THE EFFECT OF BLENDED LEARNING ON THE GOOGLE CLASSROOM APP ON STUDENTS UNDERSTANDING OF MATHEMATICAL CONCEPTS

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Abstract

This study aims to find out and answer the question of the influence of blended learning on the Google Classroom application on students' understanding of mathematical concepts. The design in this study uses pre-experimental, one form of the pre-experimental method used is One Group Pretest Posttest Design which is analyzed quantitatively. The method for sampling used is by using the Total sampling technique. The subjects in this study were grade VII students of Aya Sophia Islamic School Business Junior High School totaling 25 students. The instrument used by researchers is in the form of an instrument test for understanding mathematical concepts. Based on the results of the data obtained, the highest score on the Pretest instrument is 90 with the lowest value is 20 with an average of 60.4 while the results of the highest value of the Posttest instrument are 100 with the lowest value is 50 with an average of 81.4. With calculations using the t test, a t count of 5.320 > t table 2.069 was obtained. so that H1 is accepted, which means that there is a positive influence on the application of blended learning in the Google Classroom application on the understanding of mathematical concepts of students at SMP Bisnis Aya Sophia Islamic School, Tangerang, Banten.

Keywords: Blended Learning, Google Classroom App, Understanding mathematical concepts

INTRODUCTION

Mathematics is a universal science that underlies the development of modern technology, has an important role in various disciplines and human development. This rapid development in the field of information and communication technology is based on the development of mathematics in its field (Vivi, 2020). According to Law of the Republic of Indonesia Number 20 of 2003, it is defined that "Education as a conscious and planned effort to create a learning atmosphere and a learning process so that students actively develop their potential to have religious strength and spirituality, self-control, personality, intelligence, noble ahlak, and skills needed by society, nation and state". A learning related to what is discussed is mathematical science. Advances from the development of this technology can also affect the quality of education. Teachers are considered competent if teachers are able to master and understand thoroughly the field of knowledge that is the responsibility of the teacher. One of the objectives of learning mathematics is to improve thinking skills, especially in the ability to understand mathematical concepts (Desniarti, 2019). Learning activities in the classroom cannot be separated from the existence of a new learning, the lack of learning innovation from teachers will cause students to feel bored and not enthusiastic in learning, especially in the post-pandemic period like today. In this situation, it can affect student

motivation and interest in learning in the learning process according to (Sadirman, 2017) learning motivation indicators include: (1) diligent in facing tasks; (2) tenacious in the face of adversity; (3) show interest in a variety of problems for adults; (4) prefer to work independently; (5) quickly get bored on assigned routine tasks; (6) defend his opinion; (7) and it is not easy to let go of what is believed; (8) enjoy finding and solving problems.

In this study, researchers focused on the use of the Blended learning model which is a teaching and learning process activity that combines face-to-face activities in class with learning activities using internet media. In its application, the Blended learning model aims to reduce direct contact with students during learning hours at school (Nurin, 2017). From the explanation above, it can be concluded that Blended learning is a combination of direct learning with online-based learning. Based on several model classifications, researchers decided to use the Rotation Model with its sub-model being the Flipped Classroom Model (Sheren &; C. Asri, 2018) because the Flipped Classroom learning model includes several control elements by using a combination of face-to-face and online class time allocation where the class is online not allocated to replace face-to-face meetings.

Based on an interview conducted with a mathematics teacher of SMP B-ASIS, Mrs. Ayu Setyo Ningrum, S.Pd which was held on October 5, 2022, it was found that the school has a fairly high interest in learning, but in terms of understanding mathematical concepts which is still relatively lacking. An understanding of a mathematics is very important because by mastering a concept students will easily understand the next concept and develop students' thinking skills (Makur, Prahmana, et al, 2019). Concepts in mathematic are interrelated, even simple concepts have a role as prerequisite concepts towards understanding more complex concepts (Matitaputy, 2017). By understanding the concept, you will understand more than the method so that students will more easily remember and be able to construct when they are forgotten (Kilpatric & Swafford, 2001). Therefore, Blended learning researchers feel suitable to use besides the advantages of the Blended Learning learning model include saving time, discussions between students and teachers can be carried out outside learning hours, and can increase the attractiveness of learning. The application of the Blended learning model is always related to online learning, therefore media that can help the learning process is needed. In this case, Google Classroom can be used as an appropriate medium. Google Classroom is one of the applications part of Google that is connected to several other services,

such as gmail, google calendar, google drive and google docs as well as several other services related to learning (Packaged, 2017). The advantages of the Google Classroom application are free, time-saving, easily accessible, cloud-based and flexible (Inung, 2020).

