

## THE EFFECT OF THE MATHEMAGIC METHOD IN INCREASING LEARNING CREATIVITY IN STUDENTS POST PANDEMIC COVID-19

Liyani<sup>1</sup>, Rukmono Budi Utomo<sup>2</sup>, Ratu Sarah Fauziah Iskandar<sup>3</sup>

<sup>1</sup>Students of the Muhammadiyah University of Tangerang, South Tangerang, Banten

<sup>2</sup>Lecturer at the Muhammadiyah University of Tangerang, Tangerang, Banten

<sup>3</sup>Lecturer at the Muhammadiyah University of Tangerang, Tangerang, Banten

e-mail: [liyaniyayan26@gmail.com](mailto:liyaniyayan26@gmail.com)

### Abstract

The purpose of this study was to find out whether there was an increase in learning creativity in students after the Covid-19 pandemic between students who were given the mathemagic method and students who were given conventional methods. This study used a quasi-experimental method with a nonequivalent control group design. The population in this study were students of class VII SMP Pustek Serpong. The sample of this research was 64 students, which consisted of 32 students in the experimental class and 32 students in the control class. The data collection technique uses the Simple Random Sampling technique. The results of this study indicate that there are differences in increasing student learning creativity between students who use the mathemagic method and students who use conventional methods. This is based on the results of hypothesis testing using the t-test obtained  $t_{count} > t_{table}$ , namely  $(9.51 > 2.00)$ , so there is a significant difference between the posttest scores of students' learning creativity in the experimental class and the control class. The results were then carried out by the n-gain test, it was obtained that the value of the experimental class had  $N-gain = 0.74$ , which means that  $N-gain = 0.74 > 0.70$  so that the increased score was categorized as high. While in the control class the result is  $N-gain = 0.42$ , which means  $N-gain = 0.30 < 0.42 < 0.70$  so that the increase in score is categorized as moderate. From these results it can be concluded that the use of the mathemagic learning method in the experimental class is more effective for increasing student learning creativity compared to the control class with conventional learning methods. This is evidenced by the experimental  $N-gain$  of  $0.74 >$  the control  $N-gain$  of  $0.42$ .

**Keywords:** learning creativity, mathematic method, post-covid-19 pandemic

### INTRODUCTION

Education has a very important role in life. According to Wiwik Wirdayarti (in Helmi 2022) a country can be said to be advanced if the quality of education in that country is good. Many factors affect the quality of education in a country, some of these factors include classroom management, leadership, funding, and community support. Another factor that is no less important affecting the quality of education is the professionalism of teachers in order to achieve learning objectives and improve the quality of education. Success in achieving learning objectives depends on how the learning process takes place, and in the learning process teachers are required to be able to create meaningful, interesting and fun learning processes for students so that students have more ability to understand these things, especially in learning mathematics.

Fathani (2009) states that mathematics is important both as a tool, as knowledge (for scientists), as a shaper of attitudes and as a mindset guide. Given the importance of

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mathematics in everyday life, mathematics needs to be understood and mastered by all levels of society, especially by students as the nation's next generation. Students are expected to be able to understand learning mathematics so that they can take part in education while in elementary school to university properly. When students enjoy mathematics, it will be easier for students to understand learning mathematics. But until now mathematics in schools is often considered less fun and very boring.

In early February 2020, Indonesia was shocked by the Corona Virus Disease 2019 (Covid-19), which is a dangerous virus. This virus can be transmitted through physical contact, namely touch and droplets through the air, so people must maintain social distance (physical distancing) (Nasruddin & Haq, 2020). Through a circular letter from the Ministry of Education and Culture Number 4 of 2020, the minister of education explicitly provides direction regarding this matter. Distance Learning (PJJ) is carried out as an effort to prevent the spread of Covid-19 in the education sector where children and adolescents are an age group that is vulnerable to transmission of the virus.

According to Dewantara and Nurdiansyah (2020), Some of the problems in the Distance Learning (PJJ) process are the internet network that is already available but the internet access speed is not optimal and consumes more internet quota, because of this students also do not understand the material provided and result in a lack of student creativity in learning.

Over time, positive cases of Covid-19 in Indonesia have decreased. To solve the problems above, the government adopted a new policy through the Ministry of Education and Culture's decision regarding guidelines for implementing learning during the Covid-19 pandemic, which decided that schools could carry out limited face-to-face learning by implementing health protocols.

Based on the results of observations and interviews conducted at SMP Pustek Serpong with one of the class VII math teachers, it is known that the creativity of students in learning mathematics at SMP Pustek Serpong is still low. In the results of an interview with a mathematics teacher who teaches at Pustek Serpong Middle School, the teacher said "Almost all students can complete the assignments given, but when asked many students cannot explain the results they got, the only students who can answer are that- just that". In the interview it was shown that students could solve math problems but not all could explain

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what they were doing and only a few students were active in class in the question and answer session and the scores obtained by students were relatively the same, there was no significant difference between one student and another.

