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Flipped Classroom Learning Management Model Used by the Plickers Application

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ABSTRAK

Saat ini banyak siswa kurang tertarik pada pembelajaran, maka dari itu diperlukan metode pendekatan yang lebih interaktif. Tujuan dari penelitian ini adalah untuk mengembangkan manajemen pembelajaran Flipped Classroom yang dibantu oleh Plickers untuk meningkatkan hasil belajar matematika siswa sekolah dasar. Pendekatan yang digunakan dalam penelitian pengembangan adalah desain Bord and Gall. Penelitian dilakukan pada siswa sekolah dasar kelas VI sekolah dasar. Teknik pengumpulan data menggunakan kuisioner dan tes. Hasil penelitian menunjukkan bahwa desain manajemen pembelajaran di Flipped Classroom membantu Plickers mengimplementasikan fungsi manajemen, yaitu merencanakan analisis kurikulum, tujuan dan penilaian pembelajaran, mengembangkan langkah pembelajaran, dan menyiapkan alat pengajaran. Proses pembelajaran dilakukan di luar kelas dan di dalam kelas. Evaluasi dilakukan dengan Plickers. Hasil validasi ahli diperoleh skor rata-rata 4,5 dengan kategori yang sesuai. Hasil uji efektivitas menunjukkan bahwa F yang dihitung sebesar 95,366 dan sig yang dihitung sebesar 0,000, jadi 0.000 < 0,05, dan besarnya pengaruh model pembelajaran flipped classroom terhadap hasil belajar sebesar 0,618 atau 61,8%. Dengan demikian, manajemen pembelajaran Kelas Terbalik dengan bantuan penilaian Plickers digunakan secara efektif untuk meningkatkan hasil belajar siswa.

ABSTRACT

Currently, many students are less interested in learning, therefore a more interactive approach method is needed. The purpose of this study is to develop Flipped Classroom learning management assisted by Plickers to improve elementary school students' mathematics learning outcomes. The approach used in the development research is the Bord and Gall design. The study was conducted on elementary school students in grade VI of elementary school. Data collection techniques used questionnaires and tests. The results of the study indicate that the learning management design in Flipped Classroom helps Plickers implement management functions, namely planning curriculum analysis, learning objectives and assessments, developing learning steps, and preparing teaching tools. The learning process is carried out outside and inside the classroom. Evaluation is carried out with Plickers. The results of expert validation obtained an average score of 4.5 with the appropriate category. The results of the effectiveness test showed that the calculated F was 95.366 and the calculated sig was 0.000, so 0.000 <0.05, and the magnitude of the influence of the flipped classroom learning model on learning outcomes was 0.618 or 61.8%. Thus, Flipped Classroom learning management with the help of Plickers assessment is used effectively to improve student learning outcomes.

1. INTRODUCTION

One of the determining factors in improving the quality of education is the achievement of increased student learning achievement. Many factors support the success of the learning process, but teacher performance and the way students learn are important things that must be improved. In this case, the learning process still has many obstacles or problems that arise. This problem, as explained by previous study explains the problems that occur in the field faced by teachers related to limited facilities and infrastructure, such as the minimal use of learning resources or learning media (Aswal et al., 2019; Priyayi

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et al., 2018). Furthermore, other study also explained the problems of the learning process, namely the achievement of learning objectives that partially deviate from the law, curriculum problems, role problems, self-image, and teacher quality (Arianto, 2022; Mustaji & Arianto, 2020). Apart from that, there are also problems from the students themselves, such as learning difficulties (Megawanti, 2012; Priliyanti et al., 2021). From the problems that arise, it is necessary to overcome them by finding a way out. In this case, the role of the teacher is very important because the teacher is the one who knows the situation in the class. If the teacher has found a problem then it is necessary to make learning improvements (Asrizal et al., 2018; Das, 2019).

