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DIFFERENCES IN STUDENTS' MATHEMATICS LEARNING OUTCOMES BETWEEN OFFLINE AND ONLINE LEARNING AT SMP NEGERI 2 PALU

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ABSTRACT

This research aims to determine whether there are differences in student mathematics learning outcomes between offline and online learning at SMP Negeri 2 Palu. The research used a comparative method with a population of all students in class VIII, totalling 332 students. The sample was class VIII students who did offline and online learning, with different samples but the same abilities. The sampling technique is Purposive Sampling. The researchers took 60 samples consisting of 30 students each from classes A and B. The data collection technique was carried out by taking the even semester midterm test scores for the 2021/2022 academic year obtained by students during online learning and the even semester midterm test scores for the 2022/2023 academic year obtained by students during offline learning, with the same subject matter, namely the Pythagorean theorem. Provided that the material taught is equivalent during offline and online learning and has the same academic abilities: (1). Mathematics learning outcomes obtained an average score of 64.13 and 68.27 (2). Sig value. (2-tailed) 0.187 > 0.05. This means that H0 is accepted, and Ha is rejected. So, the research results show no difference in student mathematics learning outcomes between offline and online learning.

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1. INTRODUCTION

Authentic learning occurs through teacher interaction with students in a learning environment. The essence of this learning is the assistance teachers or educators provide to transition knowledge to students. Therefore, learning can be interpreted as an enlightenment process by teachers to help students gain learning and abilities through the learning materials

provided. This paradigm regarding the essence of learning has become classic with the COVID-19 case, which has changed the world's paradigm of learning and education (Dewi, 2020).

The variation in learning resources provided indirectly is expected to influence children's ability to receive the information provided by the teacher. One level of ability that is an indicator of the achievement of a learning process is the quality of student learning outcomes. Learning outcomes are abilities obtained by individuals after the learning process, which can provide behaviour changes in knowledge, understanding, attitudes, and skills so that students become better than before (Desy, AN, 2014). Learning outcomes will measure students' mastery of learning material. It cannot be separated from the student's willingness and opportunity to study the subject matter given to him. Students must be active and diligent in learning to get excellent and satisfying results. Students can utilize the available time to understand and learn the lessons given by the teacher. Therefore, teachers also play an essential role in the learning process by designing and implementing good learning so that the results obtained by students are also satisfactory. The level of student learning outcomes is a tool to determine whether a student is experiencing learning changes.

The learning process can be done online or offline. Offline learning is learning using a face-to-face system in class between educators and students meeting directly to convey learning information. Offline learning is also often equated with the lecture method because the learning system is still teacher centered. According to Muhammad (2020) in Isna (2021), if we look back at the obstacles and complaints regarding online learning, it is evident that the teaching profession cannot be replaced by sophisticated technology. However, due to the pandemic, offline learning cannot be carried out as it should, therefore online learning is implemented.

Online learning is all activities/activities carried out by teachers and students, students and students using internet media and online learning is also learning that is carried out without direct face-to-face contact, but through available platforms. In general, it can be said that even though the learning process is carried out online, students still get the same learning results as the offline learning process. Research conducted by Nursing et al., (2020) examined the analysis of biostatistical learning outcomes based on offline and online learning methods. This research has relevance to research conducted by researchers, namely discussing learning outcomes. However, these two studies have differences, namely that in Purnawinadi's research the subjects were students, while in this research the subjects were female students. Research conducted by Yuniarti (2021) researched differences in student learning outcomes before and during the Covid-19 pandemic in mathematics education study programs. This research has relevance to the research carried out by researchers, namely the research method used is quantitative research and data collection is carried out through documentation in the form of a list of final values. However, there is a difference in this research, namely that the previous research examined tertiary institutions while this research examined junior high schools. Based on this background, the researcher formulated the problem that will be studied, namely whether there are differences in student mathematics learning outcomes between offline and online learning at SMP Negeri 2 Palu. In line with the problem formulation, the aim to be achieved in this research is to obtain information regarding whether there are differences in student mathematics learning outcomes between offline and online learning at SMP Negeri 2 Palu.

