Teaching English Using Digital Flashcards to Improve Grammar Skills of Junior High School Students

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Abstract. Although digital flashcards are popular among English teachers, initiatives to actually measure the differences before and after using digital flashcards for teaching were relatively scarce. The study aims to investigate the statistical differences between two groups taught using digital flashcards. The design of this study is quantitative, and the method is experimental, involving 52 students at a junior high school. The students were grouped into experimental (N=26) and control (N=26) groups. The data were collected by conducting a pre-test and post-test, giving both groups 25 grammar questions on each test. The experimental group was taught English grammar using digital and printed flashcards, while the other was not. The test scores of the respondents from the two groups were analyzed using a statistical program and Microsoft Excel. The results of this study show that there is a statistically significant difference between the experimental and the control groups. The data also show that the mean of the experimental group was 68.31, and the control group's mean was 52.46. A t-test was conducted to answer the research question. The computation results showed a statistically significant difference between the experimental and control groups. It means that the alternative hypothesis is accepted. Compared to the control group, using flashcards in teaching grammar is more effective. It is recommended that English teachers could utilize flashcards, both digital and printed, to improve students' grammar skills.

1 Introduction

Many Indonesian students struggle with confidence in speaking a foreign language, with grammar being a major obstacle at all learning stages[1]. Research conducted by [2] found that EFL learners have difficulty speaking confidently because they have problems creating language and mastering correct grammar. However, [3] asserted that even advanced speakers often experience grammatical errors, which hinder comprehension and communication. Some people misunderstand that successful communication is more important than correct spelling and grammar. Unfortunately, this approach may not be correct because it is almost impossible to provide clarity without grammar. Thus, students' grammar mastery is still crucial.

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Nowadays, there are many fun learning activities to learn grammar. Various educational authors use several teaching strategies, promoting the importance of using various media and attracting students to study. Incorporating diverse teaching and learning activities, along with adapting teaching methods and utilizing educational media, can help cultivate student engagement in the learning process [4]. Some of these strategies are games, flashcards, and modern technologies. Some of the most powerful tools for teaching, such as flashcards, are considered the most effective for language learning due to their availability, versatility, and learning interest. According to [5], using flashcards is very helpful in improving English language skills. Generally, flashcards tend to be used to teach vocabulary, but in this study, flashcards were used as teaching media to help students form English sentences and grammar skills.

Flashcards are an indispensable tool for language learners. They not only support grammatical concepts, but they also have a big impact on strengthening bonds between students. Furthermore, they can ease the stress of language learning by providing a structured and interactive way to review and remember vocabulary and grammar. Additionally, using flashcards can stimulate motivation by offering a sense of accomplishment as learners progress through their learning [6]. Games that use flashcards do more than just relieve boredom; they help to develop language creativity and fluency [7].

However, even though flashcards help to reinforce basic grammar rules, their usefulness in relation to the intricacies of grammar is not very effective. This issue arises from the inherent difficulty associated with grammar rules and the necessity for contextual understanding and comprehensive exposition [8]. Thus, teachers should be cautious when designing flashcards because they should bridge a gap between brevity and complexity, allowing students to acquire knowledge of grammatical structures more sophisticatedly [9].

Other previous studies that examined the use of flashcard as instructional materials to help students improve their grammar proficiency lend support to this research. The first Rabika Rahawi's study, "The Side Effect of Applying Single Slot Substitution Drill Technique Through Flashcards on Students' Grammar Mastery," examined how flashcards affected students' acquisition of the Simple Past Tense. Participants in the study were split into treatment and control groups, with the results revealing that the experimental group outperformed the control group on post-tests. This suggests that the technique was effective in enhancing students' grammar skills [10]. The second study is Samsu Armadi's study entitled "Using Flashcards to Increase Grammar Mastery of MTs Students in Kutai Kartanegara" to evaluate the efficacy of flashcards as a teaching aid for junior high school students. Utilizing a quantitative research method with an experimental design, the study revealed that flashcards significantly enhanced grammar acquisition compared to traditional textbook methods.[11]. The last study by Octaviani and Soepriatmadji examined the efficacy of traditional flashcards in teaching present progressive tense grammar in the digital era. The findings indicate that students found traditional flashcards easier to use and more motivating, positioning them as a creative solution for schools with limited resources [12].

