

The Influence of Learning Models on The Learning Outcomes of IPAS in Grade V Students in Elementary Schools

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Abstract— The low learning outcomes of IPAS students are caused by the lack of innovative learning models in the learning process. The purpose of this study was to examine the effect of PjB, PBL and Discovery Learning models on the learning outcomes of IPAS of grade V elementary school students. This research is an experimental research using Quasy Experimental with Nonequivalent Control Group Design pattern. The population of this study were all fifth grade elementary school students totaling 75 students. The sampling technique used in this study was proportional random sampling. In this study, the data collection technique used was a test. The data analysis technique used was One Way Annova with the help of SPSS version 21. The results showed that there was a positive influence of the three learning models, namely Project Based Learning, Problem Based Learning and Discovery Learning on the learning outcomes of fifth grade students.

I. INTRODUCTION

Education has an important role in facing the development of the 21st century. Education has a relationship with the times, because the logarithmic movement of education goes hand in hand with the development of science and technology (Erlistiana et al., 2022; Qomariyah & Subekti, 2021). The education system in Indonesia currently uses the 2013 curriculum with various revisions. However, it has not been able to be mastered optimally because in the field there are still many teacher-centered learning activities. The quality of education is related to the quality of students, because the center point in learning is

students. Students are expected to gain as much knowledge and insight as possible by learning.

Education aims to prepare humans to solve life problems in the present or in the future. One of the important subjects is IPAS. It teaches about living and non-living things in the universe and their interactions. IPAS learning really needs to be given to all students, especially in elementary school to equip students with the ability to think logically, analytically, systematically, critically, and creatively, as well as the ability to socialize.

Based on the grade documents of grade V students of Citrodiwangsan 02 Lumajang State Elementary School, in the IPAS subject there are 62% of grades below average

and 38% above average. From the observation, it was found that some students were less active in learning. This is because students feel bored in participating in learning activities and prefer to talk to their friends and tend to be crowded.

Learning in schools, especially elementary schools, needs to be well planned using innovative, interesting and fun learning models and by using learning media to attract students' attention and interest in learning, and learning outcomes will be more optimal. Such learning must occur in all subjects applied in elementary schools, including IPAS learning (Andriyani & Suniasih, 2021; Astriani & Sudarma, 2019). Basically, IPAS is a way of systematically finding out about nature to master a collection of knowledge in the form of facts, concepts, principles, discovery processes and have a scientific attitude.

The low learning outcomes of IPAS are partly due to students' low creative thinking skills. IPAS does not contain concept understanding alone, but also contains the problem solving process. So it is very necessary for students' creative thinking skills to be able to solve IPAS problems. Teachers must be able to innovate by developing constructivism learning in line with the Merdeka Curriculum in order to achieve learning objectives. Teachers play a role in developing 4C competencies (Critical thinking, Communication, Collaboration, Creativity) in students systemically. With culture-based education, students with superior character will be formed who have the ability to adapt and are ready to implement the independent curriculum in the industrial world.

Efforts that can be made to improve student learning outcomes are to use learning strategies and models that attract students' attention. The use of this learning model is so that students can more easily absorb and understand the material provided by the teacher. One of the learning models that can improve IPAS learning outcomes and creative thinking skills is the Project Based Learning model or project-based learning.

There are various learning models that can be used by teachers in constructivism learning, such as cooperative learning, inquiry, jigsaw model, Problem Based Learning, Discovery Learning and Project Based Learning. Teachers must pay attention to many things in choosing a model, one of which is the characteristics of the learning model and the material to be delivered. Learning models that are expected to shape scientific, social behavior and develop students' curiosity are divided into 3, namely Problem Based Learning, Discovery Learning and Project Based Learning models.

The learning model that is expected to shape scientific, social behavior and develop students' curiosity is Project Based Learning. The Project Based Learning model is learning that uses a project in the learning process. Projects undertaken by students can be individual or group projects and carried out within a certain period of time collaboratively, producing a product, the results of which will then be displayed or presented.

Project Based Learning is student-centered learning in making a work or product that involves cooperation, skills and creative thinking so that students can explore, conduct research and interpret material in the form of results in the learning process. According to Dianti (2023) Project Based Learning is a learning method that provides opportunities for students to learn through meaningful problem-based projects or tasks. Project Based Learning is a learning model that focuses on student activity and involves all activities for students in collecting, presenting and interpreting a learning outcome (Anggelia: 2022). Based on several opinions and previous research, it can be concluded that Project Based Learning is a learning model that makes students as subjects who are given the opportunity to explore and solve problems independently so as to improve learning outcomes and develop their skills.

The Problem Based Learning model presents real problems so as to stimulate students' ability to discover new knowledge and help students develop their knowledge and can be used as a self-evaluation of the results and learning process (Indrajit, R.E: 73). Indrajit (2023: 2) states that Problem Based Learning is a learning method that familiarizes students to solve problems and reflect on them with their experiences based on their prior knowledge. Najoan (2023) said that Problem Based Learning is a model that directs students actively in learning which is delivered by presenting a problem, asking questions so that students are able to develop their own abilities. From several opinions and previous research, it can be concluded that Problem Based Learning is a learning model that begins with a problem to collect and integrate new knowledge so that it can increase student motivation and learning outcomes.

