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The Effect of MarBel Animation Media on The Ability to Recognize Numbers in Early Childhood at TK Aisyiyah Bustanul Athfal 14

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ABSTRACT

Technological advances in education are characterized by creation of varied learning media, for instance animation. Animation can be implemented in learning, especially for early childhood to develop children's cognitive knowledge, such as recognizing numbers. This study aims to find out the effect of MarBel animation on the ability to recognize numbers in early childhood at Aisyiyah Bustanul Athfal 14 Kindergarten. The researcher applied quasi-experiment with one group pretest-posttest design. The sample was 15 students of Grapes Class Kindergarten B at Aisyiyah Bustanul Athfal 14 Kindergarten. Meanwhile, data collection was carried out through observation and documentation. The data analysis applied was statistics including normality tests and hypothesis tests. The results showed the Asymp. Sig. (2-tailed) value is 0.001 <0.05 which indicates H0 is rejected and H1 is accepted. Thus, it can be concluded that there

is an effect of MarBel animation on the ability to recognize numbers in early childhood at Aisyiyah Bustanul Athfal 14 Kindergarten.

Introduction

Early childhood is a period of human life starting from birth to 6 years. Early childhood is often called Golden Age (Sa'adah et al., 2024). The term is given because human development can be more easily stimulated at an early age. In other words, children experience rapid development at an early age (Jessica & Adhe, 2020). During this period, the child's further development and growth in the future are determined (Astuti et al., 2023). At an early age, children will also develop their cognitive, social and emotional intelligence (Safitri et al., 2025). However, growth and development do not happen instantly (Damayanti et al., 2023). Collaboration between all parties is very important for children development (Safitri & Mahmudah, 2015). Thus, educational stimulation must be given during childhood (Sari & Adhe, 2022). As stated by Maulidiyah et al. (2025), early childhood education provides a great contribution to improve children's skills and potential. This is because one of the goals of education is to facilitate comprehensive child development and growth (Nurjanah & Fauzi, 2025).

Early Childhood Education (PAUD in Indonesian term) is an institution that organizes education for children from 0 to 6 years of age (Anggraini, 2024). PAUD gives a basic framework for forming the basis

of children's behavior, skills and knowledge (Simatupang et al., 2023). Kindergarten is a form of educational unit aimed at children aged 4 to 6 years. Kindergarten aims to prepare children for elementary school (Utami & Setyowati, 2018). Based on Zusanti et al (2022), there are 6 aspects of development that are very important for early childhood including language, religious and moral values, social emotional, cognitive, art, and physical motor skills.

Cognitive is an ability to understand something. In line with this, Bjorklund (2022) stated that cognitive is a person's ability to think. Meanwhile, Dewi and Gaisani (2021) stated that cognitive ability is related to a person's intelligence. In education, cognitive ability is a field of basic ability development designed by teachers to support and develop children's creativity and abilities according to their developmental stage. In fact, Isnariyati et al. (2025) mentioned that children with good cognitive can understand academic concepts more easily. The purpose of developing cognitive abilities is to help children understand space and time, sort and group, develop mathematical logic skills, find various solutions to problem solving, and prepare themselves for the development of careful thinking (Aisyah, 2020). Falera et al. (2018) said that cognitive development includes learning and solving problems, logical thinking, and symbolic thinking. Symbolic thinking as one of the cognitive scopes can be the ability to relate to number symbols or numbers (Aisyah et al., 2024).

Cahyaningrum et al. (2022) stated that the ability to recognize numbers is identified as an individual's ability to recognize and know the number of objects which in this case is related to calculations and quantities, relationships between one and another, and how to write numbers or number symbols. Number recognition is very useful for children to prepare them for next mathematics material (Susanto & Fitria, 2018). The ability to recognize numbers is related to Mathematics (Ayuni et al., 2022). The ability to recognize numbers is needed by children as basic knowledge to prepare them for the next educational process, especially in Mathematics which is a compulsory subject. By recognizing numbers, children can also apply them to their daily lives. Number as a part of mathematics is always in human life starting from the basic things like counting buttons until doing transactions (Suarsih & Istiarini, 2018). In other words, number recognition contributes to the child's success both in the future and in everyday life.

