

## **MATHEMATICAL PROBLEM SOLVING ABILITY AND STUDENT INTEREST IN LEARNING USING GOOGLE CLASSROOM**

Ari Septian<sup>1</sup>, Citra Laila Ramadhanty<sup>2</sup>, Darhim<sup>3</sup>, Sufyani Prabawanto<sup>4</sup>

<sup>1,2</sup> Universitas Suryakancana  
<sup>3,4</sup> Universitas Pendidikan Indonesia

*ariseptian@unsur.ac.id*

### **ABSTRACT**

This research was conducted when the world was experiencing Covid-19 pandemic. The purpose of this study was to determine the ability of mathematical problem solving and student interest in learning mathematics using E-Learning media, namely Google Classroom. The research method used was the Pre-Experimental Design with the research design of The One Group Pretest - Posttest Design. The population of this study was students of class X SMA Negeri 1 Ciranjang academic year 2020-2021. This study involved a sample of 32 people who came from one class, namely X MIPA 5 who were selected through purposive sampling technique. The research instrument used was a mathematical problem solving ability test and a questionnaire on student learning interest. Based on the results of the study, it was found that there was an increase in students' mathematical problem solving abilities between before and after using Google Classroom. Students' interest in learning mathematics using Google Classroom in improving mathematical problem solving abilities is generally positive.

**Keywords:** *problem solving ability, interest in learning, Google Classroom, mathematics*

### **INTRODUCTION**

Education is one of the most important things in life. With human education, there will be changes and developments that can make him a better human being. With education, people who initially don't know will become all-knowing. Education is carried out since humans are born into this world, and education is carried out so that humans are more dignified, ethical, and uphold moral, religious, social, and cultural values that are appropriate in people's lives. According to Wedan (2016) "Education is a conscious and planned effort to create an atmosphere of learning and the learning process for students to actively develop their potential to have religious-spiritual strength, self-control, personality, intelligence, noble character, and the skills they need. and society. " Therefore, to realize and develop that potential education has a function and purpose as a guide. Education has the functions and objectives listed in Law no. 20 of 2003 concerning the National Education System, Article 3 which states: "National Education functions to develop and shape the character and civilization of a nation with dignity in order to educate the nation's life, aiming at developing the potential of students to become human beings who believe and fear God Almighty, have a noble character, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens ". (Undang-undang, 2003).

It is clearly stated in the Law that one of the functions of education is to educate the nation's life. The nation here is the people who carry out education, or when at school they are called students or learners. These functions and objectives are carried out by educators or teachers. Therefore, teachers play an important role in realizing the functions and goals of this education. Students who are smart and capable are proof of the realization of the functions and goals of education stated in the Law. Intelligent and competent students must be supported by good cognitive, affective, and psychomotor aspects. Cognitive, affective, and psychomotor aspects are used as a reference for assessment in the education curriculum, namely the 2013 curriculum. The curriculum is one of the most important educational tools. According to the Ministry of National Education (Yusri et al., 2018), the curriculum has goals that must be achieved through learning mathematics, namely so that students can solve a problem which includes the ability to understand

problems, design mathematical models, solve mathematical models and explain the solutions they get.

According to the 2004 KBK and KTSP 2006 curricula in (Sembiring & Mukhtar, 2013), the objectives of learning mathematics are (1) training how to think and reason in drawing conclusions, for example through investigating, exploring, experimenting, showing similarities, differences, consistency, and inconsistency; (2) developing creative activities that involve imagination, intuition, and discovery to develop divergent, original thinking, curiosity, making predictions and experimenting; (3) develop problem-solving skills; (4) develop the ability to convey information or communicate ideas, among others through conversation, graphics, diagrams in explaining ideas.

Mathematics itself is a science of arithmetic, structured science, exact science, and abstract science whose structures require more study or study. Meanwhile, according to (Imami, 2018) that mathematics is a means or means of thinking to develop a logical, systematic, objective, critical, and rational thinking patterns that must be fostered since basic education. Therefore, it takes capable abilities to be able to solve a mathematical problem and be able to develop a logical, systematic, objective, critical, and rational mindset. Meanwhile, according to (NCTM, 2000) there are five standard mathematical abilities that students must have, namely problem-solving skills, reasoning and proof skills, communication skills, connections skills, and representations skills.

