

Research Article

# The Effect of Flash Card Games on Early Children's Reading Ability

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## ABSTRACT

The purpose of this study was to determine whether flashcard games influence the reading skills of young children. The problem of low reading skills in early childhood remains a serious challenge in Indonesia. Various studies and national data show that most children aged 5–6 years have not yet mastered early reading skills appropriate to their developmental stage. This condition is exacerbated by the lack of engaging learning media and the lack of innovative approaches in reading instruction. The use of conventional methods tends to make children bored and unmotivated to learn to read. Therefore, interactive, fun solutions are needed that are appropriate to the characteristics of early childhood. One potential solution is the use of game-based learning media such as flashcards. Flashcards are visual media that can increase children's interest in letters and words while also fostering the association process between images and written symbols. The use of flashcards can improve visual memory, accelerate letter recognition, and create a fun learning atmosphere. Several studies have shown that this method is effective in improving early childhood reading skills, particularly in aspects of letter recognition and early reading as a whole. This study aimed to determine the effect of flashcard games on early childhood reading skills. The method used was an experiment with a one-group pretest-posttest design. Subjects were given a pretest, then given treatment using flashcards, and then a posttest. Data collection was conducted through observation using indicators of language and reading development. Data analysis used a paired sample t-test to determine the significance of changes before and after treatment.

**Keywords:** Early childhood; flash cards; reading

## 1. INTRODUCTION

Early childhood education supports the physical, cognitive, and mental maturation and development of children outside the home environment, which will influence their development in later stages (Rakesh et al., 2024; Suryana et al., 2022; Tamblyn et al., 2023). One important aspect that needs to be developed in early childhood is language skills (Huda and Hernawati, 2024; Kholila, 2024; Tama & Oktriani, 2023). Language skills enable children to express their thoughts using appropriate words. The language skills stage begins at age 0–1, when children begin to acquire language from their surroundings. Between ages 2 and 6, children experience rapid language development through interactions at home, school, and in the community. If children do not receive appropriate language stimulation from parents or the environment, disorders such as speech delays or difficulty expressing their feelings can occur.

Language learning in early childhood is often divided into two: language learning for communication and literacy learning (Safi'i & Harahap, 2024; Setyaningsih & Katoningsih, 2021; Tanbusai & Nasution, 2023). Literacy learning includes reading and writing activities, which are crucial for supporting children's intellectual development. Through reading, children can cultivate their curiosity and broaden their horizons. Children with good reading skills tend to be able to express ideas and feelings and interact more effectively with their surroundings. Reading is also known as the door and window to children's knowledge. Reading is not just about recognizing letters and words; it also involves a deep thought process. This process enables children to grasp the full meaning of words, both literally and contextually. Therefore, reading is not just a visual activity but also involves reflection, psycholinguistic skills, and metacognitive skills that develop with age.

According to Mushlih (2018), reading is a complex and reflective process. In this process, children not only see written words but also understand their meaning through various cognitive activities. Therefore, learning to read from an early age is an important foundation for developing children's thinking skills and communication skills comprehensively. Appropriate stimulation in this regard plays a crucial role in developing children who are proficient in language and critical thinking from an early age. Reading is not limited to recognizing letters but also encompasses the ability to

understand the meaning of written symbols. At an early age, a child's brain development is at its peak, so it is highly recommended that reading be started in a fun and appropriate manner (Alfiah & Darsinah, 2023; Choiriyah et al., 2023; Nungala & Isaac, 2024). Unfortunately, many young children still experience difficulties recognizing letters and understanding complete words. This problem is frequently encountered in various studies on children's literacy development. Delays in early childhood reading skills can impact learning difficulties at later levels. Therefore, it is crucial to find fun, interactive, and effective solutions to improve reading skills from an early age. Recent research by Hutasuhut and Simbolon (2021) revealed that reading skills developed at ages 4-6 contribute 68% to children's literacy skills in primary education. Reading skills are not only key to academic success but also play a crucial role in developing critical thinking, creativity, and problem-solving skills in children.