Based on the results of observations made by researchers, show that the learning outcomes of students at several elementary schools in Gugus Gunung Agung, Mijen District, Demak Regency have experienced a decline in achievement. In class VI mathematics subject content there was a difference in final semester achievement results from the implementation of the offline model with the percentage of learning completeness reaching 82% dropping drastically to below 70% with the minimum learning completeness standard (SKBM) set at 70. This matter is a challenge for educators to find the root causes of low mathematics learning outcomes, as well as solutions to overcome these problems. Many students are less interested in the methods taught by teachers because they seem boring (Magdalena et al., 2020; Setiadi et al., 2018). This is proven based on observations in the field, even though the group method is used, this method still does not make students actively involved in learning. This is in line with (Cahyono, 2019; Dewi & Lestari, 2021) the cause of the problem of students not being actively involved in learning is a lack of motivation from the teacher, a lack of interest in following lessons due to a lack of use of teaching aids.

Seeing the current phenomenon, students are more interested in learning using digital-based media. Today's students are a digitally native generation, a generation born where technology is already present in their environment (Kibirige & Teffo, 2014; Umam, 2023) The term digital native is a predicate given to all categories of children who have grown up using technology such as the internet, computers and mobile devices. The digital native generation is described as multitaskers, they feel comfortable engaging in several tasks simultaneously. Another characteristic of digital natives is their high curiosity in obtaining information and knowledge, being adaptive, and expecting instant responses and benefits from the technology they use (Kusumawardani et al., 2018; Satria, Aliriad, et al., 2023). The general characteristics of students in this era require a variety of learning strategies that can facilitate them with a set of learning experiences that can make students active and meaningful.

Learning design that integrates Information and Communication Technology (ICT) in the learning process is a logical consequence of the dynamics that occur (Chatterjee & Chakraborty, 2021; Puspitarini & Hanif, 2019). Various existing learning models can be a reference for educators in designing learning. One model that can be used by educators is the Flipped Classroom learning model (flipped learning). Previous study argue that basically, the concept of the Flipped Classroom Model is reversing learning activities, namely learning activities that are usually completed in class can now be completed at home and learning activities that are usually done at home can now be completed in class (Fauzi et al., 2022) . Students read the material and watch instructional videos before they come to class and they start discussing, exchanging knowledge, and solving problems, with the help of other students and teachers, train students to develop procedural fluency if needed, inspire and help them with projects that challenges by providing learning control larger (Supeni et al., 2019; Umam, 2023). Implementing a Flipped Classroom is possible to enhance collaborative learning. In this case, students learn and build their knowledge through group interactions and they already have a clue from educators in learning activities. Plus, you can give social benefits to shy students (who have interpersonal interactions) and build diverse students' understanding/opinions (Henry Suryo Bintoro & Sumaji, 2021; Jayaseely, 2020). Meanwhile, increasing students' learning motivation can be done by using online-based assessments. One of them is Plickers.

Plickers are a supporting tool that can be used by teachers to provide assessments and collect data from assessment results in real-time by creating a pleasant atmosphere. This Plickers application can enable students to play an active role in the learning process because the assessment form is packaged like a game (Kent, 2019; Masita & Fitri, 2020). Thus, this research aims to develop a Flipped Classroom Learning Management Model Helpful Plickers and test the effectiveness of Flipped Classroom assisted learning management Plickers in sixth-grade mathematics learning in elementary schools. The novelty of this study is developing a Flipped Classroom learning management model that uses the Plickers application to provide a more interactive learning experience. Different from previous studies that generally use video media or other online platforms, the use of Plickers allows teachers to collect student responses directly and in real time without the need for special devices for students, which is a solution for schools with technological limitations.

2. METHOD

Research methods relate to strategies for collecting, analyzing, and interpreting data. This research refers to the development research method (research and development / R&D). Development research design using the Plomp model (Sugiyono, 2019). Development research is a process used to develop, validate, and test the effectiveness of products (Budiyono, 2019; Sukestiyarno, 2020). The product produced in this research is assisted flipped classroom learning management Plickers. Development research design using the Plomp model. The Plomp model consists of five phases, namely: initial investigation phase, design phase, realization/construction phase, test phase, evaluation and revision, and implementation phase (Plomp & Nieveen, 2013). Figure 1 shows the development procedures for the five phases.

