THE EFFECT OF PROJECT-BASED LEARNING MODEL ON THE LEARNING MOTIVATION OF 4TH GRADE STUDENTS

Aina Isma Salsabila*[1], Arum Fatayan[2]
[1,2] Universitas Muhammadiyah Prof. Dr. Hamka
e-mail: ainaisma23salsabila@gmail.com

Abstract
The purpose of this study was to increase the motivation of science learning of fourth grade students of SDN Setia Mulya 01 Taruma Jaya Bekasi. The research method that will be used in data collection is the Quase Experiment Method. The results of this study indicate that: (1) The average value of the experimental class pretest was 80%, while the average value of the control class was 81%; (2) obtained an average N-gain for the experimental class of 0.069 and included a moderate category. While the control class obtained an N-gain value of 0.016 and included the low category. This shows that the increase in student learning motivation in the experimental class has a significant difference; (3) the results of the post-test hypothesis test with an Asymp. Sig 0.003 which means smaller than the value of a (0.05). So based on this data, the hypothesis is accepted with the conclusion that there is a significant difference in increasing student learning motivation. there is an influence on the use of the Project Based Learning (PJBL) learning model on the learning motivation of grade IV students at SDN Setia Mulya 01, this is evidenced by the results of the final hypothesis test calculation, namely Asymp. Sig < 0.05 (0.003 < 0.05) which means there is a significant difference. Based on the average value of learning motivation in students, the experimental class gets an average of 85% while the average value of the control class is 79%, this shows that the use of the Project Based Learning (PJBL) learning model has a significant effect on student learning motivation.

Keywords*: *Project Based Learning; IPAS; Learning Motivation.

Abstrak
Tujuan penelitian ini yaitu untuk meningkatkan motivasi belajar IPA siswa kelas IV SDN Setia Mulya 01 Taruma Jaya Bekasi. Metode penelitian yang akan digunakan dalam pengumpulan data adalah Metode Quase Eksperimen. Hasil penelitian ini menunjukkan bahwa: (1) Nilai rata-rata pretest kelas eksperimen sebesar 80%, sedangkan nilai rata-rata kelas kontrol 81%; (2) diperoleh rata-rata N-gain untuk kelas eksperimen sebesar 0,069 dan termasuk kategori sedang. Sedangkan kelas kontrol memperoleh nilai N-gain sebesar 0,016 dan termasuk kategori rendah. Hal ini menunjukkan peningkatan motivasi belajar siswa pada kelas eksperimen memiliki perbedaan yang signifikan; (3) hasil uji hipotesis post-test dengan nilai Asymp. Sig 0,003 yang berarti lebih kecil dari nilai a (0,05). Maka berdasarkan data tersebut hipotesis diterima dengan kesimpulan terdapat perbedaan yang signifikan pada peningkatan motivasi belajar siswa. terdapat pengaruh pada penggunaan model pembelajaran Project Based Learning (PJBL) terhadap motivasi belajar siswa kelas IV di SDN Setia Mulya 01, hal ini dibuktikan dengan hasil perhitungan uji hipotesis akhir yaitu Asymp. Sig < 0,05 (0,003 < 0,05) yang berarti terjadi perbedaan yang signifikan. Berdasarkan nilai rata-rata motivasi belajar pada siswa, kelas eksperimen mendapatkan rata-rata 85% sedangkan nilai rata-rata kelas kontrol 79%, hal ini menunjukkan penggunaan model pembelajaran Project Based Learning (PJBL) cukup berpengaruh secara signifikan terhadap motivasi belajar siswa.

Kata kunci:* *Project Based Learning; IPAS; Motivasi Pembelajaran

INTRODUCTION

Education is a determining factor for success in national development, through the basic education program, namely by providing basic education to Indonesian citizens so that they are not only intelligent but have the provision of knowledge and skills that are integrated with the quality of their faith and piety in God Almighty and can develop an independent personality to live in society and the state.

At the school level, education can be achieved by learning, which is a change in behavior that occurs in a person and is the result of direct and repeated practice. At school, learning students are taught directly about the material being studied through practice not just theory. In the learning process, students must be able to actively search, find, analyze, formulate, solve problems, and conclude a problem related to the subject matter (Mustofa, Arif; Thobroni, 2011), in the end students are expected to be motivated and feel happy when carrying out learning activities, because directed learning can make students understand the material being studied.