2. METHOD

The research method used by researchers is quantitative research. Quantitative research is research used to test the relationship between variables (Sugiyono, 2018).

Meanwhile, the type of research used by researchers is comparative research. This research was carried out at SMP Negeri 2 Palu, which is located on Jalan Wolter Monginsidi No.4, North Lolu, East Palu District, Palu City, Central Sulawesi Province. This research was carried out in the even semester of the 2022/2023 academic year. The population of this research was all class VIII students at SMP Negeri 2 Palu who carried out offline and online learning in mathematics, totaling 332 students, consisting of eleven classes. The sample was class VIII students, sampling was carried out using *purposive sampling.* The students that the researchers took were students who carried out offline and online learning, with different samples but had the same academic abilities. Students who carried out offline learning were taken as many as 60 students and students who carried out online learning were taken as many as 60 students, so the total sample taken was 120 students. The data collection technique in this research is by taking the mid-semester test scores on the Pythagorean theorem material for the even semester of the 2021/2022 academic year obtained by students during online learning and the mid-semester test scores on the Pythagorean theorem material for the even semester of the 2022/2023 academic year obtained by the students. during offline learning. Provided that the material taught is the same during offline and online learning and the students being taught have the same academic abilities. The data obtained was analyzed to find out whether there were differences in student mathematics learning outcomes between offline and online learning. Before testing the data, a normality test needed to be carried out to find out whether the data used was normally distributed or not. The normality test used is the Kolmogorov Smirnov test. If the normality test results show that the data obtained is normally distributed, then proceed with the homogeneity test and then analyzed using the *Independent samples test* , whereas if the normality test results show that the data obtained is not normally distributed then the data is analyzed using the Mann-Whitney test. Apart from that, the data was also analyzed using descriptive statistics to determine the average value and standard deviation. The tests used were carried out with the help of SPSS 25.

3. RESULTS A ND DISCUSSION

3.1. Results

Researchers used mid-semester test score data on the Pythagorean theorem material for the even semester of the 2021/2022 academic year, attended by 60 students in online learning, while mid-semester test score data on the Pythagorean theorem material for the even semester of the 2022/2023 academic year were attended by 60 students in offline learning.

The following is data on the difference between the lowest and highest scores as well as the mean for mathematics subjects for the 2021/2022 academic year, the online method for the even semester and the offline method for the even semester for the 2022/2023 academic year.

Table 1. Data on differences in scores for offline and online learning.

Statistics	Offline Learning	Online learning
N	60	60
Minimum	15	32
Maximum	95	88
Mean	68.27	64.13
Std. deviation	22.29	15.71

Source: SPSS output offline and online learning data

The results of the descriptive statistics presented in table 1 show that the mean and standard deviation values for offline learning are 68.27 and 22.2 9. A standard deviation value that is smaller than the mean indicates that the data is homogeneous. From this average score, it can be concluded that the average mid-semester test score on the Pythagorean theorem material taught online in the even semester is 68.27. The minimum and maximum values for this data are 15 and 95. Meanwhile, the results of descriptive statistics for online learning, namely the mean and standard deviation values, are 64.13 and 15.71. A standard deviation value that is smaller than the mean indicates that the data is homogeneous. From this average score, it can be concluded that the average mid-semester test score on the Pythagorean theorem material taught offline in the even semester is 64.13. The minimum and maximum values of the data are 32 and 88.

