

The Effectiveness of the Flipped Classroom Learning Model on Improving Learning Outcomes in 4th Grade Elementary Students of IPAS Subjects at SDN Mayong Jepara

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DOI: <https://doi.org/10.52403/ijrr.20230948>

ABSTRACT

This study is experimental research with the aim to determine the effectiveness of flipped classroom learning on the learning outcomes of IPAS subjects for fourth grade elementary school students in Mayong Jepara. The sample used in this study totalled 50 students, of which 25 students from SDN 1 Kuanyar as the experimental class and 25 students from SDN 1 Sengonbugel as the control class. The data collection technique used was a test instrument to both class groups that produced data on student learning outcomes. The data was analysed using the independent sample t-test by looking at the results of Sig. (2-tailed) 0.013 < 0.05 and the increase in the mean score where the learning outcomes in the Experiment class had an average value of 84.28 while in the control class had an average value of 79.08, the experimental class results had a higher mean score than the control class. So it can be concluded that the test results show the effectiveness of the use of flipped classroom learning on student learning outcomes.

Keywords: Learning, Experiment, Flipped Classroom, Outcome, Control.

INTRODUCTION

The Covid-19 pandemic that has hit various parts of the world including Indonesia has affected the daily activity patterns of the general public. The effects of this force

everyone to adjust to new habits, including in educational activities, especially the teaching and learning process at school. Educational activities that are generally carried out in schools with face-to-face meetings have turned into learning from home with distance learning (PJJ) due to the social restrictions of the effects of the Covid-19 pandemic. Distance learning (PJJ) during the Covid-19 pandemic is carried out online or online from home with parental guidance in accordance with Circular Letter Number 4 of 2020 issued by the Minister of Education and Culture of the Republic of Indonesia on 24 March 2020 regarding the Implementation of Education Policies during the Covid-19 Spread Emergency Period, which explains that the learning process is carried out at home through online or distance learning as an effort to provide meaningful learning experiences for students. Learning from home can be focused on life skills education, among others, regarding the Covid-19 pandemic. Over time the Covid-19 rate in Indonesia has decreased. In the 2022/2023 academic year, Jepara district itself has implemented 100% face-to-face learning (PTM) in accordance with the direction of the Ministry of Education and Research which encourages the implementation of 100% face-to-face learning (PTM) while taking

into account the Joint Decree (SKB) of the Minister of Education, Research and Technology (Mendikbudristek), Minister of Religion, Minister of Home Affairs, and Minister of Health. This is in line with the news published on the website ditpsd.kemdikbud.go.id with the title "Kemendikbudristek Encourages 100% PTM in the 2022-2023 Academic Year" in the news contains a statement from the Director of Primary Schools at Kemendikbudristek, Dr Muhammad Hasbi in the SMB webinar: Restoring Education Through Face-to-Face Learning which aired on the Ministry of Education and Culture's Youtube channel on 14 July 2022.

Based on observations through unstructured oral interviews with grade 4 elementary school teachers at elementary schools in Jepara district, namely SDN 1 Kuanyar Jepara. Researchers obtained information that learning activities have not been maximised in face-to-face learning (PTM) 100% after the covid-19 pandemic. The ability of students to understand lessons is still lacking due to the lack of literacy of students on subject matter, one of which is IPAS (Natural and Social Sciences). Learning motivation and students' desire to learn are reduced, this is because the learning system during the co-19 pandemic two years ago was quite low and not optimal in achieving learning outcomes and objectives. There is a need for an innovative and appropriate learning model to be able to motivate students in accordance with the conditions of face-to-face learning (PTM) after the Covid-19 pandemic, which can reduce learning loss caused by learning during the Covid-19 pandemic. Limited number of student book facilities in grade 4 when there is a new curriculum, namely the independent curriculum.

Considering this, teachers need to determine the right learning model, which not only affects learning outcomes, but can also affect scientific literacy and learning motivation, to realise students' concept mastery of the material that has been given

and be able to reduce learning loss after the Covid-19 pandemic.

