



The Effect of Prodigy Math Learning Media Based on Digital Based Learning on Student Learning Outcomes in Grade IV Mathematics Subjects

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Abstract --- The purpose of this study was to determine the effect of *prodigy math* learning media on the learning outcomes of fourth grade students in Mathematics subjects. The method used in this research is a quantitative experimental method with a *quasi experimental design* type two group *pre test-post test control group design*. The population in this study were all fourth grade students of SDN Cipinang Melayu 04 Pagi, with a research sample of 30 students in class IV-A as the experimental class and 30 students in class IV-B as the control class. The results of this study showed a significant increase in Mathematics learning outcomes in the experimental class using *prodigy math* learning media, with an average value before being given treatment of 45.33 and after being given treatment 63.55. So it is concluded that the use of *prodigy math* application is effective in improving the learning outcomes of fourth grade elementary school students.

Keywords: Prodigy Math, Mathematics, Digital Game Based Learning.

1. INTRODUCTION

Education is a right that every individual must receive as a provision in carrying out daily life. This is in line with the opinion (Rini 2013: 3) which gives its opinion, that education is a process that can change a person's attitude and behavior and behavior through teaching and training, so that these factors can mature each individual. Nowadays, following the times, education is a very important aspect to prepare generations to face challenges in the digital era. In the digital era there is a change, one of which is the advancement of science which produces many new technologies (Fadia Puja Ainun et al, 2019). There is supporting evidence that there are already educational units that have implemented digital technology in the learning process that is more effective and interesting, helps students get new experiences when learning, and can help students to understand abstract material concepts. One example of the application of digital technology in education is in the form of

learning media where the media can be in the form of learning videos, educational games, and digital textbooks.

Games can be said to be a means of entertainment to overcome leisure time so as not to feel bored. Game users are usually children, teenagers or even adults can play it. According to the results of research conducted by Hendrawan & Marlina (2022), it shows that online games are considered to have negative effects. So it can be said based on the results of this study that games have a negative effect in the context of education. However, along with the times, the mindset of society has become open, so that games can now be utilized in the world of education as a learning medium. It should be noted, that games that are utilized in the world of education are games that are educational, containing elements of education and learning.

Mathematics is an aspect that is most often applied in everyday life. Therefore, it is very important to learn from an early age, but everyone's perception of Mathematics varies. There is someone who really likes Mathematics so that they can apply it in everyday life very well, there are also those who are mediocre but have no difficulty in applying Mathematics in everyday life, and there are even those who do not like Mathematics because it is considered a complicated and boring thing. To make it easier for students to understand mathematics, the help of concrete objects or learning media is needed, besides that mathematical concepts should be conveyed abstractly (Rafianti, 2016). Abdurahman (2012: 20) many students find it difficult to understand math material, one of the main factors is the very monotonous classroom conditions due to the lack of teacher creativity to make the learning atmosphere fun, so that student activeness is reduced. This is one of the challenges that teachers go through in teaching mathematics, if students are not interested and do not pay attention when studying mathematics it is feared that students do not understand what has been learned, it will have an impact on student learning outcomes.

Djabba & Ilmi (2022), express their opinion that learning outcomes are often the main focus in assessment, learning outcomes can reflect students' abilities on the material that has been taught, so to find out whether learning objectives have been successfully achieved can be seen from student learning outcomes. The acquisition

of student learning outcomes is influenced by 2 factors, namely internal and external factors. One of the internal factors can be seen from the various conditions of students related to physical and mental, while external factors can be seen from the environment, how to teach teachers, student learning abilities, and the learning approach model used by teachers during the implementation of learning (Simamora et al., 2020).

According to data based on the Program For International Student Assessment, the PISA test results are divided into several levels. Starting from level 1 (lowest) to level 6 (highest) for math and science to see how far students' reasoning has gone, it can be seen based on the level of work on the PISA test results. Most Indonesian students have not reached level 2 for math (75.5%) and science (66.6%), there is a concern that 42.3% of students have not been able to reach the lowest level (1) for math, and 24.7% for science, (OECD, 2013). Based on research from PISA, it shows that there are still students who have low enough abilities so that the results of the mathematical literacy test are not satisfactory, of course this is caused by several factors such as the variety of questions and materials chosen.

According to the results of observations that have been made at SDN 10 Cipinang Melayu 04 Pagi, it appears that only a few students have enthusiasm for learning math, while other students tend to be passive. Based on interviews conducted with the class IVa teacher, the low enthusiasm for learning mathematics in students is one of the factors that affect learning outcomes. There are 35 students in class IVa, who managed to reach the KKM only 10 students, the other 25 students still did not reach the KKM.

Based on these problems, an interesting learning media is needed in the learning process, one of the interesting media applications is to insert gamification in learning mathematics. Gamification is a concept that utilizes systematic games in it, aesthetics and thinking games that are able to bind people (Jusuf, 2016). The act of motivation, promoting learning and solving problems. The concept of games or gamification is included in the *Digital Game Based Learning* (DGBL) learning method because through digital games it has been proven in the effectiveness of increasing student engagement, activating an interactive learning process, and supporting improvement in understanding the material. The elements involved in

DGBL are game elements that encourage student engagement and improve student skills in solving a problem (Wati et al., 2020). One of the media including DGBL that can be applied in learning mathematics is *prodigy math game*.