Table 2. Data Normality Test Results for Offline and Online Learning

Statistics		**Offline learning**	**Online learning**
N		**6 0**	**6 0**
Normal parameters	Mean	64.13	68, 27
	Std. Deviation	1 5.71	22.27
Most Extreme Differences	Absolute	0,13	0,18
	Positive	0,07	0,12
	Negative	-0,13	-0,18
Kolmogorov-Smirnov Z		1,01	1,42
Asymp. Sig. (2-tailed)		0,255	0,125

Test the normality of mid-semester test score data on Pythagorean theorem material taught online using the *Kolmogorov-Smirnov test* presented in table 2 with a significance level of α 0.05, Asymp was obtained. Sig. (2-tailed) is worth 0.125. Meanwhile, in offline learning, Asymp. Sig. (2-tailed) has a value of 0.255 due to the Asymp value. Sig. (2-tailed) is greater than the significance level α 0.05, so it can be concluded that the online and offline learning data is normally distributed.

Table 3. Data Homogeneity Test Results in Offline and Online Learning

	Levene's Test for Equality of Variances				
	F	Sig	t	Df	Sig. (2-tailed)
Equal **Learning Outcomes** variances Assumed **mathematics**	5.84	.098	-1.17	118.00	0,243
Equal variances not assumed			- 1.17	118 .00	0,243

Source: SPSS output analysis data

Test the homogeneity of mid-semester test score data on the Pythagorean theorem material taught online and offline using the *independent samples test* presented in table 3 with a significance level of α 0.05, obtaining a Sig value of 0.098. Because 0.098 is greater than the significance level α 0.05, it can be concluded that the offline and online learning results data have the same or homogeneous variance.

Tabel 4. Hypothesis Test On Offline And Online Learning

		Levene's Test Equality of Variances		**T-Test for Equality of Means**			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Hasil belajar matematika	Equal Variance assumed	5.84	.098	-1.17	118.00	.243	-4.13
	Equal variances not assumed			-1.17	106.02	.243	-4.13

Sumber: data analisis output SPSS

Test the hypothesis of data on offline and online learning results for mathematics subjects at SMP Negeri 2 Palu using *tests independent sample test* is presented in table 4.6. with a significant level of α 0.05 obtained Sig. (2-tailed) is worth 0.243. Because 0.243 is greater than the significance level α 0.05, it can be concluded that the critical area H_0 is accepted while Ha_{is} rejected which means there is no difference in student mathematics learning outcomes between offline and online learning.

3.2. Discussion

This research was conducted to determine the differences in student mathematics learning outcomes between offline and online learning at SMP Negeri 2 Palu. Researchers conducted an analysis of the mathematics learning outcomes of class VIII students in online and offline learning.

The learning process carried out online has several obstacles that affect the learning process, as well as offline learning which has several obstacles for students. Based on the results of interviews conducted by researchers, it can be concluded that when learning online, some students still experience internet quota difficulties because students still depend on their parents to buy internet quota, and subsidies from the government have stopped when offline learning is carried out. Students also have difficulty getting high grades due to students' lack of activity in searching and studying in depth the material the teacher has presented. Meanwhile, when learning offline, many students admitted that they were hampered in getting transportation to school during offline learning because the distance from home to school was quite far and they did not have private means of transportation. Students stated that they did not understand the material and explanations from the teacher during offline learning. However, students felt there was no difference in getting high grades online or offline. Most of the research subjects also had difficulty adapting and socializing, such as asking about material or working in groups with friends during offline learning. Based on the results of the data normality test, it was found that offline and online learning had a normal distribution. After the data is normal, the data homogeneity test continues, based on the results of the data homogeneity test in offline and online learning which has the same or homogeneous variance. Because the t test requirements are met, the hypothesis test continues using the t test. Based on hypothesis testing using *the Independent sample test,* the results obtained are sig. (2-tailed) namely 0.243. Because 0.243 is greater than the significance level α 0.05, it can be concluded that there is no difference in student mathematics learning outcomes between offline and online learning at SMP Negeri 2 Palu. Learning using Google Classroom as carried out by Maskar et al., (2019) produces interesting and good findings, one of which is the increase in student activity during the learning process compared to offline learning. This is due to the absence of direct face-to-

face contact, causing some students who are usually embarrassed to ask questions in class, to be more active during the online learning process. In line with research conducted by nursing et al., (2020) which researched the analysis of biostatistics learning outcomes using offline and online learning methods with research results that there were no significant differences between offline and online learning outcomes.

