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The Effectiveness of Animation Film Media to Know Ability Mathematical Concept of Early Childhood Based on Gender

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Abstract

The background of the research is how to low ability to recognize mathematical concepts of early childhood. The low ability is due to the use of instructional media which is less enjoyable for children when playing and learning in class. Gender of boys and girls may have different orientations in playing and in recognizing mathematical concepts. The purpose of this study is to analyze the differences in the influence of the use of animated films and animation on the ability to recognize mathematical concepts, analyze the differences in the influence of gender on the ability to recognize mathematical concepts, and analyze the interaction between animated films and gender in their effects on the ability to recognize mathematical concepts early childhood. This research uses a quantitative method with a quasi-experimental design using Factorial (2x2). A population of 151 children with a purposive sampling technique obtained a sample of 105 kindergarten B children in the Dahlia PAUD cluster in Batangan's Kecamatan. The collecting of data in this study from the results of observations and tests and analyzed using two-way ANOVA. The results showed, there were differences in the influence of the use of animated films and animation, F = 17.546 in sig. 0.001, there is a difference in the influence of gender, F = 5.399 with sig. 0.022 and there is no interaction between animated films with gender differences in the ability to recognize mathematical concepts in early childhood, F = 0.130 with sig. 0.719. This research can be used as an alternative in choosing fun learning media to introduce mathematical concepts in early childhood.

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INTRODUCTION

Education in kindergarten facilitates various activities that can be develop various aspects including aspects of religious and moral values, physical motor, cognitive, language, art and social-emotional (Lisa, 2017). The cognitive ability is one aspect that measures the readiness of children in further development (Utanto Y. et al, 2017). One of the developments of cognitive abilities in PAUD is the mathematical ability (Novikasari, 2016). There are six aspects of developed in kindergarten, cognitive ability is believed to be the determinant of academic success in further education. Development of cognitive abilities in early childhood one of through mathematical ability.

The concept of mathematics can be mastered first by children before they know mathematics (Mansur, 2018). Mathematical concepts can be introduced early on in PAUD institutions by taking into account the stages of growth, development and the provision of appropriate stimulation (Rini et al, 2018). The concept mathematical divide into several, there are can be introduced to early childhood, including classifying, recognizing numbers, and counting (Novikasari, 2016). The mathematical concepts that can be introduced to children according to their stage of growth are classifying objects based on shapes, recognizing symbol symbols, using symbol numbers to count, matching numbers with symbol numbers.

Understanding mathematical concepts in early childhood still low because the teaching teaching aids used cannot make the student enjoyed. (Pebriyanto et al, 2016). The happiest children are children who are active in playing with their teachers and friends at school (Pranoto Y.K.S., et al, 2018). Nowadays computers and digital applications are part of a child's daily life (Zaranis et al, 2013). Information technology for children can be in the form of software about education to help to learn activities (Handayani S.S.D. et al, 2010). Teachers must improve their ability to use digital media in learning (Utami et al, 2018).

In this digital era, the use of digital media in learning is highly recommended because every day children are in an environment filled with digital media. Fun learning media is one way to increase children's learning interest so that learning objectives will be achieved.

The teacher must be able to choose media that is close to the child. The animated film is one of the most popular video media for children (Astuti Y.W. et al, 2014). In addition to animated films, the use of animation is explored to facilitate students obtaining problem-solving (Han H.D. et al, 2019). The media animation films and animation media in addition to fun for children are also able to stimulate the imagination, give a lasting impression in memory and have a great ability to attract attention, influence the attitudes and behavior of children.

In related with the mathematical abilities of many research figures who analyze gender, Einsberg et al in Santrock (2008) state that boys are better at mathematics. Coley (2001) state that there is no difference between the mathematical abilities of boys and girls. Differences in the potential of the male and female sexed children allow differences in the ability to recognize mathematical concepts in early childhood.

In other research, that are relevant to study: (1) Pebriyanto and Rahajan (2016) research, the use of animated films to help children in numeracy learning, (2) Research conducted by Nusir, et al (2014) entitled "Studying the Impact of Using Multimedia Interactive Programs on Children's Ability to Learn Basic Math Skills ". The relevance of these two studies to this research is the benefits of using learning media for numeracy learning skills in early childhood. The difference with this research has not been analyzing gender differences and differences in the influence of learning media in the ability to recognize mathematical concepts in early childhood.

The purpose of this study is to analyze the differences in the influence of the use of animated film media and animation, the effect of gender differences and interaction of both in the ability to recognize mathematical concepts in early childhood. The expected benefits of this research

are: (1) contributing theories about the ability to recognize mathematical concepts in terms of gender differences, (2) There is a picture of the ability to recognize mathematical concepts in terms of gender differences, can be utilized by teachers in optimizing the learning process in the classroom, (3) as a reference for further research interested in similar problems.

