JPPIPA 9(9) (2023)

Jurnal Penelitian Pendidikan IPA

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

The Effect of the Problem Based Learning Model on the Students Motivation and Learning Outcomes

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Received: July 23, 2023
Revised: September 14, 2023
Accepted: September 25, 2023
Published: September 30, 2023

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DOI: 10.29303/jppipa.v9i9.4772

Abstract: The background of this study is the low learning motivation and learning outcomes of grade V students of SDN 01 Banjar Sari. This study aims to determine the effect of the Problem Based Learning (PBL) Model on student learning motivation and learning outcomes of grade V students at SDN 01 Banjar Sari. This research uses a type of experimental research type of Quasi-Experimental research design. The method used is by quantitative research methods, with. The quasi-experimental design used in this study was a pretest posttest nonequivalent control group design. This study used two classes consisting of a control class and an experimental class. In the experimental class, they will get a Problem Based Learning model, while in the control class they will get an expository learning model. The population of this study is all grade V students of SDN 01 Banjar Sari for the 2021/2022 academic year. The number of population subjects is 60 students divided into 2 classes, namely VA and VB classes, with each VA class 30 students and VB 30 students. Data collection in this study used Nonprobability sampling technique. The results of this study show that the Problem Based Learning model affects student learning motivation by 100.00, the Problem Based Learning model affects student learning outcomes by 95.00. The average score of the learning outcomes of the control class was 57.00, the average score of the experimental class was 82.83. The average value of the control class learning motivation was 85.93 and the average value of experimental class learning motivation was 90.15.

Keywords: Motivation; Learning Outcomes; PBL

Introduction

The national education system aims to educate the nation's life and develop Indonesian people. To support the intended educational goals, teachers ideally create learning that adapts to the needs of students, one of which is by applying a student-centered learning model. The expectation that has always been the teacher's demand is how the learning material delivered can be mastered by students thoroughly and thoroughly. This is quite a difficult problem for teachers. This difficulty is caused by the learning model applied does not pay attention to the abilities and needs of students. Students in learning are not only subjects and objects, but need to be realized that they are individuals with different backgrounds. According to Octavia, (2020) learning model is a conceptual framework that describes systematic (orderly) procedures in organizing learning to achieve learning objectives.

Ponidi (2021) Explaining the learning model is a planning process for guidelines in the learning process. The learning model is an important element for the creation of optimal learning. According to Sholekah (2020) The learning model serves to make it easier for teachers to evaluate the learning process that has taken place. But this is not seen in science learning in class V, based on observations of thematic learning processes Science content in class V SDN 01 Banjar Sari shows that grade V students have difficulty in solving problems that require student motivation and learning achievement. This shows that learning motivation and learning achievement of grade V students of SDN 01 Banjar Sari are still lacking, and better improvement efforts are needed. Learning motivation is very essential

How to Cite:
Safitri, R., Hadi, S., & Widiasih, W. (2023). The Effect of the Problem Based Learning Model on the Students Motivation and Learning Outcomes. *Jurnal Penelitian Pendidikan IPA*, *9*(9), 7310-7316. https://doi.org/10.29303/jppipa.v9i9.4772

in learning, but conditions in the field show another thing, the learning motivation of elementary school students has a low tendency. The results of observations of learning motivation and student achievement show that the number is still low, in addition to learning motivation, the next problem is when viewed from the daily assessment of students in odd semesters, which is complete Minimum completeness criteria (known with KKM) ≥ 75 only as many as 9 students, lack of student learning concentration and still centered learning on teachers. One effort to foster student interest and motivation is to apply a problem-based learning model or PBL. According to Ariani (2020) *Problem Based Learning* is a learning model that requires students to be critical in solving the problems they face. According to Yulianti (2019) PBL is a learning model based on problem solving. This model provides opportunities for students to solve problems based on student experience and provides encouragement and motivation to learn because it departs from ideas from students (Yasmini, 2021).

