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THE INFLUENCE OF PROBLEM BASED LEARNING (PBL) MODEL ON IMPROVING LEARNING OUTCOMES IN SCIENCE SUBJECTS IN GRADE IV OF SD NURUL HUDA II YAPIS

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Abstract. This study aims to determine whether the Problem Based Learning (PBL) model influences the improvement of learning outcomes in Science subjects in Grade IV of SD Nurul Huda II Yapis for the academic year 2023/2024. The results of this research are expected to be beneficial both theoretically and practically. This study is an experimental research with a quasi-experimental design. Data collection techniques include observation, documentation, and testing. The data analysis technique used is the Independent Samples T test to determine if there is an effect of using the Problem Based Learning model on improving student learning outcomes. Based on the research results, the average scores obtained in the experimental class were 75.96 and in the control class were 65.08, as evidenced by the students' post-test results. The hypothesis testing resulted in a calculated t-value > critical t-value, specifically 2.596 > 1.673, with a significance level less than 0.05 (0.012). This indicates that the alternative hypothesis (Ha) is accepted and the null hypothesis (Ho) is rejected. Therefore, it can be concluded that there is a positive and significant influence of using the Problem Based Learning model on improving learning outcomes in Grade IV of SD Nurul Huda II Yapis for the academic year 2023/2024.

INTRODUCTION

Education is one of the factors that requires separate attention in national development, namely the effort to educate the nation's life, because education will improve the quality of human resources which is the main capital for the implementation of development. Quality education has become a current government program that is still being pursued (Nurfatimah et al., 2022). Education to support development in the future is education that is able to have and solve the educational problems it faces. The school as an educational agency or institution should ideally be able to carry out the process of education, socialization, and transformation. In other words, a quality school is a school that is able to act as an educational process (an educational process that emphasizes teaching and learning activities), a socialization process (a social process, especially for students), and a transformation process

waddah (a process of changing behavior in a better or more advanced direction). In the teaching and learning process, teachers are the main factor and teacher performance in the teaching and learning process is the main parameter of education quality. Teachers are the determining factor in the quality of education because they are the ones who deal directly with students, because each teacher has the freedom to choose and use various learning models according to the needs and characteristics of the subjects to be taught (Nugraha, 2023).

IPAS is a combination of Natural Sciences (IPA) and Social Sciences (IPS) which is now a new subject in the Merdeka Curriculum (Hattarina, 2022; Purnadewi, G. A. A & Widana, I. W., 2023). Moreover, in the current curriculum, namely the Merdeka Curriculum, there are IPAS subjects, which of course really need a learning strategy to support the learning process. The 2013 curriculum is in principle an attempt to perfect the previous curriculum, therefore of course this curriculum has strengths and weaknesses. For this reason, it is very necessary to be able to support the Government in improving and perfecting the quality of the curriculum in order to create competent students in facing global challenges (Aisyah, S., & Astuti, R., 2021).

The success of the teaching and learning process is determined by the teaching model, namely how the teacher conveys the material to be taught. Literally method (method) means "way". In general use, a model is defined as a way of doing something or a way of doing work by using facts and concepts systematically. Teaching models are ways of presenting learning materials to students to achieve predetermined goals (Hamruni, 2012). Meanwhile, the learning model is basically a form of learning that is illustrated from start to finish which is presented characteristically by the teacher. The learning model is a framework of activities that can provide a systematic description in carrying out learning and help students and educators to achieve the desired learning objectives (Ardianti et al., 2021; Yasa et al., 2023).

Teacher ability is one effort to improve the quality of education in schools (Widana, I. W. & Laksitasari, B. D., 2023). Teachers are elements in schools that directly and actively intersect with students. The ability in question is the ability to teach by applying the right, efficient and effective learning model. The lecture approach is considered traditional and needs to be changed because the lecture approach, where learning is centered on education with an emphasis on covering and disseminating material, while students are less active, is no longer adequate for the guidance of the knowledge era.