Based on observations during the implementation of the School Field Introduction (PLP) on October 10, 2024 at Grapes Class Kindergarten B at Aisyiyah Bustanul Athfal 14 Kindergarten, researcher found that out of 15 children, there were 6 children who were still less than optimal in recognizing numbers. This can be seen from the data where several children put the numbers 1-20 in the wrong order, counted backwards from 1-20, and wrote numbers incorrectly. Thus, teachers need to pay more attention to developing children's ability to

recognize numbers. Then, the results of interviews with teachers at Aisyiyah Bustanul Athfal 14 Kindergarten showed that teachers used animation to introduce new material, not for learning numbers. Meanwhile, teachers only apply teaching methods using whiteboards and worksheets. Therefore, learning to recognize numbers becomes unvaried and monotonous so that children are not very motivated to focus on the learning process.

Teachers as educators must know what influences students' learning development (Safitri, 2021). In order to stimulate children's development, learning media is used so that learning can be more varied. Teachers need to choose learning media that meet the learning materials and are in accordance with the level of experience, learning and special characteristics of the student group (Tibyani & Adhe, 2021). Learning media helps children understand the material given (Wardana, 2020). The use of interesting learning media also plays an important role in increasing children's motivation to continue participating in learning activities with enthusiasm. Febrita and Ulfah (2019) argue that media is useful for fostering children's interest in participating in learning. An interesting learning atmosphere is dynamic and supports teachers to focus on the creative aspects of teaching and learning activities (Adhe et al., 2025).

Media makes children more interested and easier to understand the contents of the lesson (Saroinsong et al., 2020). In line with this, Aristanti

& Setyowati (2020) stated that learning media is needed so that children's interest grows so that children can master number learning easily. The teaching and learning process using the lecture method and showing books is certainly monotonous and tends to be boring. Therefore, learning media is used to provide various lessons. In addition, the efficiency and effectiveness of teaching and learning activities also depend on the learning media available. In other words, learning media plays a major role in the learning process (Supardi et al., 2023). The implementation of media in learning can stimulate teachers' ideas to create teaching innovations and support teachers to continue to adapt to advances in the times (Safitri, 2023). Therefore, learning media contributes to the quality of education because it helps both students and teachers in educational activities (Safitri et al., 2024).

In the modern era, technology has made rapid progress to make human life easier (Syifa et al., 2024). Most children are already connected to digital media (Azir et al., 2021). Education is one of the things that is required to use technology (Nashirah et al., 2025). At this time, technology is applied as a learning medium (Adhe et al., 2025). Technology-based learning media can facilitate learning activities and develop children's cognitive abilities (Aisyah et al., 2024). An example of technology-based learning media is animation. Animation is defined as an art that brings characters or objects to life through sequential images displayed at high speed (Farastuti, 2021). Safittri & Titin (2021)

stated that animation can convey information interactively through visuals with a combination of sound, color, and movement.

Animation is broadcast on television and through various applications such as YouTube. YouTube is a video portal site that can be accessed by all internet users (Ifadloh & Widayati, 2021). Various groups, especially children to teenagers, like to watch animation, especially those that can be easily accessed on YouTube for entertainment and to fill their free time. Animation is not only entertaining, but also has an educational side. Now, animation has been widely used in the world of education. Hasmirati et al. (2023) mentioned that the implementation of animation in the education sector has attracted the attention of researchers and teachers to use it as a learning medium. Educational animation can be used to channel information or learning materials to children more effectively. This is because educational animation combines various elements ranging from images, writing, graphics, audio and so on and displays visuals so that children like it. In addition, animation is able to provide information to children in short language that is easy for children to digest (Kirom et al., 2024).

The use of animation provides a number of benefits in the context of learning. Animation can stimulate children's motivation and interest in learning. The use of animation can create a fun learning atmosphere for children (Subagyo, 2021). Novelia & Haziah (2020) stated that animation media has the power of attraction for children which makes

children not feel bored so that it has an impact on children to focus on receiving information from the animation effectively.