Despite the crucial role of reading skills, data shows that significant gaps remain in reading mastery among young children in Indonesia. According to the Program for International Student Assessment (PISA) report released in 2022, Indonesia still ranks low in literacy skills compared to other countries (Suryani et al., 2023). This indicates a fundamental problem in developing reading skills from an early age. A 2023 study by the Indonesian Ministry of Education and Culture found that approximately 65% of children aged 5-6 in Indonesia do not yet possess the developmentally appropriate letter recognition and early reading skills. This low level of literacy is due to various factors, including limited engaging learning methods, a lack of stimulation in the home environment, and a lack of effective learning media suited to the characteristics of early childhood.

Data shows that the reading skills of early childhood in Indonesia are still relatively low. Based on an assessment conducted by the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) in 2022, more than 30% of early elementary school children do not yet have adequate reading skills. Ideally, children should begin to demonstrate pre-reading skills in early childhood education (PAUD). This indicates that the learning strategies used to introduce reading skills to children are still suboptimal. Teachers and parents still often use conventional approaches that tend to be boring for children. As a result, children become less interested in actively learning to read. Innovative approaches that align with the characteristics of play-while-learning are needed.

Another identified problem is the lack of learning media specifically designed to develop early childhood reading skills in accordance with their developmental characteristics. A study by Wahyuni et al. (2022) showed that only 35% of PAUD institutions have varied and adequate learning media to stimulate children's reading skills. Yet, learning media plays a strategic role in capturing children's attention and creating meaningful learning experiences. The limited availability of interactive learning media leads to children being less motivated to learn to read and tending to view reading as boring. This aligns with research by Hidayati & Nurjanah (2021), which reported that 67% of children aged 5-6 years showed a lack of enthusiasm in reading activities due to the use of uninteresting and monotonous media.

Based on initial observations at Bina Anaprasa Kindergarten, it was found that most children in Group B still had difficulty recognizing letters and reading simple words. Of the 20 children observed, only around 30% were able to correctly name the letters, while the remainder still made errors in identifying letter shapes and sounds. Furthermore, children tended to be less enthusiastic about participating in reading activities because the methods used were still conventional, such as memorizing letters from the blackboard and printed books without engaging visual media. Reading learning activities at Bina Anaprasa Kindergarten also did not optimally utilize media appropriate to the play-and-learn characteristics of early childhood. Teachers often used a one-way instructional approach, which quickly bored children and made them less actively engaged in the learning process. The lack of visual learning media, such as flashcards or educational games, makes it difficult for children to associate letter symbols with meaning or real-life images.

This situation suggests that the lack of interactive learning media is a major contributing factor to the low motivation and reading ability of children at Bina Anaprasa Kindergarten. This is a critical issue that must be addressed immediately to ensure children receive developmentally appropriate literacy stimulation. Therefore, innovative efforts are needed, including the implementation of engaging and enjoyable learning media, such as flashcard games, to effectively improve children's reading skills.

One way to improve the reading skills of young children at Bina Anaprasa Kindergarten is through the use of educational games, including flashcards. Flashcards are an effective and enjoyable learning tool for young children. Attractive picture cards can stimulate children's interest in reading and help them recognize letters, words, and sentences. Flashcards can also improve children's memory and comprehension of reading material. Therefore, flashcard games can be an effective solution for improving early childhood reading skills. Flashcards are learning tools in the form of picture cards with words or letters written on them, designed to help children visually recognize letters, words, or concepts. In the context of reading, flashcards can help children associate images with words quickly and enjoyably. Several studies have shown that using flashcards can improve visual memory and accelerate the process of letter and word recognition. Children more easily remember words accompanied by interesting images. Therefore, flashcard games have great potential for use in early childhood reading lessons. Previous research by Rosalita and Wulandari (2023) found that regular use of flashcards for two weeks significantly improved letter recognition and early reading skills in children aged 5-6 years. Children who learned through flashcards were more active and enthusiastic and recognized words more quickly than children who learned traditionally. This suggests that learning methods involving visual and kinesthetic aspects are highly

suitable for early childhood. Learning activities become more engaging and less boring, which ultimately boosts children's learning motivation. Furthermore, teacher and parent involvement in the use of this media also contributes to successful learning. Therefore, it is important to further explore the effectiveness of flashcard games in improving children's reading skills. Although various studies have proven the effectiveness of flashcards, there remains a gap in research that focuses specifically on early reading skills in early childhood, not just letter recognition. Most research still focuses on alphabet recognition or general vocabulary (Hadi et al., 2021; Robiatul & Basri, 2023). However, reading is a complex cognitive process that involves symbol recognition, understanding meaning, and concentration. Therefore, it is important to further examine the effect of flashcard use in the context of a more comprehensive reading learning process in early childhood. Specifically, flashcards are able to integrate letter recognition, word recognition, and comprehension into a single play activity. Based on this description, the purpose of this study was to determine the effect of flashcard games on early childhood reading skills.

