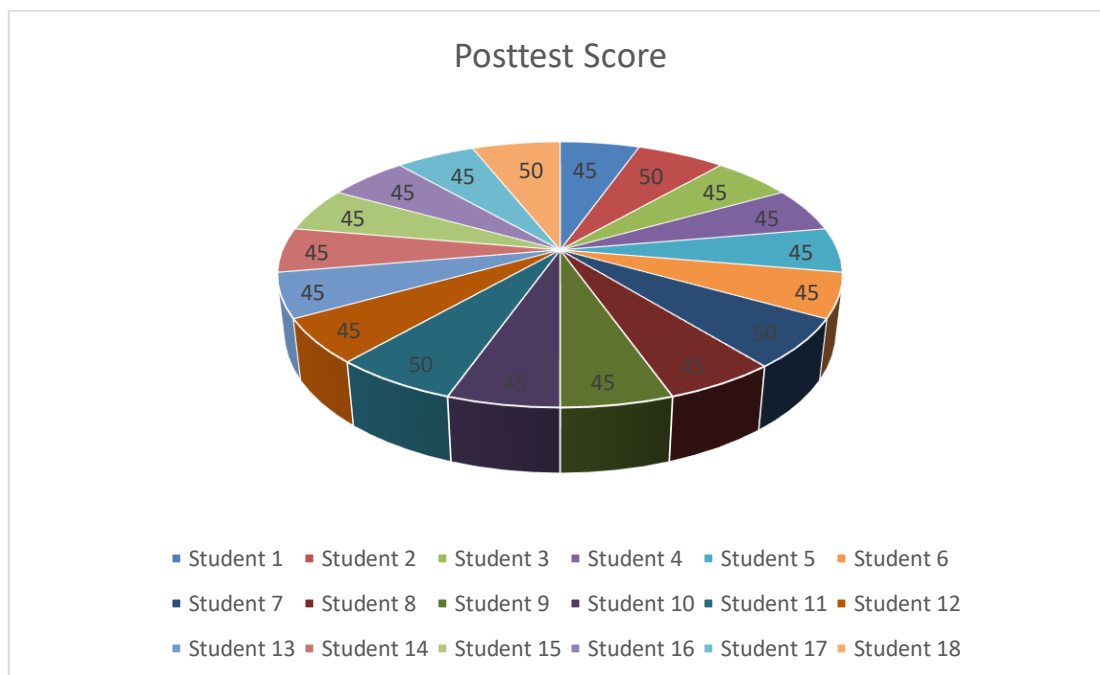


Figure 5. One Class Pretest-Posttest Design

Based on the table 4 of post-test results above, the score minimum was 45, and score maximum was 50.

Comparison between Pre-Test and Post-Test Result

Pre-test findings give a preliminary image of participants' knowledge or skill levels before the learning or intervention, and they frequently reveal significant individual differences in comprehension. On the other hand, post-test data, which are gathered after the intervention is finished, should ideally demonstrate a notable improvement over the pre-test, demonstrating the efficacy of the strategies or resources used. Table 3 below shows a comparison of the pre-test and post-test data values.

Table 3. Comparison Scores of Pre-Test and Post-Test

No	Subject	Pretest Score	Posttest Score	Gain Score
1	Student 1	40	45	5
2	Student 2	10	50	40
3	Student 3	45	45	0
4	Student 4	15	45	30
5	Student 5	15	45	30
6	Student 6	15	45	30
7	Student 7	10	50	40
8	Student 8	10	45	35
9	Student 9	35	45	10
10	Student 10	35	45	10
11	Student 11	35	50	10
12	Student 12	45	45	0
13	Student 13	20	45	25
14	Student 14	45	45	0
15	Student 15	15	45	30
16	Student 16	10	45	35
17	Student 17	20	45	25
18	Student 18	10	50	40
19	Student 19	0	45	45

20	Student 20	25	45	20
21	Student 21	20	50	30
22	Student 22	15	50	35
23	Student 23	15	45	30
24	Student 24	5	45	40
Total		510	1110	595
Score Minimum		0	45	0
Score Maximum		45	50	40
Mean		21.25	46.25	24.79

Based on the information contained in Table 3, the average pretest score for class I was recorded at 21.25, while the average post-test score reached 46.25. From this data, it is clear that the average post-test score in class I is higher than the average pretest score. Thus, it can be concluded that the use of flashcards positively contributed to improving students' mastery of English vocabulary in the Teaching Assistance Program at SD Negeri 50 Kendari.