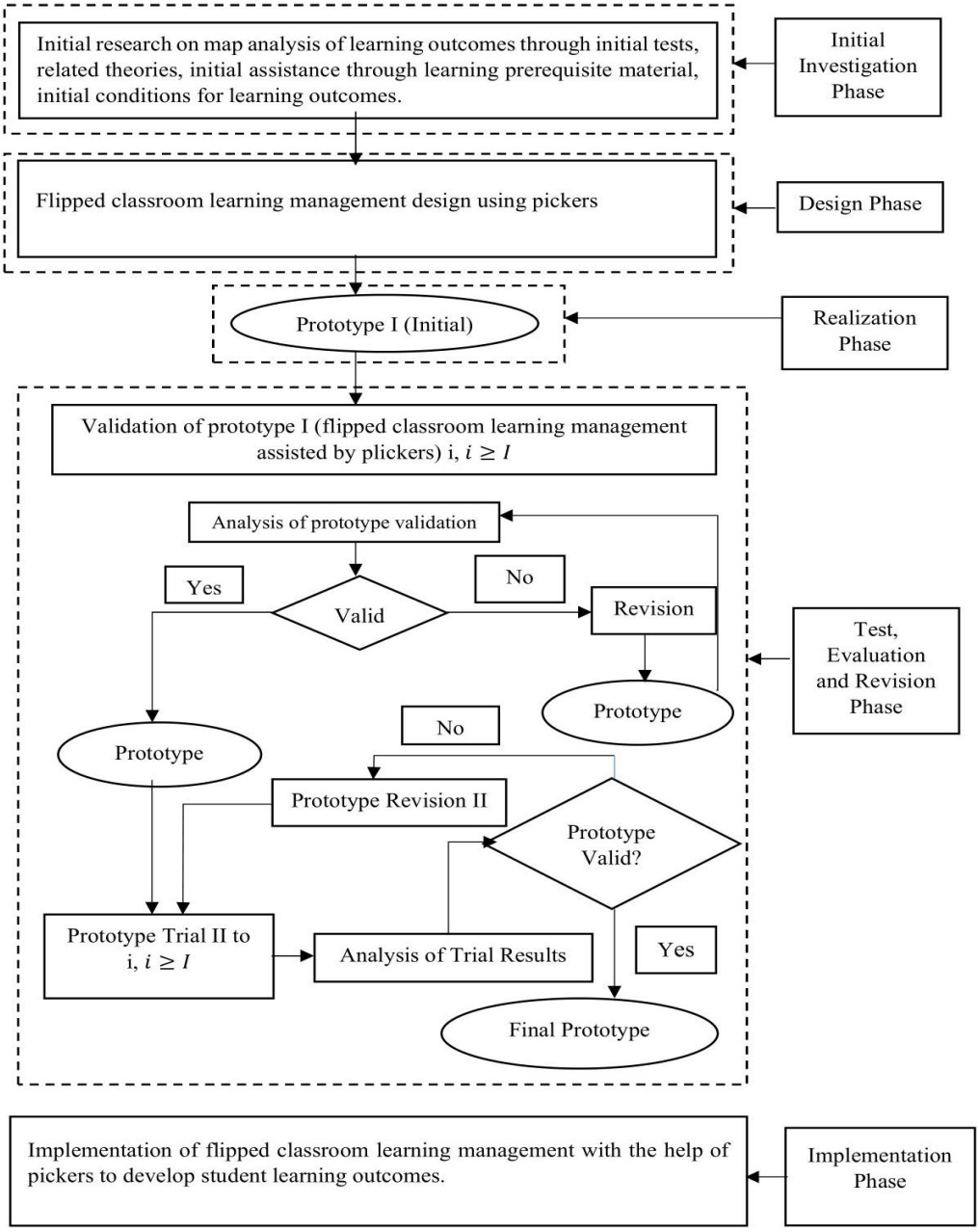

Figure 1. Design Of Flipped Classroom Learning Management Arrangement Assisted By Plickers

This research data is qualitative and quantitative. Meanwhile, the quantitative design used is a Quasi-experimental design, namely a form of experimental design that has a control group but cannot fully function to control external variables that influence the implementation of the experiment. In this Quasi-experimental design research, the researcher used a simple experimental design in which there were two

groups, where one group acted as the control group and the other group acted as the experimental group. In the experimental class, the Flipped Classroom model based on Plicker's assessment was applied, while in the control class, conventional learning was applied. At the end of the lesson, a test was carried out, where the tests carried out in the control class and experimental class were given the same questions. The design of this research is show in Table 1.

