

# The Influence Of Learning Models And Motivation On Learning Outcomes In Elementary School Mathematics

Lenny Gusti Anggraini<sup>1</sup>, Asmin<sup>2</sup>, Mulyono<sup>3</sup>

{Lenigusti285@gmail.com<sup>1</sup>}

Postgraduate program of elementary education, Universitas Negeri Medan, Indonesia <sup>1,2,3</sup>

**Abstract.** The Covid 19 period made student learning outcome invisible. Particularly in learning Mathematics class V. So the research was conducted analyze: 1)The effect of learning models student learning outcomes; 2)The effect of motivation on learning outcomes; 3)The interaction between learning models and motivation student learning outcomes. This type quasi-experimental research with factorial design (2x2). The sample in the study ClassV students SDN 060911 Medan Denai was 85 student. Data was collected through learning achievement test and motivatio questionnaires. The results showed: HypothesisI was obtained ( $F_{count}=44.90 > F_{table}=3.96$ ) then  $H_0$  is rejected and  $H_1$  was accepted. Interpreted there is influence of the PjBL model on student learning outcomes. HypothesisII is obtained ( $F_{count}=7.46 > F_{table}=3.96$ ) then  $H_0$  is rejected and  $H_1$  is accepted. This means there is influence of motivation on the learning outcomes of students. HypothesisIII is obtained ( $F_{count}=4.11 > F_{table}=3.96$ ) then  $H_0$  is rejected and  $H_1$  is accepted. It was concluded there a significant interaction between learning models and motivation on student learning outcomes.

**Keywords:** Learning Model, Motivation, Learning Outcomes of Mathematics.

## 1 Introduction

The learning model is a whole series of presentation of teaching material which includes all aspects before and after the learning process carried out by the teacher and all related facilities that are used directly or indirectly in the teaching and learning process. The learning model that will be carried out in this study is the project-based learning model and the direct learning model. Project-based learning is a model that organizes learning around projects, in the form of complex tasks that involve students in designing problem-solving based on challenging questions. Project assignments provide opportunities for students to work relatively independently over long periods of time to carry out investigative activities and culminate in a realistic product or presentation [1]. The direct learning model according to the Ministry of National Education is defined as a learning model in which the teacher transforms information or skills directly to students, learning is goal-oriented and structured by the teacher [2]. The implementation of project based learning (PjBL) is one of the priority programs in the independent curriculum which offers relevant and interactive learning. The PjBL learning

model is also part of the newest curriculum, namely the independent curriculum. Where is the project to strengthen the achievement of the Pancasila Student Profile (P5) determined by the government and shown as a product at the end of the learning semester in a school. The steps in learning with the Project Based Learning model students will be given problems at an early stage, then make project designs, arrange schedules to monitor project progress, assess results and carry out experience evaluations. Students do not only learn in theory, but students also learn practically in real life. So that students can find the necessary information and get experiences that will always be remembered in learning.

### 1.1 Problems Found in the Research

In Indonesia from 2019 to 2021 it was attacked by an outbreak of the corona virus which is commonly called covid-19 (corona virus disease-19). Not only in Indonesia. However, the whole world was attacked by the covid-19 virus which resulted in tens of thousands of people being exposed to the co-19 virus, even thousands of people have become victims of the co-19 virus death. Therefore the government implemented restrictions on community activities (PPKM) with the aim of breaking the chain of transmission of the Covid-19 virus which enforces WFH (Work From Home) for workers throughout Indonesia. Especially for Education in Indonesia. That is, Education is no longer from school. However Education from home

Results of interviews and observations of one of the teachers in class V SD Negeri 060911 Medan Denai. During online, offline and home visit learning activities, the teacher applies direct learning that is teacher centered. That the teacher only used the textbook from the school and gave practice questions came from the textbook. In the learning process the teacher only explains briefly and provides material. While students only listen, receive formulas, do practice questions and then send them via the WhatsApp group or practice questions are collected during the learning process with an offline system or home visit. That is, the teacher places himself as the only source of information without involving students in constructing knowledge.

Such conditions affect learning outcomes which are still relatively low in Mathematics. Obtained data on the results of the odd midterm exam scores which can be seen in table 1 below:

**Table 1.** Data on Middle Semester Mathematics Test Score Result in Class V SD Negeri 060911 Medan City Denai.

No	KKM	Class		Number of Students	Percentage	Information
		V <sub>A</sub>	V <sub>B</sub>			
1.	> 65	15	13	28	33%	Complete
2.	< 65	27	30	57	67%	Not finished
Amount		42	43	85	100%	

Based on the table above, the results of the midterm exam obtained data which stated that out of 85 students who met the minimum completeness (KKM), 28 were students. Meanwhile, 57

other students did not meet the minimum completeness criteria (KKM). This means that 67% of the 85 students did not meet the minimum completeness criteria (KKM) and only 33% of students met the minimum completeness criteria (KKM).

