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The Effect of Problem Based Learning Model on Students' Critical Thinking Ability at SDN 2 Pecangaan

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Abstract: Problem-based learning model is a learning model in which children are given a real problem, so as to grow the curiosity of students to find the solution together with the group. This study aims to determine the activeness of students using the Problem Based Learning (PBL) model with a conventional model on the volume of space building material of class IV SD 2 students. This research method is quantitative research with the research design used in this study is Pre-Experimental Designs with the type of one group pretest-posttest Design. The data analysis technique in this study uses descriptive quantitative. normality test to test whether the data is normally distributed or not. Homogeneity test is used to test the instrument relationship. The data was then processed with a simple linear regression test and tested t. The sample used was all 4th grade students of SDN 2 Pecangaan with a total of 40 students. From the results of data analysis and discussion above, it can be concluded that the problem-based learning model can increase student learning activeness at SDN 2 Pecangaan. This is evidenced in hypothesis testing of pre and post test results where the sig (2-tailed) value shows 0.000 or sig (2-tailed) <0.05 so it can be concluded that Ho is rejected or there is an average difference between the pretest and posttest. The average value increased from the pretest of 70.5 and to the posttest of 76.2.

Keywords: Problem based learning, Learning Activity, Elementary School

1. Introduction

Education plays an important role in the development of the times. The quality of a nation's human resources depends on the quality of that nation's education. Mathematics is a course that is available at all educational levels, including elementary school. First, students are taught mathematics in tangible, semi-concrete, and abstract forms. According to Nikmah, et al (2020), The goal of teaching mathematics in elementary school is to make sure that students can use it effectively. In addition, learning mathematics can put pressure on students to organize their thinking when applying it to real-world problems in their communities (Lestari & Putra, 2020).

According to Harwati (2022), The term "activeness" is derived from the word "active," which implies bustle or activity, while the word "activeness" refers to being able to respond and participate. According to (Karima & Hardini, 2023), The practice of organizing teaching and learning activities to best create a supportive classroom environment is known as learning activeness. Learning activeness may be defined as a student-led activity that involves working or participating actively in the classroom learning process in order to gain experience, knowledge, comprehension, and other elements of what has been done.

It can be concluded that student learning activeness is the busyness or activities carried out by students in the learning process so as to create a conducive classroom atmosphere. There are several indicators that show the characteristics of student learning activeness according to Rukoyah, Ekowati and Wahyuningtyas (2023), including: 1) The existence of students in formulating learning objectives according to their needs and abilities as well as their experience and motivation as a consideration in determining learning activities, 2) There is student involvement in developing learning designs, and 3) There is involvement in determining and procuring learning media to be used, Meanwhile, according to Rahmayanti (2022), there are several indicators of student learning activeness, namely: (1) paying attention to the explanation of the material from the teacher, (2) asking the teacher about material that is not clear, (3) answering questions from the teacher, (4) listening to the explanation of the material from the teacher, (5) taking notes on the material from the teacher, (6) doing exercise questions from the teacher, (7) paying attention to other groups' presentations, (8) giving

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opinions on problems and solutions, (9) daring to present the results of their work in front of the class, (10) listening to other groups' presentations, (11) discussing with friends.

According to Sudjana in Prasetyo & Abduh, (2021), there are a number of ways to identify indicators of learning activity, including: Students want to be involved in problem-solving during learning activities, they want to participate in carrying out their learning tasks during teaching and learning activities, and they want to ask friends or the teacher for help when they are confused or run into difficulties. (4) Pupils wish to look for information that could be required to address the issues they are having, (5) In accordance with the teacher's directions, students lead group discussions. (6) Students have the ability to evaluate their own skills and accomplishments, (7) Students practice problem solving, and (8) Students are given the chance to use or apply what they have learned to solve the tasks or issues they confront.

It can be concluded that the indicators of student learning activeness are 1) Pay attention, 2) Actively participating in classroom activities, 3) Actively asking questions or having opinions, 4) Confidently presenting the results of their work, 5) Discussing to solve problems.