METHODS

This research is a quasi-experimental quantitative research design that is an experiment to control as many variables as possible in the situation. The data collection is done by observation and learning achievement tests. Observation sheet to determine student activity and implementation of the learning process. While the test is to determine the child's ability to recognize mathematical concepts. The data on the ability to recognize mathematical concepts are analyzed using two- way variance (Two Way Anova).

The study population was kindergarten B children in PAUD Dahlia Subdistrict in Batangan District with a total of 151 children. Sampling with purposive sampling technique because based on certain considerations (Sugiyono, 2017), a total of 105 children aged 5-6 years in TK Dharma Wanita Gunungsari, TK Dharma Wanita Tompomulyo, TK Dharma Wanita Kuniran and TK Dharma Wanita Pecangaan. The independent variable in this study is the media of animated films and animation media and the dependent variable is the ability to recognize mathematical concepts.

Before testing the hypothesis with ANOVA analysis must be met, first test the assumptions and prerequisites namely normality test and homogeneity test. Normality test aims to test whether the regression model of confounding or residual variables has a normal distribution (Imam Ghozali, 2007). It is known that value t and F tests assume that the residual value follows the normal distribution.

Normality test used SPSS (Statistical Program for Social Science) software v.23 for windows with data criteria will be considered normal if the significance score (sig.) On Kolmogorov-Smirnov > significance level (t.s) is equal to 0.05. Analysis of the normality test data, it can be seen in Table 1.

Table 1. The result of Normality Data Children's Learning

Class	Sig.	Description
AF (M)	0.181	Normal (0.181 > 0.05)
AF (F)	0.128	Normal (0.128 > 0.05)
A (M)	0.075	Normal (0.075 > 0.05)
A (F)	0.200	Normal (0.200 > 0.05)

The results of the normality test show that the learning outcomes of the four classes are normally distributed with a significance value of greater than 0.05. Furthermore, the data homogeneity test is performed to determine whether the variance of the data of the four classes studied is homogeneous or not. Data analysis is presented it can be seen in Table 2.

Table 2. The Result of Homogenitas from Children's Learning

Class	Levene statistic	Sig	Description
Animated film (M) Animated film (F) Animated (M) Animated (F)	0.209	0.648	Homogen

Homogeneity test results indicate that all four classes have homogeneous variance with a significance value of 0.648 greater than 0.05.

RESULTS AND DISCUSSION

Differences in the Effects of the Use of Animated Film and Animation in the Ability to Recognize Mathematical Concepts

Table 3 shows that there are differences in the average learning outcomes of each class. Mastery learning is found in classes that get learning by using animated film media with a mean value of 77.53 has exceeded the KKM value limit set at 70, while the class with animation media the average value is 67.29 is still below the KKM value, these results indicate that children who get learning with animated film media have achieved mastery learning.

Table 3. The Results of to Know Mathematic Concept

Videos / Gender	Animated film	Animated	Totals
Male	74.23	64.81	69.52
Female	80.83	69.64	75.23
Totals	77.53	67.29	72.41

Table 4. The Frequency Knowing of Ability Mathematical Concepts

Value (x)	Frequency			
	AF(M)	AF(F)	A (M)	A (F)
70-100	19	22	13	16
40-60	7	2	14	12
0-30	-	-	-	-
Totals (N)	26	24	27	28
Good	73%	92%	48%	57%
Bad	27%	8%	52%	43%

Table 4 shows the frequency of ability to recognize mathematical concepts in all four classes. These results indicate that class completeness is only found in classes that use animated film media, male gender classes at 73% and female gender classes at 92%, because these results have passed the specified 70% climax completeness.

Table 5. The Result of Two Way Anova Through Learning Media

Variables	F	Sig	Description
Learning Media	17.546	0.000	Failed H_0

Table 5 showed that H_0 was rejected with an F_{value} of 17.546 which was greater than the F_{table} of 2.461 at a significance of 0.0001 smaller than $\alpha = 0.05$ which meant that there were differences in the ability to recognize mathematical concepts between learning and film media animation and animation media in kindergarten B cluster PAUD Dahlia Batangan District.

Based on testing the first hypothesis shows that the ability to recognize mathematical concepts in each class is different. The mean value of children who use animated film media is higher than the average value of children who use animated media. The findings in this study are in accordance with some previous studies by Yuliani (2017), the use of instructional video media can improve the initial numeracy ability of kindergarten B. Istova and Hartati (2016) children, the use of Islamic fiction animated film media is effective to improve the listening and speaking abilities of school students Base in the city of Bandung. In other research conducted by Fahrudin and Nurdianti (2019) about the effectiveness of the use of film media in developing an attitude of respect for children.

