The Effect of Animated Film Media on Early Childhood's Ability to Recognize Mathematical Concepts Based on Gender (Animated Film Media for Education)

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Abstract. The goals of this study was to analyze differences in the effect of animated films, the impact of gender, the impact of animated movie and gender on the ability of early childhood to recognize mathematical concepts in material. This type of research is quantitative with a quasi-factorial (2x2) experimental design. The sampling technique was purposive sampling from 105 children aged 5-6 years in the Merpati PAUD group, Pati. The data was collected through the results of observations, documentation and tests. The data analysis technique used two-way ANOVA. The results showed F=17,545 with sig. 0.001 which means there is a difference effect of animated filmson children's ability. Gender also affected kids's ability beause the result F=5.399 with sig. 0.022 and for the combination of animated ilm media and gender, there was no significant effect on the ability to recognize mathematical concepts in preschool children with F=0.130 and significant value of 0.719. The conclusion showed that animated film media can be used to introduce mathematical concepts to early childhood.

Key words: animated film media; mathematical concepts; early childhood; gender.

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INTRODUCTION

Development efforts for children from birth to the age of 6 years which are carried out through educational stimulation to help the growth and physical development of children. and spiritual that can make them ready for entering further eduacation. According to Waluyo et al (2018), early childhood education (referred as PAUD) has main function to improve human quality. Stages in childhood occur only once and must be stimulated properly so that the child can show optimal development (Seran et al, 2017). Child's development is regulated in the Government Regulation Number 146 of 2014 concerning National Standard of PAUD which explains that six aspects must be developed including language, cognitive, physical motor, art, social emotional and religious moral values. According to Suryana & Dadan (2014) the benchmark used for children's readiness for further development is cognitive ability. Mathematical ability is one of the cognitive developments that need to be developed for children (Nasrulah & Marsigit, 2016).

In developing mathematical abilities, it can be started at the level of PAUD by paying attention to the stages of growth and development as well as providing appropriate stimuli (Lisa, 2017). Classifying, recognizing numbers, counting, matching numbers are some mathematical concepts that can be given to early childhood (Nur & Palobo, 2018). All mathematical concepts have before they know mathematics they must understand as a first step in a mathematics instruction (Maragustam, 2017).

In carrying out activities to recognize mathematical concepts, the right media is needed. The use of media is needed to support the instruction (Putri & Hariani, 2013). Mathematical concepts's ability in early childhood tends to be low because the media used are less fun (Pebriyanto & Rahajaan 2016). This causes children are not interested in the instruction. According to Pranoto & Hong (2018), the happiest children are children who play activities with their teachers and friends at school. Therefore, activities at school should be fun. Media that are familiar to children can help teacher to deliver the material. One of the media is information technology (such as handphone, laptop, computer, etc). According to Hand & Toh (2019) digital applications have become a part of children's daily lives such as computer. Teachers have to be able to use digital media in their instruction because information technology can help children's activities (Azizah ,2016). Children are already in an environment full of digital media, therefore the use of this media is highly recommended. Fun media is a solution to increase

children's attention in the instruction.

Besides digital media such as computers, it is also necessary to pay attention to the learning materials delivered to children. One of digital media favored by children is animated film media. Besides animated film media, there are animation media that can be explored to facilitate students in obtaining problem solving. Animated film are not only becomes an attraction for children, but also can be used to construct imagination, give a huge impression in the memory, influence children's attitudes and behavior. The use of animated film media allows users to communicate and interact (Phillips et al, 2019).

Several researchers analyzed the relationship between gender and mathematical ability. Animation can be used to helped children to solve a problem(Wouters et al 2008). Benoleken R (2014) stated that girls and boys have no difference in undrstanding mathematical abilities. Thus, children's mathematical ability, both girls and boys, has the potential to have differences.

Research that is relevance with this research: Research by Purwanto & Susanto (2017), which states that in supporting instruction, animated films media help children in mathematics especially about counting, (2) Study presented by Nusir, et al (2013) which studied the impact of program use interactive multimedia about children's ability to understand basic mathematics. This study is relevance with the studies above because the goals were to show the advantage of using media on the ability to learn numeracy for children. The difference is this study analyzed about gender and the impact of media in children's mathematics the ability to understand the concept of arithmetic.