Based on the results of interviews conducted at SD Nurul Huda II Yapis on April 29 that in general there are still many students who have not reached the KKM, this is due to the lack of teacher creativity in applying various learning models which are certainly in accordance with the development and needs of students. So far, IPAS learning in Class IV of Nurul Huda II Yapis Elementary School still applies a conventional learning model. This research indicates that the learning activities implemented by teachers are less innovative and creative, and still use conventional approaches without considering the activeness of learners (Pujawan et al., 2022). For example, when the teacher enters the class, the teacher only explains the material contained in the textbook, after which the teacher gives assignments and evaluates students at the last moment of class time. Students are asked to open notebooks and work on worksheets or answer questions posed by the teacher. The learning process with the lecture method learning model is very monotonous and still not enough to give a deep impression on students, because learning seems monotonous and boring which makes students sometimes not focus on lessons and makes student learning outcomes

decrease. Many students are still busy and talk to their friends when the teacher explains the subject matter. So a solution is needed to overcome this matter. Therefore, teachers must have high creativity in choosing learning models, one of which is the Problem Based Learning (PBL). Problem-based learning (PBL) has been widely adopted in diverse fields and educational contexts to promote critical thinking and problem-solving in authentic learning situations. Much of the earlier studies on PBL have examined the effects of this approach within the curriculum with more recent studies delving deeper to examine how the processes within PBL lead to positive learning outcomes (Dianti Purwaningsih, N. M., & Widana, I. W., 2017). Problem Based Learning (PBL) first developed in the 60s in the context of health education (Barrows, 1980; Kek & Huijser, 2011; Kong, et al, 2014; Trullas, et al, 2022).

Previous research (Ernawati, 2023) obtained that the Problem Based Learning model has a significant effect in increasing the learning concentration of elementary school students in Integrated Thematic Subjects, which means that the Problem Based Learning model has a positive and significant effect in increasing the learning concentration of elementary school students in Integrated Thematic Subjects in terms of Learning Outcomes. Furthermore, previous research (Nurtanto, M., & Sofyan, H., 2015) found that learning by using the Problem Based Learning model can increase student activeness from cognitive, affective, and psychomotor aspects significantly.

The Problem Based Learning model has several advantages, including (1) the Problem Based Learning model can increase student activity in the learning process, and (2) the Problem Based Learning model can provide opportunities for students to apply their knowledge to the real world (Darta, I. K., 2020). Some of these benefits are considered as the advantages of the Problem Based Learning model and it is hoped that students can be skillful in applying the Problem Based Learning model. The Problem Based Learning (PBL) learning model is a learning model that is centered on students by giving problems that exist in real life and students try to solve these problems (Nuarta, I. N., 2020).

Based on the background description, the research objectives are to describe the learning outcomes of students after applying the Problem Based Learning to grade IV students at SD Nurul Huda II Yapis; to determine the significant effect of using the Problem Based Learning model on the learning outcomes of grade IV students at SD Nurul Huda II Yapis. The research hypothesis is if Ha is accepted and H0 is rejected, then there is an effect of the Problem Based Learning model on the learning outcomes of IPAS SD Nurul Huda 2 Yapis, whereas if Ha is rejected and H0 is accepted, then there is no significant effect of the Problem Based Learning model on the learning outcomes of IPAS SD Nurul Huda 2 Yapis.

METHOD

The type of research used in this research is Quasi-Experimental Research. The research design is non-equivalent control group design. The research was conducted at Nurul Huda II Yapis Elementary School located in Gurabesi Village, North Jayapura District, Jayapura City, Papua Province, Indonesia. The sample in this study were all fourth grade students of SD Nurul Huda II Yapis with the sampling technique using purposive sampling. Data collection techniques using observation, tests, and documentation, while data analysis techniques using the T test (Independent sample t-test) with the help of the SPSS Version 26.0 program, the reason researchers use the T test is because only 2 variables are tested so that using the T test is considered sufficient and able to test the research hypothesis.

RESULTS AND DISCUSSION

The results showed that the Problem Based Learning learning model had a significant effect on the learning outcomes of students who were treated using the Problem Based Learning learning model, this was evidenced by the test results using SPSS version 26. Students who were treated using the Problem Based Learning model, obtained an average pretest score of 58.11and increased to 75.96 on the posttest score, while students who studied without using the Problem Based Learning model obtained a pretest score of 57.12 and even decreased to 65.08. The results of this study showed that the use of Problem Based Learning model had a positive effect on student learning outcomes. The following is a table of the average scores obtained by students in the control class and experimental class.