Definition of Learning Motivation Motivation comes from the word "motive" which means as an effort that encourages someone to do something. According to Rianto, motivation is something that moves a person or group of people to do or not do something (Rianto, 2005). Motivation can be interpreted as a driving force that has become active. Motives become active at certain times, especially when the need to achieve goals is very urgent / felt. Learning motivation can activate student behavior to achieve a goal, namely good and satisfying learning outcomes.

To achieve learning objectives and results that can motivate students, one learning approach that can be used is through the Project-based learning approach, which is a learning approach that gives students the freedom to plan learning activities, carry out projects collaboratively, and ultimately produce work products that can be presented to others (Sardiman, 2019). The learning model of PJBL uses problems as the first step in collecting and integrating new knowledge based on their experiences with real-life activities. This is done to help, encourage and guide learners to focus on cooperation by involving group work and helping students to focus on their development (Saefuddin, 2014).

The learning process with PJBL is inseparable from the role of the teacher as a class manager. This is because the teacher is someone who is responsible for the course of

learning. A pleasant classroom atmosphere can be seen from how the teacher can provide models, strategies, and learning models well to students. Professional teachers are teachers who are able to plan learning programs, implement and lead the teaching and learning process, assess the progress of the teaching and learning process and utilize the results of teaching and learning assessments and other information in improving the teaching and learning process of students (Sidiq, 2018).

As for natural science (IPA) is an educational science which contains various concepts of subject matter, so that improving the quality and learning outcomes in this field of science is the main thing. Natural Science (IPA) applied to elementary schools (SD) is related to learning activities that should be able to provide opportunities for students to increase curiosity about the science material being studied. With the emergence of this curiosity, it can help to develop the ability to ask questions and think scientifically, so that students can also find out answers to questions that arise from their minds about natural phenomena based on real evidence (Astawan et al., 2019).

The purpose of learning science in elementary school is that science subjects have educational values that can shape the child's personality as a whole, so that students can develop knowledge and understanding of science concepts that are useful and can be applied in everyday life. This shows that the science subject itself has an important position (Samatowa, 2016).

In science learning at SDN Setia Mulya 01, it has not met the needs of teaching and learning activities, including the lack of models used by teachers of science learning activities and the delivery of material is still fixated on the textbooks used. Seeing the above conditions, the researcher wants to provide an alternative solution in the form of applying a learning model that directly involves students in learning activities. The right learning model used to actively involve students during the course of learning activities is *Project Based Learning* (PJBL) where this learning model directly involves students to be active in learning activities, can create projects which can then produce products.. With *Project Based Learning* (PJBL) learning, it is expected to provide learning experiences for students to be able to understand more deeply about their knowledge through problem solving activities, namely from their activities to create projects which then produce products (Arifianti, 2020). This PJBL learning does not only focus on the results but emphasizes more on how students process in completing the project. Thus it can be

concluded that applying PJBL learning can make students have a memorable and enjoyable learning experience so that it can increase student learning motivation.

RESEARCH METHOD

The method used in this study uses quantitative to develop hypothesis theories with phenomena or also about measurements that can help to see empirical observations with the results of research data can also help find relationships between variables in a population. Similarly, the Quase Experiment Method involves two classes, namely the control and experimental classes.

Data collection in this study used a questionnaire in the form of a questionnaire filled in by the control class (grade 5) and the experimental class (grade 4) as a sample, namely regarding the material application of the *Project Based Learning* lesson model and learning motivation filled in by students of SDN Setia Mulya 01 which became the population or the entire object of this study, all students of SDN Setia Mulya 01.

In the research instrument, after the questionnaire data is obtained, it is tested again using the validity test and reliability test. In order for the data instrument to be valid, it is measured by the validity test using the product moment correlation formula, while the reliability test is used so that the questionnaire data is reliable (getting the same results) when tested on the same group on different occasions. Then for the hypothesis results, it is calculated using the normality test to test whether the data obtained comes from a normally or abnormally distributed population, the N-Gain test to show the increase in students' understanding / mastery of concepts after learning by the teacher related between the pretest and posttest, the homogeneity test is used to determine whether the two research classes (experimental and control) have homogeneous variations or not (Maulana, 2021). Finally, the t test is used to determine whether the *project-based learning* model has an effect on student learning motivation.

