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Comparative Study of Student Learning Outcomes in Online and Offline Learning during the Pandemic

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ABSTRACT

Learning is carried out offline starting April 2022 after the COVID-19 pandemic began to subside and the statistics on COVID-19 cases in the city of Surabaya showed a low risk status. Learning that was originally done online was changed back to being done offline. Therefore, this study aims to identify differences in student learning outcomes in online and offline learning. This research is a quasi-experimental research with comparative method and quantitative approach. Research data was collected on macroeconomic theory courses in the even semester of the 2020/2021 academic year for online learning and the 2021/2022 school year for offline learning. The study population was 18 students who were randomly selected from the economic education study program in 2020 and 2021. Processing and analysis of research data used an independent sample T-test. Based on the results of the independent sample t-test, the Sig (two-sided) value is 0.356 > 0.05. These results indicate that there is no significant difference in the average student learning outcomes between online and offline learning. Students' online learning has an average learning outcome of 85.8889, higher than offline learning of 81.3333. Therefore, learning activities are more flexible during the pandemic and can be done online or offline.

INTRODUCTION

Since the outbreak of the COVID-19 virus in March 2020, all sectors in Indonesia have been severely affected, especially the education sector. The impact of the world of education is that learning takes place remotely or online. The emergence of the government's appeal for online learning is a breakthrough to continue learning and the right solution to mitigate the high risk of spreading the COVID-19 virus. Online learning is learning that takes place in a network where teachers and students do not meet in person (Pohan, 2020). Online learning is learning through the internet with accessibility, connectivity, flexibility, and the ability to create different kinds of learning interactions (Moore et al., 2011). According to Kurtarto, (2017) online learning is learning that allows students and teachers to collaborate and interact over the internet. Online learning is a learning system that uses platforms that can support teaching and learning processes that take place remotely rather than in person (Handarini & Wulandari, 2020). Online learning is one form of lecture that can be used as a solution during the COVID-19 pandemic, this is to connect students with learning resources (databases, experts/lecturers, libraries) that are spatially separated or far apart, interact or collaborate synchronously and asynchronously (Sadikin & Hamidah, 2020).

Now, after the COVID-19 pandemic has begun to subside and the statistics of COVID-19 cases in the City of Surabaya are of low risk, then based on a circular letter surrounding the Universitas Negeri Surabaya from April 2022 onwards for the even semester of 2021/2022 learning is carried out face-to-face or offline for students batch 2021. Learning that was originally used to be done online is now trying to adapt again

to be done offline. This offline learning was carried out starting from meeting 9, where previous meetings were conducted online.

Offline learning, or learning off-network, is learning that takes place without internet or intranet access (Ambarita et al., 2021). Offline learning is face-to-face learning between teachers and students, which takes place offline, so the teacher provides material to students in the form of print assignments (Pratama & Mulyati, 2020). According to Nengrum et al. (2021) offline learning is an acronym from outside the network, where students learn manually or face-to-face classes. In harmony with Malyana (2020) if there is teacher-student interaction in the classroom and books are used as learning aids, it is called offline learning. Offline learning is nothing but traditional learning that teachers often used before the idea of Indonesian education (Ramadhan et al., 2022).

Learning outcomes are one of the key indicators of the effectiveness of learning and the achievement of learning objectives. Students who have tried or tried to do a learning activity at least have learning outcomes (Wahyuni & Kurniawan, 2018). According to Nurdyansyah & Fitriyani (2018) learning outcomes are the results that a person achieves after performing cognitive, emotional and psychomotor learning activities and are represented by symbols, numbers and letters. According to Lahir et al., (2017) learning outcomes are learning achievements in the learning process that lead to changes in one's behavior and attitudes. Meanwhile, according to Suprijono (2011) learning outcomes are patterns of change, attitudes, and skills.

Research conducted Yudhira, (2021b) there are differences in student learning outcomes between offline and online learning, and offline learning is found to be more effective than online learning. There is a significant difference in student learning outcomes using online learning and offline learning in the tenth grade Moral Theology subject at *MA* Ma'arif Klego (Setianingrum, 2021). The results of the final semester examination for basic physics courses also have a clear difference between offline and online learning, where offline learning is more effective than online learning (Sinensis & Firdaus, 2022). The average student learning outcomes for offline learning are higher than online learning (Astriyanti & Rejeki, 2022). Pathophysiology learning outcomes of offline learning classes are significantly different (higher) compared to online learning classes (Yani & Teting, 2020). Offline learning is considered to be more effective, more accessible, less technically problematic, and less cheating and deceptive than online learning (Hanafy et al., 2021).