The implementation of the learning model will have an impact on student learning motivation because students are not only required to know but understand and interpret every knowledge obtained. The paradigm shift from teacher-centered learning to student-centered learning, called *Student Center Learning* (SCL). According to Efriani (Marta et al., 2020) Explaining learning motivation is assumed as an unstable tendency in learning activities, in the sense that student learning motivation can increase and can decrease. Some factors that affect learning motivation include internal factors, such as physical factors are factors that affect a person's body and appearance. Physical factors include diet (nutrition), health, and body functions, especially the five senses. The next factor is psychological factors, namely this factor concerns the mental condition of students. In addition to internal factors, external factors also influence, such as social factors are factors that come from people in the environment around students. Including teachers, classmates, parents, neighbors, and non-social factors are factors that arise from the physical condition around students. Includes weather conditions (hot or cold weather), time of day (morning, afternoon, or evening), location (quiet, noisy or quality of student study), and learning opportunities. According to Handayani (2020) motivation in the learning process is needed for acceleration in achieving educational and learning goals specifically. Learning motivation will also affect student science learning outcomes, learning outcomes according to Elisabet (2019) is the final result of the process of student learning activities from all student activities in following learning in class. Learning science in the classroom will be effective if learning can challenge students to explore, this is according to Yasmini's opinion (2021) which states that the learning of Natural Sciences in basic education, should seek learning through concrete activities, by presenting natural phenomena in each learning. Through this PBL model, students will be encouraged to distinguish and integrate ideas about challenging phenomena (Yasmini, 2021). Another thing is that implementing PBL can improve students' ability to think critically, this is in accordance with the results of research conducted by Yulianti (2019) which concluded the results of his research that the application of the PBL model to students' understanding of concepts and critical thinking. Because in this PBL students will be involved in the form of participation they experience by discussing, presenting, asking, and answering in the learning process so that it can strengthen students that they can be independent without having to rely on others (teachers) to explain something newfound in the reading text. Therefore, the role of the teacher is very important because one of the factors that can increase student understanding in learning is the teacher. Qualified and professional teachers are the key to educational success through the teaching and learning process as outlined in every curriculum change. From this background, research was carried out by applying the PBL Learning Model to improve student motivation and learning outcomes.

This study aims to determine the influence of the problem-based learning (PBL) learning model on the learning motivation of grade V students of SDN 01 Banjar Sari.

Method

The type of research used is quasi-experiment, this research design uses a pretest-posttest nonequivalent control group design using two classes consisting of a control class and an experimental class. This design is used because before and after treatment, the control class and experimental class get pretest and posttest.

Table 1. Research Design

Group	Pretest	Treatment	Posttest
Experimental Class	O1	X1	O2
Control Class	O1	X2	O2

The population of this study is grade V students of SDN 01 Banjar Sari for the 2021/2022 academic year. The number of subjects of the population is 60 students. The research instruments are learning outcomes tests, observations, and questionnaires. Instrument validation is carried out to determine the mockery of the instrument including content validation and empirical validation. Data analysis techniques use inferential statistical analysis carried out by processing sample data

that can be generalized to the population. Next is the final analysis test carried out to determine the influence of the variables studied. Testing this hypothesis uses linear regression test statistics and calculates the gain index (normalized gain) with the formula proposed by Hake (Zahara et al., 2020) by the Formula 1.

$$(g) \frac{\%sf - \%st}{100 - \%st} \quad (1)$$

Description:
Normal Gain
Sf = Postest Results
Si= pretest result
And the conversion to the table is done as follows:

Table 2. N-Gain Score Conversion

Classification	Criterion
(g) ≥ 0.70	High N-gain
0.30 ≤ (g) < 0.70	Moderate N-gain
(g) < 0.30	Low N-gain

Result and Discussion

Knowledge Learning Outcomes

The results of the research presented in this chapter, namely: 1) the learning outcomes of grade V students using the problem-based learning model 2) student learning motivation using the problem-based learning model; 3) significant differences in students' cognitive learning outcomes before and after learning using problem-based learning models. The research data to be presented is in the form of analysis prerequisite test data and research result data. For more details, it will be presented in student learning outcomes data obtained from pretest and posttest. The posttest score data of experimental and control class students are presented in Table 3.

