

## Effect of Augmented Reality Flash Card Media on Reading Interest and Storytelling Ability in Children Aged 5-6 Years

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### ABSTRACT

**Objective:** This study is to determine the influence of media Flash Card Augmented Reality on Reading Interest and Storytelling Ability of 5-6 Years Old Children.

**Method:** This research is quantitative research experiment with design Nonrandomized Pretest-Posttest Control Group Design experiment, the research subjects were 50 children divided into 2 groups, namely the experimental group of 28 children, with 9 boys and 19 girls, the control group of 22 children, with 11 boys, 11 girls so that the total number of boys was 20 children or 40% and girls 30 or 60%, with an age range of 5-6 years, the instrument used was an observation sheet for reading interest and storytelling ability. The data analysis technique used test Mann-Whitney U test.

**Results:** This study shows a significant level where the p score shows a result of less than 0.001, that there is a difference in gain score between the experimental group and the control group. This shows that because there is a difference between the control group and the experimental group, it means that there is an Influence of Flash Card Augmented Reality on Reading Interest and Storytelling Ability of Children Aged 5-6 Years. **Novelty:** Through the fun Augmented Reality Flashcard media mechanism, it triggers children's interest in reading and storytelling skills. Through this study, it is expected to find empirical evidence regarding the benefits of using augmented reality-based flashcards, as well as provide recommendations for educators in improving the quality of learning in the classroom.

## INTRODUCTION

Reading interest and storytelling skills are very important for children aged 5-6 years which support their cognitive, social, and emotional development, where reading interest and storytelling skills are the foundation of early literacy (Adityas, Ulfah, & Budairi, 2024). Children's literacy skills consist of listening, speaking, reading and writing skills which are very much needed in children's lives and must be developed (Gultom & Setyami, 2022). Literacy skills are knowledge and ability to read and write, process and understand information when reading and writing and the ability to analyze, respond and use language (Santín & Torruella, 2017). In the era of revolution, of course, literacy skills are needed from an early age, where good literacy skills will produce good character (Damanik, Silaban, & Nurfajriani, 2024). The world's world literatenations conducted a study where the results of the study stated that Indonesia's literacy skills were in the second lowest position out of 61 other countries from the countries studied (Nurhasanah, Najib, & Ruknan, 2023). One way to handle Indonesian literacy skill are with AR Flashcard from children around age 4-6 years old (Elvina, Tanjungpura, Miranda, Tanjungpura, & Tanjungpura, 2024). Meanwhile, the results of the study program for international student assessment (PISSA) showed that the reading ability of Indonesian children was 371, which was 116 points behind the average score of other

countries studied. From the results of this study, it can be concluded that the literacy skills of Indonesian children, especially in reading interest and storytelling skills, should receive more attention from all levels of Indonesian society, such as the government, teachers, parents and the environment around the child in efforts to improve literacy skills, especially reading interest and storytelling skills, which are still low (Hanipah, 2015).

Based on initial observations and interviews conducted at TK. IT. Nada Ashobah, out of 28 children, it was found that 18 children's interest in reading and their storytelling ability were still less than optimal and at TK. Ganesa Mulia out of 22 children, it was found that 12 children's interest in reading and their storytelling ability were also less than optimal. The interest in reading and storytelling ability at the school were less than optimal because, for reading interest, it was found that reading ability was limited, lack of reading habits, low self-motivation, monotonous reading media, for storytelling ability, it was found that there was a lack of language skills, lack of self-confidence, less interesting learning methods, lack of stimulation and teacher support, low focus of attention (Rogiers, Van Keer, & Merchie, 2020). Based on the data above, it is necessary to carry out stimulation using the right techniques and strategies.

The use of media is one of the right strategies to help increase interest in reading and storytelling abilities of young children. This is because media can support and stimulate children's imagination and encourage them to read and tell stories better (Miftahul Jannah, Ahmad Fajian, Husin, Rizka Maulida, & Abdul Rashid bin Abdul Aziz, 2022). By using media, children can understand the content of stories better, which in turn helps them build a more complex vocabulary and improves their comprehension as they are frequently exposed to stories through the pictures they see (Swider-Cios, Vermeij, & Sitskoorn, 2023).

The use of digital learning media is expected to be a solution to overcome deficiencies in the learning process (Wang, 2022). There are many learning media that can be used with current technology to help students learn, the use of Augmented Reality (AR) based flashcards is one of them. According to Kartika Rinakit (2023), "Augmented Reality is a two-dimensional or three-dimensional virtual object created by technology and can be projected in real time (Darma, Margunayasa, & Trisna, 2024) so that it is closer to the real environment."