## 2. RESEARCH METHOD

This research is an experimental study aimed at determining the effect of flashcard games on early childhood reading skills. The research design used was a one-group pretest-posttest design. A one-group pretest-posttest design is a quasi-experimental research design that uses only one group of subjects without a control group. In this design, the researcher conducted an initial measurement (pretest) on the subjects, then administered the flashcard game treatment, and then conducted a final measurement (posttest) to determine the effect of the treatment. The difference in results between the pretest and posttest was assumed to be the impact of the treatment given to the subjects. The research design used was as follows:

**Table 1.** Research Design

Pretest	Treatment	Posttest
O <sub>1</sub>	X	O <sub>2</sub>

Description:

- O<sub>1</sub> = Pretest
- X = Treatment
- O<sub>2</sub> = Posttest

The research data collection technique used direct observation of the research subjects to closely observe the activities carried out. The child development aspects observed were language, with the indicator being the ability to name letter symbols according to their sounds, and reading, with the indicator being the ability to name groups of pictures that have the same initial letter. Hypothesis testing in this study used a paired sample t-test, a test of differences between two paired samples. Paired samples represent the same subjects but receive different treatments. This difference test model is used to analyze the before-and-after research model. The paired sample t-test is a testing method used to assess the effectiveness of a treatment, indicated by the difference in the mean before and after treatment. The basis for making a decision to accept or reject Ho in this test is as follows: i) If the significance value is >0.05, Ho is accepted, or Ha is rejected (the difference in performance is not significant). ii) If the significance value is <0.05, Ho is rejected, or Ha is accepted (the difference in performance is significant).

## 3. RESULTS AND DISCUSSION

### 3.1 Results

This study aims to demonstrate the effect of flashcard games on the reading skills of early childhood. The population in this study was all 17 children at Bina Anaprasa Kindergarten, consisting of 19 children in Group A and 20 in Group B. The research data were obtained from pre-tests and post-tests on the research sample, namely Group A, which consisted of 19 children. The subjects in this study were the 19 children in Group A at Bina Anaprasa Kindergarten. This subject selection was based on several considerations. First, Group A has age characteristics that align with the developmental stage of early reading skills in early childhood; thus, it is expected to provide relevant data regarding the effects of flashcard games. Second, the number of children in Group A is representative enough to be used as a research sample, facilitating data collection and analysis. Third, Group A was selected due to the availability of time and the active involvement of the class teacher in supporting the implementation of the pre-test, post-test, and the application of flashcard media during the learning process. Considering these factors, Group A is expected to represent the population of early childhood children at Bina Anaprasa Kindergarten in this study.

1. Test Requirements
  - a. Normality Test

The normality test is a statistical test to determine whether the data we have is normally distributed. Normal distribution is an essential requirement in many parametric statistical tests (such as the t-test), because the underlying assumption is that the data comes from a normally distributed population. This test was used in this study to determine whether the pretest and posttest data were normally distributed.

**Table 2.** Normality Test

Tests of Normality

	Y	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
PRE	1.00	.127	19	.200*	.963	19	.625
POS	2.00	.107	19	.200*	.958	19	.533

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The results of the normality test for the pre-test and post-test data using the Shapiro-Wilk test showed a significance value of 0.625 for the pre-test and 0.533 for the post-test. Both significance values are greater than 0.05, thus concluding that the pre-test and post-test data are normally distributed. This normality test is important to ensure that the assumption of a normal distribution is met before proceeding to parametric statistical tests. Furthermore, the results of the Kolmogorov-Smirnov test also support this conclusion, with significance values of 0.200 for both variables. With the normality assumption met, the data from this study are suitable for analysis using a parametric test, namely the paired sample t-test. This parametric test aims to determine whether there is a significant difference between the pre-test and post-test scores as a result of the use of flashcards on the reading skills of early childhood students at Bina Anaprasa Kindergarten.

