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# The Effect of Online Learning Using Zoom on Students' Learning Outcomes

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## ABSTRACT

This study aims to determine the effect of implementing online learning with the Zoom platform on students' learning outcomes. Researchers used quantitative and qualitative methodologies. Data were collected utilizing test. The population of this study was all eighth-grade students of SMP Telkom Makassar in the even semester of the 2020/2021 academic year, which consisted of 7 classes, and 1 class was randomly selected as the research sample were 24 students. Data collection was carried out using a learning outcome test after online learning with Zoom for four meetings. The data analysis technique used is descriptive and inferential statistical analysis techniques. The descriptive statistical analysis results showed: the average student learning outcomes 87.42 were in the high category, classical completeness was achieved that was 100% (24 students) achieved individual mastery. The results of inferential statistical analysis with  $\alpha=5\%$  show that students' average score after online learning using Zoom is greater than 73 (KKM). It is shown from  $p_{value} = 0,000$  with  $p_{value} < 0,05$ , so it can be concluded that the average score of student learning outcomes is significantly greater than 73 (KKM). Therefore, the application of the online learning through Zoom has an effect on the learning outcomes of class VIII students of SMP Telkom Makassar.

**Keywords:** Online learning, Zoom, Learning achievement.

## 1. INTRODUCTION

The Covid-19 pandemic has changed the way people live in Indonesia. Covid-19 has hindered people from outdoor activities that they did on normal days. The education sector is one of the parts affected by this virus. Due to the Covid-19 pandemic, schools and universities continually search for approaches to build up the teaching and learning process ceaselessly to adapt to the situation [1]. Based on the circular letter of the Ministry of Education and Culture No. 4 of 2020 concerning the Implementation of Educational Policies in the Emergency Period for Corona Virus dissemination, the education unit has decided to WFH (Work from Home) with the online learning process at schools. The Covid-19 has created many challenges and opportunities for the educational institutes to strengthen their technological knowledge and infrastructure [2].

Online learning is education that takes place over the Internet. Teachers and learners do not meet face-to-face, yet they utilize the internet network for the learning process [3]. Online learning allows students to access information flexibly without being limited by time and place [4]. In general, the characteristics of students in every province in Indonesia are "similar" in terms of thinking related to online learning, i.e., millennial

students, moreover most students already use the internet as a primary need for learning, so this data has policy implications for higher education in Indonesia during the industrial revolution 4.0 [5].

At the beginning of the Covid-19 Pandemic, all schools in Indonesia were required to work from home (WFH). Likewise, learning in schools which are usually done face-to-face must be done online, while one of the most widely used applications to carry out online learning is Zoom. According to [6] Zoom Cloud Meetings is an online teaching medium in the form of an application that has remote conferencing features by combining video conferencing, online chat, online meetings and can also be collaborated with mobile.

This study aims to describe the effect of online mathematics learning through Zoom platform on students' learning outcomes.

## 2. METHOD

### 2. 1. Type of Research

The type of research used is pre experimental design research as a research method.

2. 2. Research Design

The research design is One Shot Case Study. Design of this research involved a group of subjects, are given the right treatment experimental (experimental group).

Table 1. One Shot Case Study

X	O
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Information:

X : Treatment (The application of the guided discovery learning model online)

O : Observation (Students' learning outcomes)

2. 3. Time and Place Research

This research was conducted at SMP Telkom Makassar, which is located at Jl. AP. Pettarani No. 4 Gunung Sari sub-district, Rappocini sub-district, Makassar city, South Sulawesi province, Postal Code: 90221. Meanwhile, the timing of the research at the Telkom Makassar Junior High School is the even semester of the 2020/2021 academic year.

2. 4. Sample and Population Research

2. 4. 1. Population

The population in this research was class VIII of SMP Telkom Makassar in the academic year 2020/2021. This research was conducted in the even semester 2020/2021 academic year.