However, according to Yudhira (2021a) student learning outcomes in introductory accounting courses are more effective online than offline learning because of mastery of technology. In line with Pei & Wu (2019) since online learning has the advantage of expanding students' knowledge and skills, there is no evidence that offline learning is more effective than online learning and is considered a potential method of undergraduate medical education. The quantitative results of the study Chan (2020) also shows that online tutoring is better than offline tutoring, but both have advantages online tutoring is more effective and offlisne tutoring maximizes service outcomes.

Research and discussion have shown that online and offline learning differ in control with respect to complementary methods, media, and learning processes in acquiring basic skills (Solong, 2021). The results of the study Yulianti & Utomo (2022) offline/face-to-face learning can provide an immersive or full learning experience, especially at *SDIT* Adda'wah showing that offline learning is more suitable to be applied at the elementary school level than online learning. For hands-on learning, physical or offline

practicum is more effective than online practicum (Astuti et al., 2021). According to Narsingoju (2021) compared to online learning, offline learning avoids various problems of understanding and practical knowledge, improves health, and allows us to do a good job to solve more questions and students still need it.

Based on research Wahyudi & Yulianti (2021) different learning outcomes are determined by students' learning motivation in online and offline learning, it is found that students are lazy to follow online learning and students are enthusiastic about participating in offline learning. In line with Astriyanti & Rejeki (2022) that students with high motivation to learn achieve better learning outcomes than students with moderate or low motivation to learn. The results of this study are in accordance with the results of the study Hidayat & Kamalia (2022) that learning motivation has a positive effect on learning outcomes.

Based on the problems that have been described, it is a very interesting phenomenon to study, because previously the same course, namely Macroeconomic Theory, in the even semester of the 2020/2021 academic year was carried out online. Meanwhile, in the even semester of the 2021/2022 academic year, it will be carried out offline. Thus, this study aims to identify the difference in the average student learning outcomes when online learning and offline learning are measured by the value of the final exam and analyze its effectiveness. In previous researches, on average, they analyzed student learning outcomes when online learning was originally done offline. However, in this study, the opposite applies, namely analyzing student learning outcomes when offline learning is again carried out during the COVID-19 pandemic which is starting to subside, then comparing the results with the previous learning method, namely online learning. The urgency of this research is as a follow-up material for the evaluation of learning for lecturers.

RESEARCH METHOD

General Background

This research is a quasi-experimental research with comparative method and quantitative approach. In this study, the same class was studied, but treated differently for online and offline learning. To measure differences in student learning outcomes, the research team collected the necessary data, namely student learning outcomes in the form of final exam scores for online and offline learning. The data taken is in the even semester 2020/2021 for online learning and the even semester 2021/2022 for offline learning in the macroeconomic theory course. The sampling method adopts the random sampling method.

Participants

The population in this study were students of the 2020 Economic Education Study Program with a total of 73 students, with details of class A as many as 36 students, class B as many as 29 students, and class I as many as 8 students. For students of the Economic Education Study Program class of 2021, there are a total of 82 students, with details of class A as many as 34 students, class B as many as 38 students, and class I as many as 10 students. Based on this population, a random sample of 18 students was taken in accordance with the provisions of sampling less than 30, if it exceeds 30 then use the Z test (Santoso, 2014).

Instrument and Procedures

The research team processed and analyzed research data using the Independent Sample T-Test with the prerequisites that the samples were unpaired and normally distributed using the Kolmogrov-Smirnov test. Then proceed with interpreting the data to be used as follow-up material for research discussions. The procedure of this research can be seen in Figure 1.