Previous studies have highlighted the impact of using animation in improving aspects of cognitive development, namely the ability to recognize numbers in early childhood. Ramli & Zulminiati (2021) stated that animation has an influence on developing the ability of early childhood to count. Miranti et al. (2023) in their research found that animated videos have a significant effect on increasing the ability of children aged 5-6 years to recognize numbers. So, it can be concluded that animation can affect the ability to recognize numbers in early childhood.

However, there are not many studies that discuss the influence of animation on children's cognitive skills that focus on the number recognition abilities of children aged 5-6 years, especially at Aisyiyah Bustanul Athfal 14 Kindergarten. Therefore, researchers are interested in conducting research related to the influence of MarBel animation on the ability to recognize numbers In early childhood at Aisyiyah Bustanul Athfal 14 Kindergarten.

Methods

This research was quasi-experiment research (Thyer, 2012). The researcher applied one group pretest-posttest design. This research was conducted in the academic year of 2024/2025 on 5-9 May 2025 at Aisyiyah Bustanul Athfal 14 Kindergarten. The population of this

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research was all students of Kindergarten B at Aisyiyah Bustanul Athfal 14 Kindergarten. This research used purposive sampling technique. So, the researcher took 15 students of Grapes Class at TK Aisyiyah Bustanul Athfal 14. The sample was chosen because the researcher had conducted observations and found that there were children who still had difficulty recognizing numbers in the class.

The instrument implemented was observation and documentation to collect the data. The research was conducted through pretest, 3 times of treatment, and post test. In measuring students' skill, the researcher used checklist sheet which the indicators were adapted from Panjaitan & Rangkuti (2022) and Suparmi et al. (2021). The indicators can be seen in Table 1 below.

Table 1. Indicators of Research Instrument

No	Indicators
1	Mentioning numbers 1 to 20
2	Sorting numbers 1 to 20
3	Connecting total things and numbers 1 to 20
4	Writing numbers 1 to 20

Then, the students' score were accumulated in Microsoft Excel and analyzed using SPSS (Statistical Packages for Social Sciences) Version 25. The total score, percentage and mean were calculated to category the result.

Results and Discussions

According to the research results, it is known that MarBel

animation can improve early childhood cognitive development in recognizing numbers. This is evidenced by the research findings that show an increase in test results before treatment (pre test) and after treatment (post test). During the pretest, the score was only at an average of 3.133 or 78%. Meanwhile, the average score increased to 3, 616 or 90% during the post test so that it can be seen that children's development has increased by 12%.

Table 2. The Result of Pre-Test and Post-Test

Indicator	**Average Score (Pre-test)**	**Category Distribution (Pre-test)**	**Average Score (Post-test)**	**Category Distribution (Post-test)**
1. Mentioning numbers 1 to 20	3.33	1 child Starting to Develop, 8 Developing According to Expectation, 6 Developing Very Well	3.80	0 Starting to Develop, 3 Developing According to Expectation, 12 Developing Very Well

2. Sorting numbers 1 to 20	2.80	4 Starting to Develop, 8 Developing According to Expectation, 2 Developing Very Well	3.40	1 Starting to Develop, 7 Developing According to Expectation, 7 Developing Very Well
3. Connecting total things and numbers 1 to 20	2.93	6 Starting to Develop, 4 Developing According to Expectation, 5 Developing Very Well	3.53	1 Starting to Develop, 5 Developing According to Expectation, 9 Developing Very Well
4. Writing numbers 1 to 20	3.46	1 Starting to Develop, 6 Developing According to Expectation, 8 Developing Very Well	3.73	1 Starting to Develop, 2 Developing According to Expectation, 12 Developing Very Well

Based on the indicators, the first indicator, namely "Mentioning numbers 1 to 20" obtained an average of 3.33 in pre-test where 1 child was in the Starting to Develop category, 8 children Developing According to Expectation, and 6 children were already in Developing Very Well category. Furthermore, the average for the first indicator

increased during the post test, which was 3.8. In the post test findings, there were no more children who was Starting to Develop, 3 children were Developing According to Expectation, and 12 children were Developing Very Well.