Discovery Learning can assist students in building knowledge independently so as to provide opportunities for students to understand the material according to their prior knowledge and experience. Discovery Learning can develop children's firm reasoning skills because students are prepared to ask, pay attention, reason, prove and convey beyond linguistic structures (Eriansyah & Baadila: 2023). Lieung (2019) explains that the Discovery Learning model is a learning model that involves students in the discovery of material, so that they can make conclusions in

an effort to understand the material. From several opinions and previous research, it can be concluded that Discovery Learning is a learning model that invites students to find new knowledge from the information they have so that it can improve their learning outcomes.

Based on this explanation, the application of the Project Based Learning, Problem Based Learning and Discovery Learning learning models is thought to have an influence on student learning outcomes in IPAS subjects. Therefore, the purpose of this study is to examine the effect of PjBL PBL and Discovery Learning on the learning outcomes of fifth grade students.

II. RESEARCH METHODS

The research design applied in this study is a Quasi Experiment design. This research was conducted by comparing one or more experimental variables given treatment with Problem Based Learning, Discovery Learning and Project Based Learning models. The design in this study used Quasy Experimental with Nonequivalent Control Group Design pattern. Quasi Experimental research design with Nonequivalent Control Group Design pattern is as follows:

Table 1. Research Design of Nonequivalent Control Group Design

	<i>Pretest</i>	<i>Treatment</i>	<i>Posttest</i>
Group 1	O ₁	X	O ₂
Group 2	O ₁	X	O ₂
Group 3	O ₁	X	O ₂

Description:

- O₁ : Initial test (pretest)
- X : treatment given to each group
- O₂ : final test (posttest) given after treatment

(Source: Krishnan, 2023; referring to Masyhud's book, 167)

The subjects in this study were students in grades 5A, 5B and 5C at Citrodwangsan 02 Lumajang State Elementary School, with the number of students in each class being 26, 25 and 24 students. The control and experimental classes were determined using the homogeneity test. In this study, the homogeneity test was carried out using the Homogeneity of Variance Test on One-Way Anova. the results of the homogeneity test are as follows:

Table 2. Homogeneity Test Results

ANOVA					
Learning outcome					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	613.648	2	306.824	3.062	.053
Within Groups	7213.898	72	100.193		
Total	7827.547	74			

The homogeneity test results show the Fcount value of 3.062 < Ftable which is 3.124, it can be stated that the data is homogeneous.

The main data collection technique was carried out using the learning outcomes test. Other supporting techniques were carried out using the following techniques: interviews, observation and documentation. After the data were collected completely, then the data were analyzed using: techniques: (1) descriptive statistics, and (2) One Way Annova data analysis technique. The data analysis was carried out with the help of SPSS version 21.

The research procedure was carried out with the following steps: (1) conducting observation activities at the school that will be used as a place for (2) identify and formulate problems appropriately, (3) conduct preliminary studies and literature reviews, (4) formulate hypotheses, (5) determine research subjects, (6) conduct normality and homogeneity tests on experimental classes, (7) determine experimental classes that will be given treatment, (8) develop test instruments, (9) test the validity and reliability of research instruments, (10) giving pretests to experimental classes, (11) carrying out learning activities by giving treatment, (12) in experimental classes, namely by applying PBL, Discovery Learning and Project Based Learning learning models, (13) conducting posstest in experimental classes, (14) analyzing data, (15) conducting research hypothesis testing, (16) making discussions, (17) drawing conclusions based on the results of the research that has been done, and (18) compiling a research report.

III. RESULTS AND DISCUSSION

Data analysis used to answer the problem formulation in this research is using One Way Annova. The data analyzed in this study were pretest scores obtained after being given treatment in class V. Before calculating using One Way Annova, a normality test was first carried out to determine

whether the data was normally distributed or not. The results of the normality test calculation are as follows:

Table 3. Normality Test Results

Tests of Normality						
Class	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statis- tic	df	Sig.	Statis- tic	df	Sig.
Control	.161	25	.09	.962	25	.463
	Pretest			3		
Learning	.169	25	.06	.955	25	.321
	Posttest			3		
Outcome	.161	25	.09	.962	25	.463
	Pretest			3		
Outcome	.139	25	.20	.943	25	.173
	Posttest			0*		

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The results of the data normality test using the Kolmogorov Smirnov test show the significance value for all data > 0.05 so that the data is declared normally distributed. Furthermore, the One Way Anova calculation was carried out with the help of SPSS version 21. The results of the One Way Anova calculation can be seen in the table as follows:

Table 4. One Way Anova Test Results

ANOVA					
Learning Outcome					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3077.635	2	1538.818	4.366	.016
Within Groups	25021.87 8	71	352.421		
Total	28099.51 4	73			

The basis for decision making in the One Way Anova test is H0 accepted if the significance value > 0.05 and H0 rejected if the significance value < 0.05. Based on the data above, the significance value is 0.016 < 0.05 and Ftable is 3.13 < 4.366, so H0 is rejected, which means that there are differences in learning outcomes in students who learn using the Problem Based Learning (PBL), Discovery Learning and Project Based Learning models. After knowing the significant effect, then the Post Hoc test is

carried out. The Post Hoc test is conducted to determine whether a group has a significant difference from other groups. The results of the Post Hoc test can be seen in the following table:

Table 5. Post Hoc Test Results.