**b. Homogeneity Test**

**Table 3.** Homogeneity Test

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
X	Based on Mean	1.072	1	36	.307
	Based on Median	1.142	1	36	.292
	Based on Median and with adjusted df	1.142	1	35.390	.293
	Based on trimmed mean	1.046	1	36	.313

The results of the homogeneity test using Levene's Test showed a significance value based on the mean of 0.307, the median of 0.292, the median with adjusted df of 0.293, and the trimmed mean of 0.313. All significance values were greater than 0.05, thus concluding that the data variance between the pre-test and post-test groups was homogeneous. This test was conducted to ensure that one of the assumptions of parametric testing was met, namely equality of variance between data groups. With the homogeneity assumption met, data analysis could proceed using a parametric test, in this case the paired sample t-test.

**2. Paired Sample T-test**

The paired sample t-test is a parametric statistical test used to compare two means from the same data set under two different conditions. This test is often used when we want to determine whether there is a significant difference between the measurement results before and after treatment on the same sample.

**Table 4.** Paired Samples Statistics

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre	49.5789	19	4.82258	1.10638
	Pos	58.6316	19	6.05723	1.38962

The descriptive analysis results showed that the average pre-test score was 49.58 with a standard deviation of 4.82, while the average post-test score increased to 58.63 with a standard deviation of 6.05. This increase in the average indicates a difference in early childhood reading ability scores before and after the flashcard game treatment.

**Table 5.** Paired Samples Correlations Test  
Paired Samples Correlations

Pair 1		N	Correlation	Sig.
Pre & Pos		19	.850	.000

Based on **Table 4**, the results of the correlation analysis between pre-test and post-test scores show a correlation coefficient of 0.850 with a significance value (p-value) of 0.000. This correlation coefficient is categorized as very strong, indicating a very strong relationship between pre-test and post-test scores in the use of flashcards and the reading skills of early childhood students at Bina Anaprasa Kindergarten.

**Table 6.** Paired Samples Correlations Test  
Paired Samples Test

Pair 1	Pre - Pos	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
					Paired Differences				
		9.05263	3.20544	.73538	-10.59760	-7.50766	-12.310	18	.000

The results of the paired sample t-test showed that there was an average difference of 9.05 between the pre-test and post-test scores, with a standard deviation of 3.20 and an average error of 0.73. The significance value (p-value) of 0.000 ( $p < 0.05$ ) indicated a significant difference between the pre-test and post-test scores in the reading ability of early childhood after being given treatment in the form of flashcard games at Bina Anaprasa Kindergarten. These results indicate that there is a significant influence of the use of flashcard games on the reading ability of early childhood at Bina Anaprasa Kindergarten.

### 3.2 Discussion

This study aimed to determine the effect of flashcard games on the reading skills of early childhood children at Bina Anaprasa Kindergarten. Data were obtained from pre-tests and post-tests on 19 children in Group A as a sample. Group A was selected based on age appropriateness for the early reading development phase, a representative number of children, and classroom teacher support in implementing learning using flashcards (Rohmah, Elan, & Rahman, 2023).

Based on the results of the initial instrument data processing, it was found that early childhood reading skills are still relatively low. One indicator is the children's inability to repeat previously communicated information. This indicates that their understanding of letter sounds and symbols has not yet developed optimally. This problem is exacerbated by children's delays in understanding and using spoken language. Children have difficulty connecting letter sounds (phonemes) with letter symbols (graphemes), which is a fundamental reading skill. Another contributing factor is the limited variety of methods and media used by teachers in the learning process. The lack of language and literacy stimulation leads to limited vocabulary and hinders the development of children's reading skills. Early childhood naturally has a short attention span. Therefore, a visual, concrete, and engaging learning approach is essential to help children focus and engage in the learning process. One suitable medium to address this is the use of flashcards, due to their engaging visuals, such as bright colors, cute images, and easy-to-read sizes. This medium is able to capture children's attention better than media that are monotonous or too abstract.