Every student needs to be guided so that they can play an active role again without coercion in realizing their every idea and desire, therefore in education, teachers are not only assigned to be able to provide provisions about understanding a knowledge to their students, but also teachers must be able to adjust the method and the learning process in the classroom so that learning can run well, this is necessary so that teachers can improve student creativity. Many learning methods have been developed and created to make it easier for students to enjoy learning in class, especially learning mathematics, one of which is the Mathematic method.

According to Setyono (2007) Mathemagic is an approach with a new perspective on mathematics, especially in providing material. Material is given in a fun, concrete way, and pays attention to psychological aspects, how the brain works, learning styles, and students' personalities. Mathemagic comes from two words, namely, Mathematic which means mathematics and Magic which means magic, so in simple terms Mathemagic can be interpreted as mathematical magic.

The process of learning mathematics using the Mathematic method uses supporting media or games that can attract students' attention. Surely all students want learning that is simple, fun, and challenging for them. This desire can be realized by using the Mathematic method, with this method students will be more confident because learning will be more fun so that students can easily understand mathematics, of course this greatly influences student creativity, when students start to enjoy mathematics, student creativity in learning will also be increase. According to Sriraman (2011) said that creativity in mathematics can be interpreted as an ability possessed to see and choose how to solve problems in mathematics. Therefore the teacher can choose the right learning method, one of which is the Mathmagic method.

Based on the problems described, this research was carried out to find out whether there was an increase in learning creativity between students who used the Mathmagic method and students who used conventional methods in the post-Covid-19 pandemic.

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## METHODS

The method used in this research is Quasi Experiment with the design used, namely Nonequivalent Control Group Design, where different treatment is given to the two groups, namely the treatment of learning using the Mathematic method in the experimental class while in the control class is given learning using conventional methods. First of all, the two classes were given a Pretest to find out their initial abilities before being given treatment, then the class was given treatment after that it was given a Posttest to find out whether there was an increase or not in the experimental class after being given treatment. The dependent variable (Y) in this study is Learning Creativity. The independent variable (X) in this study is the Mathematical Method. Then the research design is shown as follows:

**Table 1**  
Research design

Group	Pretest	Treatment	Posttest
Experiment	$Y_E$	X	$Y_E$
Control	$Y_K$	-	$Y_K$

This research was conducted at Pustek Serpong Middle School for the 2022/2023 school year. The sample used in this study were 64 students, of which 32 students from class VII.3 served as the experimental class and 32 students from class VII.2 as the control class. The sampling technique uses Simple Random Sampling. To obtain the data needed in this study, the researchers used observation techniques, interviews and tests in the form of essay questions consisting of 7 questions on flat geometric material to measure the level of learning creativity in students. This test was given before and after being given treatment, both to experimental class and control class..

## RESULTS AND DISCUSSION

Based on the results of research data obtained in the pretest conducted in the experimental class and control class, during the implementation of the pretest the two classes had not been given special methods or treatment. Then the research results can be written in the following descriptive table:

**Table 2**  
Descriptive value of pretest control and experimental class

Statistics	Control Class	Experiment Class
Lots of data	32	32
Maximum	62	64

Minimum	34	36
Means	46.38	47.19
Median	44	46
Mode	44	46
Range	28	28
Standard deviation	8.32	7.83
Variance	69.27	61.38

Based on the results of the research data obtained in the Posttest conducted in the experimental class using the mathemagic method and the control class using conventional methods, the research results can be written in the following descriptive table:

**Table 3**  
**Descriptive value of posttest control and experimental class**

Statistics	Control Class	Experiment Class
Lots of data	32	32
Maximum	82	92
Minimum	54	68
Means	69.59	86.09
Median	70	86
Mode	62	90
Range	28	28
Standard deviation	6.80	6.97
Variance	54.44	50.93

Based on the table above, the average control and experimental classes have differences, namely the control class has an average value of 69.59 while the experiment has an average of 86.09. This shows that there is an assumption that the two classes have different learning creativity after being given the mathemagic learning method treatment in class VII 3 and conventional learning methods in class VII 2.

Then a normality test is carried out which aims to find out whether the samples taken come from populations that are normally distributed or not. In this study, researchers used Chi Square. The pretest normality test for both classes, both the control class and the experimental class, produces the following data:

**Table 4**  
**Pretest data normality test**

Group	X <sup>2</sup> count	X <sup>2</sup> Table	Information
Control	3.881	7.815	Normal
Experiment	3.073	7.815	Normal

Uji normalitas Posttest kedua kelas baik kelas kotrol maupun kelas eksperimen menghasilkan data sebagai berikut:

**Table 5**  
**Posttest data normality test**

Group	X <sup>2</sup> count	X <sup>2</sup> Table	Information
Control	4.694	7.815	Normal
Experiment	4.612	7.815	Normal

Based on the analysis of the data and the results of the calculations that have been carried out, the results of the normality test were obtained which showed that the sample came from a normally distributed population, this can be seen in the results of the pretest calculations in the control class, which had chi count = 3,881 and chi table = 7,815 where X2 count < X2 table then Ho is accepted, and the Pretest in the experimental class has chi count = 3,073 and chi table = 7,815 where X2 count < X2 table then Ho is accepted. Likewise, the results of Posttest calculations in the control class have chi count = 4,694 and chi table = 7,815 where X2 count < X2 table then Ho is accepted, and Posttest in the experimental class have chi count = 4,612 and chi table = 7,815 where X2 count < X2 table, then Ho is accepted and the sample is normally distributed so that it can be continued with the homogeneity test.