METHOD

Research Goal

The goal of this research was to analyze the different effects of using animated movie and animated movie, analyzing the effect of gender differences and their interactions on the ability to recognize mathematical concepts in preschool children (early childhood).

Sample and Data Collection

The population was 151 students of kindergarten B children in the Merpati early childhood education programs group, Pati Regency. Purposive sampling technique was used because the research need certain considerations (Sugiyono, 2019). Amount 105 from 151 child which aged 5-6 years in Pertiwi Langenharjo Kindergarten, Pertiwi Dadirejo Kindergarten, Pertiwi Penambuhan Kindergarten and Pertiwi Penanggungan Kindergarten become the sample. Animated film media and animation media in this study are independent variables. While knowing the mathematical concept be the dependent variable. This study used a quasi-experimental quantitative approach that means an experimental design to monitor as many variables as maybe in existing condition. Data collection was done by observation, documentation of children's outcomes (test). Observation sheet was used to find out children's activities and learning activities, while test be used to know children's ability about mathematical concepts.

Analyzing of Data

Data analysis of the results was using two-way variance (Two Way Anova). Assumptions and prerequisite tests were carried out before testing the hypothesis using ANOVA analysis. The normality test used to see the regression model have a normal distribution (Imam Ghozali, 2007). As it is known that the t and F tests assume that the residual value follows a normal distribution. The normality test was done by using an application called SPSS. Normality of the data was determined by the value of significance on Kolmogorov-Smirnov. If the value more than the significance level of 0.05, then data is normal. Analysis of normality test data could be seen in Table 1.

Tab1e 1. Children's Result Normality Test

Group	Sig	Result
FA (M)	0.180	Normal (0.180 > 0.05)
FA (F)	0.127	Normal(0.127 > 0.05)
A(M)	0.074	Normal(0.074 > 0.05)
A (F)	0.200	Normal(0.200 > 0.05)

After being tested for normality, it showed that all classes had normal distribution because the significance value more than 0.05. Afterthat, the homogeneity test of the data was carried out to know the data variance of the classes. In Table 2, the results of the homogeneity test are explained

The results of the homogeneity test showed that the variance of all classes was homogeneous. This is proven by the result of the a significance value of 0.649 whinc clearly more than 0.05.

Table 2. The Homogeneity Test of Children's Outcomes

Class	Levene Statistic	Sig	Result
Animated Film Media (M) Animated Film Media (F) Animation Media (M) Animation Media (F)	0.209	0.649	Homogeneous

RESULTS AND DISCUSSION

The Difference in the Effect of Using Animated Film Media and Animation Media on The Ability to Recognize Mathematical Concepts

Table 3. The result of The Ability to Recognize Mathematical Concepts

Video / Gender	Animated Film Media	Animation Media	Average
Male (M)	73.23	63.81	68.52
Female (F)	81.83	70.64	76.23
Average	77.53	67.29	72.41

Table 3 showed that the average value of four classes were different. The completeness test of the classes that used animated film media with an average value of 77.53 had passed the minimum completeness value of 70, while classes with animation media had average value of 67.29 which was clearly less than the minimum completeness value. Form the result, we can concluded that children which receive instruction supported by animated film media had exceeding the minimum completeness value.

Table 4. The Frequency of The Ability to Recognize Mathematical Concepts

Value (x)	Frequency FA(M)	FA(F)	A (M)	A (F)
70-100	19	22	13	16
40-60	7	2	14	12
0-30	-	-	-	-
Total (N)	26	24	27	28
Pass	74%	93%	49%	58%
Not pass	26%	7%	51%	42%

Table 4 showed the frequency of all classes to saw the ability to recognize mathematical concepts. From table 4, we have seen that the value which have passed the minimum completeness of 70% classically can be found in the class that supported by animated film media. The boys reach 74% , while girls 93%.

Table 5. Two Way Anova Test about Media

Variable	F	*Sig*	Interpretation
Media	17.545	0.0001	Rejected H_0

The results of the Two Way Anova test on media show that H_0 was declined with an F_{value} of 17.545 which is briefly greater than the F_{table} of 2.461 with a significance of 0. It means that there was a difference in the ability to recognize mathematical concepts between using animated film and animated media in Kindergarten B, Merpati early childhood education programs group, Pati Regency.