Harland (2019) argues that the Problem Based Learning model is a model based on problem solving by providing real-life problems as a context for students to practice how to think smart and critically and be able to understand a problem and analyze how to solve the problem appropriately.

Problem-based learning model is a teaching model with a focus on solving real problems, a process where students carry out group work, feedback, discussion, thus students are encouraged to be more active in the subject matter and develop critical thinking skills and student learning outcomes (Effendi & Reinita, 2020).

Erika et al (2019: 85) Problem-based learning model is a cooperative learning model that can provide active learning to students, PBL focuses on students by directing students to become independent learners and actively involved in group learning.

It can be concluded that the problem-based learning model is a learning model where children are given a real problem, so as to grow the curiosity of students to find the solution together with their group.

According to Effendi and Reinita, (2020) the syntax of problem-based learning is (1) orienting students in (2) organizing students to learn (3) guiding individual and group investigations (4) developing and presenting work (5) analyzing and evaluating the problem-solving process.

Previous research that applied the problem-based learning model was research conducted by Annisa, Fajrie, and Ahsin (2021) with the title "Application of Problem Based Learning Model Assisted With Ilustrated Picture Card Media To Increase Student Concept Understanding Class Iv Basic Schools" The average score in cycle I's knowledge aspect is 72.428, indicating that using the problem-based learning methodology can help students grasp topics better. The average score rose to 75.285 in cycle II, marking another improvement. The average score for teacher abilities in cycle I was 67%, whereas the average score in cycle II was 78%. The information above leads to the conclusion that, when used to the class IV SD N 4 Kalipucang Wetan topic of "Beautiful Diversity in My Country," the problem-based learning approach, in conjunction with illustrated picture card medium, can enhance students' conceptual thinking abilities and teaching skills.

2. Methodology

The approach in this research is a quantitative approach. According to Sinambela (2021) quantitative research is a type of research that uses numbers in processing data to produce structured information. The research design used in this research is Pre-Experimental Designs with the type of one group pretest-posttest Design.

According to Sukandarrumidi (2021), the research technique is the main technique by which researchers accomplish their objectives and identify solutions to the issues raised. The purpose of the experimental research technique, which is a quantitative approach, is to ascertain the influence of independent variables (treatment/treatment) on dependent variables (results) under carefully regulated circumstances (Sugiyono 2019).

This study aims to determine the activeness of students using the Problem Based Learning (PBL) model with a conventional model on the material of the volume of building space of class IV SD 2 Pecangaan students, students are said to be active if students get good qualifications in student questionnaires or with a percentage of 68%-83%.

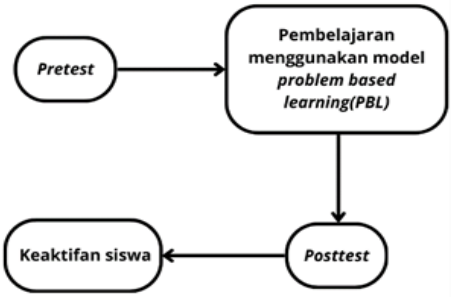

Figure 1: Research Design

Based on the chart above, it can be explained that. The researcher first prepared a student activeness questionnaire, then the researcher asked the subject to fill out a pre-test questionnaire. Furthermore, after carrying out the pre-test, the researcher gave a learning treatment to the experimental class with a problem-based learning research model. The next step after the treatment of students, researchers gave a posttest questionnaire to both classes to find out student activeness after being given problem-based learning.

The sample used was all 4th grade students of SDN 2 Pecangaan with 40 students. Data collection techniques are According to Sugiyono (2019), data collection techniques are the most strategic step in a study, because the main purpose of research is to obtain data, (1) observation, which is a way of systematically observing and analyzing using the five senses regarding individual or group behavior, (2) a questionnaire questionnaire to determine student activeness.

The data analysis technique in this study uses descriptive quantitative. normality test to test whether the data is normally distributed or not. Homogeneity test is used to test the instrument relationship. The data was then processed by simple linear regression test and t test.