Augmented Reality (AR) technology offers an innovative platform to implement multisensory learning by overlaying digital elements onto the physical environment, creating interactive and immersive educational experiences. In early childhood education, AR flashcards have emerged as a tool that combines traditional learning with digital enhancements, aiming to boost vocabulary acquisition and engagement. Studies have shown that AR flashcards can significantly improve children's vocabulary learning, providing an enjoyable and effective alternative to traditional methods (Chen & Chan, 2019).

This AR-based flashcard learning media is one of the latest technological innovations that can be used in the classroom. AR technology provides an interesting learning

experience, because it allows children to see three-dimensional illustrations directly (Fitria, 2023). AR-based learning experiences that provide chemistry content at three levels (Câmara Olim, Nisi, & Romão, 2024).

In this study, to stimulate children's interest in reading and storytelling skills to increase, the Flashcard Augmented Reality media was used in the research of Kartika Rinakit (2023) which has been tested so that it is able to increase interest in reading and storytelling skills of children aged 5-6 years, the media used for the development of learning models that can improve literacy and critical thinking skills by using Flash card Marker-based Augmented Reality (Novianti, Pratiwi, Childhood, & Education, 2024). This type requires special visual objects, such as QR codes or symbols, known as markers. When the marker is scanned by the camera, digital content will be displayed according to the position and orientation of the marker, but for this study the Flash card Augmented Reality media was used to determine how much it affects the interest in reading and storytelling skills of children aged 5-6 years.

## RESEARCH METHOD

This study uses a quantitative approach with a quasi-experimental method to test the effect of the Influence of Flash Card Augmented Reality Media on Reading Interest and Storytelling Ability of Children Aged 5-6 Years. The design used is a nonrandomized pretest-posttest control group design, where participants are divided into two groups, namely the experimental group that received Flashcard Augmented Reality media intervention and the control group that followed conventional learning. The research subjects were 50 children divided into 2 groups, namely the experimental group of 28 children, with 9 boys and 19 girls, the control group of 22 children, with 11 boys, 11 girls so that the total number of boys is 20 children or 40% and girls 30 or 60%, with an age range of 5-6 years.

A likert scale was used to assess the participant's improvement of AR flashcards. The scale ranged from 1 (strongly disagree) to 5 (strongly agree), enabling a comprehensive evaluation of children's responses and learning progress. The independent variable in this study is Flashcard Augmented Reality media, while the dependent variables include reading interest and storytelling ability. Data collection was carried out through observation using instruments that had been tested for validity and reliability through expert judgment tests and reliability tests between risks and documentation. Data analysis was carried out using parametric or nonparametric tests, depending on the results of the normality and homogeneity assumption tests. If the data is homogeneous and normal, then use parametric with the independent t-test, but if the data is not normal and not homogeneous, then use nonparametric statistics using the t-test Mann-Whitney U test.

Comparison of pretest and posttest results was conducted to measure the increase in abilities in both groups, with gain score calculations to determine the effectiveness of the intervention.

This study was designed to provide insight into the influence of Augmented Reality Flashcard media on reading interest and storytelling ability of children aged 5-6 years, with data analyzed systematically to produce valid and reliable findings.