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

Table 6. Two Way Anova Test for Student Outcomes Based on Gender

Variable	F	*Sig.*	Inepretation
Gender	5.399	0.022	Rejected H_0

The results of the Two Way Anova test on learning outcomes data by gender indicate that H_0 is declined with an F value of 5.399 more than the F table value of 2.461 with a significance of 0.022 which is less than 0.05. That means children's ability to recognize mathematical concepts are different for girls and boys in the Merpati PAUD group, Pati Regency.

Descriptive analysis result also show that the different ability to recognize mathematical concepts for girls and boys can be seen through the average value. Girls exceed an average value of 76.23 that is greater than the avegare of boys 68.52.

Interaction of Animated Film Media with Gender Differences

Table 7. Two Way Anova about Interaction between Media and Gender

Class	F	*Sig.*	Interpretation
Interaction between Media and Gender	0.130	0.719	Accepted H_0

The results of the Two Way Anova test show that H_0 is accepted with an F_{value} less than the F_{table}, which is 2.461 at a significance of 0.719, which is greater than 0.05, which means that video and gender on the ability to recognize mathematics concepts have not interact among each other.

Hypothesis test result shows that animated film media and gender differences don't have any significant effect on each other to influence the ability to recognize mathematical concepts. Animated films and gender can't affect children's learning outcomes although performed together. In the other word, gender and media are mutually independent.

Animated film media become the key of the success of the instruction that given to Kindergarten B in the Merpati early childhood education programs group because learning using animated film media can make students participate in learning enthusiastically and children can construct idea by themself. Likewise, gender has effect in the children's ability to recognizing mathematical concepts because the characteristics of girls who are superior to boys.

Discussion

Based on the result, it shows that there are differences of the ability to recognize mathematical concepts in each class. Class that use animated film media reach higher average value than that use animated media. Several studies that support the result such as Yuliani (2017) who use of a learning video to pursue the skills of children about numbers. Istova and Hartati (2016), improve listening and speaking skills of elementary school students in Bandung city with the assistance of Islamic fiction animated film media. Fahrudin and Nurdianti (2019) also stated that the moral value of a film media can develop respect for children that influenced their daily lives.

By using animated film media, children can be stimulated to contruct their own idea to build knowledge which means children be expected to remember the material deeply. Ahmadi F. and Weijun (2014) stated that games make children remembering and understanding about the steps of their activity. This is in line with the research of Saputra et al, (2016), there is a positive response from children in material for the human digestive system by using animated film media. Sero M.M. (2016), audio-visual media (documentary films) give a good effect on the ability to understand mathematical concepts.

Instruction with animated film media is emphasized by Pebriyanto and Rahajan (2016), a teacher have to choose the right instuctional design, including how to use a media to make it easier to deliver material. The difference in the effect of animated film and animation media in this study is the ability to recognize mathematical concepts because animated film created relaxing environment in learning than animation media. Thus, the instructional program become more interesting, children make their own knowledge about counting and participate actively without pressure from the teacher.

Based on the hypothesis test about gender, it shows that girls have higher average than boys. This statement supported by Sri (2016), which stated that boys used to explore their spatial abilities dominantly while girls used logical reasoning based on their mental development. Girls are better to interpret new things that have to be learned. This is in line with Todor (2014), revealed that girls are better than boys because the differences on children's abilities and self-efficacy certainty in mathematics. Dilla, et al (2018), girls have higher average than boys in mathematical thinking skills, and the last Gasco et al (2015), showed the gender different in mathematics ability statistically. The characteristics of children also give a huge impact on the ability to ability to know mathematical concepts. Girls are better at hearing, sensing, and quickly remembering the placement of objects and words from the guide of teacher.

The result of the study shows that there was media and gender are irrelated on children's mathematics ability. This result is also in line with research conducted by Kibrislioglu (2015) which stated that attitudes caused the differences achievement of students, not gender specifically. Sumianingrum et al (2017) also stated that the Discovery method of learning with the help Edmodo media and gender have no interaction eventhough they performed together.

CONCLUSION

This research shows that : (1) Animated film media more effective to improve the competence to recognize mathematical concepts in TK B group PAUD Merpati, Pati Regency than animation media, (2) There is an effect of gender on the ability to know mathematical concepts in preschool of Merpati PAUD , Pati Regency, (3) Animated movie and gender on the the effect of gender on the ability to know mathematical

concepts have no effect in preschool in the Merpati early childhood education programs , Pati Regency.

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