Result

Quantitative analysis methods, specifically statistical analysis, were used to assess the data from the questionnaire. Respondents' answers were calculated for the frequency of each question item and converted into percentages. After that, a summary of the answers was given. After the analysis, all answers were used to corroborate the research findings and report on knowing the effectiveness of digital flashcards in improving students' English vocabulary acquisition in the Teaching Campus Program at SD Negeri 50 Kendari.

The SPSS software was used to analyze the data in order to identify any notable variations between the students' first and second questionnaire responses. These findings were then utilized to provide quantitative answers to the study questions. The SPSS 16.0 software was used to code and statistically analyze the students' questionnaire answers. Mean scores were computed by the analysis of quantitative data. The significance threshold in the study's statistical analysis was determined to be 0.05. Several tests, such as the paired t-test and the normality distribution test, were performed once the post-test results were obtained.

The Result Paired Sample Test

The means of two related or paired variables can be compared using the inferential statistical technique known as paired sample statistics. Data obtained from the same subject at two separate times (for example, before and after an intervention), when two treatments are administered to the same subject, or when matched pairs of individuals are employed in a study are the reasons for this link. Determining whether the means of the two paired measurements differ statistically significantly is the primary goal of paired sample statistics. To put it another way, we are interested in determining whether the observed change is larger than what may be the result of pure chance.

Table 4. Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-Test	21.2500	24	13.53337	2.76249
	Post Test	46.2500	24	2.21163	.45145

A statistical description of the Pre-Test and Post Test measurements is provided in the above table. The mean score for the pre-test is 21.2500, and the mean score for the post-test is 46.2500. The average has significantly increased from before to after. A total of 24 samples (subjects or pairs) were measured. This shows that 24 data pairs were used for the analysis. A statistical description of the Pre-Test and Post Test measurements is provided in the above

table. The mean score for the pre-test is 21.2500, and the mean score for the post-test is 46.2500. The average has significantly increased from before to after. (N) A total of 24 samples (subjects or pairs) were measured. This shows that 24 data pairs were used for the analysis.

The Result Paired Samples Correlation

Samples in pairs a statistical method for determining the strength and direction of a linear link between two paired variables is correlation analysis. When every value on one variable directly correlates with a value on the other, the variables are said to be paired. The objective is to determine whether two sets of linked measurements have a meaningful relationship.

Table 6. Paired Samples Correlations

				N	Correlation	Sig.
Pair 1	Pre-Test & Post Test			24	-.200	.349

As can be seen from the previous table, the conclusion to accept H_0 and reject H_a is appropriate and in accordance with the decision-making guidelines in hypothesis testing because the sig value, also known as the p-value, is 0.349, which is higher than the significance level of 0.05. The statistical basis for rejecting the alternative hypothesis and not rejecting the null hypothesis is a p-value that is greater than the significance level.

The Result Paired Sample Test

The SPSS 16.0 software was then used to test the data (pre-test and post-test scores) using the Paired Sample T-Test at a significance level of 0.05. In order to understand judgments based on the probability of success, specifically:

If the sig > 0.05, means H_0 is accepted

If the sig < 0.05, means H_0 is rejected

Table 7. Paired Samples Test

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Pre-Test - Post Test	-2.50000E1	14.14214	2.88675	-30.97170	-19.02830	-8.660	23	.000

According to table 7 above, the average difference between pre-test and post-test scores is represented by the mean value of -2.50000E1, or -25. Post-test results are often greater than pre-test scores, according to this negative number. The standard deviation number of 14.14214 shows the degree of variation in the score difference. Standard Error The sample mean difference's potential deviation from the actual population mean difference is estimated by the mean value of 2.88675. The range of values within which we are 95% convinced that the population mean difference truly lies is indicated by the 95% Confidence Interval for the Difference between -30.97170 and -19.02830. This interval further supports the idea that the Post-Test scores are much greater because it is completely negative. The t statistic has a value of -8.660. This gauges how significant the variation in sample means is in relation to the

data's variability. However, the number of data pairs minus one ($n-1$) is shown by the df value, which is 23. Additionally, the p value is .000 (or $p < 0.001$), which is the Sig. (2-tailed). Since this value is so little, the likelihood of obtaining the observed mean difference in the event that the population's Pre-Test and Post-Test results are identical is extremely low.

