Implementation of A Blended Learning Model Based on Google Classroom on Class XII TKJ Data-Centering Size Material

(Case study at SMK Bina Nusa Slawi Student Year 2021/2022)

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Abstract. Related to the role of teachers as learning agents, teachers are required to be able to provide optimal learning by using various learning methods and models that are adapted to the characteristics of students. One of the learning models that can be an alternative solution in learning during a pandemic situation is Blended Learning. The Blended Learning learning model is effective learning and can also be applied to anyone, one of which is those who have difficulty for face-to-face learning continuously. One of the right applications to use in learning using *Blended Learning* is *google classroom.* The purpose of this study is to find out that the Google Classroom-based Blended Learning Model can improve mathematics learning outcomes on data centering size materials and to find out whether there are differences between students who are applied google classroom-based blended learning to conventional learning. Based on the results of data analysis, it shows that there is a significant increase between pretest and postest using a google classroom-based blended learning model. The difference is shown by the average pretest value of 68,973 and posttest of 84,865.

Keyword: Blended Learning, Google Classroom

1. Introduction

In the implementation of the standards of the educational process, the teacher has a fairly significant role and position in the learning process. As stated in PP No.14 of 2005 Article 4 concerning Teachers and Lecturers is stated as follows. "The position of teachers as professionals as referred to in Article 2 paragraph (1) serves to increase the dignity and role of teachers as learning agents serves to improve the quality of national education" Related to the role of teachers as learning agents, teachers are required to be able to provide optimal learning by using various learning methods and models that are adapted to the characteristics of students. In addition, teachers as the spearhead of education have a very important role in the world of education. The teacher becomes the main axis in the course or not of learning in a systematic and structured manner. Qualified and professional teachers are believed to be able to create a generation of the nation that is of high quality and dignity and able to face global competition.

Indonesian education is now being tested with the Covid-19 pandemic. Indirectly, this pandemic has tested the readiness of all education personnel in the face of distance learning. It is certain that mastery of science and technology has become the hope and demand of the global community. It is almost certain that mastery of science and technology has become the hope and demand of the global community. Not only teachers who are required must be able to apply learning in accordance with the context of the times.

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Teachers, students and parents are expected to be able to participate in a very competitive global competition. However, in reality, education personnel are not ready for distance learning or online learning methods. Therefore, it is necessary to make hard and earnest efforts in implementing distance learning, both in the use of *online* applications and determining learning models or methods that are suitable for pandemic conditions. In accordance with the statement in the Ministerial Decree 4, it is estimated that in July 2021, limited face-to-face learning will be held. One of the learning models that can be an alternative solution in learning during a pandemic situation is *Blended Learning. Blended* Learning is a combination of face-to-face, *offline* and *online* learning. Blended learning can combine *face-to-face* learning with computer-based learning. *Blended learning* can also be interpreted as learning with a technology approach to learning a combination of face-to-face learning resources with teachers or contained in computer media, cell phones, *mobile phones*, satellite television channels, video conferences, and other electronic media ([1]:60).

The *Blended Learning* learning model is effective learning and can also be applied to anyone, one of which is those who have difficulty for face-to-face learning continuously. In addition, the use of this model can also be used as a means of providing additional lessons .[2] *Blended learning model is* also said to be an integrated or mixed learning model, which is a combination of two learning environments. The learning environment is a face-to-face learning environment or often referred to as a traditional learning environment and a distributed learning environment that grows and develops in an exponential way through new technologies. Integrated learning has the characteristics of, among others, face-to-face and online learning, student-centered, providing hands-on experience, being flexible and allowing independent learning. The effective combination of different ways of delivering, ways of teaching and learning styles found in open communication between all the parts involved with the training are some that support blended learning.[3]

According to Prayitno *Blended Learning* is needed at a time when the existing situation demands a combination or mixing of various learning environments to achieve learning objectives. For example, when distance learning is not so needed, face-to-face learning is needed. This *blended learning* process is needed for students who need addition and combination in learning. *Blended learning* is needed under certain conditions. These conditions include;

1. the teaching and learning process is not only face-to-face, but increases learning time by utilizing cyber technology,
2. simplify and speed up the process of non-stop communication between educators and learners
3. assisting in the process of accelerating teaching [4]

