



The Effect of Blended Learning on Student Learning Outcomes

(An Quasy Experimental Research)

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Abstract. This study aims to: 1) analyze the differences in student learning outcomes using the blended learning method and students who do not use it and 2) analyze the differences in student learning outcomes before and after implementation of the blended learning method. The type of research was quasi-experimental. The research population is all students of class XI SMA N 1 Salimpaung, divided into two majors: science and social studies. The sample of this research was 58 students, divided into 29 students in the control group and 29 in the experimental group. The method of data collection was in the form of pre- and post-treatment written tests. The data obtained were analyzed and tested with an Independent Sample t-test and Paired Sample t-test using SPSS version 20. The results showed that 1) there were significant differences between student learning outcomes using the blended learning method and students not using the blended method. 2) There is a difference in the learning outcomes of the average student before and after implementing blended learning methods.

Keywords: Learning Outcomes · Blended Learning · Online Learning

1 Introduction

The learning process is an activity of transferring knowledge from a teacher to students using appropriate learning methods so that the knowledge transferred can be well received and get good learning outcomes [1]. The teacher is important person on learning process, namely guiding, encouraging, and providing learning facilities to achieve learning objectives. Every learning process that is followed, of course, expects good learning outcomes [2]. Learning outcomes are a process of student activity in interacting with their environment to produce changes in student behavior in a positive direction, namely changes in psychomotor aspects, knowledge, and attitudes. Learning outcomes are also said to be the final assessment of activities that are carried out repeatedly and will be stored for a long time and can change students' mindsets and produce good work behavior [3]. Accordingly, the teaching model is one of them, and the use of the teacher's learning model influences the acquisition of the material and the learning outcomes of the students, and the teacher must be creative and incorporate the role of the student in learning. [4].

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Based on an interview conducted on February 25, 2021, with an economics teacher at SMA N 1 Salimpaung, teachers at SMA N 1 Salimpaung in teaching and learning activities still very often use the lecture method. The Lecture Method is one of the traditional teaching and learning methods. Where the delivery of learning materials directly through oral. This method requires direct face-to-face between teachers and students in following the learning process [1].

Based on the results of interviews conducted on February 26, 2021, with students of class XI Social Sciences at SMA Negeri 1 Salimpaung, students felt that economics subjects were difficult to learn and the scope of the material was wide which caused a decrease in learning outcomes and enthusiasm for learning in these subjects. Low student learning outcomes include students choosing not to go to class because they are late due to the distance between home and school, late because parents help before leaving, and some students deliberately skipping class during class hours. As a result, students are left behind in the subject matter and get poor learning outcomes. The low economic learning outcomes are caused is due to two factors, internal and external, that students and teachers need to pay particular attention to. Seeing the facts in the field will harm students, such as being left behind in learning materials and not going to grade [2].

Seeing conditions like this, it is time for the learning methods applied by teachers in teaching and learning activities to take advantage of technological developments that contain the principle of modernity. In the current principle, teachers and students will use modern learning methods such as information and communication technology (ICT), teaching materials, and learning media. Using appropriate and varied learning methods can improve student learning outcomes in learning activities. Specially designed technologies and media will contribute to more effective teaching. Thus, using information and communication technology (ICT), students will be required to continue learning both inside and outside school. In line with that, according to Novitayati (2013: 48), the consequences of technological developments in the world of education, you can learn remotely, resource sharing is carried out jointly between educational institutions in a network, getting many sources of information, both from libraries and internet networks. The effectiveness of information and communication technology with multimedia [5].

A teacher must determine a learning method where teachers and students carry out learning activities to produce efficient and effective student learning outcomes, the learning methods applied by each teacher vary depending on the approach used and learning techniques that are considered relevant to the learning strategy to support the results. Better student learning [6]. Mixed learning methods are a good alternative to use in the learning process. Blended learning is learning that combines or mixes traditional (presence) learning with e-learning-based learning models using electronic media [7]. The mixed learning model makes the learning process more effective, because the usual (traditional) teaching and learning process is supported by e-learning on the information technology infrastructure anytime, anywhere.

Blended learning originally referred to subjects that sought to combine classroom and online learning. In addition to blended learning, other terms are also commonly used such as blended learning and hybrid learning. The terms above have the same meaning: learning blending, mixing, or combining [3].

