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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 is a learning model that uses contextual problems to help students understand the concept of learning by collaborating between students to solve problems. This study aims to determine the effect of Problem Based Learning model on critical thinking skills of fifth grade students at SDN 2 Pecangaan. The method used in this research is experimental. The design in this study was pre-experimental with a one group pretest posttest design. The research was conducted at SDN 2 Pecangaan. The population of this study were all students of SDN 2 Pecangaan. The sample taken by the researcher was the fifth-grade students of SDN 2 Pecangaan which amounted to 30 students. The data analysis technique used is descriptive quantitative using the T Test (Paired T-Test). From the results of the T Test (Paired T-Test), the Sig value was obtained. (2-tailed) of 0.000 which means Sig. (2-tailed) <0.05. It can be concluded that there is an average difference in test results before and after applying the Problem Based Learning learning model. That way, the Problem Based Learning learning model can improve students' critical thinking skills.

Keywords: Problem based learning, critical thinking skills, elementary school

1. Introduction

According to Samsinar (2019) learning is a systematic process to provide learning resources so that the learning process occurs in students. In line with this, according to Fajrie, et al (2023) Learning is a process in which students interact with teachers and learning resources in a learning environment. According to Febriana & Indarini (2020) In a learning process in order to achieve the expected goals, active thinking is needed. From the various opinions above, it can be concluded that learning is a process of interaction between students and educators by providing learning resources so that the learning process occurs to achieve the expected goals.

According to Djamaluddin & Wardana (2019) Learning outcomes are determined through intellectual questions, emotional questions and spiritual questions (IQ, EQ, SQ). These three things cannot be separated from one another. In order for these three aspects to be realized, learning and educators who can combine adequate learning methods and strategies are needed. According to Slameto, learning outcomes can be seen in the characteristics of changes in behavior as a result of the learning process are (1) Changes occur consciously; (2) Be permanent or continuous, and functional; (3) Be positive and active; (4) Have goals and are directed; (5) Cover all aspects of individual behavior. If the learning process is carried out properly, the expected learning outcomes will be achieved. Through learning, students are expected to become the next generation of the nation who have the competence to advance development, character, critical thinking, so that they become superior human resources.

Multidimensional quality of education consists of input, process, and output. The quality of education will be considered good if it can produce good output, so that in achieving this, quality educators and learning processes are needed. But in reality, the learning process that takes place today is less than optimal. There are many factors that influence the learning process which results in less effective learning activities. According to Samsinar (2019) The results of the analysis contained in the Ministry of Education's Strategic Plan show that the learning process so far is still too oriented towards mastery of theory and memorization in all fields of study. Likewise, teacher-centered learning methods tend to ignore the needs and growth and development of students. In addition, the overloaded learning content makes the

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learning process less flexible with social and environmental changes. These factors hinder a fun and meaningful learning process that causes students' learning abilities to be less than optimal.

Learning should direct students to understand the environment around them, know the problems faced, so that students will understand the essence and purpose of the material they learn. For this reason, a learning model is needed that can facilitate students in understanding the problems around them. According to Febrita & Harni (2020) Problem Based Learning is an approach that uses real-world problems as a context. The problem-based learning model really requires students to collaborate with other students to solve a problem Pratiwi & Setyaningtyas (2020). Problem-based learning allows students to exchange information and solve problems so that students' critical thinking skills automatically increase (Rahmatia & Fitria, 2020). Based on these statements, it can be concluded that Problem Based Learning is a learning model that uses contextual problems to help students understand the concept of learning by collaborating between students to solve problems. Because the reference in the problem-based learning model is problem solving, during the learning process students' critical thinking skills will automatically increase.

The steps of learning using the Problem Based Learning model are (1) Orienting students to the problem; (2) Organizing students to learn; (3) Guiding individual and group investigations; (4) Developing and presenting work; (5) Analyzing and evaluating the problem-solving process. According to Annisa, et al (2021) Problem Based Learning is a learning model that can create students understand material through discoveries or guided by problems so that students are faced with a problem to solve during the learning process. Selection. Through learning activities using the Problem Based Learning learning model, learning will be oriented to problems that occur in students' daily lives so that it will be easier to understand and the meaning of learning will be conveyed properly.