One of the right applications to use in learning using *Blended Learning* is *google classroom*. In a journal it says as follows:

"One e-learning application to support the implementation of learning with a blended learning model is google classroom. This tool is very easy to use and free. Teachers can create online classrooms and invite their students then create and distribute assignments and materials. The main advantage of google classroom is that all assignments are displayed in good order and they can always be accessed and checked. Therefore, the students don't need to worry about losing assignments when they submit. Teachers can also directly give the scores and give feedback".[5]

Google Classroom is also a platform that can be used for free for online teaching and learning activities. Google Classroom also offers features that are efficient, easy to use, and

help teachers manage assignments. In addition, teachers can create classes, distribute assignments, grade, send feedback and view everything in one place.

Some of the advantages that we get when using google classroom in learning include easy preparation, saving time and being able to train student discipline. Google Classroom can be easily accessed via computer or mobile phone with any browser. Google Classroom can also be downloaded on the playstore with the keyword "Google Classroom" both on Android and iOS. [6]

The learning model used in this research is the *Flipped Classroom model.* According to Herried, *Flipped classroom* is a teaching model in which educators give assignments to students to actively study the material provided through digital media in the form of videos or e-books or other forms of learning resources as a starting material in preparing for learning in class (face-to-face)[7]. Based on the description above, the author is interested in conducting a study with the title "Implementation Of *A Google* Classroom-Based *Blended Learning* Model On Class Xii Tkj Data Centering Size Material". The purpose of this study is tofind out that the *Blended Learning* Model berbasis *Google Classroom* can improve mathematics learning outcomes on data centering size materials and to find out whether there are differences between students who are applied google classroom-based blended learning with conventional learning.

2. Method

This research is a quantitative study using the *true experimental design* method using the *pretest-postest control group design pattern.* According to [8] in *the pretest-postest control group design* there is a group that is selected *true experimental design* using the *pretest-postest control pattern of the design group* randomly then given a *pretest* to find out the initial state, namely the difference between the experimental and control groups. Pretests are given before the implementation of learning, and after learning are given posttests.

The experimental design of the random *control group pretest-postest* design pattern can be described in the following table.

Table 1. Random *control group pretest-postest* design pattern experiment design

Group	Teknik Pengambilan	Pretest	Treatment	Postest
E	R	O^1	X	O^2
K	R	O^3		O^2

Information:

R : random sampling
E : experimental group
K : control group
X : Treatment
O_1 : Pretest experimental group
O_2 : Posttest experimental group
O_3 : Pretest control group
O_4 : Posttest group control

The implementation design pattern above illustrates the comparison of experimental groups using *google* classroom-based *blended learning* models and control groups that do not use *google* classroom-based *blended learning* models (conventional models only). This difference is carried out to find out the extent to which the implementation of learning with *a google* classroom-based *blended learning* model in mathematics subjects, the data centering size material can be carried out This research was carried out at SMK Bina Nusa Slawi, Tegal Regency. The population in this study was all students of class XII Computer and Network Engineering (TKJ) for the 2021/2022 academic year consisting of 4 classes (XII TKJ 1 to XII TKJ 4) with a total of 148 people.

The sampling technique in this study used *Cluster Random Sampling.* This is done by paying attention to the same characteristics, namely students get the same material, students are taught by the same teacher, students sit in the same class and there is no superior class. The samples in this study were class XII TKJ 1 as an experiment class and XII TKJ 3 as a control class.

The instrument used in this study was a learning outcomes test consisting of trial questions and *pretest postest*. The trial questions consist of 10 description questions. The questions are then tested to obtain valid questions and then selected into 5 questions used for the *pretest postest* questions. The test is used to obtain data on student learning outcomes in experimental classes and control classes. Testing the effectiveness of *google* classroom-based *blended learning* models is carried out by assessing student learning outcomes based on daily test scores. The daily test score is seen from the learning outcomes of students on the subject matter of the centering measure. The flow of assessing the effectiveness of learning based on learning outcomes is depicted in the following chart