Table 1. Pretest And Posttest Control Group Design Research Design

Class	Pre Test	Treatment Stage	Test
Experiment	O_1	X	O_2
Control	O_3	-	O_4

Base on Table 1, posttest scores from the experimental group (O_2) and the control group (O_4). If there is a difference in scores between the two groups, where the score in the experimental group (O_2) is higher than the score in the control group (O_4), then it can be concluded that the treatment given has an influence or is effective on the changes that occur in the dependent variable.

The population in this study were all students in class IV of State Elementary Schools in the Gunung Agung Cluster, Mijen District, Demak Regency for the 2023/2024 academic year. The samples taken were divided into 2 classes, namely Class VI SDN Gempolsongo as the experimental class, and Class VI SDN Bermi as the control class. Data collection techniques are carried out using instruments in the form of tests. Meanwhile, the validity test of the test instrument uses product moment while the reliability test Cronbach's Alpha. The analysis was carried out quantitatively, namely (1) The normality test in this study was carried out using the Ryan-Joiner test; (2) The homogeneity test carried out was Fisher's test; (3) Test the hypothesis in this study using the MANOVA test ; (4) The N-gain test is obtained by comparing the difference between the posttest and pretest scores with the difference between the Ideal Maximum Score (SMI) and the pretest. N-gain in this research is used to see the increase in student learning achievement. The N-gain value is determined by the criteria as show in Table 2.

Table 2. N-Gain Value Criteria

N-Gain Value	Criteria
(G) ≥ 00.70	Tall
(0.30 < (G) < 0.70	Currently
(G) ≤ 0.30	Low

3. RESULT AND DISCUSSION

Result

Assisted flipped classroom learning management Plickers to increase the motivation and learning outcomes of students in grade VI elementary school mathematics begins with conducting a needs analysis by giving questionnaires to students in D4 schools with the results as shown in Table 3.

Table 3. Desired Learning

No	Question	Answer Choices	f	N	%
1	Settings Class	Classroom learning	15	104	14
		Learning outside the classroom	32	104	31
		Outside the classroom/ at home and in the classroom	57	104	55
2	Types of learning resources	Digital	94	104	90
		Textbook	10	104	10
3	Presentation of material	Related to daily life	89	104	86
		Not related to daily life	15	104	14
4	Method	Investigate and discuss	79	104	76
		Lectures and discussions	25	104	24
5	Evaluation	Application	88	104	85
		Manuals	16	104	15

The analysis results show that 98% of students need digital learning resources and want to learn. Based on the Table 3 shows that 98% of students need digital learning resources, this is because they are more interesting. Learning arrangements require mixed learning outside of class and inside class as much

as 55 % compared to learning inside class as much as 14% and outside class 31%. Based on the results of the needs analysis, an assisted flipped classroom learning management design was developed Plickers to increase the motivation and learning outcomes of students in mathematics as show in Figure 2.