The key difference between the previous research and the current study is based on the utilization of both digital and printed flashcards in the current study. This approach was adopted to cater to students who lacked access to mobile phones. In addition, the current research attempts to bridge the gap between the different views of using flashcards in improving students' grammar. Thus, the current study investigates whether using flashcards to teach English grammar effectively improves junior high school students' grammar mastery. Combining various interesting resources, such as using flashcards and ways to interact with the teacher and other students in the classroom, can inspire EFL students and encourage better grammar understanding. Considering the findings of many previous studies, the hypothesis (Ha) of this study was developed under the presumption that, following the

intervention of employing flashcards to enhance students' mastery of grammar, a statistically significant difference will be observed between the experimental group and the control group.

2 Research Methods

The main objective of this research is to examine, using a quantitative framework, how well flashcards can help students become more proficient grammar users. The quantitative approach enables examining the interaction between variables [13]. Grammar proficiency is the dependent variable in this study, and flashcard instruction is the independent variable. The selection of an experimental strategy is essential to effectively answer the research question by implementing the intervention, selecting, and regulating variables, and handling confounding variables [13]. To effectively compare the progress of the experimental group, which used flashcards, with the non-intervention control group, it was essential to employ a quasi-experimental design. This approach allowed for a more reliable assessment of the impact of flashcards on the experimental group's progress by ensuring that any differences observed were more likely attributable to the intervention rather than other factors [13]. The study involved 52 eighth-grade students at a junior high school in Yogyakarta as participants in this study, categorized into experimental (N= 26) and control (N= 26) groups.

The data collection procedure in this study involved administering a 25-item multiple-choice test that mainly measured the students' grammar mastery level in the initial research process. The test was given in printed form, consisting of present tense problems explained in a descriptive narrative that addressed various aspects of grammar. The data collection technique in this study was using tests, which were conducted twice: pretest and posttest. Two classes were tested in a pre-test: the experimental group and the control group, prior to intervention in the experimental group. Students were asked to do 25 multiple-choice grammar questions focusing on part of speech and simple present tense with a time allocation of 45 minutes.

Following the pre-test, students were given the teaching treatment using flashcards for five meetings. The learning materials used were related to descriptive text, with the grammar taught focusing on simple present tense and descriptive text structure. In addition to learning grammar, students also learned to develop descriptive texts in writing by applying the grammar they have learned. After receiving the intervention for five meetings, students were tested again on their grammar skills through a post-test. The implementation of the post-test was the same as the pre-test. Students were asked to do 25 multiple-choice questions related to grammar, focusing on parts of speech and simple present tense.

After collecting the data, it was analyzed using Microsoft Excel to determine the score of each participant. A statistical program was then employed to compare the pre-test and post-test scores of both the experimental and control groups using an independent t-test.

3 Result and Discussion

The research was conducted by utilizing a test to answer the research question of this study. The test was administered on two occasions: a preliminary assessment to ascertain the students' baseline proficiency prior to implementing an intervention involving flashcards to enhance their grammatical mastery, and a subsequent assessment to evaluate any improvement in the students' level of grammatical proficiency following the intervention. Here are the findings of the conducted research.

Table 1. The Mean Score of the Pre-Test

	Category Pretest	N	Mean	Std. Deviation	Std. Error Mean
Pretest	Experimental	26	66.46	11.374	2.231
	Control	26	53.85	12.30	2.413

Table 1 indicates that the experimental group achieved a mean score of 66.46 with a standard deviation of 11.374, whereas the control group had a mean score of 53.85 with a standard deviation of 12.302. This information implies that the experimental group had a better initial understanding of English grammar compared to the control group.

Table 2. The Mean Score of the Post-Test

	Category Posttest	N	Mean	Std. Deviation	Std. Error Mean
Posttest	Experimental	26	68.31	14.127	2.771
	Control	26	52.46	11.884	2.331

Following the intervention and post-tests, the experimental group recorded a mean score of 68.31, with a standard deviation of 14.127 and a standard error of 2.771. Meanwhile, the control group had a mean post-test score of 52.46, with a standard deviation of 11.884 and a standard error of 2.331. The results show that the experimental group performed better than the control group, with their average score rising by 1.83 points, while the control group's average score fell by 1.39 points.