According to (Handoko, 2018) after making learning achievements, then teachers must also determine the allocation of time to be used in allocating learning activities with Blended Learning, of course, this is developed in accordance with the objectives of the implementation of learning itself, for example, if teachers want to focus on online learning, then the allocation of online activities and tasks Reproduced. Vice versa, if the focus of learning is face-to-face learning, then online activities and assignments serve to sharpen students' understanding of the topics given face-to-face. Based on this presentation, it can be concluded that the advantages of Blended Learning learning activities can be carried out in class and outside the classroom by utilizing technology to add learning materials and questions given in class and through online which are managed and controlled in such a way by teachers so that learning and teaching activities can take place properly (Deklara &; Wardhani, 2018).

According to (Wiharno, 2017) that the ability to understand mathematics is a strength that must be considered in the process and objectives of learning mathematics, especially to gain mathematical understanding during learning, this can only be done through learning with understanding. According to (Siti &; Ratih, 2016) understanding is one of the processes consisting of the ability to explain and interpret something, be able to provide examples, images, and be able to provide more creative descriptions. While understanding mathematical concepts is something that is drawn in the mind in the form of an idea or understanding. Based on this explanation, it can be concluded that understanding mathematical concepts is the ability of students to master a material, characterized by students being able to explain back the material taught into a more understandable form.

According to (Arcat, 2016) one of the competencies that need to be mastered in learning mathematics is understanding concepts. In learning, comprehension is referred to as student understanding to be able to do what has been taught by the teacher (Luriwati, 2018). The knowledge and understanding of students towards mathematical concepts according to the National Council of Teachers of Mathematics (NCTM) can be seen from the ability of students to: (1) Restate a concept verbally and in writing; (2) Make examples or not examples; (3) Use models, diagrams and symbols to represent a concept; (4) Change one form of

representation to another form, (5) Recognize various interpretations of concepts; (6) Use the properties of a concept and recognize the conditions that determine a concept; (7) Compare and contrast concepts.

Based on the background presentation related to the Blended Learning and Google Classroom learning models, researchers are interested in conducting a study entitled "The Effect of Blended Learning on the Google Classroom Application on the Understanding of Student Mathematical Concepts".

METHODS

The method used in this study is an experimental quantitative method because in accordance with the purpose of the study that looks at the relationship between the research variables in question is learning using the Google classroom application as an independent variable and understanding mathematical concepts as a dependent variable. The research design used is pre-experimental, one form of this design that will be used is One Group Pretest Posttest design, in this design there is a pretest before being treated so that the results of treatment can be known more accurately (Sugiono, 2014) The population in this study is grade VII students at Aya Sophia Islamic School Business Junior High School where the total number of students is 25 students. The sampling technique used in this study is by taking Total Sampling, total sampling is a sampling technique where the number of samples is equal to the population (Sugiyono, 2017).

This learning model uses two stages. The first stage is the online learning stage which is carried out independently or alone and in the second stage is learning carried out directly or face-to-face. Classroom meetings are used to discuss and explain problems faced by students during the online learning process which is carried out independently. Before calculating the data has first been validated by two validators in the field of Mathematics, after that the data is tested using the Reliability Test, then the calculation of the final value data validation is analysed, carried out by giving scores to the Pretest and Post-test instruments that have been given. Statistical hypotheses are also called test hypotheses, namely a hypothesis expressed in the form of null hypothesis (H0) and hypothesis (H1) (Supardi, 2017).

The hypothesis proposed in this study is (H0) = There is no difference between the average before learning Blended Learning using the Google Classroom application and after learning Blended Learning using the Google Classroom application, and (H1) = There is a

difference between the average before learning Blended Learning using the Google Classroom application with after a Blended Learning using the Google Classroom app. Furthermore, the data in the Test uses the Prerequisite Test, namely the Normality Test, the Normality Test is carried out to find out the data from the research obtained is normally distributed or not. In the Normality Test, researchers use the SPSS program, then also with the homogeneity test aims to find out whether the two groups studied have the same variance or not. If both groups have the same variance, then the group is said to be homogeneous (Sugiyono, p. 142).