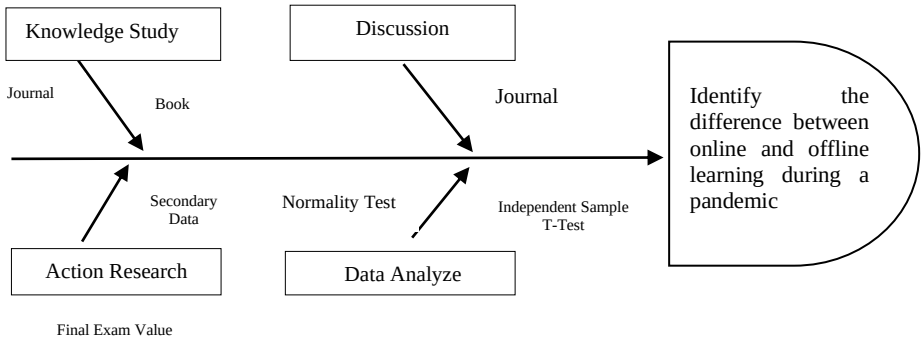

Figure 1. Research procedure

The hypotheses in the study are:

H0: There is no significant difference in the average student learning outcomes between online learning offline

Ha: There is a significant difference in the average student learning outcomes between online learning offline

Data Analysis

According to Sujarweni, (2014) the basis for decision making in the independent sample t-test, namely:

1. If the value of Sig. (2-tailed) > 0.05 then H0 is accepted and Ha is rejected, which means there is no difference in the average student learning outcomes between online and offline learning.
2. If the value of Sig. (2-tailed) < 0.05 then H0 is rejected and Ha is accepted, which means that there sis a difference in student learning outcomes between online and offline learning.

The existence of similarity or homogeneity in the variance of two samples of research data is not a mandatory requirement. We can perform an independent sample t-test even if the distribution of the data from the two samples is found to be unequal. However, the decision was made based on the results contained in the SPSS "equal variances not assumed" output table. According to Sarwono (2015) decisions based on comparing t-scores and t-tables in independent-samples t-tests are guided by the following decision criteria:

1. If the value of t count < t table then H0 is accepted and Ha is rejected, which means there is no difference in the average student learning outcomes between online and offline learning.
2. If the value of t count > t table then H0 is rejected and Ha is accepted, which means that there is a difference in the average student learning outcomes between online and offline learning

RESULTS AND DISCUSSION

Results

The research data is in the form of learning outcomes for the Macroeconomic Theory course, namely the final exam scores in PE 20 A, B and I classes to measure online learning and the final exam scores in PE 21 A, B and I classes to measure offline learning. The samples taken were random, namely 3 students in each class, so that a total sample of 18 students was obtained. The first step after obtaining the research data is the normality test. The results of the Kolmogrov-Smirnov normality test using SPSS 25 can be seen in Table 1.

Table 1. Normality test.

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		9
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	2.75558213
Most Extreme Differences	Absolute	.195
	Positive	.144
	Negative	-.195
Test Statistic		.195
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Table 1 shows Asiymp.Sig (2-tailed) has significance values of 0.200 > 0.05. It can conclude that the data are normally distributed according to the decision criteria of the Kolmogrov-Smirnov normality test. Also, once it know that the data are normally distributed, it can proceed to an independent-samples t-test. T

Table 2. Average student learning outcomes.

Group Statistics

	Learning	N	Mean	Std. Deviation	Std. Error Mean
Learning Outcomes	Online	9	85.8889	2.93447	.97816
	Offline	9	81.3333	13.71131	4.57044

As shown in Table 2, the number of learning outcome data for online study sessions is 9, and the number of learning outcome data for offline study sessions is 9. Average student learning outcomes or average online learning is 85.8889 and offline learning is 81.3333. From this, statistically conclude that there is a difference in learning outcomes for the average student between online and offline learning. Based on the output of table 3, it can be seen that the value of Sig. Levene's Test for Equality of Variances is 0.041 < 0.05, which means that the data variance between online and offline learning is not homogeneous. So that the interpretation of the Independent Samples Test output table is guided by the values contained in the "Equal variances not assumed" table. Based on the output table of "independent samples test" in the "equal variances not assumed" section, it is known that the value of Sig. (2-tailed) of 0.356 > 0.05, so as the basis for decision making in the independent sample t test, it can be interpreted that H0 is accepted and Ha is rejected. Thus, it can be concluded that there is no significant

(significant) difference between the average student learning outcomes in online and offline learning.