Multiple Comparisons

Dependent Variable: skor

Bonferroni

(I) Group	(J) Group	Mean Dif- fere nce (I- J)	Std. Erro r	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Class A	Class B	1.000	5.31	1.00	-12.02	14.02
	Class C	-	5.36	.048	-26.40	-.09
Class B	Class A	-1.000	5.31	1.00	-14.02	12.02
	Class C	-	5.36	.029	-27.40	-1.09
Class C	Class A	13.248*	5.36	.048	.09	26.40
	Class B	14.248*	5.36	.029	1.09	27.40

*. The mean difference is significant at the 0.05 level.

Post Hoc test results show that there is a significant difference between class C with class A and class B. Based on the one way anova test, it shows that there is a significant difference in student learning outcomes using the Problem Based Learning, Discovery Learning and Project Based Learning models obtained sig value < 0.05. This proves that the three learning models can improve student learning outcomes. This study succeeded in improving student learning outcomes but student completeness has not been met 100% because there are still students who do not meet the KKM seen from their posttest scores. This happens because there are other factors that influence such as internal and external factors such as intelligence, motivation, interest and family or peer environment. In addition, student completeness can also be assessed from daily grades, student activeness in learning activities and changes in student behavior after learning.

The Problem Based Learning (PBL) model is a learning model that is based on a real-life problem. learning model that is based on a real-life problem to improve students' ability to gain knowledge, think critically, and solve

problems. This can be seen clearly in the steps of applying the Problem Based Learning (PBL) model, where in this model students are directly involved in solving a problem. students are directly involved in solving an existing problem. The Problem Based Learning (PBL) model affects student learning outcomes, because this model has several advantages, namely providing awareness students that learning activities are not always teacher-centered but also depend on the motivation of students. depends on the motivation of the students. This can be seen in research activities that have been carried out in experimental classes, where through the application of this model, students play an active role with their motivation in solving problems in the learning process. in solving problems in the learning process

Learning using the Discovery Learning model is effective in improving student learning outcomes compared to conventional learning, because with Discovery Learning learning students are required to be active in finding and formulating problems so that Discovery Learning learning strongly encourages students not to be passive in the learning process. In Discovery Learning learning students are required to be able to answer critically and logically, problem solving skills, develop a sense of curiosity objectivity, careful thinking and tolerance for different opinions

The Project Based Learning learning model is suitable for improving creative thinking skills and IPAS learning outcomes, this can be proven by the results of the analysis. Stating that there is a positive effect of the Project Based Learning learning model on the learning outcomes of IPAS of grade V elementary school students. This is in line with previous research which states that the Project Based Learning model can improve IPAS learning outcomes. The advantages of using the Project Based Learning model in classroom learning are able to increase students' understanding and creativity through projects that have been made.

Before the application of the Project Based Learning learning model, students' understanding of IPAS learning was poor. This can be seen from the results of student pretests, many students whose scores are still far below the KKM (Minimum Completeness Criteria).

This is in line with the results of research from several researchers who also conducted research related to the application of project-based learning.

Research related to the application of project-based learning in classroom learning. According to Mulyono (2023), the findings of the research he has conducted reveal that project-based learning does not only improve students' performance in learning. elementary students'

learning motivation but also improve their problem-solving ability. The contribution of this study lies in its significance for vocational education, particularly by providing teachers with practical examples of project-based learning (PjBL).

Students' understanding of IPAS lessons after the application of the Project Based Learning learning model has increased, which can be seen from the increase in student scores after carrying out the posttest. This can be seen from the difference in the average score of the class given the Project Based Learning model learning rather than conventional learning. Teachers play a crucial role in determining the success of the learning process. Improvement efforts made by teachers play an important role in creating an interesting and efficient learning environment (Veronika, 2023).

The Project Based Learning (PjBL) learning model is very helpful in the learning process because it can make students' knowledge deeper, this model is packaged to make a project and form a group where students here directly practice how to make the product to be made. In addition to discussing and practicing directly making products, students are also trained to speak in front of their classmates or in the school environment, so that the experience students experience is increasing. By using the PjBL model, especially in IPAS subjects, learning becomes very enjoyable and students are enthusiastic in the learning process.

IV. CONCLUSION

The application of Project Based Learning, Problem Based Learning and Discovery Learning models can improve the learning outcomes of IPAS grade V elementary school students. However, of the three models that show the most effective is the Discovery learning model. This can be seen from the results of the posttest scores obtained by students after being given a treatment. For the development of learning in elementary schools is expected to improve IPAS learning outcomes. Teachers are also advised to optimize students' basic potential space. In the learning process, it must be optimized with the availability of facilities and facilities in learning. And for other researchers it can be used as a basic reference for conducting further research. And for other similar researchers, these findings can be used as a reference and basis for conducting further research.

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