Based on the results of the preliminary study, an effort is needed to overcome it, including finding and finding a learning model to be applied in learning. The selected learning model is a learning model that provides opportunities for students to construct their own knowledge so that students are easier to understand concepts where the teacher provides learning materials in advance to study independently before doing learning in the classroom together with the teacher, with the active role of students to support the effectiveness of the learning process, namely the Flipped Classroom learning model. Because this learning model is centred on students who can test students' creative attitudes, responsibilities, and learning skills to increase learning motivation, science literacy and student learning outcomes and reduce learning loss after the Covid-19 Pandemic. (Zamzami & Hajar, 2015) noted that Flipped classroom is an element of Blended learning, which integrates face-to-face learning in the classroom through group discussions and distance learning outside the classroom by watching asynchronous video lessons and online collaboration. According to (Johnson, 2013) Flipped classroom is a strategy provided by educators by minimising the amount of direct interaction in their teaching practice while maximising interaction with each other. In contrast, (Ahmet Basal, 2015) states that the flipped classroom is a learning method where students learn theory on their own by applying previously learned theory through learning media. So it can be concluded that flipped classroom is a learning strategy that is oriented towards students' learning where students' activities and learning achievements become the centre of attention in learning. based on the explanation above, researchers have an interest in obtaining evidence related to the effectiveness of flipped classroom learning on the learning outcomes of IPAS subjects in Grade IV Elementary School in

Mayong Jepara. the purpose is to find out whether the learning outcomes of IPAS using the flipped classroom learning model are better than the learning outcomes of ipas with conventional learning.

MATERIALS & METHODS

This research is a quasi-experimental design, which is an experiment that has a control group but cannot fully function to control external variables that have the implementation of experiments (Sugiyono, 2017). In this study with two sample groups, the experimental group was given special treatment, namely the learning process by applying the Flipped Classroom learning model, while the control group was given a conventional learning model or lecture. The research variables consist of independent variables in the form of learning with the Flipped Classroom learning model and the dependent variable in the form of learning outcomes.

The population in this study were all fourth-grade students at SDN 1 Kuanyar Jepara and SDN 1 Sengonbugel Jepara in the 2022/2023 school year. The sample taken in this study consisted of two classes, namely class IV SDN 1 Kuanyar Jepara (25 people) as an experimental class that applied the Flipped Classroom model and class IV SDN 1 Sengonbugel Jepara (25 people) as a control class that was applied using a conventional model or lecture. Inform briefly about the materials and methods used in the research, including the subjects/materials studied, tools used, experimental design or design used, sampling techniques, variables to be measured, data collection techniques, analysis and statistical models used.

The instrument used in this study is a multiple-choice IPAS learning outcomes test. Before being used, this instrument has gone through a validity and reliability test process, where the validity test uses the

product moment correlation coefficient while the reliability test uses the Cronbach Alpha formula so that a valid and reliable instrument is obtained. According to Khumaedi (2012: 26) reliability is a coefficient that shows the extent to which a tool or measuring instrument can be trusted, meaning that if a tool is used repeatedly to measure the same object, the results are relatively stable or consistent.

The data analysis of this study used independent sample t-test with prerequisite tests, namely normality test and homogeneity test. The normality test used the Kolmogorov-Smirnov test which found that the data on students' IPAS mathematics learning outcomes were normal. While the homogeneity test uses the Levene test which is obtained that the data of students' mathematics learning outcomes are homogeneous.

RESULT AND DISCUSSION

Before conducting research, the instrument must be tested for the validity of the instrument first. Items or question items used as data collection instruments must first be tested for validity and reliability to determine whether the test questions made are valid and reliable so that they can be used as research data collection instruments. The number of items that researchers made to obtain data on student learning outcomes was 20 items using a Likert scale of 4 choices (Option) answers for each item and data on learning outcomes and science literacy skills were 20 multiple choice questions. Test instruments and questionnaires before researchers distributed to experimental and control class students were first tested first on 25 people. The test results were analysed using the Product Moment formula. The results of the product moment test of student learning outcomes data can be seen in table 1 as follows

Table 1. Student Learning Outcomes Validity Test Results.

No	Pearson Corelation	r table (N=25)	Taraf Signifikansi 5%	Information
1.	0,531		0,396	Valid
2.	0,420		0,396	Valid

3.	0,572	0,396	Valid
4.	0,344	0,396	Invalid
5.	0,796	0,396	Valid
6.	0,075	0,396	Invalid
7.	0,766	0,396	Valid
8.	0,517	0,396	Valid
9.	0,157	0,396	Invalid
10.	0,470	0,396	Valid
11.	0,653	0,396	Valid
12.	0,649	0,396	Valid
13.	0,511	0,396	Valid
14.	0,095	0,396	Invalid
15.	0,531	0,396	Valid
16.	0,573	0,396	Valid
17.	0,766	0,396	Valid
18.	0,470	0,396	Valid
19.	0,668	0,396	Valid
20.	0,816	0,396	Valid

(Source: Researcher Data, 2023)

Based on Table 1, it can be concluded that the result of $r_{hitung} > r_{tabel} = 0.396$ with an $\alpha = 0.05$ value. So that in the study it was found that there were 4 invalid items, namely statement numbers 4, 6, 9, and 14. If there are invalid instrument statement items, they must be discarded or not used in research. So that valid items are suitable for use as instruments in research.