Therefore the purpose of this study is to find out and analyze the extent to which the influence of the learning model and motivation has on learning outcomes after the pandemic with a system of dividing the days in the learning process. Project based learning is also highly recommended to be implemented in the implementation of the Independent Curriculum which is a post-pandemic education solution, with the aim that students have more valuable experiences, can be critical in learning activities and make students more active so that students are motivated in the learning process. Directly learning outcomes or student achievement increases

## 2 Method

This research is a quantitative research, where the specifications are systematic, planned and clear from the beginning to the research design. Quantitative research is inductive, objective and scientific where the data obtained is in the form of numbers and analyzed by statistical analysis [3]. In addition, this study used a quasi experiment. The experimental design has a control group, but cannot fully function to control external variables that affect the implementation of the experiment. The research design used the Nonequivalent Control Group Design in which this study involved two groups. The experimental group and the control group were not randomly selected, each group was given a pre-test. The two groups received different treatment, in which the experimental group used a project-based learning model and the control group used a direct instruction model and ended with a final test for each group. The design used in this research is a factorial design (2x2) and as a moderator variable on initial knowledge. The design of this research can be described in table 2 as follows:

**Table 2.** 2x2 Research Design.

<b>Learning Motivation</b>	<b>PjBL Model (A<sub>1</sub>)</b>	<b>DI Models (A<sub>2</sub>)</b>
Tall (B <sub>1</sub> )	A <sub>1</sub> B <sub>1</sub>	A <sub>2</sub> B <sub>1</sub>
Low (B <sub>2</sub> )	A <sub>1</sub> B <sub>2</sub>	A <sub>2</sub> B <sub>2</sub>

Population is the entire object of research or all objects of groups of people or objects that live together in one place and become the target of conclusions from the final results of a study [4]. So, the population in this study was all class V SD N 060911 Medan Denai T/A 2021/2022 which consisted of two classes with a total of 85 students. The class chosen as the sample is the VA class as the experimental class with 42 students and the VB class as the control class with 43 students.

Sampling is the process of selecting a number of individuals for research so that these individuals become representatives of a larger group. However, according to Suharsimi Arikunto, [5] if the population is below 100, then all the samples taken are. However, if the study population is more than 100, the sample can be taken between 10-15%, 20-25% or more.

Based on the sentence above, the number of respondents in the study was less than 100, so all respondents became samples for research in class V SDN 060911 Medan Denai, which consisted of two classes whose number of students could be seen in table 3 below:

**Table 3.** Research Sample.

Class	Student
V <sub>A</sub>	42
V <sub>B</sub>	43
amount	85

Data collection techniques are the most important step in research, so the main objective of this study is to obtain research data. Without knowing data collection techniques, researchers will not get data that meets the established data standards. The data collection technique used in this research is to use a test in the form of an essay for learning outcomes and use a questionnaire for learning motivation

### 3 Result and Discussion

The following is a description of the research data carried out in class V SD Negeri 060911 Medan Denai. The results of the research are in the form of the average learning achievement test based on the learning model, the average learning test results based on the learning motivation of students in learning mathematics on geometric material. The research data obtained on the results of student learning outcomes tests in the experimental class and control class are the average value, the highest value (Max), the lowest value (Min), Standard deviation (S), Variance (S<sup>2</sup>) which can be seen in the table. Table 6 below:

**Table 4.** Average Learning Outcomes Based on Learning Model.

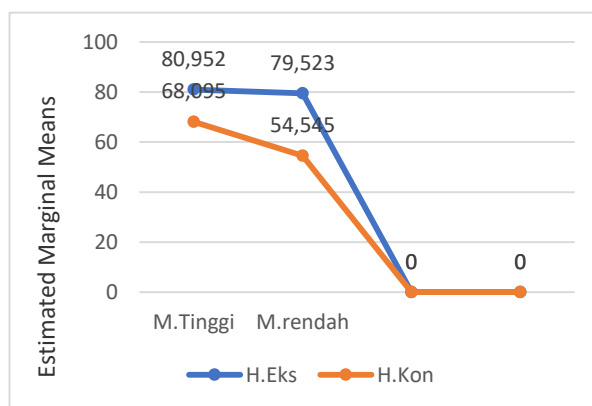
Treatment Class	N	Average	Max	Min	S	S <sup>2</sup>
Experiment	42	81,42	100	50	12,01	14,79
Control	43	60,46	90	30	14,79	218,82