According to Febriana & Indarini (2020) Critical thinking requires students to further improve their ability to analyze a problem, find problem solving and provide new ideas that can also provide a new picture of solving a problem. According to Nurkhasanah (2022) Critical thinking ability is a high-level thinking ability in solving problems rationally. According to Ati & Setiawan (2020) Students who have critical thinking skills can make careful considerations in making decisions to deal with the problems around them. Critical thinking skills can improve students' ability to solve problems. With good critical thinking skills, students will be better able to analyze problems, find solutions, and find new ideas. Students will have the awareness to design, assess, and understand what they are learning so that students are active in learning. The indicators of critical thinking can be formulated into 4: (1) understanding the problem; (2) planning problem solving; (3) solving problems according to procedures; (4) drawing conclusions.

Grade 5 students of SDN 2 Pecangaan have varying abilities in learning math. Students' curiosity about learning math is still lacking. Most students still do not understand the material being taught, so students do not understand how to solve problems and the application of the material in everyday life. During learning, there are students who can understand well, and there are some students who do not pay attention to the teacher's explanation. The teacher's teaching method is good, but students' enthusiasm is still lacking.

There are several previous studies that are relevant to the problems that will be examined by researchers. Among them are research from Ika Deana Fatmawanti and Vita Istihapsari (2022) on Improving Critical Thinking Ability through Problem Based Learning Model Assisted with LKPD Triangle Quadrilateral Material. The results showed that the Problem Based Learning (PBL) learning model assisted by LKPD in mathematics learning was effectively used in improving the critical thinking skills of VII B class students at SMP Negeri 1 Bantul. This is indicated by the satisfaction of the success indicators and the increase from 56% to 71% The critical thinking ability of students increased from Cycle I to Cycle II. Research from Arindra Ikhwan Nur Huda and Muhammad Abduh (2021) on Improving Students' Critical Thinking Skills through the Problem Based Learning Model for Elementary School students. The results of this study indicate that there is an increase in students' critical thinking skills, this is evidenced by before the action is taken students get an average critical thinking skills score of only 53.7 with the lowest score of 47 then the highest score of 81. After the first cycle action was carried out, it was known that there was an increase in the score of students' critical thinking skills in the average score of 68.96 and the highest score of students was known to be 91 and the lowest score was 47. After that, the second cycle action was continued, it was known that the results obtained by the average student in creased to 85.36 then the highest score of students obtained was 94 until the lowest score was 68. Research from Dewi Nurkhasanah, et al (2022) on the Application of Problem Based Learning Model to Improve Critical Thinking Skills of Grade V Elementary School Students. The results showed that the ability to think critically with the application of problem-based learning increased from cycle I by 58.98% and in cycle II by 97.4%. The increase in student learning outcomes in cycle I there were students who were complete with KKM $\leq$ 70 as many as 22 students with a percentage of 56.4% of 39 students. In cycle II, there was an increase of 33 students with a percentage of 84.6% with KKM $\leq$ 70 and a performance indicator of 80%.

2. Methodology

This research uses a quantitative approach. Quantitative research is a type of research based on calculations, or research that involves itself in calculations, numbers, or quantities (Saat & Mania, 2020). The method used in this research is experimental. Experimental research is a research activity that intends to determine the effect of an educational action on student behavior, or test hypotheses about the presence or absence of the effect of a treatment or action when juxtaposed with other actions (Akbar et al., 2023). The action in experimental research is called treatment, which is any action that

will be taken by the researcher whose effect will be known. The design in this study is pre-experimental with a one group pretest posttest design. This design uses one group, because the pre-experimental design only applies treatment to one subject without a control group (Syam et al., 2022). Before students are given treatment, researchers will conduct an initial test (pretest) to determine the results of the treatment more accurately. researchers will provide treatment, namely implementing learning using the Problem Based Learning model. At the end, the researcher gives a final test (posttest) to determine the effect of the treatment that has been given. The research procedure can be seen in the chart below.

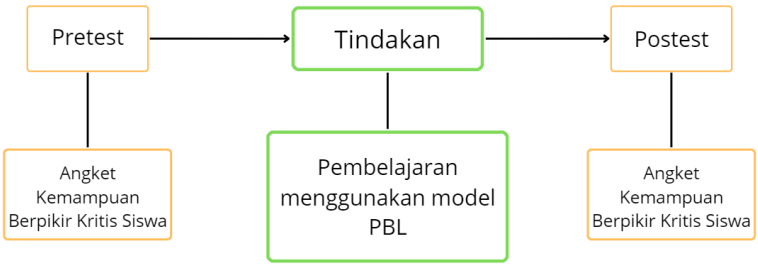

Figure 1: Research Design

The research was conducted at SDN 2 Pecangaan. The population of this study were all students of SDN 2 Pecangaan. The sample taken by the researcher was the fifth-grade students of SDN 2 Pecangaan which amounted to 30 students. Samples are part of the population or part of the sub-population from which the data is actually taken, so they are commonly referred to as data sources or research subjects (Saat & Mania, 2020). The data collection technique in this study uses a questionnaire (questionnaire) which is adjusted to the indicators of students' critical thinking skills. The data that has been obtained will be analyzed.