After testing the validity of the questions, then the questions were tested for reliability using Cronbach's alpha. The results of the reliability test can be seen in table 2 as follows:

Table 2. Reliability Data Results of Student Learning Outcomes Questions

Reliability Statistics	
Cronbach's Alpha	N of Items
.853	16

(Source: Researcher Data, 2023)

Based on the results of the reliability test calculation in table 2, it shows that the valid question items have a reliability index of 0.853. Based on Cronbach' alpha statistical testing, the instrument is said to be reliable for measuring variables if it has an alpha value greater than 0.60 ($\alpha > 0.60$). So based on the reliability test of these questions, the value is 0.853, which means that the items are declared reliable and can be used as a tool to measure learning outcomes.

After being tested for validity and reliability, the instrument was then carried out research on the experimental class, namely SDN 1 Kuanyar Jepara and the control class, namely SDN 1 Sengonbugel

Jepara by giving pretest and posttest tests. Student learning outcomes with the results of tests conducted after attending as much learning. The test results are shown in table 3.

Table 3. Student Learning Outcomes Experiment Control

Class	X	Xmin	Xmax	SD
Eksperiment	84.28	73	93	6.943
Control	79.08	63	90	12.039

(Source: Researcher Data, 2023)

Based on the data in Table 3, it can be seen that the average IPAS learning outcomes in the flipped classroom class are higher than those in the conventional class. However, none of the students obtained a perfect score. If you pay attention to the standard deviation value, the value in the control class is more diverse than the experimental class. Based on this explanation, it can be stated that the experimental class has better student learning outcomes than the control class.

To determine whether the average difference between the two classes is significant or not, it is necessary to conduct a statistical test. Before determining the type of test used, a prerequisite test was first carried out, namely the normality test and homogeneity test on the data of students' IPAS learning outcomes. The results of the normality test of learning outcomes data using the Kolmogorov-Smirnov test can be seen in table 4 below:

Table 4. Normality Test Results of Student Learning Outcomes

		Tests of Normality		
		Kolmogorov-Smirnov ^a		
		Statistic	Df	Sig.
Result	Pre_EksHB	.126	25	.200*
	Post_EksHB	.155	25	.123
	Pre_KonHB	.106	25	.200*
	Post_KonHB	.147	25	.171
(Source: Researcher Data, 2023)				

Based on the normality test in table 4 above, it is known that the research data is normally distributed, where the results of

the normality test calculation using Kolmogorov-Smirnov, have a Sig. (2-tailed) $> \alpha$ (0.05), namely the experimental class pretest of 0.200, the experimental class posttest of 0.123, the control class pretest of 0.200 and the control class posttest of 0.171. Because the class data is normally distributed, it can be continued with homogeneity testing. The homogeneity test results can be seen in table 5 as follows:

Table 5. Homogeneity Test Results of Student Learning Outcomes

Test of Homogeneity of Variance					
		Levene Statistic	df1	df2	Sig.
Result_Learning	Based on Mean	3.370	1	48	.073
	Based on Median	2.573	1	48	.115
	Based on Median and with adjusted df	2.573	1	47.343	.115
	Based on trimmed mean	3.294	1	48	.076

Based on table 5 above, it is known that the results of sig Based on Mean $0.073 > 0.05$, so it can be concluded that the data variants of the Experiment Posttest and Control Posttest classes are the same or homogeneous, thus one of the requirements of the independent sample t-test test is met. Based on the results of the normality and homogeneity tests above, the student learning outcomes data have met the prerequisite test assumptions so that hypothesis testing can be continued for the independent sample t-test. The research hypothesis is as follows:

Ho : Students' IPAS learning outcomes with flipped classroom learning are not better/ineffective than students' mathematics learning outcomes with conventional learning.

Ha : Students' mathematics learning outcomes with flipped classroom learning are better/effective than students' mathematics learning outcomes with conventional learning.

The hypothesis was tested using the independent sample t test using SPSS assistance resulting in the following results:

Table 6. Hypothesis Test Results with Independent Sample t Test

		Independent Samples Test				
		F	Sig.	t	Df	Sig. (2-tailed)
Result_Learning	Equal variances assumed	.036	.851	2.592	48	.013
	Equal variances not assumed			2.592	47.917	.013

(Source: Researcher Data, 2023)

Based on table 6 above, it is known that the results of Sig. (2-tailed) $0.013 < 0.05$, so it can be concluded that Ho is rejected and Ha is accepted, so that the data on learning outcomes using the flipped classroom model is more effective than those using conventional methods. This is in line with the results of research conducted by Kadek Ayu Mutiara Pratiwi (2021), that the data analysed using the right-side independent sample t-test with a significance level of 5%

shows tcount \leq ttable so that H0 is rejected and Ha is accepted. This means that students' mathematics learning outcomes with flipped classroom learning are better than students' mathematics learning outcomes with conventional learning. This finding shows the effectiveness of using flipped classroom learning on mathematics learning outcomes during the Covid-19 pandemic.