RESULTS AND DISCUSSION

This study aims to determine the effect of the Project Based Learning (PJBL) learning model on student learning motivation in IPAS subjects. The implementation of learning was carried out in two classes that were given different treatments, namely an experimental class of 24 students and a control class of 26 students. So the total number

of class samples is 50 students. The following researchers present data on the results of research on student learning motivation in IPAS subjects.

- **Experimental and Control Class Pretest Results**

Pretest data was obtained through a learning motivation questionnaire in the form of answer choices Strongly Agree, Agree, Disagree, and Strongly Disagree. For the pretest, a learning motivation questionnaire was given as many as 15 statements. After the learning motivation questionnaire was checked, the lowest score (Xmin), the highest score (Xmax), the average score (Xr-rata) of the experimental class and control class were obtained as described in the table below:

Table 1. Description of Experimental Class and Control Class Pretest Percentage Scores

Description	Class	
	Experiment	Control
Low Score	67	67
High Score	90	91
Median	78	81
Mode	87	74
Average	80%	81%
Total	24	26

Based on Table 1 above, it can be seen that the average percentage score of learning motivation of the experimental class is 80%, while the average percentage score of learning motivation of the control class is 81%. From the table above, it can be seen that the average difference between the pretest scores of the experimental class is lower than the control class.

- **Post-test Results of Experimental Class and Control Class**

After learning in the experimental class using Project Based Learning (PJBL) and the control class using a conventional learning model, students were given a final test question (post-test). Based on statistical calculations, some data were obtained as shown in the following table:

Table 2. Recapitulation of Pretest and Post-test Percentage Scores of Experimental and Control Classes

Data	Experiment Class		Control class	
	Pretest	Post test	Pretest	Post test
Highest Score	90	96	91	88
Lowest Score	67	70	67	66

Mean	80%	85%	81%	79%
Median	78	87	81	80
Mode	87	88	74	83
Standard Field	5,48	6,40	4,80	2,73
N-Gain	0,069		0,016	

Based on table 2 above, it shows that the average percentage score of the experimental class post-test is better than the control class. The experimental class got an average percentage of learning motivation of 85%, while the control class got an average percentage of learning motivation of 79%. While in the lowest score, highest score, median and mode in the experimental class and control class, the experimental class has a greater value.

- **Prerequisite Test Results**

The prerequisite tests in this study used normality and homogeneity tests. Normality and homogeneity tests are needed to qualify the two means test using the t-test or parametric statistical test, while if the data test results are not normal and not homogeneous, a non-parametric test is carried out. The hypothesis for testing the normality test using the Kolmogorov-Smirnov Test is as follows:

H0: D table < D count max then the data is not normally distributed
H1: D table > D count max then the data is normally distributed

The results of the normality test with the Kolmogorov Smirnov test using excel are shown in the table below:

Table 3. Normality Test Results of Pretest and Post-test Values of Experimental and Control Class Students

Data		D- table	α	D max	Description
Experiment	Pretest	0,269	0,05	0,182	Normal
	Post-test	0,269	0,05	0,159	Normal
Control	Pretest	0,204	0,05	0,181	Normal
	Post-test	0,204	0,05	0,195	Normal

Based on table 3 above, it can be seen that the D table value for the Kolmogorov-Smirnov test for the experimental and control classes on the pretest is 0.269 and 0.204, respectively. The D table value for the experimental and control classes from the pretest above is greater than D count max so reject H0 and accept H1. This shows that the

samples obtained from the pretest of the experimental class and control class come from a normally distributed population. Then the results of the homogeneity test to test the pretest data of the two classes are homogeneous or not, the author uses the F test in Excel 2016. The homogeneity test criteria are carried out by comparing the F table number and F count, with the determination, if the F table number> F count, then H0 is rejected, otherwise if then H0 is accepted (Rosalina et al., 2023). This can be seen in the table below:

Table 4. Results of Homogeneity Test of Variance of Pretest and Post-test of Experimental and Control Classes

Data	Class	F table	α	F count	Description
Pretest	Experiment and Control	1,97	0,05	1,40	Homogeneous
Post test	Experiment and Control	1,97	0,05	1,59	Homogeneous

Based on table 4 above, the F Table obtained on the pretest is 1.97 and the F Count is 1.40. Because the value of F table is greater than F count, H0 is rejected and accept H1 with the conclusion that the pretest data of the experimental class and control class are homogeneous or have the same population variant.