2. 4. 2. Sample

The sampling technique is cluster random sampling. The sampling steps taken are as follows:

1. The authors identification class VIII of SMP Telkom Makassar in the school year 2020 /2021
2. The sample is taken at random 1 class from 7 class VIII of SMP Telkom Makassar this is done on the grounds that students' learning outcomes achieved in the first semester of class VIII mathematics subjects are homogeneous in terms of the results of observations and information from SMP Telkom Makassar.
3. The school provides an explanation that there is no special class. Which means, the background of all students' of class VIII SMP Telkom is same.
4. The selected class for the experimental class. The experimental class was taught by applying Zoom learning mathematics online in statistics topics at class VIII students' of SMP Telkom Makassar.

2.5. Research Instruments

In this research, the tests was conducted. The test aims to determine whether the subject matter, namely statistics, has been mastered well by students'. The learning method is determined based on the minimum completeness criteria (KKM) in learning mathematics at SMP Telkom Makassar students' are said to have completed learning if they reach a value exceeding 73 from a scale of 0 to 100. So the learning method is said to be effective if the average students' achieves a score exceeding 73. The test of learning outcomes obtained after the application the Zoom meeting on statistics topics.

2. 6. Data Analysis Technique

2. 6. 1. Descriptive Statistical Analysis

In this research, descriptive statistical analysis is used to describe the characteristics of students' mathematics learning outcomes. Data on students' learning outcomes were obtained from the test to determine the increase in students' learning outcomes in mathematics.

The minimum completeness criteria (KKM) used in mathematics subjects at the SMP Telkom Makassar in the 2020/2021 Academic Year are as show in the Table 2:

Table 2. KKM of SMP Telkom Makassar

Interval	Criteria
< 73	Incomplete
≥ 73	Complete

Source : SMP Telkom Makassar

In addition, the test data on students' learning outcomes were converted to five scales. As [7] states that the criteria used to determine the category of students' mathematics learning outcomes were as follows:

Table 3. The Category of Students' Mathematics Learning Outcomes

Interval	Criteria
90 – 100	Very High
80 – 89	High
65 – 79	Medium
55 – 64	Low
0 – 54	Very Low

2. 6. 2. Inferential Statistical Analysis

Statistical analysis inferential is the analysis used to test the hypothesis of the research to draw conclusions about a population based on a sample drawn populations. The homogeneity test was carried out on the results of the data in the test. For the average learning outcomes, the students' learning outcomes of hypothesis test is used.

The inferential statistics is using the software Statistical Product and Service Solutions (SPSS). Hypothesis testing is intended to answer the hypothesis that has been proposed. To analyze and interpret the data obtained from the sample used, then analyzed using the normality test, and hypothesis test.

2. 6. 2. 1. Normality Test

Normality test is the first step in analyzing the data specifically, to find out whether the data is normally distributed or not. This normality test uses the Software Statistical Product and Service Solutions (SPSS) with the Kolmogorov-Smirnov and Shapiro tests using a significance level of 5% or 0.05.

$H_0$  : the sample comes from a normally distributed population.

$H_1$  : the sample comes from a population that is not normally distributed.

With the provision of:

If  $p_{value} \geq \alpha = 0,05$  then statistically the data comes from a population that is normally distributed.

If  $p_{value} < \alpha = 0,05$  is statistically the data comes from a population that is normally distributed.

2. 6. 2. 2. Hypothesis Test

The test was carried out using the t-test. Data were analyzed using One Sample t-Test. The steps for One Sample t-Test are as follows:

(1) Determining hypothesis

Hypothesis has tested hypothesis are formulated in the form of statistical hypothesis as follows:

(a) Major hypothesis

The guided discovery learning model online has an influence in statistics topics at SMP Telkom Makassar.

(b) Minor hypothesis

Average students' learning outcomes after treatment by using model guided discovery learning model online minimally greater or equals 73 (category complete).

$$H_0: \mu = 72,9 \text{ versus } H_1: \mu > 72,9$$

Information:

$\mu$  : Average score of students' learning outcomes are taught using Zoom learning online.

