THE LENGTH OF PLAYING THE GAME FISH MATH ON ELEMENTARY SCHOOL NUMERACY SKILLS

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Abstract

This study aims to describe: (1) how the results differ from the use of the Fish Math game in terms of length of play on the numeracy skills of grade VI SD/MI students in Kramat sub-district, (2) Which duration of playing the Fish Math game is best used to improve numeracy skills Grade VI SD/MI students in the Kramat sub-district. The population in this study were Grade VI SD/MI students in the Kramat sub-district for the 2022/2023 academic year. Sampling using the Cluster Random Sampling technique. Data collection methods used are interviews, tests, and documentation. Previously the test instrument data was tested for validity, reliability, difficulty level, and discriminatory power. The data analysis technique used the one way ANOVA test and continued with the Tukey HSD test. The results of the study stated that there were differences in the results of using the Fish Math game in terms of the length of play on students' numeracy abilities. Further test results show that playing time of 45 minutes per day is the best length of play with an average post-test score of 88.75 with a completeness presentation of 100%.

Keywords: Game Fish Math, Calculating Ability, Playing Time

1   INTRODUCTION

The Covid-19 pandemic that hit the world in early 2020 resulted in setbacks in various aspects, one of which was in the field of education. Teaching and learning activities had to be carried out online for 2 years. This has resulted in some students experiencing the learning loss phenomenon. Learning loss is a loss of knowledge and limited ability of students which refers to academic abilities, usually occurs in prolonged gaps (Terayanti, 2020). One of the impacts of learning loss on mathematics learning for elementary school students is that students' numeracy skills are low. The ability to count is a basic ability in children in learning mathematics related to understanding numbers (Sari et al., 2020). According to Ariyanti & Muslimin (in Nawafilah & Masruroh, 2020) Counting is one of the student's learning tasks that must be mastered well apart from learning to read and write. The process of counting is the key to other ability concepts, either directly or indirectly. Children who have low numeracy skills will have difficulty learning mathematics (Mandailina, 2018).

Mathematics learning difficulties can be defined as a disturbance experienced in students which results in ineffective learning. Students' learning difficulties in mathematics must be handled appropriately so that students can learn well. Difficulties in learning mathematics if allowed to continue will result in low numeracy skills in children. Children's learning interest will decrease in learning mathematics. Mathematics will continue to be a frightening specter and a subject most avoided by students (Mukminah, Hirlan, Sriyani 2021).

This was reinforced by the results of interviews with class VI teachers at SDN Kertaharja 01, SDN Jatilawang 01, MI NU 01 Kemantran, and SDN Jatilawang 02 which resulted that students' understanding of the concept of counting was still low, most children still could not understand and could not solve questions. count correctly. Meanwhile, the learning methods used by teachers in elementary schools are still simple and monotonous so that students' interest in learning decreases, students feel bored and less enthusiastic when learning takes place.

To improve numeracy skills in children, an innovative and creative strategy is needed in the learning process to increase students' interest in learning, one of which is by utilizing technology. Along with the development of the times, various types of new games have emerged. Technology is very fast, giving influence to the emergence of new types of games. Apart from being made for fun, games are also made for educational purposes with the specific purpose of being an educational tool (Septiyani and Irsyadi, 2020). Games as educational media can make students learn while playing (Hamdani and Muni, 2016). According to Permatasari and Setiawan (2020) educational games can also improve

concentration and increase student interest in learning. According to Dony in Nabila et al. (2022) educational games are games that are made specifically as learning media as a means of developing concepts and understanding, training skills and guiding students as well as a medium to motivate students in order to support learning activities. With some of these opinions, researchers feel interested in using games as a learning strategy.

Playing online games can have a negative impact if played excessively. The influence of online game addiction also has an impact on the psychological, social, academic and physical aspects of children. The physical impact for children who play games excessively is blue light radiation on laptop/gadget screens. The radiation emission can damage the health of the eyes (Anderson & Bushman, 2001). According to Rayadi (2018) the role of parents in supervising their children in playing games is very important because the family is the first place for children to learn, with parental supervision so that children can control their habit of playing games excessively. Therefore it is necessary to limit the time of playing games to prevent the negative effects of online games. So that researchers feel interested in researching the use of games in terms of length of play. The use of games that can be used as a medium to practice and hone numeracy skills is the Fish Math game. Game Fish Math is an educational game that contains material for arithmetic operations on integers. Inside there are 5 levels from the easiest level to the most difficult level.

Based on the above background, this study discusses: (a) What are the differences in the results of using the Fish Math game in terms of length of play on the numeracy skills of grade VI SD/MI students in Kramat sub-district? (b) Which duration of playing the Fish Math game is best used to improve the numeracy skills of grade VI SD/MI students in Kramat sub-district?