In accordance with the NCTM statement, students must have one of the five standards of mathematical ability, namely problem-solving abilities. Students are expected to be able to understand the problem, design, and make strategies to get solutions or solutions to the problems they face. Not only in math problems but students can solve problems in real life with the capital of their problem-solving abilities through learning mathematics. Also, based on the 2004 KBK and 2006 KTSP curricula regarding the objectives of learning mathematics, students are expected to be able to develop the ability to solve problems. Permendiknas Number 22 of 2006 concerning Content Standards states that problem-solving ability is one of the general objectives of learning mathematics where mathematical problem-solving ability is the skill to solve or solve a mathematical problem that can develop thinking patterns, student creativity in finding solutions that are not only problems mathematics but in his life. According to the results of the PISA survey (Widodo & Kartikasari, 2017) students in Indonesia in 2012 have low mathematical problem-solving abilities, this puts Indonesia in 64th place out of 65 countries with an average score of 365 math skills from the average standard score. -the average set by PISA is 500.

The results of the PISA survey are directly proportional to the observations and results of interviews with several students, that the majority of them do not like learning mathematics due to a lack of understanding and the ability to find solutions and solve problems in the problems given by their teachers. Many factors cause students to lack understanding and ability to find solutions or solve problems in mathematics, namely: (1) a learning atmosphere that is not supportive or not conducive; (2) Lack of motivation so that students are not ready to take part in learning and result in a lack of understanding and mathematical problem-solving skills; (3) The learning method or model used by the teacher is unattractive and makes students tired of taking mathematics lessons; (4) Reduced interest in student learning.

Low student interest in learning is a problem that has a negative impact on students' abilities, especially their mathematical problem-solving abilities. To improve mathematical problem-solving abilities and student interest in learning, student-centered learning strategies and methods or models can encourage students' desire to take part in learning actively, positively, and creatively in solving problems. But currently, being able to hold face-to-face learning is a difficult thing, because of the outbreak of a virus called Coronavirus or Covid-19 which in Indonesia occurred in early 2020. Lots of people have been affected by this virus outbreak, for example, the industrial sector, the economy that has declined, whether it's the upper, middle, and lower classes. The Indonesian government has also issued several regulations and policies to deal with this virus outbreak because this virus is very fast spreading and contagious and also takes many lives. Some of the regulations, namely, impose PSBB (Large-Scale Social Restrictions) in big cities and even regions, the closure of tourist attractions which are centers of public gatherings, malls or supermarkets that do not sell basic needs or food, and also schools which of course carry out many social activities with people.

This condition causes workers and students to have to work or study at home or it is called Work From Home (WFH). Educators must use online or network-based media to make learning that is usually carried out in the classroom to become distance learning. The 21st century, which is the digital age, has brought many changes and developments in the world of technology and has influenced the world of education (Muthy & Pujiastuti, 2020; Septian, Darhim, & Prabawanto, 2020a). Over time, there was a digital revolution that had an impact on the world of education. With this digital, the learning process is carried out not face to face. This is where learning occurs using electronic media or called e-learning. The use of technology or electronic media can be aimed at breaking the chain of spreading the Covid-19 virus and carrying out the rules that have been made by the government to carry out learning and work activities at home. Researchers take advantage of current conditions to test and examine how mathematical problem-solving abilities and student interest in learning are carried out online or online learning by utilizing a media design from a google company called google classroom.

Based on the explanation above, further research is needed to find out whether learning using google classroom has an effect on improving mathematical problem-solving abilities and student interest in learning, therefore researchers need to conduct research with the title “Mathematical Problem Solving Ability and Student Learning Interest Using Google Classroom”.

## **METHOD**

This study uses the Pre-Experimental Design research method, which is an experimental design that is not serious because there is no comparison with the non-treated group or there are external variables that influence the formation of the independent variables. (Emzir, 2008: 96; Sugiyono, 2012: 109). The form of research used is The One Group Pretest - Posttest Design. Sugiono (EFENDI, MUNFADLILA, & ZAINUDIN, 2018) reveals that this design uses a pretest and post-test or pre-test and final test, before obtaining a better assessment, the researcher conducts a pretest first, and the post-test is carried out after obtaining the material with the hope that there is a comparison between before and after the material is given.

The research subjects were carried out at SMA Negeri 1 Ciranjang, namely in class X MIPA 5, totaling 32 people. The research instrument used was a mathematical problem-solving ability test and a questionnaire on student learning interest. For the data analysis technique, the test was carried out by testing the normality of the population distribution, followed by the Paired Sample T-Test if the data were normally distributed if the data was not normally distributed, the data were tested using the Wilcoxon Signed Ranks. While the questionnaire data analysis technique used descriptive analysis.

## **FINDINGS AND DISCUSSION**

The results of this study are the results of the SPSS test data which aims to determine students' mathematical problem-solving abilities and descriptive analysis in order to determine students' learning interest in mathematics using google classroom.

### **Analysis of Students' Mathematical Problem Solving Ability Results**

Data analysis was carried out to determine whether an increase in the increase in the management system of students' mathematical problems before and after receiving treatment through google class was obtained from statistical results using SPSS 22 software.