Followed by hypothesis testing using t tests carried out to determine whether there is an influence of the blended learning model with the help of Google Classroom on students' mathematical concepts. The type of t test used is the Paired Sample Test T-test is part of the comparative hypothesis or comparison test, the paired sample t test aims to find out whether there is an average difference between two samples that are paired or related. After it is known whether there is an influence from the application of Blended Learning, then proceed with calculating the magnitude of the influence using the N-Gain Test. In this study, it will be seen how much influence the Blended Learning learning model uses the Google Classroom application has on students' understanding of mathematical concepts using N-Gain calculations. N-gain (normalized gain) is used to measure the increase in science process skills and cognitive learning outcomes between before and after learning and is calculated using SPSS assistance with the following criteria:

Tabel 1. gain index criteria

N – Gain Score	Criteria
−≥ 0,70	High
0,30 < −≥ 0,70	Medium
−≤ 0,30	Low

Tabel 2.Kategori Tafsiran Efektifitas

Percentage (%)	Criteria
< 40	ineffective
40–55	less effective
56–75	moderately effective
> 76	Effective

RESULTS AND DISCUSSION

This study discusses the influence of blended learning on students' mathematical comprehension positions using the Google Classroom application. In general, during the

learning process of most students in the subject matter of Social Arithmetic, students' mathematical understanding tends to increase after the implementation of the blended learning system. Students' mathematical understanding is seen from the calculation scores from the Pretest and Post tests that have been carried out and tested using Prerequisite Tests and Hypotheses with the following data:

Table 3. Normality Test Results

Tests of Normality		
	Shapiro-Wilk	
Test Results	Df	Itself.
PreTest	25	.151
Post	25	.312

Based on the results of the Shapiro-Wilk normality test using SPSS, the output results show in the Shapiro-Wilk Column Test of Normality table with the Sig value for the Pretest result is 0.151 where the sig value is > 0.05, and the Sig value for the Posttest result is 0.312 where the sig value is > 0.05. This indicates that the data is normally distributed.

Table 4. Homogeneity Test Results

Tests of Homogeneity of Variances		
	Levene Statistic	Itself.
Test results	3.925	.053

Based on the table above, it is explained that the significance value (sig.) of the variable motivation to learn mathematics in grade 7 students of SMP B-ASIS is 0.053. Because of the value of sig. 0.053 > 0.05, then it can be concluded that the variance of the data is accepted or both data are homogeneous.

Table 5. Results of Paired Difference Sample T-test

Paired Samples Test							
		Paired Differences					
			95%				
		Mean	Lower	Upper	T	Df	Sig 2
Pair 1	Pretest – Posttest	21.000	29.147	12.853	5.320	24	>,001

Based on testing criteria, it can be stated that Blended Learning in the Google Classroom application on the understanding of students' mathematical concepts is influential, so the results of the hypothesis H0 are accepted and H0 rejected. Which means, there is a difference between the average before H1H0 learning Blended Learning using the Google Classroom application and after learning Blended Learning using the application.

Table 6. N-Gain Test Result

	Minimum	Maksimum	Mean	interpretation
N-gain Score	38	100	.7004	High
N-gain Percentage	38,00	100,00	70,04%	moderately effective

Based on table 4.6 the calculation of the N-gain test results shows that the minimum N-gain score is 38 and the maximum is 100 while the average value of the N-Gain Score is 0.7004 with a percentage value of 70.04%, which means that the value is included in the category High in the category of effectiveness Moderately Effective is the effect of blended learning with the Google Classroom application on the ability to understand mathematical concepts of class VII students of SMP B-ASIS Tangerang.

CONCLUSION

Based on the results of data and discussion of research conducted on the effect of blended learning on the mathematical understanding of grade VII students of Aya Sophia Islamic School Tangerang Business Junior High School, it was concluded that: There is an influence of blended learning on the Google Classroom application on students' understanding of mathematical concepts and There is an influence with high criteria and a fairly efficient percentage after applying the blended learning model to the Google Classroom application.

SUGGESTION

The suggestions that can be given by researchers are as follows: Teachers are expected to use diverse learning models to improve students' understanding of mathematical concepts. It is expected that students will be more active, focused, and active in the teaching and learning process, especially for SMP B-ASIS students, It is expected for schools to pay more attention to the activities of teachers and students in carrying out the teaching and learning

process that takes place so that the planned learning objectives can be achieved properly. And then the hope of researchers is that this thesis is useful later as a reference in the implementation of mathematics research and learning.

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