## RESULTS AND DISCUSSION

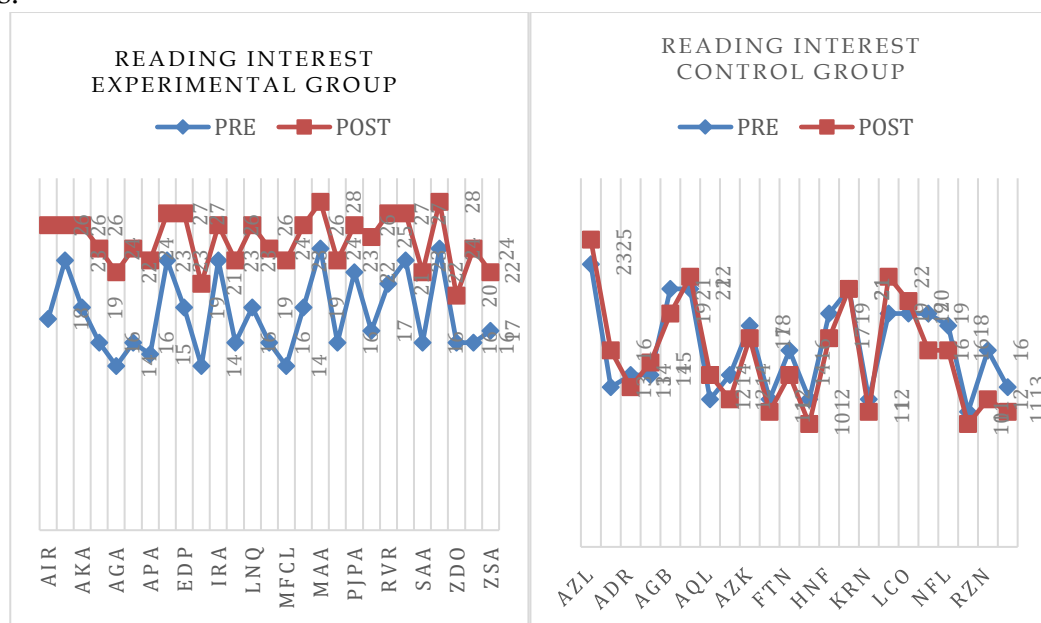
### Results

Based on the Mann-Whitney U test calculations, the calculation results are as follows:

**Table 1. Test 1 Reading Interest**

	Test	Statistics	df	P
GAIN INTEREST IN READING	Student	12.838	48	< .001
	Mann Whitney	614.000		< .001

In the table results above the p score shows a result of less than 0.001. This proves that p is smaller than 0.05 meaning the hypothesis is accepted. The results prove that there is a difference in gain score between the experimental group and the control group. This shows that because of the difference between the control group and the experimental group, the augmented reality flash card has an effect on reading interest in children aged 5-6 years.



**Figure 1. Reading Interest Chart of Experimental Group and Control Group**

**Table 2. Test 2 Storytelling Ability**

	Test	Statistics	df	P
GAIN Story	Student	12,682	48	< .001
	Mann Whitney	616,000		< .001

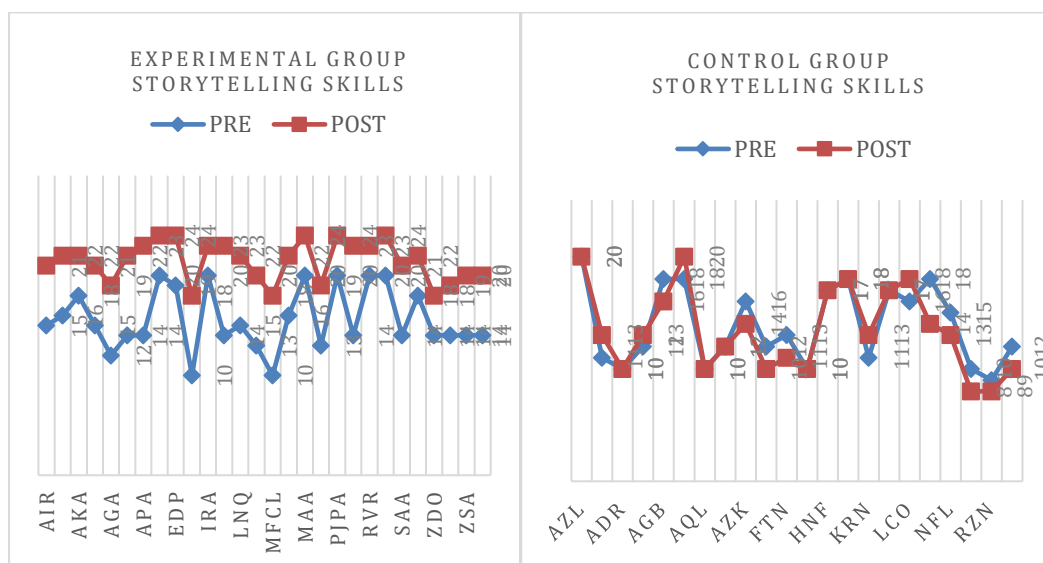


Figure 2. Storytelling Ability Chart of Experimental Group and Control Group

Based on the results of table 4.13 above, the p score shows a result of less than 0.001. This proves that p is smaller than 0.05, meaning that hypothesis 2 is accepted. The results prove that there is a difference in gain score between the experimental group and the control group. This shows that because of the difference between the control group and the experimental group, FCAR has an effect on storytelling skills in children aged 5-6 years.

### Discussion

In this study, it can be said that there is an influence of Flashcard Augmented Reality on reading interest and storytelling ability of children aged 5-6 years. In this study, there is a difference in the average score of the assessment of reading interest and storytelling ability of children between the control class and the experimental class. If we compare the average post-test scores of the two classes, it can be seen that the results of the experimental class assessment score are higher, the use of flashcard augmented reality has been proven to have a positive influence on reading interest and storytelling ability of children aged 5-6 years.