2   METHODOLOGY

The research method used in this research is quantitative. The type in this research is experimental research because when researching, the sample will be given special treatment related to the use of the Fish Math game seen from the length of play on the ability to count. The experimental design used was the Pre-Experimental Design with the reason that this study did not use control variables and the research form was One Group Pretest-Posttest.

The population in this study were SD/MI in the Kramat district for the 2022/2023 school year. The population in this study was 52 schools, including 40 public primary schools, 4 private primary schools, and 8 private MI. The sampling method in this study was Cluster Random Sampling with the Multiple Stage Cluster Sampling type (gradual or multilevel sampling method). This sampling technique is usually used through several stages, namely the first stage determines the area. At this stage the designated area is Kramat sub-district, Tegal district. In the second stage determine the village. In the Kramat sub-district there are 20 villages, 6 villages are randomly selected. The third stage determines the School. Of the 6 villages that were randomly selected, one primary school was taken from each village. In these 6 schools class VI was assigned as the object of research.

In the next stage the sample is taken randomly from students who have not fulfilled completeness seen from the pretest value. The completeness criteria are in accordance with the KKM of each school. From one elementary school there were 12 students who had not finished, so 8 students were taken randomly. So from 6 schools taken from several villages in the Kramat sub-district there were 48 students as a sample. In this study, the sample consisted of experimental classes 1, 2, 3, 4, 5, and 6. The duration of playing in this study was determined randomly on the grounds that each elementary school has the same numeracy skills because the samples taken in this study were students who had not complete in the pretest. In experimental class 1 with 30 minutes of play per day, namely SDN Bongkok 02. Experimental class 2 with 45 minutes of play per day, namely Kertayasa 03 Elementary School. Experimental class 3 with 60 minutes of play per day, namely Jatilawang 02 Elementary School. Experimental class 4 with 30 minutes of play minutes per two days, namely MI NU 01 Kemantran. Experimental class 5 with 45 minutes of playing time per two days is SDN Munjung Agung 01. Experimental class 6 with 60 minutes of playing time per day is Dinuk Elementary School. This research was conducted for 2 weeks with 10 meetings at SDN Bongkok 02, SDN Kertayasa 03, SDN Jatilawang 02 and 4 meetings at MI NU 01 Kemantran, SDN Munjung Agung 01, and SDN Dinuk.

Data collection techniques in this study were tests which included pretest and posttest, interviews and documentation. Data analysis included research prerequisite tests, namely the normality test using Shapiro Wilk and the homogeneity test using Levene. The hypothesis test in this study used the One Way Anova test and continued with the Tukey HSD advanced test.

3   RESULTS

3.1   Description of Numeracy Ability Test Results

The research data were obtained from the numeracy skills test scores in the form of short entries, totaling 25 pre-test items and 20 post-test items on the subject matter of integer arithmetic operations. The following is a summary of the results of the numeracy test.

Table 1. Summary of Numeracy Ability Test Results

Playing Time	Average value			
	Numeracy Test		**Completeness**	
	Pretest	*Posttest*	*Pretest*	*Posttest*
30 minutes per day	53.5	81.88	0%	100%
45 minutes per day	52.5	88.75	0%	100%
60 minutes per day	51	85.63	0%	100%
30 minutes per two days	50	74.38	0%	75%
45 minutes per two days	49	76.88	0%	87.50%
60 minutes per two days	50.5	75	0%	75%

The test results show that the average posttest score is better than the pretest score, meaning that the use of the Fish Math game in terms of playing time can improve numeracy skills. As well as the percentage of completeness of students after playing the Fish Math game which has a complete score above the KKM of more than 60%

3.2   First Hypothesis Testing

Testing the first hypothesis was used to find out whether there were differences in the results of students' mathematical arithmetic abilities after being treated with the Fish Math game in terms of playing time between experimental classes 1, 2, 3, 4, 5, and 6. To test the first hypothesis, the One Way Anova test was used. The summary of the calculation results of the One Way Anova test is as follows:

Table 2. Summary of One Way Anova Test Results

One Way Anova	F_{hitung}	F_{tabel}
Posttest value	4.068	2.438

Based on the calculation of the one way ANOVA test, it is obtained = 4.068 and = 2.438, because > then it is rejected, meaning that there is a difference in the results of students' mathematical calculation abilities after being treated with the Fish Math game in terms of the length of time they play between experimental classes 1, 2, 3, 4, 5, and 6 Because the results of the One Way Anova test resulted in differences in the results of using Fish Math Game results in terms of playing time, further tests were carried out to find out significant comparisons and choose the best playing time.