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
					Std. Error		

PRETEST	32	6	2	8	5.91	0.282	1.594	2.539
POSTTES	32	8	3	11	8.37	0.307	1.737	3.016
Valid N (listwise)	32							

**Table 1. Data Description Statistics Mathematical Problem Solving Ability**

Based on table 1, it can be seen that the average score from the pretest was 5.91, while the average score from the posttest was 8.37. From the descriptive data, it can be seen that the average posttest score is greater than the pretest average score with the difference in mean score is 2.46. Furthermore, the data must be tested using the Paired Sample t-test if the data is normally distributed, whereas if the data is not normally distributed, a non-parametric test is carried out using the Wilcoxon Signed Ranks test. So before doing the t-test or non-parametric test, the data is tested first whether it is normally distributed or not. And the results of the normality test are as follows:

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PRETEST	,305	32	,000	,845	32	,000
POSTTES	,133	32	,159	,927	32	,032

a. Lilliefors Significance Correction

**Table 2. Population Distribution Normality Test**

Based on Table 2, it can be seen that the results of the normality test using the Shapiro-Wilk test obtained the sig value. pretest  $0,000 < 0,05$  and sig. posttest  $0,032 < 0,05$ , which means that the data are not normally distributed. As mentioned above, if the data is not normally distributed, the next step is to test the data with a non-parametric test, namely the Wilcoxon Signed Ranks test. The results of the calculations can be seen in table 3.

			POSTTES - PRETEST
Z			-4,973 <sup>b</sup>
Asymp. Sig. (2-tailed)			,000
Monte Carlo Sig. (2-tailed)	Sig.		,000
	95% Confidence Interval	Lower Bound	,000
		Upper Bound	,000
Monte Carlo Sig. (1-tailed)	Sig.		,000
	95% Confidence Interval	Lower Bound	,000
		Upper Bound	,000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

c. Based on 10000 sampled tables with starting seed 2000000.

**Table 3. Wilcoxon Signed Ranks Test**

Based on Table 3, it can be seen that the statistical test results show sig.  $0.000 < 0.05$  ( $H_0$  rejected), which means that there is an increase in students' mathematical problem-solving abilities between before and after using google classroom. In other words, the results of the Posttest test are better than Pretest. This is because google classroom media makes it easy for students to access or view material (in the form of videos, files, etc.) indefinitely until they really understand the

learning material and provide opportunities to collaborate and discuss in the comments column that can be accessed by all members in class in google classroom.

Table 3 shows that students have been able to adapt to the google classroom as a substitute for face-to-face learning media in class because during the Covid-19 pandemic the government did not allow direct physical interaction. This is in line with research findings (Maharani & Kartini, 2019; Septian, Darhim, & Prabawanto, 2020b) that by using google classroom media, the ability to solve mathematical problems will be better.

### **Analysis of Student Interest Results**

Analysis of the student interest in learning questionnaire was carried out to determine how student interest in learning mathematics using google classroom. The analysis was carried out with descriptive analysis based on indicators of interest in learning which can be measured through 4 indicators as mentioned by (Slameto, 2010), namely: (1) Interest in learning. (2) Attention in learning. (3) Motivation to learn. (4) Knowledge. (Nurhasanah & Sobandi, 2016)

NO	Indicators of Interest in Learning	Average Frequency and Percentage (%)		Explanation
		<b>Attitude</b>		
		<b>Positive</b>	<b>Negative</b>	
1.	Interest in learning	86,25	13,75	Almost All Positive
2.	Attention in learning	78,65	21,35	Almost All Positive
3.	Motivation to learn	90	10	Almost All Positive
4.	Knowledge	75,78	24,22	Mostly Positive
Average Percentage of Indicators		<b>82,67</b>	<b>17,33</b>	Almost All Positive

*Table 4. Student Interest in Learning Mathematics Using Google Classroom*

Based on table 4, it can be seen that the indicators (1) Interest in Learning; shows that almost all students give a positive response, this means that students have an interest in learning mathematics using google classroom. The same is the case with indicators (2) Attention in Learning and (3) Learning Motivation. On indicator (4) Knowledge; shows the results that only the majority of students gave positive responses. The final result states that almost all students give positive responses and conclude that students have a positive and good interest in learning mathematics using google classroom and this is in line with several research results that online learning, especially google classroom media, has a positive effect on interest. student learning during the Covid-19 pandemic (Inggriyani, Hamdani, & Dahlan, 2019; Yunitasari & Hanifah, 2020).

### **CONCLUSION**

Based on the results of research and analysis of mathematical problem-solving abilities and student interest in learning using google classroom which was conducted at SMA Negeri 1 Ciranjang class X MIPA 5 which involved 32 students, it was concluded that there was an increase in students'

mathematical problem-solving abilities between before and after using Google Classroom, in other words, the Posttest test results are better than the pretest and almost all students show a positive interest in learning mathematics using google classroom.

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