Based on the presentation of Table 6 above, it can be seen that the average learning achievement test is based on the learning model used in both classes, namely the experimental class obtained an average of 81.42 and the control class obtained an average of 60.46. This states that the learning model used in learning affects the competency of student learning outcomes, especially in mathematics subject matter of geometric shapes. Furthermore, hypothesis testing is carried out which aims to see the results of the treatment given to the samples in the study. This hypothesis is carried out after knowing the learning outcomes test. Hypotheses 1, 2, 3 using the two-way Anava test can be seen in the following summary table 7:

**Table 5.** Summary of Hypothesis Test Results with Test (Two Way ANOVA).

Sources of Variance	db	JK	RJK	F-hitung	F-tabel
Between Columns (A)	1	9545,68	9545,68	58,39	3,96
Between Rows (B)	1	167,44	167,44	8,44	
Interaction (AB)	1	42,56	42,56	527,31	
Between Columns A and B	3	9755,68	3251,89		
In Group	81	15401,95	190,14		
amount	84	3913,31			

The results of the above calculations use the two-way Anava test. **In Hypothesis I**, Fcount is 58.39 and Ftable is 3.96, because (Fcount>Ftable) then H0 is rejected and H1 is accepted. In this way it can be interpreted that there is an influence of the PjBL learning model on student learning outcomes from the direct instruction learning model. One party test;  $t_0(A) = \sqrt{58.39} = 7.64 > t_{table} = t(0.05;81) = 1.29$ ; H0 is rejected or the mathematics learning outcomes of students who are taught with a project based learning learning model are higher than students who are taught with a direct instruction model. **Hypothesis II**, in testing hypothesis II also obtained Fcount of 8.44 and Ftable 3.96, because (Fcount > Ftable), then H0 is rejected, H1 is accepted. This means that there is an influence on the learning motivation of students who are taught with a project-based learning model that is better than the motivation of students who are taught with a direct instruction model. **Hypothesis III**, obtained Fcount of 527.31 and Ftable 3.96. Because Fcount is greater than Ftable, H0 is rejected and H1 is accepted. It was concluded that there was a significant interaction between the project based learning learning model and students' learning motivation. This can also be described in Figure 1 below:



**Fig. 1.** Graph of Interaction Between Learning Model and Motivation on Student Learning Outcomes.

From Figure 1 above shows whether there is an interaction between learning models and motivation on learning outcomes. If the lines show intersecting lines, then it can be assumed that there is interaction.

Based on the analysis of data on the learning outcomes of the fifth grade students at SD Negeri 060911 studied, it was shown that students who were taught using the project-based learning model were good as a whole, both students who had high learning motivation and students who had low learning motivation. Where it can be seen from the results of the hypothesis testing that has been done so that a discussion of the analysis is carried out. Three main points of discussion are carried out based on relevant theoretical foundations, namely: (a) the learning model used influences student learning outcomes, (b) the learning motivation possessed by students influences learning outcomes, and (c) the interaction between learning models and motivation learning affects student learning outcomes..

### 3 Conclusion

Based on the analysis of the results of the research, it can be concluded that the project based learning model and motivation greatly influence the results of students' mathematics learning. Where: a) The learning outcomes of students who are taught using the project based learning model are higher (average 80.238) compared to those taught using the direct instruction learning model (average 61.162); b) The learning outcomes of students who have high motivation (average 74.523) are higher than students who have low motivation (average 67.03); c) There is an interaction between the learning model and motivation on learning outcomes in mathematics. The learning outcomes of students who have high motivation who are taught with the project based learning model (average 80.952) are higher than the learning outcomes of students who have low motivation with the same learning model (average 79.524). Likewise when compared with the learning outcomes of students who have high motivation (average 68.095) and low (average 54.545) who are taught with the direct instruction learning model. It turns out that the learning outcomes of students who have high motivation are still higher who are taught with a project based learning learning model

The results of these findings can be used as material for consideration for elementary school teachers, especially grade V, in using the project based learning model. By having knowledge and insight about learning models, teachers can easily design learning designs that are able to maximize the achievement of learning outcomes and increase student motivation in learning. If the teacher applies an interesting learning model in learning, it can significantly improve student learning outcomes. Students have their own experience after learning by applying the project based learning learning model

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