During the lesson, the children appeared very enthusiastic when introduced to the flashcard game. They were invited to take turns picking a picture card and reading the word or letter it contained. This activity helped them focus more on recognizing letters and simple words (Maharani & Ramadan, 2023). According to Husna et al. (2024), flashcards can increase children's attention and motivation in literacy activities due to their visually appealing nature. Normality test results showed that the pre-test and post-test data were normally distributed, with Shapiro-Wilk significance values of 0.625 and 0.533, respectively. This meets the requirements for using parametric tests (Ningsih, 2022). Data normality is crucial to ensure unbiased and reliable statistical test results (Amani, Robbani, & Yuniarti, 2024).

Learning activities using flashcards also demonstrate increased active participation by children. They begin to feel confident in coming to the front of the class, spelling letters, and even reading simple words in front of their peers. According to Puspitasari et al. (2023), play-while-learning methods using visual media like flashcards can foster children's self-confidence and social skills. The results of the homogeneity test using Levene's Test showed a significance value  $>0.05$ , indicating homogeneity of variance between the pre-test and post-test groups. This meets the requirements for further analysis using the paired sample t-test (Sari et al., 2023). This equality of variance is crucial for valid comparisons of pre-test and post-test means (Hafidah, Yusuf, & Subagya, 2022).

The use of flashcards during teaching and learning activities also creates a more lively classroom atmosphere. Children not only learn to read but also play in groups, which fosters cooperation and communication. In line with research by BS (2024), flashcard-based educational games are effective in improving cognitive and social skills in early childhood. The use of flashcards also allows for enjoyable learning through play-while-learning activities. Children can be invited to match letters, guess words, play memory cards, or compete to find the correct letter. These activities not only increase learning motivation but also strengthen children's cognitive and linguistic abilities. Learning becomes less boring because children feel actively involved in a fun activity.

Descriptive analysis showed a pre-test average of 49.58 with a standard deviation of 4.82, while the post-test increased to 58.63 with a standard deviation of 6.05. This improvement indicates a positive effect of flashcard games on early childhood reading skills (Nasution, 2022). The correlation test results showed a coefficient of 0.850 with a significance level of 0.000, indicating a very strong relationship between pre-test and post-test scores (Husna et al., 2024). This means that children who already have early reading skills tend to experience greater improvement after being treated with flashcards. Learning activities also showed tangible results in the classroom. Some children who initially only knew a few letters were able to read simple words like "ball," "house," and "horse" by the end of the lesson. This finding aligns with research by Puspitasari et al. (2023), which found that literacy activities with flashcards accelerate word recognition.

The results of the paired sample t-test showed a mean difference of 9.05 with a p-value of 0.000 ( $p < 0.05$ ), indicating a significant difference between pre-test and post-test scores (Maharani & Ramadan, 2023). This supports the finding of Hafidah et al. (2022) that flashcards are effective in improving early literacy skills in children aged 4–6 years. Furthermore, flashcards are flexible and easy to use in both individual and group learning. Teachers can easily control and adapt the material to suit each child's developmental level. Considering their ease of use, flexibility, and significant potential to support early literacy development, flashcards are highly suitable for early reading instruction in early childhood. This way, children can more easily remember the letters and words they learn through fun activities. Therefore, it can be concluded that flashcard games have a significant impact on improving the reading skills of early childhood children at Bina Anaprasa Kindergarten. This medium is expected to be an effective alternative learning strategy for early childhood teachers in developing children's basic literacy skills (Sari et al., 2023).

#### 4. CONCLUSION

Based on the results of data analysis and discussion that has been done, it can be concluded that flashcard games have a significant influence on improving the reading ability of early childhood children in Bina Anaprasa Kindergarten. This is proven by the results of the paired sample t-test, which shows that there is an average difference of 9.05 between the pre-test and post-test scores, with a standard deviation of 3.20 and an average error of 0.73. A significance value (p-value) of 0.000 ( $p < 0.05$ ) indicates a significant difference between the pre-test and post-test scores in the reading ability of early childhood children after being given treatment in the form of flashcard games in Bina Anaprasa Kindergarten. This media not only helps children recognize letters and words visually but also can increase children's attention, motivation, and active participation in the learning process. The visual advantages and fun form of the game make flashcards an effective learning tool. With these results, it shows that there is a significant influence of the use of flashcard games on the reading ability of early childhood children in Bina Anaprasa Kindergarten.

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