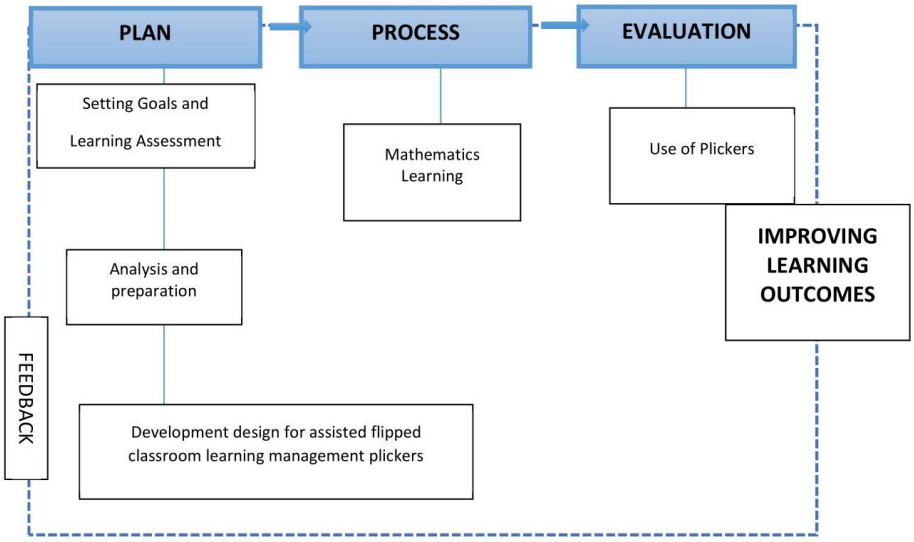

Figure 2. Development Design For Assisted Flipped Classroom Learning Management Plickers

Data was obtained through multiple-choice tests. Table 4 is the average value of the pretest and posttest learning outcomes of students in the experimental class and control class.

Table 4. Learning Results For Control Class And Experimental Class

		Pretest Learning Results		Posttest Learning Results	
		Control Class	**Experimental Class**	**Control Class**	**Experimental Class**
N	Valid	30	31	30	31
	Missing	1	0	1	0
Mean		37.47	42.68	52.43	85.48
Median		40.50	45.00	55.00	82.00
Mode		27	45	45	82
Minimum		9	9	27	64
Maximum		64	64	82	100
Sum		1124	1323	1573	2650

Table 4 of learning outcomes for the control class and experimental class shows that in the control class the average pretest score was 37.47 with a maximum score of 64 and a minimum score of 9. Meanwhile, the average post-test score for Learning Outcomes was 52.43 with a maximum score of 82 and a minimum score of 27. In the experimental class, the average pretest score was 42.68 with a maximum score of 64 and a minimum of 9. Meanwhile, the posttest score for learning outcomes was 85.48 with a maximum score of 100 and a minimum of 64. Based on these results, it shows that the average score The pretest average between the control class and the experimental class tends to be almost the same and there is no significant difference. This indicates that the student's abilities before treatment were almost the same and nothing was striking. This can also be seen in the maximum and minimum values which have almost the same magnitude.

In the posttest score, the learning outcomes of the experimental class were greater than those of the control class, the data obtained also showed differences in the learning outcomes of students on the circle element material. An increase in average learning outcomes can be calculated by subtracting the average post-test score from the pretest. The increase in the average value of the control class was 14.56 while the experimental class was 42.8. Obtaining pretest and posttest data on learning outcomes for both classes is presented in Figure 3.

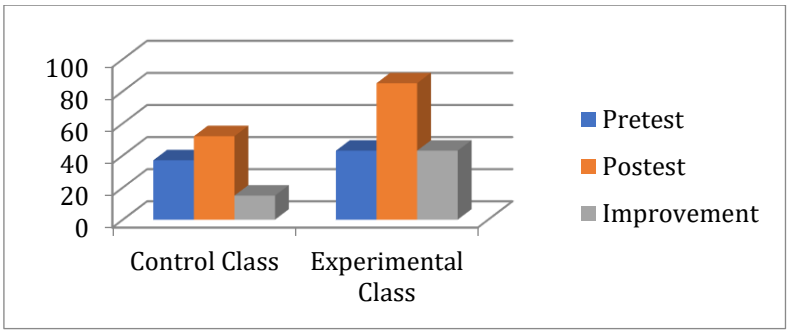

Figure 3. Student Learning Result

The hypothesis can be tested. The analysis prerequisite tests consist of a normality test and a homogeneity test. Testing whether the data in this study is normal or not uses SPSS with a normality test Shapiro-Wilk, this is used because the sample size is <50. The normality test uses the Shapiro-Wilk test, this test is carried out in the experimental class and the control class posttest results with SPSS with sig value. 5%. Normality test results of student learning motivation values and results student learning is as show in Table 5.