Table 3. Independent sample t-test.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Learning Outcomes	Equal variances assumed	4.940	.041	.975	16	.344	4.55556	4.67394	-5.35275	14.46386
	Equal variances not assumed			.975	8.731	.356	4.55556	4.67394	-6.06743	15.17854

Then from the output Table 3, it is known that the "Mean Difference" value is 4.55556. This value indicates the difference between the average student learning outcomes in online and offline learning is 85.8889-81.3333= 4.55556 and the difference between the differences is -6.06743 to 15.17854 (95% Confidence Interval of the Difference Lower Upper). Based on table 3, it is known that the t value is 0.975. The value of t table with reference to df = n-1 = 18 – 1 = 17 and a = 0.025 is 2.110. Thus, the value of t count is 0.975 < t table 2.110. So based on the basis of decision making, it can be concluded that H0 is accepted and Ha is rejected, which means that there is no difference in the average student learning outcomes between online and offline learning. So that either with online or offline learning, student learning outcomes do not experience significant differences.

Discussion

Lectures in the even semester of 2022 began to be carried out offline where previous lectures were still carried out online. The results of the study and discussion Nengrum & Petta Solong (2021) online and offline learning have been shown to manage acquisition of basic skills differently in terms of methods, media and complementary learning processes. Research hypothesis testing finds no difference in average student learning outcomes between online and offline learning. This is in line with Purnawinadi, (2021) that there is no significant difference in learning biostatistics using offline and online methods. In addition, research Novera et al. (2021) also shows that there is no difference in student learning outcomes using offline and online in school physics studies courses. The results of the research Tang et al. (2021) also show that there is no significant difference in the learning outcomes of male and female students. Thus, more flexible learning can be carried out online or offline because according to Astriyanti & Rejeki (2022) that affects learning outcomes is learning motivation. If students have high learning motivation, they will get better learning outcomes than

students with low and moderate learning motivation. Motivational factors affect the students' perceived learning outcomes (Baber, 2020). In addition, designing a good teaching and learning process requires mastery of technology by students and teachers, as well as qualified infrastructure to facilitate good student learning outcomes.

The results of this study are inversely proportional to Yudhira (2021b) who found that there were differences in student learning outcomes in offline and online learning. Likewise with Setianingrum (2021) states that there is a significant difference in student learning outcomes between online and offline learning. According to Sinensis & Firdaus (2022) there are also significant differences in final exam results for the Basic Course of Physics Learning Process in offline and online learning. Thus, the results of the three studies are not in line with the results of this study, namely there is no significant difference in the average student learning outcomes between online and offline learning.

Based on descriptive statistics on research data, it can be seen that there is a difference in the average student learning outcomes between online learning and offline learning. The average value of student learning outcomes or the mean for online learning is 85.8889, higher than offline learning of 81.3333. This result is in line with Yudhira (2021a) which is that student learning outcomes in online learning are higher than offline learning due to mastery of technology, namely students are accustomed to using online-based communication tools, so that when implementing online learning they can adapt easily. The results of this study are also directly proportional to the research Hanafy et al. (2021) the average score for the online final semester exam is higher than conventionally. In line with Chan (2020) which shows that online learning is better than offline learning even though both have different advantages, namely online learning is more effective and offline learning maximizes services. The findings Zheng et al. (2021) also show that learning dentistry is also better online than face to face. Accordance with Kamalia & Andriansyah (2021) that the evaluation of online student learning in the form of middle test and final exam learning outcomes is positive.

Advances in technology and the concept of self-directed learning through online learning methods allow students to learn more actively and freely through online media, so that the learning process does not adversely affect learning outcomes during the pandemic Yudhira (2021a). Based on the results of the research Kristianto & Gandajaya (2022), it is recommended that online learning use the problem based learning method. The average online learning learning outcomes which are higher than offline learning are not in line with Astriyanti & Rejeki (2022) that the average student learning outcomes in offline learning is higher than in online learning. Likewise with Yani & Teting (2020) showing the opposite that the learning outcomes of offline learning classes are significantly different (higher) compared to online learning classes. According to Hanafy et al. (2021) offline learning is considered more effective, more accessible, less technically problematic, and less cheating and fraudulent than online learning. In accordance with Singh et al. (2021) findings that online learning is not effective because students find it difficult and they prefer offline learning.

CONCLUSION

Based on descriptive statistics, the average value of student learning outcomes for online learning is higher than offline learning. However, based on the results of the independent sample t test, it shows that there is no significant difference between the

average student learning outcomes in online and offline learning. Thus, more flexible learning can be carried out online or offline. The limitation of this research is that the identification of comparative student learning outcomes in online and offline learning during the pandemic is only carried out in one study program with the same subject, namely macroeconomic theory. It is hoped that in the future further research will be carried out by adding research objects.

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