In learning with animation film media the activeness of children is very high in building their own knowledge, and this is expected to help children to remember and understand learning material longer, according to the statement of Ahmadi F. and Weijun (2014) that through children's play will remember and understand what they have done. In other research Saputra et al, (2016), the positive category of children's responses to the animated film media material of the human digestive system. Sero M.M. (2016), there was a significant influence on the use of audio visual media through documentary films on the ability to understand mathematical concepts.

Learning by using animated film media by Pebriyanto and Rahajan (2016), a teacher must be able to integrate the ability to design learning, one of which is how to use a media to facilitate the delivery of material. The difference in influence of the use of animated film media and animated media in this case is the ability to recognize the material.

The difference in influence of the use of animated film media and animated media in this case is the ability to recognize mathematical concepts because animated film media makes the learning atmosphere more active when compared to the use of animated media. In addition, his high curiosity makes learning interesting, spontaneously the children participate in counting and counting on their own without instructions from the teacher.

Differences in the Effect of Gender on the Ability to Recognize Mathematical Concepts

Table 6. The Result of Two Way Anova Based on Gender

Variables	F	Sig.	Description
Gender	5.399	0.022	Failed H_0

Table 6 shows that H_0 is rejected with a calculated F_{value} of 5.399 greater than the F_{table}

value of 2.461 with a significance of 0.022 smaller than α = 0.05 which means there are differences in the ability to recognize mathematical concepts between children who are male and female in PAUD Dahlia Subdistrict, Batangan District.

The results of descriptive analysis also showed differences in the ability to recognize mathematical concepts between children sexed male to female, female sexed children have a mean value of 75.23 higher than male sexed children with an average value of 69.52.

The results of this study are related with research conducted by Asis M. et al (2015), which concludes the frame of reference and mental rotation of dominant male subjects using their spatial abilities while dominant female subjects use their logical reasoning. Children who are sexed with women are better at speed of perception so that they are more sensitive to new things that attract their attention. Gasco et al (2015), shows that there are statistically significant gender differences in mathematics.

Todor (2014), revealed that gender differences had a significant effect on children in intelligence and beliefs. Self-efficacy in mathematics, the ability of female gender children was better than male gender children. Dilla, et al (2018), the mean value of female gender children is higher than the mean value of male gender children in mathematical thinking abilities.

The difference in children's learning outcomes in the ability to recognize mathematical concepts based on gender is caused by differences in the characteristics of each child. Female gender children have more careful hearing, are more sensitive, and are faster able to remember the placement of objects and memorize words so they can quickly understand the instructions given by the teacher.

Interaction of Animated Film Media with Gender Differences

Table 7. The Result Two Way Anova Test Interaction of Learning Media through Gender

Class	F	Sig.	Description
Interaction learning media- Gender	0.130	0.719	Accept H_0

Table 7 show that H_0 is accepted with a F_{count} value smaller than the F_{table} value of 2.461 at a significance of 0.719 greater than α = 0.05 which means there is no interaction between the video learning media with gender on learning outcomes ability to recognize mathematical concepts in kindergarten B children in PAUD Dahlia Subdistrict, Batangan District.

Hypothesis testing shows that there is no interaction between animated film media and gender differences in their effects on the ability to recognize mathematical concepts. Variable animation film media and gender differences are mutually independent or not interrelated together will affect children's learning outcomes.

The success of Kindergarten B children in the Dahlia PAUD sub-district of Batangan in learning is only influenced by the use of animated film media because learning by using animated film media can make students actively and actively participate in learning. Likewise with the success of children in recognizing mathematical concepts that are influenced by gender due to the characteristics of female gender children who are superior to men.

Other research that shows there is no relationship between learning media and gender on children's learning outcomes is a study conducted by Kibrislioglu (2015) which states a positive attitude towards mathematics, high and low achievement differences only due to student attitudes, not related to gender. In line with research conducted by Sumianingrum et al (2017) which states that there is no interaction between Discovery Learning methods assisted by Edmodo E-Learning media and gender.

The statement from Kibrislioglu (2015) and Sumianingrum (2017) can be concluded that the results of this study are still in line with previous studies that have similar relevance discussions that researchers have successfully obtained. Nevertheless it is necessary to conduct similar research in the future to prove the theories that are still valid and can be used as a reference given the development of learning technology that is still massive.

CONCLUSION

Based on the results of the research that has been stated, it can be concluded that: (1) There are differences in the influence of the use of animated film media and animation media in the ability to recognize mathematical concepts in kindergarten B children in Dahlia PAUD Bars, (2) There are differences in the influence of gender on the ability to recognize mathematical concepts in kindergarten B children in PAUD Dahlia group, (3) There is no interaction between animated film media with gender differences on the ability to recognize mathematical concepts in kindergarten B PAUD Dahlia Batangan groups.

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