

Application of the Flipped Classroom Model to Improve Mathematics Learning Outcomes

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Abstract. This study has a background of low Mathematics learning outcomes for fifth-grade with a percentage of 37.93% complete and 62.07% incomplete. Meanwhile, the minimum score limit for Mathematics is 75. The purpose of this study is to determine the application of the Flipped Classroom learning model to improve mathematics learning outcomes with the concept of a combined area of flat shapes at Salman Al Farisi Elementary School Bandung in the 2022/2023 academic year. The research procedure uses classroom action research which includes 4 stages, namely planning, implementation, observation, and reflection. The population in this study were all fifth-grade students of SD Salman Al Farisi Bandung. The research sample is class 6D with a total of 24 students. This study consisted of 2 cycles, each cycle 1 meeting. The study conclude of this study is that through the flipped classroom learning model, it shows that the results of learning Mathematics in terms of knowledge seen from the learning outcomes test are 75% in cycle 1 students who get scores above the minimum score and 95.83% in cycle 2 get scores above minimum score. It can be concluded that the application of the flipped classroom model can improve student learning outcomes.

Keywords: Flipped classroom, learning outcomes, elementary school.

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INTRODUCTION

Currently, we have all gone through the Covid-19 pandemic, which has changed many things, including the field of education. During the Covid-19 pandemic, teachers and students were forced to carry out distance learning (Pratama et al., 2020). This also has a significant impact, especially regarding the absorption of learning (learning loss) both in terms of knowledge and skills (Donnelly & Patrinos, 2021). In Indonesia, the distance learning system still has problems with various limitations in terms of infrastructure, with separate distances between teachers and students (Warsihna et al., 2021).

Based on observations and interviews, some problems that arise especially in learning Mathematics at SD Salman Al Farisi grade 6, including the lack of student motivation in learning Mathematics. Then, teaching methods are still monotonous, and students are still not adapted to full face-to-face learning. In addition, the allocation of time at school for learning mathematics is still relatively lacking, after entering the study.

The thing that is the root of the problem is the decline in learning ability which is still below the minimum completeness criteria. The mastery learning is 75. Things that affect the root of the problem include changes in the learning system which changed again after the Covid-19 pandemic caused these problems. Students also need adjustments to the way of learning that returns to full face-to-face at schools where previously students were used to PJJ or online learning systems. In addition, teachers also need to present effective and innovative learning.

Mathematics is one of the subjects that is considered difficult, especially for students. The thing that becomes difficult is the formulas and calculations which are difficult to understand. Of course the teacher has tried to present effective learning but has limitations in time allocation. Based on this, the researcher thinks that it is difficult to teach Mathematics with limited time.

One solution to this problem is to do learning that combines online and offline learning or Flipped Classroom. The Flipped Classroom model was developed by Bergmann & Sams (2012). There are three stages of the flipped classroom model, namely the session outside the class, the session in the class, and the session after class.

This learning model is one of the solutions suggested by Fauzi et al. (2020) which suggests that one of the suggestions for overcoming this difficulty is to hold a mixed learning (flipped classroom) in learning Mathematics. The advantages of the Flipped Classroom model include that the flipped classroom is a teacher's strategy by reducing the number of instructions directly in the learning process. This strategy utilizes teaching materials that have been provided by the teacher which is given to students to study at home before participating in class learning on the next material (Johnson, 2013).

Therefore, in this study, it is necessary to carry out classroom action in the form of a flipped classroom model that can improve mathematics learning outcomes for sixth-grade students of Salman Al Farisi Elementary School. The expected result of this PTK is an increase in Mathematics learning outcomes through the implementation of flipped classrooms.

METHOD

The method used in this research is a classroom action research method (CAR). CAR is a teacher's effort to improve the learning process. The purpose of CAR is to find out the efforts made in improving learning outcomes, overcoming improvements in the learning process (Arikunto, 2021). CAR consists of several cycles. Each cycle consists of four stages, namely planning, action, observation, and reflection. In CAR, two cycles were carried out. The sample in the study was sixth-grade students at Salman Al Farisi Elementary School in semester I of the 2022/2023 school year, a total of 24 students.

Experiment Procedural

Researchers used the Kemmis and Mc Taggart spiral model with several stages in each cycle, namely planning, action, observation, and reflection. The planning stage will be carried out again if there are problems that have not been resolved in the previous cycle. Data collection techniques are used for research data which include 1) tests, 2) observations, 3) interviews, and 4) documentation or field notes. Implementation of learning using the application of the Flipped classroom model on the material measuring the combined area of class V SD. The tests conducted in this study were to determine student learning outcomes after planning.

Analyze of Data

Data analysis techniques in this PTK are quantitative data and qualitative data. Quantitative data is in the form of test data on student learning outcomes after participating in learning using the Flipped Classroom model and qualitative data in the form of observational data. Acquiring the value of learning before the action with after the action. Data was calculated using the following steps: a. calculating the value of learning outcomes cycle I and cycle II. b. calculate the average value in cycle I and cycle II. The average value was calculated by a formula (Sudjana, 2010):

$$x = \frac{X}{N}$$

Description: x = mean

X = total score

N = total student

To find out the percentage of student learning completeness by using the percentage calculation as follows:

$$\text{completeness percentage} = \frac{\text{total students of complete}}{\text{total students}} \times 100\%$$

Action success criteria

In the characteristics of successful CAR, it is marked by a change to improvement, this is related to the atmosphere of learning and learning. The indicator of success in this study is called successful if 80% or more of the students participating in the lesson have achieved minimal mastery.

RESULTS

Salman Al Farisi Elementary School is one of the elementary schools in the city of Bandung. The following are the results of research from these two cycles of CAR. Based on the results of the second cycle of learning tests, students have achieved indicators of success in this study. This can be seen from the increase in the average value of students from cycle 72.23 to 89.45. While the percentage of completeness of student learning outcomes increased from 75% in the first cycle to 95.83% at the end of the second cycle. Learning outcomes data can be seen in Table 1 below:

Table 1. Learning Outcome Data Hasil

Aspect	Total of students Pre cycle	Total students Cycle I	Total of students Cycle II
Complete	11	18	23
Uncomplete	18	6	1
Percentage of completeness	37,93%	75%	95,83%
Average	60,47	72,23	89,45

DISCUSSION

The results of this CAR by applying the Flipped Classroom model to learning Mathematics for sixth-grade Salman Al Farisi Elementary School show that it can improve student learning outcomes. Based on the data obtained and analyzed it can be said that the learning process has achieved the expected goals.

This research expected that teachers can provide strategies in presenting learning so that it can be more effective in line with what was stated by Johnson (2013) that teachers can provide teaching materials to students before learning in class so that students can study them before learning to meet the teacher.

CONCLUSION

Based on the results and discussion, it can be concluded that learning Mathematics through the application of the Flipped Classroom model on the discussion of the combined area of flat shapes can improve the learning outcomes of sixth-grade students at Salman Al Farisi Elementary School. This is shown by the fact that it is seen from the learning outcomes test that is 75% in cycle I of students who score above the minimum score and 95.83% in cycle II score above the minimum score.

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