The IPAS learning outcomes of students in the experimental group were higher than those in the control group because the experimental class used the characteristics of flipped classroom learning. This is in line with the opinion of Nofrion in Pebriyanti et al., (2020) which states that the advantage of flipped classroom learning is that it is able to prepare students so that they have prior knowledge before starting learning in the classroom.

Based on this decision, there is a difference and obstacles that can be seen during the research. Teachers and students are not used to implementing the Flipped Classroom learning model, so when teachers ask students to use the Flipped Classroom learning model, students feel unfamiliar with it. The solution given to this obstacle is, students as researchers always direct students in the use of the Flipped Classroom learning model, in every lesson. Coordinate with the teacher about the stages of using the Flipped Classroom learning model, so that it is in accordance with the learning methods used. The teacher's position in flipped classroom learning is as a facilitator and mediator for students. This is in line with Purwitha's research (2020) which explains that flipped classroom learning activities in the classroom are fully filled with discussion activities that require student participation in forming perfect knowledge, so the presence of teachers in the classroom is only a facilitator.

Based on theoretical and operational considerations, the implications of this research when viewed from the understanding of learning according to constructivism is the activity of students building their own knowledge. Students must gain experience hypothesising, searching for answers, imagining and discovering in an effort to develop new constructions, so that the achievement of learning outcomes is better. So the learning model that can accommodate the achievement of better learning outcomes is the Flipped Classroom learning model in IPAS subjects. Ahmad Mubarak (2017) in

his proceedings explained that efforts to increase student motivation, apart from being intrinsic to students, teachers must also strive from outside students (extrinsic), one of which is through the application of the flipped classroom learning model so that students feel more enthusiastic and enthusiastic in participating in class learning because the flipped classroom facilitates students to learn in the way they consider easy and makes it easy for teachers to deliver learning materials.

Flipped classroom learning was conducted for 4 meetings where 2 meetings for the experimental class and 2 meetings for the control class. Before learning, the researchers distributed pre-test questions first to test students' abilities before getting lessons from researchers. After going through the learning process, a test was conducted, namely distributing post-tests to the experimental and control groups, so as to obtain data on student learning outcomes. The implication of the flipped classroom learning process is the increase in student learning outcomes compared to conventional learning.

Some studies that produce similar results include Pebriyanti et al, (2020) that there are differences in mathematics learning outcomes between students taught with a flipped classroom strategy and students taught with conventional learning strategies, Igrisa's research, (2017) which resulted in mathematics learning outcomes between students who followed the flipped learning model higher than students who followed the direct learning model and research from Rahmah & Ikashaum, (2021) which resulted in the flipped classroom model making a significant contribution in improving students' mathematics learning outcomes during the covid-19 pandemic. This shows that flipped classroom learning has advantages over conventional learning. In addition, flipped classroom learning using e-learning media can also improve student learning outcomes due to its effectiveness. The implementation of flipped classroom learning went well, and received positive

responses from teachers and students. Students also look enthusiastic in flipped classroom learning characterised by students' activeness in discussion, students' ability to express opinions, and competing in discussing practice questions.

This research is also linear with the research of Marfi Ario (2018), that the results of research and statistical tests conducted provide the conclusion that there is an effect of flipped classroom learning on the learning outcomes of integral calculus material of mathematics education students. This influence is caused by the flipped classroom learning process that gives students longer time to understand the subject matter and the existence of learning videos that allow students to play them repeatedly if they forget the past material. In general, flipped classroom learning consists of out-of-class and in-class activities. Both activities are equally important and must run well to get maximum results.

CONCLUSION

Based on the hypothesis testing and discussion previously described, it is found that the learning outcomes of students who learn with flipped classroom learning are better than the mathematics learning outcomes of students who learn with conventional learning. This proves that flipped classroom learning has a positive influence on the IPAS learning outcomes of primary school students in Mayong Jepara.

Declaration by Authors

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

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How to cite this article: Lutfi Izurrohman, Ngurah Made Darma Putra, Agus Wahyudin. The effectiveness of the flipped classroom learning model on improving learning outcomes in 4th grade elementary students of IPAS subjects at SDN Mayong Jepara. *International Journal of Research and Review*. 2023; 10(9): 475-482. DOI: [10.52403/ijrr.20230948](https://doi.org/10.52403/ijrr.20230948)