Tabel 1. Descriptive Data Analysis Results

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest Experiment	28	27	87	58.11	15.978
Pretest Control	26	33	100	57.12	15.820
Posttest Experiment	28	47	100	75.96	13.517
Posttest Control	26	40	100	65.08	13.371

Furthermore, to test the hypothesis, the prerequisite test is first carried out, namely the normality test of data distribution. The normality test uses the Kolmogorov-Smirnov method. The analysis results showed that the obtained data were normally distributed as seen from the sig. value> 0.05, that is 0.253 in the control class and sig. value> 0.05, that is 0.128 in the experimental class. The following is a table of normality test results for the control class and the experimental class:

Tabel 2. Normality Test

	Kolmogorov-Smirnov[a]		
	Statistic	*Df*	*Sig.*
Experiment	.939	28	.128
Control	.952	26	.253

a. Lilliefors Significance Correction

After the prerequisite test is fulfilled, both classes are declared normal, so the next step is to test the hypothesis using an independent sample t-test with the help of SPSS Version 26. The test results can be seen in the following table.

Tabel 3. Hypothesis Test

Independent Samples Test		
Levene'sTest for Equality of Variances	t-test for Equality of Means	

		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Model PBL	Equal variances assumed	0.089	0.766	2.973	52	0.004	10.887	3.538	3.538	18.236
	Equal variances not Assumed			2.973	51.783	0.004	10.887	3.541	3.541	18.234

Based on table 3 above, it can be seen the results of the t-test calculation and obtained a tcount value of 2.973, then the tcount value is compared with the ttable value in the degree of freedom (df) = n-2 (54-2) = 52 column with an error rate of 5% for a 2-party test (2-tailed). Based on the results of hypothesis testing, the tcount value is greater than the ttable, namely 2.973> 1.673, then H0 is rejected and Ha is accepted. Furthermore, the significance value (two-sided) is 0.004, smaller than the significance level α (0.004 < 0.05), then H0 is rejected and Ha is accepted. Thus, it can be concluded that the Problem Based Learning learning model has a positive effect on IPAS learning outcomes in class IV SD Nurul Huda II Yapis in the 2023/2024 school year.

The results showed that students in the experimental class who were treated using the problem-based learning model obtained higher scores than students in the control class who were not treated using the problem-based learning model. The study results strongly suggest that the integration of creative pedagogy in Problem-Based Learning sessions significantly increases the proficiency of higher order thinking skills in the context of natural science education. Furthermore, Problem-Based Learning not only focuses on increasing knowledge, but also develops critical thinking skills, creativity, teamwork, and the ability to overcome real-world challenges (Dawood et al., 2021).

The problem-based learning model is able to overcome failure in learning because students themselves experience and are directly involved in the learning process, when students experience difficulties in the learning process, the teacher is only a guide in solving these problems, in the learning process using the PBL model, the teacher's role is more as a facilitator who tries to stimulate, guide, and direct students in overcoming learning problems in accordance with basic competencies and learning objectives (Masitoh, 2023). This is in line with research by (Cavanagh et al., 2019) which says that integrating Problem-based learning with creative pedagogy offers students the opportunity to engage more meaningfully in the learning process.

The Problem Based Learning (PBL) model is one of the learning models that can be used as a solution in the learning context. The purpose of this approach is to encourage learners to be able to build their own understanding, develop higher-level thinking skills and inquiry, increase independence, increase understanding of meaning, facilitate problem solving, and build teamwork (Sofyan & Komariah, 2016). However, further researchers need to understand that the problem-based learning model also has several things that need to be improved and have difficulties in its application. Assessment of learner performance in problem-based learning may be a challenge, as the problem-based learning model emphasizes thinking and problem-solving skills (McColgan et al., 2017). In addition, learning that involves students directly is able to manage their own learning to achieve the desired learning goals and not fully dependent on educators, more motivated to learn, and able to reflect on their own learning (Van Nguyen, S., & Habók, A., 2021). Therefore, educators need to

develop active learning, considering that autonomy can be obtained through planning, implementation, and evaluation of learning that focuses more on developing learners' 21st-century skills (Tseng et. al., 2020).

CONCLUSION

This research focuses on the application of the problem-based learning model in learning to improve students' IPAS learning outcomes which aims to make a distinctive and important contribution to understanding and innovative ways of teaching IPAS material to improve the quality of learning in the context of education for the better and quality. The application of the problem-based learning model shows a very significant effect as evidenced by the test results obtained, and during the teaching and learning process it can be seen from the students' interest in learning, being able to show improvement in analyzing problems, being able to evaluate various solutions, and even being able to create innovative solutions to problems in complex learning.

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