Table 5. Normality Test Results

Class		Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistics	df	Sig.	Statistics	df	Sig.
Learning outcomes	Control Class	0.162	30	0.043	0.949	30	0.161
	Experimental Class	0.197	31	0.004	0.880	31	0.102

Based on Table 5, it shows that the calculated sig is > 0.05, so all data is normally distributed, both the control class and the experimental class on learning outcomes. The homogeneity test aims to determine the similarities between two populations. In this research, the homogeneity value was obtained using a homogeneity test with a sig of 0.05. If the calculated sig value is >0.05 then the data is homogeneous, conversely, if the calculated sig value is <0.05. then the data is not homogeneous is show in Table 6.

Table 6. Homogeneity Test Results

Test of Homogeneity of Variance					
		Levene Statistics	df1	df2	Sig.
Learning outcomes	Based on Mean	2.037	1	59	0.159
	Based on Median	1.979	1	59	0.165
	Based on the Median and with adjusted df	1.979	1	58.955	0.165
	Based on trimmed mean	1.970	1	59	0.166

Base on Table 6, in the homogeneity test table used is the table sig value (Based on Mean). The homogeneity test results are the values of the control class and experimental class. The significance value is 0.05, so the learning result value of the sig table (Based on Mean) is 0.159 so the calculated sig > sig table is 0.159 > 0.05. This means that homogeneity testing on student learning outcomes has the same variance or homogeneity. The gain test is carried out in each class, both the control class and the experimental class. The results of the gain test in each class are show in Table 7.

Table 7. N-Gain Test Results For Experimental Class And Control Class

No	Mark	Flipped Classroom	Control Class
1	Mean	73.8	18.5
2	N-Gain	0.738 _	0.185 _
3	Criteria	tall	low
4	N-Gain %	73.8	18.5
5	Interpretation	Quite effective	Ineffective

Based on Table 7, the N - Gain value obtained is 0.738. This means that the experimental class applies flipped classroom has an effect on science and science learning outcomes in the high category because the n-gain value is included in g) ≥ 00.70. The N-Gain% value is 84.263 which is interpreted as a Flipped learning model The classroom is quite effective in improving science and science learning outcomes for elementary school students in Class I V (Y 2) in Gugus Mount Agung, Mijen District, Demak Regency.

The N-Gain value is 0.185, so the N-Gain value is included in g ≥ 0.3. This means that direct (conventional) learning does not affect science learning outcomes because the gain value is in the low category. The N-Gain% value of 18.5 is interpreted to mean that conventional learning models are not effective in improving learning outcomes for elementary school students in Class I V (Y 2) in the Gunung Agung Cluster, Mijen District, Demak Regency.Test the hypothesis this time using the multivariate test (MANOVA) in the SPSS program. The results of the MANOVA test is show in Table 8.

Table 8. Multivariate Test

Multivariate Tests [b]				
Effect		**Value**	**F**	**Sig.**
Intercept	Pillai's Trace	0.994	5.175E3 [a]	0.000
	Wilks' Lambda	0.006	5.175E3 [a]	0.000
	Hotelling's Trace	178.447	5.175E3 [a]	0.000
	Roy's Largest Root	178.447	5.175E3 [a]	0.000
Class	Pillai's Trace	0.837	1.487E2 [a]	0.000
	Wilks' Lambda	0.163	1.487E2 [a]	0.000
	Hotelling's Trace	5.128	1.487E2 [a]	0.000
	Roy's Largest Root	5.128	1.487E2 [a]	0.000

Table 8 explains that the comparison test is taken from the average components of learning motivation and learning outcomes with treatment (experiment and control). There are statistical tests, namely Pillai's Trace, Wilks' Lambda, Hotelling Trace, and Roy's Largest Root. The results of significant treatment by Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root procedures show value The significance is 0.000, where 0.000 < 0.05 then according to the criteria that H_0 is rejected and H_a is accepted the independent variable f lipped classroom shows that there is an influence on the dependent variable (learning outcomes). Tests of between-subjects effects is show in Table 9.