Homogeneity test was carried out to find out whether the sample used was from a homogeneous variant or not. The homogeneity test used in both classes is the F-test, by comparing the largest variance with the smallest variance. Based on the results of the homogeneity analysis, it can be seen that both data for class VII 3, namely the experimental class and class VII 2, namely the control class in the pretest, obtained F count = 1.13 and obtained F table = 1.82. Then Fcount < Ftable, thus Ho is accepted and at the Posttest obtained Fcount = 1.07 and obtained Ftable = 1.82. Then F count < F table, thus Ho is accepted and it can be concluded that both classes, both the control class and the experimental class, are in a homogeneous state.

From the results of the normality test and homogeneity test it is known that both classes are normally distributed and in a homogeneous state, then the results of the calculation of the pretest data hypothesis test using the t-test are as follows:

**Table 6**  
Pretest data hypothesis testing

<b>t-test</b>	<b>t count</b>	<b>t table</b>
	0,40	2,00

From the table above, we get t count = 0.40 and we get t table 2.00. Then t count < t table, thus Ho is accepted, based on these results it states that there is no significant difference in learning creativity between the control class and the experimental class, because in the Pretest students have not been given learning treatment in either the control class or the experimental class. Furthermore, the results of the calculation of the post-test data hypothesis test using the t-test are as follows:

**Table 7**  
Posttest data hypothesis testing

<b>t-test</b>	<b>t count</b>	<b>t table</b>
	9,51	2,00

From the table above, we get t count = 9.51 and we get t table 2.00. Then t count > t table, thus Ho is rejected, meaning that there is a difference between the control class and the experimental class. Furthermore, the N-gain test was carried out to determine the increase in score in a sample class in the study. In the N-gain test, the average score of the initial data, namely the Pretest and the final data score, namely the Posttest, will be compared and tested for improvement. The following is a table of N-gain calculation results in the control class and the experimental class.

**Table 8**  
Data peningkatan skor Pretest dan Posttest

<b>Class</b>	<b>Pretest average</b>	<b>Posttest average</b>	<b>N-Gain Class</b>	<b>Category</b>
Control	46,37	68,93	0,42	Currently
Experiment	47,18	86,18	0,74	Tall

The results of the analysis show that the experimental class has N-gain = 0.74, which means N-gain = 0.74 > 0.70 so that the increased score is categorized as high. While in the control class the result is N-gain = 0.42, which means N-gain = 0.30 < 0.42 < 0.70 so that the increase in score is categorized as moderate. From these results it can be concluded that the use of the mathemagic learning method in the experimental class is more effective for

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increasing student learning creativity compared to the control class with conventional learning methods. This is evidenced by the experimental N-gain of  $0.74 >$  the control N-gain of  $0.42$ .

Based on the results of observations in the control class, namely in class VII 2 which was given conventionally, it was seen that students did not play an active role in learning, the class atmosphere was quieter because they only listened and paid attention to the teacher explaining the material without any feedback from students. It's just that in conventional learning, the class atmosphere is more orderly.

Based on the results of observations in the experimental class, namely in class VII 3 which was given the mathemagic method, in this class students seemed to play a more active role, students were more enthusiastic in the learning process, the learning process in class was more fun, it's just that in this learning the class atmosphere became more noisy.

The use of the mathemagic method in learning really helps students because this method conveys material in a more enjoyable way so that students can easily understand learning. Learning is done with pleasure so it will be more memorable and students will find it easier to understand the learning given. In the learning process mathemagic can grow self-confidence, students will be more courageous in solving existing problems so that this will increase student learning creativity

## **CONCLUSION**

Based on the results of research on "The Effect of the Mathematical Method in Increasing Learning Creativity in Students in the Post-Covid-19 Pandemic" at Pustek Serpong Middle School, it can be concluded that the Creativity of students in the experimental class using the mathemagic method is higher than the learning creativity of students in the control class which using conventional learning methods. It can be seen from the results of the analysis that the experimental class has an N-gain ( $0.74$ ) with a high score increasing category and the control class has an N-gain ( $0.42$ ) with a medium score increasing category. From these results it can be concluded that the use of the mathemagic learning method in the experimental class is more effective for increasing student learning creativity compared to the control class with conventional learning methods.

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