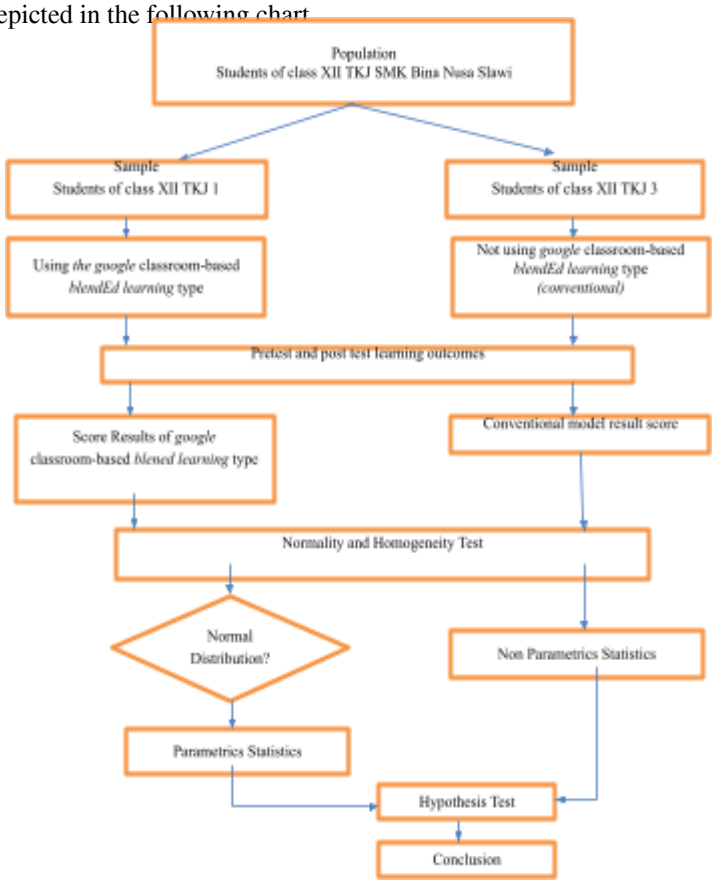

Figure 1. Learning Effectiveness Assessment Flow Based on Learning Outcomes

The data analyzed from this study are data on the learning outcomes of class XII TKJ students through pretest and postest. Data analysis of student learning outcomes on the material of the data centering size was analyzed using the *Paired Sample T Test* with the prerequisite test normality test and homogeneity test. Data analysis using SPSS *software*.

3. Discussion

This study was carried out three times in the experimental and control class groups. This study gave different treatment to the two groups of classes. The learning experiment class uses *google* classroom-based *blended learning*, while the learning control class uses conventional learning models. The steps on *google classrom-based blended learning* can be shown in the following table:

Table 1. Learning Plan Activity Steps

TYPES OF ACTIVITIES		**ACTIVITIES**	**ESTIMATED TIME**
Pre-class activity		1. Teachers prepare for *Google Classroom* 2. Teachers design and create problem-based learning media on the topic of Single data median and group data 3. Teacher uploads learning module on *Google Clasroom* 4. Guru uploads median LKPD on *Google Clasroom* 5. Students independently study learning materials uploaded by *Google Clasroom* and work on the median LKPD ***(Independent, Critical thinking and Problem Solving)*** 6. The teacher analyzes the results of the work of the learners. 7. The teacher reminds the division of the group as the previous meeting	1 day before the defense
In-class activity	Introduction	1. Students and teachers open the learning process by praying. ***(religious)*** 2. The teacher checks the attendance of the learners. 3. The teacher asks about the results of the students' *self-learning in the pre-class activity stage.* 4. The teacher explains the learning objectives and explains the learning procedures and assessments.	10 minutes