Table 3. Experimental and Control Class Posttest Scores

Data	Class	Ideal Score	Shoes My	Shoes Max	Average	Sd
Post Test	Experi-ment	100	78	100	82.83	8.95
	Control	100	65	100	57.00	9.10

Based on the table above, it can be described that the cognitive learning outcomes of students in experimental classes using the PBL method are better than the cognitive learning outcomes of students in control classes using expository learning. The experimental class obtained a class average of 82.83 while the control class obtained a class average of 57.00. After knowing the value of cognitive learning outcomes in the experimental class and control class, they carried out data normality tests, classical due diligence, independent sample t tests, and N gain score tests.

The data normality test is used to determine the posttest value data in the experimental class and whether the control class is normally distributed or not. The data normality test in this study used SPSS version 23 Lilliefors. Those results are presented in Table 4.

Table 4 Data Normality Test

Normality Test	Statistical Value	df	Sign	a = 0.05	Conclusion
Experiment	0.124	30	0.152	0.05	Normal
Control	0.157	30	0.055	0.05	Normal

The table above summarizes the value of the normality test results of cognitive learning outcomes of the experimental class with the PBL method and the control class with expository learning is more than the value of α = 0.05 (sign >0.05) so that it can be concluded that the data is normally distributed. After the data is known to be normally distributed, it can be continued with classical due diligence, average difference test, and N gain score test. After the normality test, the next result is the Independent Sample Test T-Test Posttest Student Learning Outcomes between the experimental class and the control class with the results regarding the two average difference tests can be seen in the t-test column for Equality of Means, in the t-test for Equality of Means column obtained sig value = 0.001 < 0.05 with calculated value = 3.382>1.697 = table So Ha is accepted in other words the average learning outcomes of students with a problem-based learning model Better than the average student learning outcomes students do not use the problem-based learning model, the conclusion is that the video media-assisted jigsaw method is more effectively applied in learning activities.

The N-gain result in the experimental class showed 0.65 and the N-gain in the control class showed 0.43. N-gain in the experimental class is included in the medium category. N-gain on the control class belongs to the medium category. The conclusion of the N-gain results in the experimental class and the control class is that the N-gain Test results are higher compared to the N-gain results of the control class.

The purpose of this study is to determine the influence of problem-based learning models on student learning outcomes and learning motivation of grade V students in Theme 5 of the Ecosystem. This research design uses Quasi Experimental Design. The population in this study is all SDN class V students at SDN 01 Banjar Sari. The research samples used were students of SDN 01 Banjar Sari class Va there were 30 students of experimental class and SDN 01 Banjar sari class Vb which consisted of 30 control classes.

The pretest results of student learning outcomes between the control group and the experimental group showed that there was a significant difference between the two groups. This shows that the experimental group and the ability control group were originally the same. Furthermore, the experimental group's learning activities were given treatment that applied a problem-based learning model and the control group carried out expository learning activities.

After being treated by applying a problem-based learning model, the experimental group experienced a significant increase known as the experimental group's average pretest score of 55.00 and the average posttest score of 82.83 which means an increase of 27.83, this indicates that the experimental group experienced a greater increase compared to the control group.

The effectiveness of problem-based learning is in accordance with the results of research conducted by Imama (2021) demonstrate the development of technology-based PBL models in learning proven effective and can improve learning activities and outcomes. In addition to improving learning outcomes, the results of research conducted by Christians (2022) shows that PBL is effective for improving student independence and literacy outcomes. Research results from Sajidan (2022) explained that the PBL model is also seen to be able to improve collaborative capabilities and foster collaborative skills needed in the era of the Industrial Revolution 4.0 and Indonesian Society 5.0. The PBL model can also grow students' ability to conduct experiments in the laboratory, this is according to the results of research from Jabarullah (2019) which outlines that PBL models can improve performance in written and laboratory-based assessments.