3. Result and Discussion

3.1 Result

3.1.1 Normality test

In the data test process, researchers used the help of the IBM SPSS Statistic 23 application. The following are the results:

Hypothesis formulation:
Ho = data is normally distributed
Ha = data is not normally distributed
Significance level (α) = 0.05
The test criteria are as follows:
Ho is accepted if sig > 0.05
Ho is not accepted if sig < 0.05

Table 1: Normality Test

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Kode	Statistic	df	Sig.	Statistic	df	Sig.
Hasil	1,00	,116	40	,192	,954	40	,107
	2,00	,120	40	,148	,941	40	,038

a. Lilliefors Significance Correction

From the shapiro-wilk normality test table above, it can be seen that the pre-test results get a sig value of 0.107, and the post-test results get a sig value of 0.038, so it can be concluded that both data are normally distributed.

3.1.2 Paired T-Test

In the paired t test, there are references used to determine the average difference between the pretest and posttest, including the following:
Hypothesis formulation:
Ho = there is no difference in the average test results before and after applying the Problem Based Learning learning model
Ha = there is a difference in the average test results before and after applying the Problem Based Learning learning model
Level of significance (α) = 0.05
The test criteria are as follows:
Ho is accepted if the Sig value. (2-tailed) > 0.05
Ha is accepted if the Sig value. (2-tailed) < 0.05

Table 2: Descriptive Analysis

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	70,5500	40	11,34980	1,79456
	Posttest	76,2500	40	12,50590	1,97736

The average pretest score was 70.5 and the posttest score was 76.2. It can be seen that the average results have increased. So, it can be concluded that the problem-based learning model can improve critical thinking ability.

Table 3: relationship between pre-test and post-test

		N	Correlation	Sig.
Pair 1	Pretest & Posttest	40	,782	,000

From the table above, it can be seen that sig <0.05 or there is a relationship between pre-test and post-test.

Table 4: Paired T-Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pretest - Posttest	-5,70000	7,94597	1,25637	-8,24124	-3,15876	-4,537	39	,000

It can be seen from the paired sample test table above that the sig (2-tailed) value shows 0.000 or sig (2-tailed) <0.05 so it can be concluded that Ho is rejected or there is an average difference between the pre-test and post-test.

3.2 Discussion

Based on the data analysis above using the paired sample test from the comparison after and after learning using the problem-based learning model, it was found that the activeness of class IV students of SDN 2 Pecangaan increased after being given learning using the problem-based learning model.

The research is relevant to research conducted by Yunitasari and Hardini (2021) "Application of the PBL Model to Increase Student Activeness in Online Learning in Elementary Schools" The results showed that in cycle I there was an increase in student activity of 90.16. This means that only 1 learner (3.3) has a less active level. 18 learners (60%) have a sufficient category, 8 learners (26.7%) are active, and 3 learners (10%) are very active. In cycle II, the average learner activeness increased to 118.57. This means that 11 learners (36.7%) are very active, 18 learners (60%) have active criteria, and only 1 learner (3.3%) is quite active. Thus, through the application of the problem-based learning model during online learning, it is proven that it can increase the activeness of class IV students of SDN Anggaswangi in thematic learning in the 2020/2021 learning year.

Silalahi & Hardini, (2023) argue that learning models can affect the activeness of students in the classroom and can improve learning outcomes, this opinion is reinforced by Muhammad Mucharom (2019) that in the implementation using a problem-based learning model can increase the learning activeness of students. The use of PBL learning methods students will find it easier to understand the material because they are invited to learn through problems that arise and how to solve these problems (Rizki et al., 2019).

4. CONCLUSION

From the results of data analysis and discussion above, it can be concluded that the problem-based learning model can increase student learning activeness at SDN 2 Pecangaan. This is evidenced in hypothesis testing of pre and post test results where the sig (2-tailed) value shows 0.000 or sig (2-tailed) <0.05 so it can be concluded that Ho is rejected or there is an average difference between the pretest and posttest. The average value increased from the pretest of 70.5 and to the posttest of 76.2.

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