TYPES OF ACTIVITIES		ACTIVITIES	ESTIMATED TIME
		5. Participants educate and teachers each other Discuss related with misconceptions that appear for Participants educate learn self-sufficient. ***(Communication, Ask answer)*** 6. Teachers confirm students' understanding by providing routine questions that students have done in *pre-class activities*	
	Core	**Problem Orientation** 1. Learners are given several cases related to solving median problems through *powerpoint* slides displayed by the teacher: 2. Students and teachers identify and analyze information on the problems contained in point 1. ***(Critical thinking, HOTS -Critical Thinking)*** **Organizing Learners to Learn** 3. Students who form 2 groups of four people to develop strategies based on the information obtained in stage 2**.** 4. Teachers share LKPD problem solving single data median and group data. 5. The teacher monitors and guides each group in designing strategies/formulating steps to solve problems related to single data medians and group data. **Guiding Group Investigations** 6. Learners and their groups analyze and identify information contained in the problem. ***(collaboration, information collection)*** 7. Learners formulate the information obtained to design strategies for solving problems of single data median and group data ***(data processing)*** 8. Learners apply the strategies they have designed to solve a given problem, namely determining the median, modeling the problem, and solving the problem given in stage 1. ***(reasoning, critical thinking and problem solving, HOTS-critical thinking)*** 9. Teachers monitor and guide each group related to the application of strategies they carry out to model mathematics on problems and solution findings. Students	60 minutes

TYPES OF ACTIVITIES		ACTIVITIES	ESTIMATED TIME
		ask questions that are not understood (***critical thinking and problem solving, questioning)*** **Developing and Presenting Work** 10. Learners present the results of solving the problem carried out. ***(Creativity)*** 11. Representatives of learners from the group presented the results of solving the problem. ***(Communication, observe)*** 12. The rest of the group responded to the results of the group presentation. ***(Communication)*** **Analyzing and Evaluating** 13. The teacher monitors, responds to, and evaluates the results of the work of each group of learners who have been presented in front of the class. 14. The teacher provides reinforcement of the results of solving problems in each group and directs students to the concepts learned.	
	Cover	1. Students and teachers discuss and conduct questions and answers on the learning outcomes obtained in that day. ***(Collaboration, Communication)*** 2. The teacher concludes the points that learners must understand, namely the step of determining the median of a single data and group data. 3. The teacher provides information related to the Task to be done 4. The teacher closed by praying. ***(religious)***	10 Minutes
Post-class activity		● The teacher gives assignments to students in the form of 1 HOTS question related to solving median problems 1. The learner works on the task in point 1 and uploads it into the LMS. ***(Independent)*** 2. Teachers provide *feedback* on the results of students' work.	

The data obtained in this study is data collected from tests given to students at SMK Bina Nusa Slawi in the form of *pretests* and *posttests* given in experimental classes and control classes. *Pretests* are given before the treatment to determine the initial abilities of

students, while posttests are given after treatment is given using google classroom-based blended learning.

Normality Test

The first stage on data analysis is the normality test, as a requirement of the t test. A normality test is performed to find out whether the sample studied is normally distributed or not. The acceptance criteria for a data are normally distributed or do not use the following formula:

If the sig < 0.01 means that the data distribution is abnormal

If the sig > 0.01 means that the data distribution is normal

The results of the normality test are shown as follows:

Tabel 2. One-Sample Kolmogorov-Smirnov Test (Normality Test) Experimental Class

		PRE TEST	POST TEST
N		37	37
Normal Parameters[a,b]	Mean	68.973	84.865
	Std. Deviation	7.2590	10.8171
Most Extreme Differences	Absolute	.303	.187
	Positive	.303	.187
	Negative	-.292	-.179
Test Statistic		.303	.187
Asymp. Sig. (2-tailed)		.000[c]	.002[c]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Tabel 3. One-Sample Kolmogorov-Smirnov Test (Normality Test) Control Class

		PRETESTKONTROL	POSTTESTKONTROL
N		36	36
Normal Parameters[a,b]	Mean	69.0000	71.4167
	Std. Deviation	5.10462	10.89003
Most Extreme Differences	Absolute	.217	.163
	Positive	.209	.163
	Negative	-.217	-.090
Test Statistic		.217	.163

Asymp. Sig. (2-tailed)	.000[c]	.017[c]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Based on the data in Table 2 and Table 3 it can be concluded that the data from the pretest and postest results of both classes are normally distributed. The data meets the criteria, namely sig > 0.01. it means that the data is normally distributed.

Homogeneity Test

The second stage in data analysis is the homogeneity test. Homogeneity testing is carried out to find out whether the research data has homogeneous variants or not. In this study, the hiomogenicity test was carried out using SPSS with a signification level of 0.01. The acceptance criteria for a data are normally distributed or do not use the following formula:

If the sig < 0.01 means that the data is inhomogeneous

If the sig > 0.01 means homogeneous data

The results of the homogeneity test are shown as follows.