In addition to laboratory skills and student learning outcomes, critical thinking skills are important in science learning, among them is to improve critical thinking skills with the PBL model. Zuryanty (2019) said that outlining efforts to improve the thinking skills of elementary school students in science learning with PBL looks effective. The PBL model is also able to improve students' numeracy skills and student independence. This is in accordance with the results of Wardono research (2023).

The PBL model is also seen to be able to improve students' social attitude skills and critical thinking skills. This result is in accordance with the results of Qondias' research (2022). Similar to the results of research by Putri (2019) which explains that learning with PBL is effective in learning.

The results show that the achievement of completeness of learning outcomes is because the problem-based learning model has succeeded in improving student cognitive learning outcomes. The results of classical completeness calculations show that the proportion of students achieving completeness is more than the criteria. This fact proves the success of the learning process using a problem-based learning model. This success is because this learning model can train students to learn to be more active in speaking and opinions. Furthermore, students are directed to solve the problems being discussed in learning through a series of systematic learning.

Student Learning Motivation Outcomes

Motivation is one of the important factors in the learning process that can have a positive impact on student achievement. Learning motivation can be formed through the involvement of teachers and parents in various ways in encouraging student motivation. The result by applying the PBL model is as follows:

Table 5. Learning Motivation Posttest Due Diligence

Classical Due Diligence	N	Min.	Max.	Mean	sd	P (%)
Experiment	30	85	95	90,15	8.871	90%
Control	30	83	90	85,93	7.297	87%

The results show the value of the classical due diligence results of the learning motivation of experimental class students with a problem-based learning model of 90% and the control class with expository learning of 87% so that it can be concluded that classical completeness in the experimental class is better than classical completeness in the control class.

The N-gain result in the experimental class showed 0.78 and the N-gain in the control class showed 0.49 N-gain in the experimental class included in the medium category. N-gain on the control class belongs to the low category. The conclusion of the N-gain results in the experimental class and control class is that the N-gain Test results are higher compared to the N-gain results of the control class.

The difference in cognitive learning outcomes of pretest and posttest students in the experimental class increased after using the problem-based learning model. From the table above, the cognitive learning outcomes of students in the experimental class increased by 804. This can be seen from the score in the experimental class with a number of 1710 to 2514 with an average of 55.00 to 82.83.

Than, it can be concluded that the use of problem-based learning models can improve students' cognitive learning outcomes. Based on the results of the hypothesis test from table 4.11, the experimental group showed that the results of the posttest data test there was a significant difference between learning before using the problem-based learning model and after using the problem-based learning model on students' cognitive learning outcomes. This was shown by a significant

increase in scores on students' cognitive learning outcomes in the experimental group between before and after treatment.

Test the hypothesis obtained that Ho was rejected and Ha was accepted. So, it was concluded that the experimental group experienced an increase in students' cognitive learning outcomes with an average difference of 55.00 to 82.83 so that there was an increase in score of 27.83 it can be concluded that the experimental group experienced a significant increase or there was a significant difference between the pretest results and the posttest results of the experimental group.

The conclusion that can be drawn is that the use of problem-based learning models is an effective learning method used in improving students' cognitive learning outcomes. Analysis of experimental group pretest and posttest results using independent t-tests. The improvement of experimental group results is influenced by a method carried out in research, namely the use of problem-based learning models can improve student learning outcomes and learning motivation. In accordance with the results of Safrida's research (2020) which concludes the results of the research is that Problem Based Learning (PBL) has a positive impact on student learning outcomes, this can be seen from the increasing student scores after the application of the Problem Based Learning (PBL) model in science subjects Food Making material in plants. Further research was conducted by Kristiana (2021) which concludes that the application of the Problem Based Learning model can help increase and improve the ability of science learning outcomes of elementary school students. Nisah (2021) concluded the results of the study that the pretest and posttest learning outcomes were normally distributed with an increase in the average pretest score of science learning outcomes by 76.00 to 83.00 in the average posttest results.