The data analysis technique used is descriptive quantitative. Quantitative descriptive research is a study that uses quantitative methods and descriptive data analysis techniques in order to understand academic meaning (Alfatih, 2021). The data obtained will be tested using the T-test. The tests that will be carried out include Normality Test, and T Test (Paired T-Test).

3. Result and Discussion

3.1 Result

3.1.1 Normality test

Normality test is a prerequisite test conducted to test whether the data is normally distributed or not. Based on the data of the two samples, namely the results of the pretest and posttest, the normality test can be carried out as follows.
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

Tabel 1: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.085	30	.200*	.963	30	.365
Posttest	.111	30	.200*	.968	30	.476

In the Shapiro-Wilk test, the pretest data has a significant value of 0.365. The posttest data has a significant value of 0.476. Both data have a sig value> 0.05, so Ho is accepted. It can be concluded that both data are normally distributed. After the data is declared normally distributed, the Paired T-Test is continued.

3.1.2 Paired T-Test

Paired T-Test is a test conducted to determine the average difference between pretest and posttest. Based on the data of the two samples, namely pretest and posttest, the T test can be carried out as follows.
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

Tabel 2: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	65.0333	30	8.88813	1.62274
	Posttest	81.9333	30	8.56590	1.56391

The average pretest score was 65.03 and the posttest score was 81.93. The average value (mean) between the pretest and posttest has increased. It can be concluded that the Problem Based Learning model can improve students' critical thinking skills.

Tabel 3: Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pretest & Posttest	30	.519	.003

In the correlation test, the sig value is 0.003. This value is smaller than 0.05. So, it can be concluded that the two data are correlated.

Tabel 4. Paired Samples 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	-16.90000	8.56758	1.56422	-20.09919	-13.70081	-10.804	29	.000

From the results of the T Test (Paired T-Test), the Sig value is obtained. (2-tailed) of 0.000 which means Sig. (2-tailed) <0.05, then Ha is accepted. It can be concluded that there is an average difference in test results before and after applying the Problem Based Learning learning model. That way, the Problem Based Learning learning model can improve students' critical thinking skills.

3.2 Discussion

Based on data analysis using the Paired T-Test test through comparison of scores before and after learning using the Problem Based Learning model, the results show that this learning model can improve the critical thinking skills of grade V students of SDN 2 Pecangaan. The average pretest score was 65.03 and the average posttest score was 81.93. With the difference in average scores before and after the action amounted to 16.9. These results are relevant to previous research, namely research from Aiman, et al (2023) on the Effect of Problem Based Learning Model with Mind Map Supplements on Critical Thinking of Elementary School Students. With the results seen in the average pretest score of 58.7, while the average posttest score is 73.8. This difference is seen that the Problem Based Learning (PBL) learning model emphasizes student activeness in finding problems in an inquiry and collaborative manner.

The Problem Based Learning (PBL) learning model is effectively applied in learning to improve students' critical thinking skills. Where critical thinking is an ability needed today so that students can digest and understand the problems around them. The Problem Based Learning model is a problem-based model by linking events in the surrounding environment, so that students will more easily understand and can improve critical thinking skills (Nurlaeli, 2022).

Learning with the Problem Based Learning model based on problems in everyday life will help students link the information and knowledge they have to apply to the problem-solving process. This will certainly stimulate students to think critically. Unlike the conventional method, learning is only centered on the teacher. Students more often listen, memorize and record what the teacher says, this results in students becoming passive (Aiman et al., 2023).

4. Conclusion

From the results of data analysis and discussion, it can be concluded that the Problem Based Learning model can improve students' critical thinking skills at SDN 2 Pecangaan. evidenced in hypothesis testing which shows a significant value of 0.000 which means this value is less than 0.05. Then Ha is accepted. That way, there is a difference in the average test results before and after applying the Problem Based Learning learning model.

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