Tabel 4. Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
.610	1	71	.437

Based on the data in Table 4 it can be concluded that the data from the pretest and postest results of both classes are homogeneous. The data meets the criteria, namely sig > 0.01. meaning homogeneous data.

Hypothesis Test

The next stage in the analysis is the hypothesis test, which is to use the t test. This was done after it was discovered in the prerequisite test of data analysis, it was stated that the data from the study were normally distributed and homogeneous. The results of the t test are shown as follows.

Tabel 5. Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean

Pair 1	PRE TEST	68.973	37	7.2590	1.1934
	POST TEST	84.865	37	10.8171	1.7783
Pair 2	PRETESTKONTROL	69.0000	36	5.10462	.85077
	POSTTESTKONTROL	71.4167	36	10.89003	1.81501

Tabel 6. Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	**t**	**df**	**Sig. (2-tailed)**
Pair 1	PRE TEST - POST TEST	-15.8919	11.3695	1.8691	-19.6827	-12.1011	-8.502	36	.000
Pair 2	PRETESTKONTROL - POSTTESTKONTROL	-2.41667	10.14572	1.69095	-5.84949	1.01615	-1.429	35	.162

Based on the data obtained in Table 5, it is known that the number of sata in the experimental class is 37 while the amount of data in the dick class is 36. The mean value for the experimental class was 84.865 while for the control class it was 71.4167. Thus it can be concluded that there is a distinction between the experiment class and the control class. Furthermore, to prove whether the difference is real or not, we need to interpret the following "***Paired Samples Test***" table. Based on the data obtained in Table 6 it is known that the sig < 0.01. Thus, it can be concluded that there are differences before and after using *a google* classroom-based *blended learning* model in the experimental class.

Based on the results of data analysis, it shows that there is a significant increase between pretest and postest using a google classroom-based blended learning model. The difference is shown by the average pretest value of 68,973 and posttest of 84,865. The google classroom-based blended learning model can be said to be very good in learning in today's new normal era.

This is in line with the research of Setyoko and Indriaty (2018) which states that the Blended Learning learning model has proven to be very well applied in overcoming obstacles

to face-to-face learning in person. Face-to-face meetings are limited to several things including limited face-to-face time, limited student activity range, lecturer attendance in face-to-face is not always fulfilled optimally, and a learning system that tends to conventional learning concepts.

According to Kathleen Fulton, the advantages of blended learning, especially the flipped classroom type, include: (1) Students can participate in learning according to the speed of their haming because there is an opportunity to repeat the material if needed, (2) homework is completed in class and students can ask about parts that are not yet understood, (3) students have the opportunity to access learning in full, (4) learning time in class is spent effectively by teachers and students, (5) teachers who implement flipped classrooms get higher results compared to applying traditional learning.[9]

Meanwhile, in the research of Meyla Kurniawati, et al (2019) it was stated that student learning outcomes after the application of blended learning using a flipped classroom model assisted by Google Classroom. This shows that in addition to the advantages, google classrom learning also has disadvantages. These shortcomings include: (1) the large number of online media so that supporting facilities and infrastructure are needed, (2) the lack of equitable facilities owned by students such as androids, computers and internet access, (3) lack of knowledge or stuttering technology. The application of blended learning is also inseparable from the role of teachers who control and manage learning activities so that they can occur in a sustainable, interesting and more effective manner. The need for teachers to prepare references, teaching materials, materials, develop assessment instruments, and answer questions asked by students. The learning atmosphere will feel lively if the enthusiasm of students in using the blended learning model needs to be supported by the readiness of teachers in managing and developing models creatively.

4 Conclusion

Based on the results of research and development of *the Google* Classroom-based *Blended Learning* learning model that has been carried out, it can be seen that the learning outcomes of students who are taught using a google classroom-based blended learning model are higher than those taught without using a google classroom-based blended learning model. This proves that there is a difference between the learning outcomes of students who are taught using a google classroom-based blended learning model and those who are taught without using a google classroom-based blended learning model. In addition, the application of blended learning is also inseparable from the role of teachers who control and manage learning activities so that they can occur in a sustainable, interesting and more effective manner.

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