This Blended Learning method was developed due to weaknesses in face-to-face Learning and e-learning. Then learning with the Blended Learning method was developed because of the weakness of the two learning methods. Blended Learning also creates a new atmosphere without being constrained by space and time by utilizing learning technology that can be done anytime and anywhere [8]. In line with that, Learning using the Blended Learning model provides additional time for students to learn. This learning model allows students to repeat their Learning and improve mastery of learning materials, and students can work on learning questions independently or in groups [9].

The theory that underlies learning using the blended learning method is constructivism learning theory. The concept of constructivism learning theory is a way of learning for students to gain knowledge from their own learning experiences where students are active and independent in finding learning materials. With blended learning, learning will take place in an interesting, creative, communicative manner and open a very wide discussion space so that it can grow, develop and empower the life skills of each student to the maximum so that they can lead them to become future students (gold generation). In this study, the use of google classroom is optimized so that students will try to adapt to technological advances in the teaching and learning process and can learn independently [10]. For students to learn independently, they can quickly receive learning materials to form better student characters. Independent learning can reduce students' dependence on teachers, and students will get better learning outcomes [11]. Based on the above conditions, the authors are interested in researching further with the research title "The Effect of Blended Learning on Student Learning Outcomes."

2 Method

This kind of research is quasi-experimental research. A quasi-experiment is used because in practice it is difficult to find a control group that can be used in a study (the external variables that influence the conduct of the experiment cannot be completely controlled) [12]. In this study, the sample was divided into two, namely the experimental class and the control class.

The experimental group applied the blended learning method, and the control group applied the lecture learning method. The quasi-experimental design chosen was the Pretest-Posttest Control Group Design. The pretest-posttest control group design research is as follows [12] (Table 1).

Table 1. Research Design Model

Numb	Group	Pre-test	Treatment	Pos-test
1	Experimental Class	O ₁	X	O ₂
2	Control Class	O ₃	–	O ₄

Source: Data processed in 2021

X is treatment using the blended learning method, O1 is giving experimental class pretest, O2 is giving experimental class posttest, O3 is giving control class pretest, and O4 is giving control class posttest.

Conducted this research at SMA N 1 Salimpaung. The population in this study were all students of class XI SMA N 1 Salimpaung with a total sample of 58 people. The technique of determining the sample is purposive sampling. This sampling is based on the average value of the daily economic test for class XI IPS SMA Negeri 1 Salimpaung. Data collection techniques in the form of a written test. The data obtained were analyzed and tested with an Independent Sample t-test and Paired Sample t-test. Where the analysis was carried out using SPSS Ver.20 with 0.05.

2.1 Descriptive Analysis

Based on the results of the descriptive analysis, it can be seen that the average difference between the pretest and posttest learning outcomes between the experimental class and the control class where the results of the pretest control class have a higher average than the experimental class, but the posttest results on the experimental class average are higher than the experimental class. Control. The average control class in the pretest was 56.28 and the experimental class was 53.93, while the post-test average for the control class was 80.00 and the experimental class was 88.55 (Table 2).

Based on the results of the descriptive analysis, we can see that the median difference between the experimental and control classes for pre-test and post-test results is 52.00 for the experimental class with pre-test results. While the control class has a value of 56.00 where this value is higher than the experimental class. The post-test results show that the experimental class has a high score of 88.00 and the control class has a score of 80.00. So, the median value between the results of the pretest and posttest has a median value that is inversely proportional.

Based on the results of the descriptive analysis, it can be seen that there are differences in the value of variance between the experimental class and the control class. The variance of the experimental class on the pretest results was 102,424 and the control class 115,350, while the variance of the posttest results for the experimental class was 51.113 and the control class was 84,571. Based on the descriptive analysis, it can be seen that the variance value in the control class is higher than the experimental class.