The purpose of this study is to analyze the effect of the Problem Based Learning (PBL) learning model on learning motivation and emotional learning outcomes of students in science subjects Ecosystem material. This research design uses Quasi Experimental Design. The study population is grade V students of SD Negeri 01 Banjar Sari for the 2021/2022 academic year. The research sample used was grade V students at SD Negeri 01 Banjar Sari which amounted to 60 students from 30 experimental class students and 30 control class students.

The results of a similar study were conducted by Gulo (2022) which concludes the results of his research with the application of the problem-based learning model can increase motivation and learning outcomes of science at SMP Negeri 4 Satu Atap Moro'o for the 2021/2022 academic year. Khusna (2020) concluded the results of his research that the increase in motivation to learn cycle I From cycle I the average motivation indicator was 75.16% in cycle II to 91.03%. Thus, it can be concluded that the use of Problem Based Learning (PBL) based on blended learning in science learning can increase student motivation and learning outcomes. Increased learning motivation through the PBL model occurred in Class VII students of SMPN9 Salatiga, after going through learning with PBL student learning motivation increased Sholekha (2020).

Other research results show that the PBL model can improve student learning activities according to the results of Ernawati's research (2020) which explains that the PBL model is feasible to be used in the teaching and learning process and is considered to be implemented in schools that can improve student learning activities. Fajari et al. (2019) which explains the effectiveness of PBL and multimedia learning in the classroom on science learning.

According to Galuh (2020) Explain the results of the study that the problem-based learning model can improve students' cognitive abilities, and help students in solving problems in real or simulated. The results of further research according to Murtono (2021) Problem-based learning is superior to science learning in improving critical thinking of grade V elementary school students. Other research results are in accordance with Aripin (2021) which explains that problem-based learning tools are effective and efficient to improve students' problem-solving skills and critical thinking skills. Hidayati (2021) Problem Based Learning assisted by Mind Mapping is effective in improving students' science process skills. Other results show that the effectiveness of the Problem Based Learning learning model in learning is in accordance with the results of research from Ardina (2019)

Conclusion

Student learning outcomes increased with the use of the problem-based learning model by showing: 1) the cognitive learning outcomes of students who obtained learning using the problem-based learning model classically reached 93.6%; 2) the average score of the learning outcomes of the experimental class was better than the control class, the average cognitive learning results of students using the PBL model reached 82.83 and the control class 55.00; 3) the N-gain score reaches 0.78, meaning an increase in student learning outcomes in the moderate category. Student learning motivation increased with the use of the problem-based learning model as shown in the following results: 1) the learning motivation of students who obtained learning using the problem-based learning model classically reached 90.10% for the experimental class and 87% for the control

class; 2) the average value of learning motivation of the experimental class was better than the control class, the average learning motivation of students who used the problem-based learning model reached 91.15 and the control class 87.93; 3) the N-gain score reaches 0.78, meaning an increase in student motivation in the moderate category. There are differences in students' cognitive learning outcomes between before and after participating in learning using the problem-based learning model. This was shown in the average difference test score of the increase in student learning outcomes of 55.00 and in further tests showed the magnitude of the average increase in cognitive learning outcomes of each class. The average magnitude of the increase in cognitive learning outcomes in experimental classes using problem-based learning models was 82.83.

Acknowledgments
We express our gratitude to all parties who have helped and supported the implementation of research, especially to the two final project supervisors so that the research runs according to the objectives.

Author Contributions
All authors in this article play an active role, Ria Safitri acts as a writer and researcher conducting research at the research location. Sopiyan Hadi as the second author plays a role in providing input and correction of research results, Widiasih as the third author plays a role in assisting in the methodology and analysis of research results.

Funding
This research was self-funded.

Conflicts of Interest
Research has no interest to anyone; research is purely a form of scientific writing for the world of education.

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