Mansyur (2019), Reading interest shows a liking for something and can also be seen through their participation in reading activities (Wirdiyana, Sunaengsih, & Syahid, 2024). Children show a significant increase in reading interest when involved in reading activities after using Flashcard Augmented Reality media compared to monotonous reading media and conventional methods (Maronta, Sutarto, & Isdaryanti, 2023). Flashcard Augmented Reality is an interactive and visual element that attracts children's attention, making them more enthusiastic about reading (Firdaus & Prasetyo, 2025). The importance of interesting content in learning media is because early childhood is very happy with pictures and various colors. When children are happy and interested, it becomes a stimulus for children to focus on learning (Liquin & Gopnik, 2022) so that children's early reading abilities improve. Data obtained through observation shows that

children feel happier and more involved when using Augmented Reality flash cards, which encourages them to read more.

This study also explored the impact of using Augmented Reality Flashcards on children's storytelling skills. The results showed that children after using Augmented Reality flashcards were able to compose stories better, showing a deeper understanding of the storyline, characters, and context. AR flashcards provide visual stimulation that helps children imagine the story, so they can convey narratives more richly and structured (Firdaus & Prasetyo, 2025). Observations during the storytelling session showed that children were more confident in speaking in front of their friends. After testing the effectiveness of using Augmented Reality Flashcards Based on research that shows the relationship between the use of flash card media and learning outcomes, the use of Augmented Reality flash cards can also improve children's storytelling skills (Jannah & Oktaviani, 2022). Interactive activities provided by Augmented Reality can stimulate children's imagination and creativity, so that they can more easily represent what they have learned in the form of stories (Sarifah, 2021).

## CONCLUSION

**Fundamental Finding:** The use of Augmented Reality flashcards significantly increases children's interest in reading. This media offers an interactive and fun learning experience, so that children are more interested in engaging in reading activities. With 3D object visualization and interactive elements, children feel more motivated to explore the material presented., **Improved Storytelling Skills:** Research shows that Augmented Reality flashcards have a positive effect on children's storytelling skills (Akhmadi & Siregar, 2024). Children who use this media show improvements in speaking and storytelling skills, because they can see and interact with virtual objects that support their narratives. This helps them to better understand the context of the story and enrich their vocabulary. **Validity and Practicality of Media:** Augmented Reality-based thematic flashcards are declared very valid and practical for use in early childhood learning. The evaluation results from media and material experts show that this product meets high quality standards, both in terms of content and design, making it suitable for use in the classroom learning process. **Implication:** The use of Augmented Reality flashcard media can be an innovative alternative in the learning process in the classroom. By integrating AR technology, teachers can create a more interesting and interactive learning atmosphere, which can increase student involvement in reading and storytelling activities. This shows that education in the digital era must utilize technology to attract children's attention. **Improved Language Skills:** Research shows that Augmented Reality flashcards not only increase interest in reading, but also help in the development of children's speaking and storytelling skills. With interactive media, children find it easier to understand the context of the story and enrich their vocabulary, this emphasizes the importance of using appropriate media to support children's language development at an early age. **Support for Teachers and Parents:** The results of this study provide insight for teachers and parents about the importance of choosing effective learning media. By

using Augmented Reality flashcards, they can help children in the learning process in a more fun and interesting way, so that it can increase learning motivation. In addition, it also provides guidance for teachers to develop more creative and innovative teaching methods. Curriculum Development: The findings of this study can be used as a basis for developing early childhood education curriculum. Integration of technology such as Augmented Reality into the curriculum can help create a more holistic and comprehensive learning experience, and support various aspects of child development, including cognitive, social, and emotional. **Limitation:** This study also noted several limitations, such as the small sample size and limited duration of the study. These limitations may affect the generalization of the study results to a wider population. Therefore, it is important to conduct further research with a larger sample and longer observation time to obtain more comprehensive results. **Future Research:** More Varied Content Development: Future research can focus on developing more diverse Augmented Reality flashcard content, covering various themes and learning materials. For example, in addition to animal recognition, other themes such as the environment, numbers, or letters can be explored. This aims to increase the appeal of the media and provide a more comprehensive learning experience for children. Integration of Interactive and Multimedia Elements: Future research can explore the integration of multimedia elements such as sound, animation, and direct interaction in Augmented Reality applications. By adding these features, children not only see 3D images but can also hear sounds related to the objects displayed, thereby enriching their learning experience. This can help in improving conceptual understanding and storytelling skills., Long-Term Effectiveness Evaluation: Further research is needed to evaluate the long-term effectiveness of using Augmented Reality flashcard media. This includes measuring the impact on children's literacy development over time and how their reading interests develop after using this media consistently. This research can also involve measuring children's social and emotional skills that may be affected by interactive learning methods.

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