3.3.   Second Hypothesis Testing

Testing the second hypothesis is to find out the best time to play the Fish Math game in improving numeracy skills. To test the second hypothesis, the ANOVA follow-up test was used with the

Tukey HSD Test assisted by SPSS version 24. The Tukey test was used to compare experimental classes 1, 2, 3, 4, 5, and 6. The following is a summary of the results of the Tukey HSD test:

Table 3. Summary of Tukey HSD Test Results

Count_Ability_Test

Tukey HSD[a]

Playing Time	N	Subset for alpha = 0.05 a	b
30 Minutes per two days	8	74.38	
60 Minutes per two days	8	75.00	
45 Minutes per two days	8	76.88	76.88
30 Minutes per day	8	81.88	81.88
60 Minutes per day	8	85.63	85.63
45 Minutes per day	8		88.75
Sig.		.097	.069

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 8.000.

In the table it can be seen that there are two groups called subset a and subset b. in the first group, namely subset a which includes playing time 30 minutes per two days, playing duration 60 minutes per two days, playing duration 45 minutes per two days, playing duration 30 minutes per day, and playing duration 60 minutes per day are in the same column which means that there is no significant difference between the treatments, which means that statistically group a has relatively the same effect on improving students' numeracy skills. In the second group, namely subset b which includes playing time 45 minutes per two days, playing time 30 minutes per day, playing time 60 minutes per day, and playing time 45 minutes per day are in the same column which means there is no significant difference between treatments which means statistically group b has relatively the same effect in improving students' numeracy skills.

The length of play is 45 minutes per two days, the duration of play is 30 minutes per day, and the length of play is 60 minutes per day, in the same two subset columns, for example in the table with subsets a and b, meaning that there is no significant difference between treatments. which means statistically the ab subset group has relatively the same effect on improving students' numeracy skills.

Overall there is a significant difference in the length of play of 45 minutes per day in subset b, with the length of play of 30 minutes per two days and the length of play of 60 minutes per two days in subset a and are in different subsets, meaning that there is a significant difference significant between treatments which statistically means that it has a different effect on improving students' numeracy skills. At 30 minutes per two days with an average value of 74.38 74.38 with 75% classical completeness, and 45 minutes per day with an average value of 88.75 with 100% classical completeness, it is clear that playing time is 45 minutes per day more Good. In playing 60 minutes per two days with an average value of 75.00 with 75% classical completeness, and playing 45 minutes per day with an average value of 88.75 with 100% classical completeness it is clear that playing time is 45 minutes better day. From the comparison of the two pairs, it can be concluded that playing time of 30 minutes per two days and playing time of 60 minutes per two days has an effect on improving students' numeracy skills in terms of completeness fulfilled, but playing time of 45 minutes per day has a better effect in terms of classical completeness. more and the average score on the numeracy test is higher.

If sorted based on the average value of playing time, the better is the playing time of 45 minutes per day with an average value = 88.75, followed by the playing time of 60 minutes per day = 85.63, then the playing time of 30 minutes per day = 81.88, the playing time of 45 minutes per two days = 76.88, then playing time 60 minutes per two days = 75.00, and playing time 30 minutes per two days = 74.38.

At 45 minutes per day playing time with an average pre-test score of 52.5 with a 0% completeness presentation and a posttest average score of 88.75 with a 100% completeness presentation. This means that the scores on students' numeracy tests after playing the Fish Math game with 45 minutes of playing time per day are better than before playing the Fish Math game. It can be concluded that the use of the Fish Math game for 45 minutes per day can improve students' numeracy skills. These results are in line with research conducted by Lely Shinta et al. (2022) which states that math games are effective for training numeracy skills as evidenced by the increase in numeracy ability test results.

This Fish Math game can be a learning medium for students to practice and hone their numeracy skills at home. The role of parents as facilitators is to fulfill learning facilities so that the learning process can run well. One of them is by providing technology as a learning medium. The role of parents in accompanying children in learning is very important. Parents can provide support and motivation so that children become enthusiastic about learning. Parents as facilitators during learning act as mentors and providers of learning facilities. With good facilities from parents will improve student learning outcomes. Satisfying learning outcomes are heavily influenced by the role of parents (Handayani, 2021).

4 CONCLUSIONS

Based on the discussion that has been described, it can be concluded that there are differences in the results of using the Fish Math game in terms of length of play on the numeracy skills of grade VI SD/MI students in Kramat sub-district. 45 minutes per day.

Based on the conclusions that have been presented, some suggestions can be given as follows: for students, learning media in the form of the Fish Math game can be used by students as a tool for learning at home to train and hone numeracy skills. For teachers, it is hoped that teachers can improve the learning process by giving lots of practice to students, so that students' mastery of the concept of counting is increasing. For parents, it is hoped that parents can provide motivation, facilities, and support by accompanying students in learning, so that students are more enthusiastic. For other researchers, it is hoped that this research can be used as a reference for similar research, and can develop similar games by paying attention to other aspects such as the emotional aspects of children when learning while playing games.

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