Technological advances and the concept of independent learning through online learning methods allow students to be more active and freer to learn independently through online media so that the learning process during the pandemic does not have a negative impact on learning outcomes compared to learning conditions using offline or face-to-face methods after the pandemic. Of course, this online learning process must be supported by adequate related facilities and teacher resources which are no less important in carrying out this learning. This is because students and teachers are able to master technology and are used to using online applications, so that when there is a change in learning methods from offline to online it is not a big problem to adapt to the latest methods in learning. In line with research Yuniarti (2021), but with different respondents, namely students, the results of his research explain that distance education is at least as effective as traditional classroom learning. Even though the delivery of learning material is carried out virtually in online learning and face to face in offline learning because the learning methods and steps implemented are still the same, student learning outcomes in the end are not significantly different. Apart from that, because today's students are the millennial generation who are more familiar with digital technology, adapting learning during the pandemic from offline to online has become easier.

Online learning at SMP Negeri 2 Palu has the same effectiveness as offline learning. This can be seen from the results of the mid-semester test on Pythagorean theorem material for even semester for offline learning and the mid-semester test on Pythagorean theorem material for even semester for online learning which has an average difference of 3.8. The results of this research are in line with research by Ramadina et al., (2022) The results of the research explain that there is no significant difference between the mathematics learning outcomes of SMPN 3 Waru students when doing face-to-face learning and when doing online learning at the start of the pandemic. This shows that online learning at SMPN 3 Waru has the same effectiveness as face-to-face learning. Then, according to Nurfaidawati (2021), the online learning system has no influence on student learning outcomes. However, the results of this research are different from Meliniawati's (2021) research results explaining that there are differences in learning outcomes in online learning and face-to-face learning. This is because online learning carried out by teachers has not been carried out optimally.

Evaluation activities carried out in both offline and online learning require teachers to raise enthusiasm and motivate students. So that students can carry out evaluation activities optimally and obtain satisfactory learning results. Evaluation activities carried out in offline learning mean that students are given assignments in class and only given one hour so that students cannot work together with friends or be helped by anyone. Meanwhile, evaluation activities carried out in online learning mean that students are given practice assignments in the morning and then given time to work on them until 4 in the afternoon. With the free time given, students can work on assignments at home together with friends or with help from older siblings and their parents, students can also search for answers on the internet (Google). So, this is what makes students' mathematics learning outcomes during online learning better than their mathematics learning outcomes during offline learning. The results of this research are in line with the research of Pratika & Wahyuni (2022), the results of which explain that there is no difference in mathematics learning outcomes between offline and online learning at Krida Utama Gunung Sugih Middle School. This means that students' mathematics

learning outcomes during online learning are no better than students' mathematics learning outcomes when offline learning is limited.

4. CONCLUSION

From the results of the research and discussion described in the previous chapter, it can be concluded that based on hypothesis testing of student learning outcomes data between offline and online learning using the Independent Sample test, Asymp Sig results were obtained. (2-tailed) namely 0.243. Because 0.243 is greater than the significance level α 0.05, the working hypothesis (H_0) in this study is accepted, namely that there is no difference in student mathematics learning outcomes between offline and online learning at SMP Negeri 2 Palu. At the same time, (H_a) is rejected. This shows no difference in student mathematics outcomes between offline and online learning. In general, it can be said that even though the learning process is carried out online, students still get the same learning results as the offline learning process. This has given rise to the perception that the effectiveness of the online learning process, which has been a concern for so long, can still be overcome by prioritizing good process standards in online learning. This is due to the absence of direct face-to-face contact, causing some students, who are usually embarrassed to ask questions in class, to be more active during online learning. With the current situation where offline learning has been carried out again, teachers are expected to be able to rebuild students' enthusiasm for learning, as well as students' self-confidence, so that they are expected to be able to improve learning outcomes in learning that takes place at school or offline, especially in mathematics subjects.

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