Table 9. Tests of Between-Subjects Effects

Tests of Between-Subjects Effects							
Source	**Dependent Variable**	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Partial Eta Squared**
Corrected Model	Learning outcomes	16653.678 [b]	1	16653.678	95.366	0.000	0.618
Intercept	Learning outcomes	289994.662	1	289994.662	1.661E3	0.000	0.966
Class	Learning outcomes	16653.678	1	16653.678	95.366	0.000	0.618
Error	Learning outcomes	10303.109	59	174.629			
	Learning outcomes	319313,000	61				
Total	**Learning outcomes**	**26956.787**	**60**				

a. R Squared = 0.806 (Adjusted R Squared = 0.803); b. R Squared = 0.618 (Adjusted R Squared = 0.611)

Based on Table 9, the calculation of Tests of between-subjects effects, it shows that the relationship between the flipped classroom learning model and learning outcomes gives an F value of 95.366 with a significance of 0.000 which is significant at the significance level of 0.05 so 0.00<0.05. This means that univariately, the flipped classroom learning model affects learning outcomes. The determinant coefficient R squared shows that the influence of the flipped classroom learning model affects learning outcomes by 0.618 or 61.8%. So, from the research that has been carried out, it can be concluded that the flipped classroom learning model influences student learning outcomes in science learning.

In the control class at SD Negeri Bermi, learning is carried out directly or conventionally, while in the experimental class, namely SD Negeri Gempolsongo, learning is carried out using the flipped classroom. At the initial meeting, each class was given a pretest to determine the initial abilities of the two classes. The

results of the pretest scores are the average results of learning mathematics regarding the elements of circles. The average pretest score for student learning outcomes in the control class was 37.47 and in the experimental class, the pretest score was 42.68. From the pretest learning results, the experimental class and control class have almost the same average value, which shows that both classes have the same initial abilities. The pretest results did not show an influence on student learning outcomes. Posttest learning result score for the control class was 52.43 with an increase in results of 14.56. Meanwhile, in the flipped classroom, the post-test score was 85.48 with an increase in learning outcomes of 42.8. This is because the flipped classroom learning model allows students to learn from learning videos provided by the teacher, so that when studying students do not get bored easily because they only listen to the teacher's explanations. This will make students more trained in analyzing learning and practicing questions related to the subject matter compared to conventional learning models.

Discussion

Flipped Classroom learning model is a learning model that minimizes the amount of direct instruction and maximizes one-on-one interaction. The flipped classroom is a learning model that is part of blended learning- oriented before learning takes place, students receive teaching via online videos so that when class starts students can complete and discuss (Alisha et al., 2019; Hossein-Mohand et al., 2021). Online learning uses the flipped classroom model as an alternative learning model that is appropriate and effective according to researchers. This is reinforced by previous study that the application of the flipped classroom model as an alternative learning model during the pandemic and post -covid-19 pandemic is considered ideal because it can combine internal classroom learning with distance learning at home with the main aim being to maximize achieving learning goals known as study from home or learning from home (Thai et al., 2017). Apart from that, the flipped classroom model has also been proven to have a good influence on learning outcomes based on the results of research conducted by other study the research and statistical tests carried out provide the conclusion that there is an influence of flipped classroom learning on the learning outcomes of integral calculus material for mathematics education students (Fauzi et al., 2022). This effect is caused by the flipped classroom learning process which gives students more time to understand the lesson material and the existence of learning videos which enable students to play them repeatedly if they forget the previous material. In general, flipped classroom learning consists of activities outside the classroom and inside the classroom. These two activities are equally important and must run well to obtain maximum results. Even though it has advantages, implementing flipped classroom learning can also potentially cause several obstacles. The role of educators is very important in overcoming existing obstacles for the successful implementation of flipped classroom learning (Nisa et al., 2023; U. Hasanah et al., 2023).