Table 2. Results of Descriptive Analysis of Student Learning Outcomes of SMA Negeri 1 Salimpaung

Numb	Information	Experiment Class			Control Class	
		Pretest	Posttest	Pretest	Posttest	
1	Mean	53,93	88,55	56,28	80,00	
2	Median	52,00	88,00	56,00	80,00	
3	Variance	102,424	51,113	115,350	84,571	
4	Standar Deviasi	10,120	7,149	10,740	9,196	

Source: Data processed in 2021

Based on the results of the descriptive analysis, we can see that there is a difference in the standard deviation values between the experimental and control classes. The standard deviation of the experimental class from the pre-test results is 10.120 and the control class is 10.740, and the standard deviation of the post-test results of the experimental class is 7.149 and the control class is 9.196. Based on the descriptive analysis, we find higher standard deviation values for the control class than for the experimental class (Table 3).

Based on these results, it can be concluded that each of them has a sig value >0.05 , so all data are normally distributed. Based on the normality test results, the control class sig value for the pretest result was 0.200, and the post-test result was 0.200. While the experimental class sig value for the pretest result is 0.200, the post-test result is 0.199. Based on these results, it can conclude that each of them has a sig value >0.05 , so all data are normally distributed.

Based on the normality test results, it can conclude that if each has a sig value from the control class and if the experimental class is at a value >0.05 , all data is homogeneous.

Table 3. Normality Test Results

Numb	Class	Sig	Explanation
1	Pretest Kontrol	0,200	Normal
2	Postest Kontrol	0, 200	Normal
3	Pretest Eksperimen	0,200	Normal
4	Postest Eksperimen	0,199	Normal

Source: Data processed in 2021

Table 4. Homogeneity Test Results

Numb	Class	Sig	Explanation
1	Pretest Control Class	0,433	Homogen
2	Postest Control Class	0, 413	Homogen
3	Pretest Experiment	0,414	Homogen
4	Postest Experiment	0,391	Homogen

Source: Data processed in 2021

Table 5. *Independent Sample t-test*

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Learning outcome	Equal Variances Assumed	.623	.433	3.954	56	.000
	Equal Variances Not Assumed			3.954	52.790	.000

Source: Data processed in 2021

2.2 Hypothesis Testing

Hypothesis testing in this study using the Independent Sample t-test was carried out on the post-test results of the control and experimental group students.

Based on the baseline test statistics in Table 4, the Asymp-Sig values (two-sided) are known to be $0.000 < 0.05$. Thus, it can be said that there is a difference in the learning outcomes of students who use blended learning methods compared to students who do not use blended learning methods.

To test the second hypothesis, the researcher used the Paired sample t-test. This test determines the difference in the average of two paired samples. This test is used to identify differences in student learning outcomes before and after applying blended learning methods.

Based on the baseline test statistics in Table 5, the Asymp-Sig values (two-sided) are known to be $0.000 < 0.05$. Thus, it can be said that there is a difference in the learning outcomes of students who use blended learning methods compared to students who do not use blended learning methods.

To test the second hypothesis, the researcher used the Paired sample t-test. This test determines the difference in the average of two paired samples. This test is used to identify differences in student learning outcomes before and after applying blended learning methods.

Based on the output in the Table 6, we can see that the value of Sig (two-sided) is $0.000 < 0.05$. Thus, it can be said that the learning outcomes of SMA Negeri 1 Salimpaung students are improved by applying the blended learning method. This means that there is a difference in student learning outcomes before and after applying blended learning methods.

3 Result and Discussion

3.1 Differences in Student Learning Outcomes Using the Blended Learning Method and Students not Using the Blended Learning Method

The results of the hypothesis 1 test indicate that there are differences in learning outcomes between the experimental class and the control class. It can be seen from the level of sig (2-tailed) $0.000 < 0.05$. So, it can be concluded that there is a significant difference

Table 6. Paired Sample t-test

Paired Samples Test		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest – Posttest	–34.621	9.337	1.734	–38.172	–31.069	–19.968	28	.000

Source: Data processed in 2021

between the learning outcomes of students who use the blended learning method and students who do not use the blended learning method. The results of this study are also similar to the research conducted by Sutrisno & Siswanto. Mastery of teaching methods affects student learning outcomes. The learning method is very important to be mastered by the teacher because it influences student learning outcomes [13].

The component teacher who determines the implementation of learning strategies, the success of implementing learning strategies depends on the teacher’s expertise in using learning methods, techniques and tactics. So, one of them is by using a learning method, blended learning is one of the teaching methods [14]. The blended learning method is in line with varied learning, emphasizing students to learn independently by utilizing various sources for additional insight. So, it can be concluded that blended learning is one of the learning methods that can be applied by combining the learning process carried out in the classroom with online-based learning using the google classroom application [14].