Prodigy math game is an educational game application designed to train the extent of the player's math skills. It was developed by Canadian game developer SMARTeacher inc, which focuses on educational software development. In prodigy math game, there are 8 levels of player classes. In addition, prodigy games can be easily accessed by students, because this game system can be played offline without the need for an internet network or using an internet network (online). (A & Sihotang, 2021) said that, prodigy math game in its use uses a way of identifying and solving problems that can be found in everyday life. Prodigy mate game provides educational value in understanding/learning math, even though it uses interesting media the teacher still supervises students to practice doing math problems, in order to understand math as well as possible, regular practice is needed. The concept of this prodigy math game is that the player must attack the enemy, but before attacking the enemy the player will be faced with a math problem first, if the player can answer the math problem correctly then the player can fight the enemy and win the battle game. With the prodigy math game, it is hoped that it can increase the enthusiasm for learning math (A & Sihotang, 2021).

Referring to previous research. There are several researchers who examine similar things, namely the effect of educational games on math learning outcomes, including:

First, referring to the results of research conducted by Dotutinggi, et al (2023) shows that the results of the research that has been carried out using Wordwall educational game media can affect student interest in learning, as evidenced by the results of the questionnaire as a pretest in the use of wordwall educational game media.

Second, the results of research conducted by Fitriani, et al (2019) show that after the application of kahoot media with a *computer assisted instruction* learning model is better than student learning outcomes with conventional models. Based on some of the results of previous research, the novelty in this study is in the learning media used and the learning model adapted to the independent curriculum.

2. RESEARCH METHODS

2.1 Research Approach

This research uses a quantitative experimental method with a *quasi experimental design* type *two group pre test-post test control group design*. In this study, there are 2 groups of classes, namely the experimental class and the control class. The experimental class is a class that is given special treatment by using *Prodigy Math* application-based media in learning math in class, while the control class is a class that is not given special treatment during math lessons, not taught with *Prodigy Math* application-based media.

2.2 Research Design

In this research, the research design used is *quasi experimental design* type *two group pre test-post test control group design*. Researchers can give a *pretest* at the beginning in the control and experimental classes, to find out the extent of students' understanding of Mathematics subjects, then researchers give treatment to students who are in the experimental class and at the end researchers conduct posttests in both classes to measure students' abilities after being given treatment.

2.3 Population and Sample

This research took place at SDN Larangan 10, the population used in this study were all students of grades VA and VB SDN Larangan 10. The samples used in this study were class VA totaling 35 people as the experimental class and VB totaling 36 people as the control class.

2.4 Data Collection Technique

To obtain data that will be needed in research, the authors use several techniques to collect data, including:

1. Observation

Observation is a data collection technique that is carried out by looking directly at the object to be studied. Observation is carried out to obtain data in the form of location, conditions, and facilities and pre-facilities.

2. Documentation

At the time of the research, documentation is one way to collect data in the form of documents, this can support a study. Documentation was used to obtain data about the school profile and photos during the research.

3. Test

In this study using test techniques to determine the effect of *prodigy math* learning media on math learning outcomes. The test in this study is divided into 2, namely: pre test and post test.

2.5 Data Analysis Technique

In this study, data analysis techniques were used using descriptive statistical analysis techniques and inferential statistics, the following is an explanation of descriptive statistical analysis techniques and inferential statistics:

1. Descriptive Statistical Analysis

This analysis aims to describe or explain a picture of the object under study through existing population and sample data without analyzing and making conclusions in a general sense.

2. Inferential Statistical Analysis

Inferential statistical analysis is needed when testing a research hypothesis. But before testing the hypothesis there are some basic tests that must be passed such as: normality test and new homogeneity test after that the t sample test is carried out.

The hypothesis in this study is H_0 = there is no effect of using Prodigy Math application-based media on Mathematics learning outcomes, while H_1 = there is an effect of using Prodigy Math application-based media on Mathematics learning outcomes.

3. RESULTS AND DISCUSSION

3.1 Results

This research was conducted at Cipinang Melayu 04 Pagi Elementary School in the even semester of 2024/2025. Based on the results of interviews conducted with the IVa homeroom teacher, the curriculum used in this school is the independent curriculum. The purpose of this study was to determine the effect of using the *prodigy math* application on the learning outcomes of grade IV students. Student learning outcomes in learning Mathematics material blocks and cubes are measured

using a multiple choice test instrument of 10 questions. This question instrument is given before the implementation of learning and is given in paper form. After students worked on the pretest instrument questions, the experimental class was given treatment during the learning process using *prodigy math* media. In the control class, students were also given a pretest instrument question as many as 10 questions. During the learning process in the control class, students were not treated with *prodigy math media*.

After obtaining data on the pretest and posttest results from two different classes, the data can be analyzed using descriptive analysis first, then the data is analyzed using normality and homogeneity tests, after the data results are normally distributed and homogeneous, the pretest and posttest data can be analyzed using hypothesis testing and paired sample t tests.