The hypothesis test using the Manova test in the multivariate test showed that F was 95.366 and the significant value was 0.000, so 0.000 < 0.05 so that H_0 was rejected and Ha was accepted, which means that the flipped classroom learning model showed an influence on the dependent variable (learning outcomes). The magnitude of the influence of the flipped classroom learning model on learning outcomes is 0.618 or 61.8%. The results of the MANOVA test were supported by previous study regarding the effectiveness of implementing the flipped classroom model in improving students' critical thinking skills and the interaction process between students and educators to create good learning conditions, both at home and in the classroom to produce changes for the better, both learning outcomes and cognitive, affective, and psychomotor thinking abilities. In the learning process, the teacher acts as a facilitator, motivator, and evaluator (Aliriad et al., 2023; Aliriad & Da'i, 2023; Satria, Ramadhan, et al., 2023). Good collaboration between teachers and students in the classroom can make learning more lively and meaningful. Apart from that, it can also make teachers more enthusiastic about teaching and motivate colleagues to apply innovative learning models during the online learning period. This research describes the application of learning models that are interesting, innovative, and easy to understand by students by learning theories and learning models, which are used to motivate and increase students' enthusiasm for learning so that learning outcomes can improve. Innovation in learning models must continue to be developed to support the creation of quality learning according to student's needs, especially during the pandemic and post-pandemic that have occurred (Henry Suryo Bintoro & Zuliana, 2015; Sitinjak, 2020). Learning models can help the learning process if they are designed and implemented well so that they can improve school quality and achievement. Apart from that, implementing the flipped classroom learning model can add references in using online learning models during the pandemic and post-pandemic.

During learning which is carried out asynchronously in the form of independent study with parental guidance, students learn using teaching materials and LKPD prepared by the teacher in the form of an attractive display that can be accessed via smartphone, and synchronously students meet virtually face to face with the teacher using the platform zoom meeting as a virtual class to provide understanding

and discussion of material previously studied in asynchronous activities and to develop 21st century skills, namely information and technology literacy. The application of the flipped classroom helps students understand and organize material concepts more interestingly and actively express opinions. So, with the flipped classroom, teachers can become learning facilitators who can carry out more meaningful, varied, creative learning and develop students' skills during the pandemic and post-pandemic. The implementation of the flipped classroom is supported by the use of the Plickers application.

Plickers is an application based on an interactive response system (Interactive Response System) that can be used to send teacher responses from students via mobile devices, computers, and cards by utilizing QR Codes (Michel & Hof, 2013; Rahayu et al., 2018). Plickers are a supporting tool that can be used by teachers to provide assessments and collect data from assessment results in real-time by creating a pleasant atmosphere. This Plickers application makes students play an active role in the learning process because the assessment form is packaged like a game. Plickers make it easy for teachers to provide assessments in the form of multiple-choice and true-false tests using code cards. To be able to utilize Plickers, teachers must download it Plickers via smartphone. Then open the website Plickers .com via laptop so that it can display a Live View of students' questions and answers. The use of this website is combined with the use of an Android or iOS-based smartphone application which works using cards that have been prepared by Plickers, making it easier for students to answer questions given by the teacher by simply lifting the Plickers card (HS Bintoro et al., 2021; Pujiastuti et al., 2020; Supandi et al., 2018). The teacher uses the Plickers application on Android or iOS so that he can scan to correct students' answers, while students simply lift the Plickers card to answer the questions given by the teacher. Here's what the clickers application looks like.

Based on the results of the research and discussion above, show that the Flipped Classroom learning model can improve mathematics learning outcomes regarding circle element material, by the second hypothesis states that there is an influence of the flipped classroom learning model on the learning outcomes of Class VI elementary school students in the Gunung Agung Cluster, Mijen District, Demak Regency. is proven. The flipped classroom model assisted by the Plickers application can increase student participation in learning because it allows more active interaction and direct response through an interactive evaluation system. This can motivate students to be more involved in the learning process, both inside and outside the classroom. However, the use of Plickers and technology-based classroom management requires teachers to have adequate digital skills. For teachers who are not familiar with technology or similar applications, additional training is needed to ensure the implementation of this model runs smoothly.

4. CONCLUSION

Based on the results of the research and discussions that have been carried out, it can be concluded that (1) the flipped classroom learning management design helps Plickers start from planning, process, and evaluation, (2) there is an influence of the Flipped Classroom learning model on learning outcomes for elementary school students in Class VI (Y2) in Gugus Gunung Agung, Mijen District, Demak Regency based on the MANOVA test with a calculated F of 95.366 and a calculated sig of 95.366. 0.000 then 0.000 < 0.05 and the magnitude of the influence of the flipped classroom learning model on learning outcomes is 0.618 or 61.8%. Thus, Flipped Classroom learning management with the help of Plickers assessment is effectively used to improve student learning outcomes.

5. REFERENCES

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