$H_0$  : Average score of students' learning outcomes equals 73 (KKM) after treatment by using Zoom learning online.

$H_1$  : Average score students' learning outcomes are significantly greater than 73 (KKM) after treatment by using Zoom learning online.

Accepted if the value is significant otherwise if the value is significant then it is rejected

With the test criteria  $H_0$  accepted if the significant value  $P_{value} \geq 0,05$  otherwise if the significant value  $P_{value} < 0,05$  then  $H_0$  is rejected.

3. RESULT

The results of the descriptive analysis show a description of the characteristics of the distribution of learning outcomes and answer how the problems are formulated in this research.

Analysis of learning outcomes is divided into 2 parts, namely descriptive statistical analysis and inferential statistical analysis.

3. 1. Descriptive Statistical Analysis

From the data processing, students' mathematics learning outcomes based on the test obtained data summary mathematics students' learning outcomes as shown in Table 4.

Table 4. Descriptive Statistical Data of Students' Learning Outcomes Scores

Statistics	Test
Sample Measure	24
Mean	87,42
Median	87,5
Mode	91
Standard Deviation	3,944
Variances	15,558
Range	12
Maximum Score	93
Minimum Score	81

Based on the results of students' mathematics learning shows that the average test score of 87,42 from an ideal score of 100 with a standard deviation of 3.944, indicating that the average mathematics score of students' after being given lessons by applying Zoom learning online was greater than KKM for mathematics, which was 73.

As for the test, the median is 87,5, and the mode is 91, which shows that about 50 % of students get a score greater than or equal to 87,5, and most students get a score of 91.

Based on the indicators for the criteria for the test of mathematics learning outcomes, the average students' mathematics learning outcome of students' is 87,42, which is greater than the KKM 73 it meets the criteria.

The histogram of students' learning outcomes data can be seen in Figure 1.

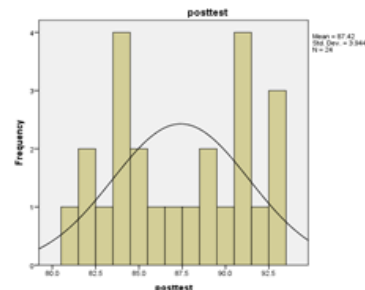


Figure 1. The Histogram of Students' Learning Outcomes Data

Table 5 shows that most of the students obtained test scores in the high and very high categories for test scores.

**Table 5.** Frequency Distribution of Students' Learning Outcomes

Interval	Category	Test	
		f	(%)
90-100	Very High	9	37,5
80-89	High	15	62,5
65-79	Medium	0	0
55-64	Low	0	0
0-54	Very Low	0	0
<b>Total</b>		<b>24</b>	<b>100</b>

This indicates that there is an increase in learning outcomes classically after applying Zoom learning online for statistics topics at SMP Telkom Makassar.

Based on the KKM that applies at SMP Telkom Makassar, especially in mathematics subjects that is 73, then the level of achievement of students' classical mathematics learning outcomes at class VIII A using Zoom learning online can be seen in Table 6 below.

**Table 6.** Classical Learning Outcomes

Test	KKM	Percentage of Classical Completeness	
		Complete	Incomplete
Test	73	100%	0%

Table 6 shows that classical test, 100 % of students met the specified KKM. For mathematics learning outcomes, classically, 100 % of students meet the KKM, which is greater than 80%.

Based on the description above, it can be concluded that the students' mathematics learning outcomes have met the criteria descriptively.

### 3. 2. Inferential Statistical Analysis

#### 3. 2. 1. Normality Test

The data normality test distribution criteria are determined by the suitability between the observed data and the normal distribution. Testing for normality using normality test in SPSS. The results of the normality test for the test scores are presented in Table 7.

**Table 7.** The Results of the Normality Test for Students' Learning Outcomes

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Test	0,152	2	0,16	0,920	2	0,05
t		4	2		4	8

According to the Table 7 output "normality test" on the test Kolmogorov-Smirnov, it shows that p-value for a p-value of test of 0.162. Because of the test's p-values, it can be concluded that the test scores are normally distributed.