DISCUSSION

According to the findings of the data analysis, the digital flashcards that were created can be deemed legitimate and practical for use in assisting students in enhancing their proficiency in learning regular and irregular verbs in the English language (Donald, 2010). The following features make digital flashcards a viable option and provide them excellent qualities. First, flashcards can pique students' enthusiasm in learning, particularly when they are digital Audie (2019); (Wati I. N., 2021). Previous studies have shown that engaging learning materials are a good way to encourage students' growth (Fadloeli N., 2021). Students will be assisted in comprehending the information that the teacher presents through the use of suitable educational materials. Since classroom instruction has an impact on children's development, primary school students' learning processes require extra care. Primary school students' development at this time offers parents and teachers a great chance to optimize their development and potential. Primary school education can be utilized to identify students' potential and help them develop it to its fullest potential in addition to preparing them for higher education. Furthermore, primary school is a great time for teachers to develop ideas and get students ready for higher education (Wulanata I., 2018). Children benefit from the use of learning media because it increases their motivation to learn. Students are stimulated by learning media to comprehend the content that is taught to them Airlanda (2021); Apriyanti et al., 2020). Since elementary school students are susceptible to the stimulation, teachers can use it to help them understand fundamental ideas. Since every child has a distinct developmental stage, the inspiration given must also be taken into account together with the child's developmental stage (Andani D., 2020).

The needs of students during the learning process and their individual traits are taken into consideration when creating digital flashcards. In order for the offered material to be effectively communicated, comprehended, and retained by students as a source of advanced knowledge, the appropriate media and subject matter selection will result in interactive learning. Because games are enjoyable and may be used in the classroom to boost student motivation and excitement for learning, the play while learning technique can also be used to develop instruction for elementary school children Fidiyanti (2020); (Utami, 2021). Students will be motivated to learn when the play while learning method is used, and teachers will be able to develop an innovative learning process. In addition to being well-prepared, teachers as professional educators must also arm themselves with competent teaching abilities because the learning process is more complex than anticipated Anisa (2018); Shafa et al., 2022). Students are given information through learning media, which is a crucial part of the learning process. As a result, learning materials can be enhanced to assist educators in making their points clear and fostering more creative learning. Teachers now have the chance to design and choose from a variety of creative, innovative learning materials that may be customized to meet the needs of students thanks to technological advancements (Hayati, 2021; (Rifqiawan, 2016). Teachers can create learning materials like these digital flashcards as they see fit with the use of technology.

The results of earlier studies, which indicate that the flashcard media created has a beneficial influence on raising student interest in learning, support the digital-based flashcard goods used in this study. According to earlier studies, using multimedia flashcard applications can enhance students' vocabulary acquisition of English (Dewangga et al., 2017). Because digital flashcards can be accessed via laptops or other devices, their use is flexible (Erviana & Andriani, 2019; Susantini & Kristiantari, 2021). Additionally, flashcard materials can make learning more creative, diversified, and less repetitive (Adhani et al., 2016; Okdiansyah et al., 2021). In order to boost student interest in the learning process, this study also uses a digital

application base, specifically Canva for the creation process to digital-based flashcards (Aba, 2019; Nasution, 2020).

Because the information supplied has been packaged and backed up by a variety of visuals and text, the research's implications include the creation of digital flashcard media that can make learning materials easier for students to absorb. Additionally, the generated digital flashcard media simplifies student learning strategies, is accessible from anywhere at any time, and may be used repeatedly to fully understand the content. Thus, it is envisaged that additional study would be able to deepen and broaden the area of studies on related subjects.

CONCLUSION

This study demonstrates that digital flashcards significantly improve vocabulary comprehension among Grade I students at SD Negeri 50 Kendari, as evidenced by the increase in average scores from 21.25 (pretest) to 46.25 (posttest), supported by a statistically significant Paired Samples T-Test result ($p = 0.000 < 0.05$). The findings confirm that digital flashcards enhance literacy skills by aiding vocabulary acquisition, particularly for struggling learners. Future research should explore long-term retention, compare digital flashcards with other tools (e.g., gamified apps), test broader demographics, integrate multimodal elements (e.g., audio/kinesthetic features), assess teacher/student perceptions, investigate adaptive AI-powered flashcards, and examine cross-linguistic applications to optimize ed-tech in early education.

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