Tabel 3. Tabel of Statistic Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Std. Error Difference
Post-test	Equal variances assumed	.483	.490	4.377	50	.000	3.620
	Equal variances not assumed			4.377	48.575	.000	3.620

The statistical analysis showed that the independent t-test identified a statistically significant difference in the test results between the experimental and control groups after using flashcards for grammar learning. A t-value of 4.377, a degrees of freedom (df) value of 50, and a significance (2-tailed) value of 0.000 support this conclusion. Since the significance value is less than 0.05, the data is considered statistically significant. Consequently, the null hypothesis is rejected, and the alternative hypothesis is accepted.

The mean grammar scores of students in the experimental group (M = 66.46, SD = 11.374) were higher than those of the control group (M = 53.85, SD = 12.30) prior to the intervention. This suggests that the students in the experimental group already had a stronger understanding of grammar rules compared to the control group. Nevertheless, after using flashcards as an intervention, there was a significant improvement in the experiment group's handling grammar compared to the control group provided by the improved mean score (M=68.31) with a standard deviation value (SD=14.127). In the post-test, however, the control group's mean score dropped (M=52.46) with a standard deviation value (SD=11.884). This increase emphasized the potential of flashcards to facilitate a better grasp of grammar and comprehension. It supports the data that such an approach can dramatically improve students' performance and knowledge of grammar. The independent sample data analysis revealed that after the intervention, the difference between the experimental and control groups was statistically significant, as indicated by the t-value (t = 4.377), degrees of freedom (df = 50), and significance level (sig = 0.000, p < 0.05). This result demonstrates the effectiveness of flashcards in enhancing students' grammar knowledge. According to [14]'s theory, a significance value less than 0.05 confirms the data's statistical significance, supporting the alternative hypothesis (Ha) and rejecting the null hypothesis (H0).

Flashcards were, in fact, effective in improving students' grammar skills, as shown by the computation table. In addition, flashcards that are used repetitively and structured can benefit students' brains, including memorizing the material learned. The findings align with research conducted by [15], which emphasizes that the repeated use of flashcards and images is considered to be an effective strategy for enhancing the long-term retention of vocabulary among students. When students engage in practice tests, there is an opportunity for them to strengthen their neural connections, making it easier for the transfer of information to occur. In addition, flashcards provide equal access for all learners by requiring them to be active and contribute to the learning process [16]. Using flashcard in teaching grammar allow students to not just have to remember the facts but also analyze and compare them to see if they have understood everything. Thus, using flashcard make the student have deeper and lasting learning of active learning are more valuable than the simple learning of passive learning [17]. Therefore, a flashcard arrangement can be modified to suit every student's learning scope and allow them to learn at their own level and style [9]. When everything noted is put together, flashcards can become one of the most valuable tools for those individuals who intend to boost their grammar abilities.

4 Conclusion

Research has shown that the use of flashcards is a highly effective method for enhancing students' understanding of grammar. The application of flashcards has been proven to significantly improve students' ability to comprehend and apply grammar rules and concepts. This method provides a visual and interactive way for students to engage with grammar, leading to better retention and application of the material. The pre-tests and post-tests provided evidence of a gradual increase in scores within the experimental group, while a subsequent decrease in scores was seen in the control group. The phrase, this shows that the use of flashcards for initial learning and improving on adjectives, nouns, and simple past tense have a strong positive effect on students' grammar mastery.

Conclusively, this research study explored the fact that learning grammar with the help of flashcards is efficient. Implementation of flashcards into grammar learning improves this discipline of studies with a more interactive and fun style therefore allowing students to study a set of grammar rules more easily. Thus, the method of the flashcards as proved to be a quite effective one in teaching grammar at school. Consequently, it can be advised to be dealt with even further as this will surely lead to better student knowledge of the language skills they are studying.

The limitation of the current research is that the intervention was only applied for a short period of time. Had the intervention been longer, the research might have been yielded different results. The research implies that English teachers are encouraged to diversify their teaching resources, i.e., using flashcards to engage students with the materials so the grammar lessons can remember the information longer. It is also recommended that students independently learned using digital flashcards outside the class to relearn the lesson taught in class. They can download the digital flashcard in their phones and actively learn grammar in their own time.

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