#### 3. 2. 2. Hypothesis Test

This hypothesis test has data to be tested, namely student learning scores after being taught by applying the guided discovery learning model online.

A t-test was carried out through the SPSS (Statistical Product and Service Solutions) program using the One-Sample Test for the students' learning outcomes scores. The proposed hypothesis is formulated in statistical hypothesis as follows:

$$H_0: \mu = 72,9 \text{ versus } H_1: \mu > 72,9$$

Information:

$\mu$ : Average score of students' learning outcomes are taught using Zoom learning online.

$H_0$ : The average students' learning outcomes score of class VIII A of SMP Telkom Makassar is equal to 73 after being taught using Zoom learning online.

$H_1$ : The average students' learning outcomes score of class VIII A SMP Telkom Makassar is significantly greater than 73 after using Zoom learning online.

With the test criteria accepted, if the significant value is  $P_{value} \geq 0,05$ , otherwise, if the significant value is  $P_{value} < 0,05$ , then  $H_0$  is rejected. The student learning outcomes hypothesis test results on KKM (73) can be

**Table 8.** Statistics One Sample Students' Learning Outcomes

	N	Average	Standard Deviation
Students' Learning Outcomes	24	87,42	3,944

**Table 9.** The Results of One-Sample Students' Learning Outcomes

	Test Value = 73		
	T	Df	Sig. (2-tailed)
Students' Learning Outcomes	17,906	24	0,000

seen in Tables 8 and 9 below.

Based on Tables 8 and 9, it can be seen that Sig. (2-tailed) for data, students' learning outcomes are 0,000, or it can be said that students' learning outcomes are  $p_{value}$  with the average students' learning outcomes 87,42. If used  $\alpha = 0,05$ , it can be concluded from Table 9 that because of Sig. (2-tailed)  $< 0,05$ , then the average student's learning outcomes score of students' is significantly greater than 73. So it can be concluded that the student's learning outcomes average score of VIII A students' of SMP Telkom Makassar is significantly greater than 73 (KKM) after being taught using Zoom

learning online. So it can be concluded that  $H_0$  is rejected.

The results of this research showed that the mathematics learning outcomes of students' were taught using the application of Zoom learning online of statistics learning in terms of the ability level of students' were in the very high category with the classical mastery level reaching 100% and students' knowledge showed a significant increase. Significantly, after using Zoom learning online in learning statistics can enhance the students' ability.

The results of inferential statistical analysis for the students' learning outcomes showed that the average students' learning outcomes of class VIII A of SMP Telkom Makassar using guided discovery learning statistics topics was greater than 72.9 (KKM 73) which means that it meets criteria. The results of the analysis of students' learning outcomes is relevant with research conducted by [8] that there was a significant difference in the post-test learning outcomes of classes given learning treatment with Zoom

#### 4. CONCLUSION

Based on the result and discussion as described in the previous chapter of research that have been put forward, the authors make conclusion:

1. After the application of guided discovery learning model online in statistics topics executed, the results of statistical descriptive analysis showed that (1) The average score of students' learning outcomes reached 87,42 higher than the KKM, (2) Classical completeness reaches 100% which means that descriptively the students' mathematics learning outcomes have met the criteria is greater than 80%.
2. Inferential significance level of  $\alpha=5\%$  (1) the data of students' learning outcomes  $p_{value}$  is 0,000 that when it compared with  $\alpha$  it will be smaller so that it can be concluded that  $H_0$  is rejected, which means that the average score of students' learning outcomes of class VIII of SMP Telkom Makassar significantly greater than 73 (KKM) after being taught using a guided discovery learning model online statistics topics for class VIII A of SMP Telkom Makassar. Then, the application of guided discovery learning model online influence on students' learning outcomes statistics topics at class VIII A of SMP Telkom Makassar.

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