- **Hypothesis Test Results**

Testing the average difference in post-test data using non-parametric statistics, namely the t-test using Excel at the significance level a = 0.05 two-party test (sig two tailed) with the test criteria: H0 is rejected, if the sig value is < than the α value, while in other circumstances H0 is accepted. The test hypothesis is as follows:

H0: there is no difference in the average scores of the two classes.
H1: there is a difference in the average score of the two classes

To test the average value of the post-test of the experimental class and the control class and to determine the significance value of the two classes, the author used the Excel test.

The results of hypothesis testing in this study can be seen in the table below:

Table 5. T-test Results of Pretest and Post-test of Experimental Classes

Data	t table	T count	A	Description
Pritest and post-test Experimental Class	2,07	5,11	0,05	H_0 rejected

Based on the table, the t table value is 2.07 and the t value is 5.11. Because t table < t count, H0 is rejected, thus it can be said that there is an effect of the *project-based learning* model on student learning motivation, there is a difference in IPAS learning motivation between the experimental and control classes. Due to the significant difference, it can be concluded that the use of the Project Based Learning (PJBL) learning model has an influence on student learning motivation in IPAS subjects. Then in the Man Whitney test results for the Experiment and Control classes can be seen below:

Table 6. Man Whitney Test Results for Experimental and Control Classes

Test Results	Score
Man-Whitney U	160.500
Wilcoxon W	511.500
Z	-2.946
Asymp. Sig. (2-tailed)	.003

Based on the table, the significance number on the post-test is 0.003. Because the significance number is smaller than 0.05, H0 is rejected, thus it can be said that there is a difference in IPAS learning motivation between the experimental and control classes. Due to the significant difference, it can be concluded that the use of the Project Based Learning (PJBL) learning model has an influence on student learning motivation in the 4th-grade IPAS subject SDN Setia Mulya 01.

- **Discussion of Research Results**

Based on the pretest data obtained from the experimental and control classes, the percentage of learning motivation of the control class and experimental class has a difference that is not too far away. This difference can be seen from the average value of each class. The average value of the experimental class pretest was 80% while the average value of the control class was 81%. The difference in class averages is not too far so it can be said that the level of student learning motivation in both classes is equivalent. From the homogeneity test, it can also be seen that the control class data and the experimental class data are homogeneous. After the post-test, the average percentage of learning motivation of the experimental class increased while the control class decreased. The experimental class obtained an average value of 85% while the control class average value was 79%. This shows that the Project Based Learning (PJBL)

learning model has a significant effect on student learning motivation. with the gain test, the average N-gain for the experimental class was 0.069 and included the moderate category. While the control class obtained an N-gain value of 0.016 and included the low category. This shows that the increase in student learning motivation in the experimental class has a significant difference. While the increase in learning motivation in the control class did not have a significant difference.

The learning motivation of experimental class students compared to the control class based on the difference in the average pretest and post-test scores after being calculated and hypothesis testing, there was a significant difference. This can be seen from the results of the post-test hypothesis test with an Asymp. Sig 0.003 which means it is smaller than the value of a (0.05). So based on this data, the hypothesis is accepted with the conclusion that there is a significant difference in increasing student learning motivation. Because there is a significant difference, it can be concluded that there is an influence on the use of the Project Based Learning (PJBL) learning model on the learning motivation of SDN Setia Mulya 01 students.

CONCLUSION

Based on the research results obtained and the discussion presented in the previous chapter, it can be concluded that there is an influence on the use of the *Project Based Learning* (PJBL) learning model on the learning motivation of grade IV students at SDN Setia Mulya 01, this is evidenced by the results of the final hypothesis test calculation, namely Asymp. Sig < 0.05 (0.003 < 0.05) which means there is a significant difference. Based on the average value of learning motivation in students, the experimental class gets an average of 85% while the average value of the control class is 79%, this shows that the use of the *Project Based Learning* (PJBL) learning model has a significant effect on student learning motivation. While based on the average value of N-gain, the *Project Based Learning* (PJBL) learning model is quite effective to increase student learning motivation because it gets an average N-gain of 0.069 (medium category) while the conventional method gets an average of 0.016 (low category) which means it is not effective to increase student learning motivation.

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