Research conducted by Sandy shows that there are differences in learning outcomes for students who are taught using blended learning methods and those who go through direct learning. The learning outcomes scores of students who take blended learning are higher than those who take direct learning [9]. Research conducted by Banditvilai where the blended learning method is applied greatly affects the learning objectives because it can do learning anywhere and anytime. It can conclude that can implement the application of blended learning in the era of globalization with existing facilities to carry out learning without space and time limits [15].

One factor that influences learning outcomes is the application of learning methods. The learning method is blended learning, where learning is carried out in the classroom and online using the google classroom application. Based on research conducted in the field at the control class meeting, students discussed a topic of material studied with their friends at each meeting. In online learning, by utilizing Google Classroom, the teacher uses to monitor student learning activities anywhere and anytime. Learning with google classroom, teachers create attendance topics to check student attendance, topics of teaching materials to read and understand the material, discussion forums to discuss material, and students do exercises and quizzes that have been uploaded. So that the

teacher can find out which students are active, late in submitting assignments, do not make assignments, do not take quizzes, and are not present in learning.

3.2 Differences in Student Learning Outcomes of SMA Negeri 1 Salimpaung Before and After Applying the Blended Learning Method

The results of the hypothesis 2 test indicate an increase in student learning outcomes at SMA Negeri 1 Salimpaung due to the application of blended learning. It can be seen from the level of sig (2-tailed) $0.000 < 0.05$. From this, we can conclude that there is a difference in the learning outcomes of the average student before and after the application of mixed learning methods. The application of blended learning clearly improves students' learning outcomes in studying economics. This can be seen in the emergence of indicators of student learning outcomes in classrooms after blended learning has been implemented. Students appear to be studying diligently, attentively, and diligently, actively debating, and searching for additional material via the Internet.

According to Kusairi, using blended learning has many advantages over face-to-face classes. One of his benefits of blended learning is that students can study content without space or time limitations. Conduct face-to-face and online discussions about the material using the existing google classroom [14]. To create good learning outcomes, a teacher must have the ability to master the learning material being taught and apply appropriate learning methods so that the learning process can learn well [16]. In addition to applying learning methods, to get good learning outcomes, teachers must also be able to provide encouragement for developing students' potential into an ability and create innovative, creative, active, and fun learning.

Learning with blended learning provides a wider space for students to explore abilities and independence, centered on classroom learning activities. Blended learning combines face-to-face learning with online, creating dynamic interactions between students and teachers and students with students. Using varied learning methods that students prefer will improve student learning outcomes [3]. In line with that, blended learning is very good for students because the learning provided can make students more interested and find something new in the learning process [18].

4 Conclusion

Based on the results of the research and discussions conducted, the following conclusions can be drawn. First, there is a significant difference in the learning outcomes of students who use blended learning methods and those who do not. Second, there is a difference in the learning outcomes of the average student before and after using mixed learning methods.

Based on the results of the research findings and discussion, It can put the following suggestions forward: First, for teachers, where teachers can develop the ability to use google classroom because, in the application of this blended learning method, teachers are required to be more creative and innovative in learning and in preparing attendance, teaching materials and questions for online student assessment. Can take advantage of the

results of this study as information and benchmarks about students' abilities. Applying this learning method to the following basic competence in economic subjects.

Second, for students, where students can take advantage of the use of google classroom that has been provided to deepen their understanding of the material. Students are expected to be able to use the time given by the teacher to follow the learning process using Google Classroom as well as possible. Improving information technology skills and working with other friends in the teaching and learning process so that good communication is established between one student and another.

Third, for schools, where schools can inform economics teachers so that they can adapt learning materials to the learning methods used so that students can learn with maximum results following learning objectives. One of the learning methods that can use is the blended learning method. The school is asked to be able to improve information technology facilities to achieve learning objectives.

Fourth, other researchers can examine other variables related to the blended learning method so that the effect of the blended learning method on learning in schools is clearer. Looking for other alternatives from developing blended learning methods by using appropriate learning media.

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