Table 1. Results of descriptive statistical analysis

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Experiment PreTest	31	20	60	43.55	11.704
Experiment PostTest	31	20	100	63.55	23.459
Control PreTest	31	40	90	56.77	15.575
Control PostTest	31	30	90	62.58	18.068
Valid N (listwise)	31				

Based on the table above, it can be seen that the average pretest results in the experimental class still did not reach the minimum completeness criteria (KKM), after being treated with a learning process that lasted 2 meetings using *prodigy math*, the average post test results were 63.55 in the experimental class, although it did not reach the KKM but the posttest results showed an increase compared to the average pretest score.

To find out whether the data obtained is normally distributed or not, the following normality test is carried out

Table 2. Normality Test

Based on the table above, it can be seen that the data tested is normal because the sig

Tests of Normality							
		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Class	Stat istic	df	Sig.	Stat istic	df	Sig.
Student learning outcomes	Experiment	.16	31	.02	.91	31	.01
	Pretest	8		7	3		6
	Experiment	.16	31	.03	.93	31	.06
	PostTest	5		1	5		2
	Control	.18	31	.00	.88	31	.00
	Pretest	4		9	2		3
	Control	.15	31	.05	.92	31	.03
	PostTest	5		6	5		3

value shows> 0.05. After doing the normality test, the data is needed for a homogeneous test which aims to determine whether the data is homogeneous or not.

Table.3 Homogeneous Test Results

Test of Homogeneity of Variance					
		Levene Statistic	df1	df2	Sig.
Student learning outcomes	Based on Mean	2.389	1	60	.127
	Based on Median	2.026	1	60	.160
	Based on Median and with adjusted df	2.026	1	54.368	.160
	Based on trimmed mean	2.357	1	60	.130

To test whether there is a significant difference in hypothesis testing, this test is conducted to determine whether the use of *prodigy math* is effective in improving Mathematics learning outcomes.

Table. 4 Paired Sample Test Results

Paired Samples Test									
		Paired Differences				Significance			
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	
					Lower	Upper			
Pair 1	Pretest Eksperimen - Posttest Eksperimen	-20.000	28.284	5.080	-30.375	-9.625	-3.937	30	<.001
Pair 2	Pretest Kontrol - Posttest Kontrol	5.806	8.475	1.522	2.698	8.915	3.815	30	<.001

Based on the results of the *Paired Sample T Test* in table 4. The use of *Prodigy Math* application in improving math learning outcomes of fourth grade elementary school students obtained a significance result of 0.01. Then the sig value is obtained <0.05, which means that H_0 is rejected and H_a is accepted. It can be concluded that the use of *Prodigy Math application* is effective in improving mathematics learning outcomes of students in grade IV elementary school.

3.2 Discussion

Based on the results of research that has been conducted on grade IV students of SDN Cipinang Melayu 04 Pagi, it shows that there is an effect of *Prodigy Math* learning media on the learning outcomes of grade IV students in Mathematics subjects. This research was conducted in two classes, namely the experimental class and the control class with 30 students each. The experimental class was taught using *prodigy math* media and the control class was taught using interactive PPT media. Data collection begins with doing a pretest first before being given treatment, then ends with doing a posttest to find out if there is an influence after being given treatment. The average posttest score obtained by the experimental class obtained a result of 63.55% which increased from the pretest results which got an average score of 45.33. This shows that there is an increase in student learning outcomes after using *prodigy math* learning media.

This research is in line with research conducted by Enny (2021), the results showed that *prodigy math* had a significant impact on math learning outcomes. *Prodigy math* has an interesting learning concept because, the game is designed in the form of an adventure, so students can learn while playing. Students are invited to explore many places and fight with other players, they can connect with each other

because they have the same password code. On the way, students are required to solve math problems to beat their opponents if they answer correctly, but if they answer wrong then they will lose. The conclusion of the research conducted by Enny (2021), *prodigy math* is able to improve math learning outcomes, because the media does not leave the original value in learning mathematics, namely students are required to understand concepts, while the basic concept of mathematics is a holistic and comprehensive unit using digital communication (Sefrianil & Sepriana, 2020).

Prodigy math media helps students to improve critical thinking and solve the concept of a problem, because the *prodigy math* system uses how to identify and solve problems in everyday life (Lyons, 2020). This is what makes *prodigy math* effective in improving learning outcomes, because by using this learning media students are required to understand the concept first and then solve the problem. This statement is supported by the opinion expressed by Krisbiantoro & Haryono, (2017) that to optimize mathematics learning well, students must understand the concept of mathematics learning which is a holistic and comprehensive unit which is interrelated and complementary to one another.

4. CONCLUSION

Based on the data that has been obtained along with the analysis carried out in this study, the conclusion obtained is that the use of *Prodigy Math* application has a significant effect in improving the learning outcomes of Mathematics of fourth grade elementary school students. This is evidenced in the results of hypothesis testing with the Paired Sample T Test obtained a significant value of $0.01 < 0.05$, which means H_0 is rejected and H_a is accepted. It can be seen that the results of the pretest and posttest in the experimental class have a higher value than the pretest value before treatment.

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