The second indicator is "Sorting numbers 1 to 20". During the pre-test, the average child obtained a score of 2.8 where there were 4 children in the Starting to Develop category, 8 children were Developing According to Expectation, while only 2 children were Developing Very Well. The score then progressed to 3.4 with 1 child starting to develop, 7 children were Developing According to Expectation, and the remaining 7 children were Developing Very Well.

The third indicator is "Connecting the number of objects with numbers". The pre-test results showed that the average score of the children was 2.93 where 6 children were in the category of Starting to Develop, 4 children were Developing According to Expectations, and 5 children were Developing Very Well. After the treatment (post-test), the children's abilities developed to 3.53 where 1 child was Starting to Develop, 5 children were Developing According to Expectations, while 9 children were Developing Very Well.

Finally, the fourth indicator is "Writing numbers 1 to 20". The average score of the children during the pre-test for this indicator was 3.46 where 1 child was in the category of Starting to Develop, 6 children were Developing According to Expectations, and 8 children were

Developing Very Well. The treatment provided development in the children's scores during the post-test to 3.73 where 1 child remained in the category of Starting to Develop, 2 children were Developing According to Expectations, and 12 children were Developing Very Well.

Table 3. Hypothesis Test Result

Test Statistics[a]	
	Post Test - Pre-Test
Z	-3.207[b]
Asymp. Sig. (2-tailed)	.001
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

Based on Table 3, the Wilcoxon Signed Rank test results showed the Asymp. Sig. (2-tailed) value is 0.001 <0.05 where there is a difference between Pretest and Postest. Thus, H0 is rejected and H1 is accepted. In other words, the use of Marbel animation can improve the ability to recognize early childhood numbers at Aisyiyah Bustanul Athfal 14 Kindergarten.

The results of this study are similar to several previous studies stated that animation has a positive effect on children's number recognition skills such as the findings of Maulida and Kaidaro (2022) which stated that animation affects children's ability to recognize numbers including recognizing number concepts, number symbols, counting which is done in a fun atmosphere. In addition, another study conducted by Sari, Iriyanto & Astuti (2024) also proved that the ability to recognize numbers can be improved through the use of animation

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media. Moreover, research conducted by Enjela et al. (2024) showed that learning through animation can effectively facilitate children to concentrate and support early counting learning including recognizing numbers.

During the treatment, the children showed enthusiasm and interest in watching the MarBel animation. Almost all children even mentioned what was in the animation. The content displayed and the moving images and sounds that attract children's attention help in children's teaching and learning activities with an joyful experience. This experience is in line with a research conducted by Miranti et al. (2023), that learning activities using animation can create an enjoyable experience for children where children can learn and watch videos about numbers with teachers and friends. This is also in accordance with the opinion of Enjela, et al. (2024) that counting activities presented by animation such as guessing the number of images to counting together can provide an interesting experience that makes children more enthusiastic.

So, MarBel animation can be used in number learning activities both in class and at home. This is supported by the findings of Maulida and Kaidaro (2022) who stated that animation is suitable for use anywhere and anytime as an alternative learning media, for example at home. Therefore, it can be concluded that Marbel animation affects the development of early childhood abilities in Aisyiyah Bustanul Athfal 14

Kindergarten in recognizing numbers.

Conclusion

Based on the results of the study, the value of Asymp. Sig. (2-tailed) value was 0.001 <0.05. So, H0 is rejected and H1 is accepted, which means that there is a significant difference between the pre-test and post-test results. It can be concluded that there is an effect of MarBel animation on the ability to recognize numbers in early childhood at Aisyiyah Bustanul Athfal 14 Kindergarten. Thus, teachers and parents are hoped to applied MarBel animation as an alternative media for learning numbers so that teaching and learning activities can be more interesting and enjoyable.

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