

THE EFFECT OF PBL-BASED LKPD ON CRITICAL THINKING SKILLS OF VII-GRADE STUDENTS AT MTS AL USWAH BERGAS ON ENVIRONMENTAL POLLUTION MATERIAL

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Abstract

Problem-solving, communication, creativity, invention, cooperation, and critical thinking are among the skills of the 21st century. The study aims to know the effect of PBL-based LKPD on the critical thinking skills of VII students on environmental pollution material. This kind of research is quantitative. The quasi-experiment method was used, with a pre-test and post-test non-equivalent control group design. Population in class VII MTs Al Uswah designed 175 students. The sampling technique used was the purposive sampling technique. The research sample was 55 students. The number of samples in the experimental class was 26 students and 29 students in the control class. The instrument used was an essay question and observation. The data analysis used was an independent t-test. The results of the independent t-test obtained Sig. (0,009) < α (0,05) then H_a is accepted, so it is suggested that there are differences in students' critical thinking skills between the experimental class and the control class on environmental pollution material in class VII. The correlation analysis results obtained Sig. (0,000) < α (0,05), so there is a correlation between two variables. The regression analysis obtained Sig. (0,000) < α (0,05) then H_a is accepted, with the regression equation is $Y = 35,748 + 0,592X$ positive values, so, if the use of PBL-based LKPD increases, the ability to critical thinking will also increase. The coefficient determination in this research is 60,7%. The use of PBL-based LKPD affects the critical thinking skills of VII grade students at MTs Al Uswah on environmental pollution material.

***Keywords:** effect, problem-based learning (PBL) based LKPD, critical thinking skills, environmental pollution material.*

Introduction

Problem-solving, communication, creativity, invention, cooperation, and critical thinking are among the skills of the twenty-first century (Hasanah, 2021). The development of 21st century skills is possible through education. However, Indonesia's educational system has suffered as a result of the COVID-19 pandemic. The growing number of students who are unable to finish their education because of financial and technological limitations. The limitations not only impede learning but also result in a loss in students' interest, creativity, and critical thinking abilities (Rahayu, 2021).

Nowadays, it is crucial to foster in children the ability to think critically, in particular. In the Qur'an, An-nisa verse 82 says, "As for the word of Allah." If the Qur'an had come from a source other than Allah, they would have discovered a great deal of contradiction in it. To find quality human resources, one needs critical thinking abilities. Education can be used to produce quality human resources. Education is a means of raising each student's potential

and caliber in order to raise their standard of living. In the current era of globalization, developing and growing human resources are crucial. Because developing the potential for critical thinking, innovation, and approaches to tackle challenges in the future requires high-quality human resources.

The learning process should give a pleasant impression to student. Results from interviews and observations of teachers, students, and the learning process at MTs Al Uswah Bergas indicate that the expectations placed on pupils, particularly in the area of critical thinking skills, are not comparable to the usage of media and learning models. The monotonous learning process is still centered on memorization of textbook material. Monotonous instruction can lower student engagement, particularly with regard to their critical thinking abilities (Marhamah et al., 2020) Critical thinking abilities in Indonesia have been studied, and the results indicate that they are still in the poor group (Rusmansyah et al., 2019)

The solution that will be done is to use PBL-based LKPD. Some of the relevant studies include, (Wenno & Batlolona, 2021), in their research they said that PBL facilitates in improving students' creative and critical thinking skills on static fluid. The research of (Fadilla et al., 2021) they said the use PBL in learning process can be affects the improving students' critical thinking skills. And (Putri et al., 2021) based on the results of his their research, the use of student worksheets (LKPD) is efficient to improving students' critical thinking skills. LKPD or worksheet makes learning easier and more efficient (Susanti et al., 2019). LKPD can help students who get bored easily, who don't do assignments, who have bad test scores but listen and behave well in class, and etc (Kelley, 2015).

With the use of real-world situations, problem-based learning (PBL) encourages students to apply their critical thinking skills to find a solution (Setyo et al., 2020). With the use of PBL, students can increase their knowledge by connecting all of their prior learning and all of what they have learned from engaging in group activities and interacting with others. PBL requires students to solve problems using a number of different approaches and to pinpoint the root of an existing issue (Nadeak et al., 2020).

Students' participation in their education can aid in the development of their critical thinking abilities. Through their ability to solve problems, PBL students will instantly become involved in the learning process. In order to solve the issues and make conclusions based on their understanding, students must practice critical thinking in this assignment. The study aims to know the effect of PBL-based LKPD on the critical thinking skills of VII students at MTs Al Uswah Bergas on environmental pollution material.

Method

The research was carried out at MTs Al Uswah Bergas. Research time in March, even semester of the 2021/2022 in grade 7st. There are two variables used, namely the independent variable is PBL-based LKPD and the dependent variable is students' critical thinking skills. This kind of research is quantitative. The quasi-experiment method was used, with a pre-test and post-test non-equivalent control group design. The steps in this research are (1) do a pretest in the experimental class and control class, (2) do treatment by applying PBL-based LKPD in the experimental class and conventional learning in the control class, and (3) do a posttest in the in experimental class and control class.

Population in class VII MTs Al Uswah Bergas designed 175 students. The research sample was 55 students. And the number of samples in the experimental class was 26 students and 29 students in the control class. The sampling technique used was the purposive sampling technique. The instrument used was an essay question by rubric and observation. Critical thinking ability parameters in this research using critical thinking indicators developed by Ennis. Ennis stated that there are 12 indicators of critical thinking skills in 5 groups (Ngabidin & Arwan, 2021).

The steps of this research data analysis are 1) Normality test, the test of normality using the Kolmogorov-Smirnov test with SPSS. This test criteria if the value of $\text{sig} > \alpha$ (0,05), so it is said to be normal. 2) Homogeneity test, the test of homogeneity using the Levene test with SPSS. This test criteria if the value of $\text{sig} > \alpha$ (0,05), so it is said to be homogeneity. 3) Independent t test with SPSS. The test was performed to examine the difference in average of the concepts of critical thinking skills between the experimental class and the control class. This test criteria if the value of $\text{sig} < \alpha$ (0,05), so there is the difference in average. 4) Correlation analysis, to examine the relationships between the two variable. This test criteria if the value of $\text{sig} < \alpha$ (0,05). 5) Regression analysis, to determine the effect of the independent variable on the dependent variable. This test criteria if the value of $\text{sig} < \alpha$ (0,05), so H_a is accept. And regression equation can be written with the formula $Y = a + bX$. 6) Coefficient determination, to find out the presence from the use PBL-based LKPD on students' critical thinking skills.

Result and Discussion

The problem based learning (PBL) is a learning model that uses real problems in the environment as a focus in learning process and helps to improving students' thinking ability, solve problems, and get the concept or essential from a lesson (Lismayanti, 2019). PBL provides opportunities for students to be involved in problems solving (Purnama, 2019). The process of solving this problem helps students integrate the knowledge they have or information obtained enabling them to offer various alternative solution (Nadeak et al., 2020). That uses real problems in the environment related to learning material, so students know why they learn.

In the research LKPD is structured according to the PBL syntax. Problem Based Learning process designed by Arend. The use PBL implemented accordance with the PBL steps. Phases were: (1) finding the problem, (2) organizing the students to analyze the problem, (3) helping the independent investigation and study in group, (4) presenting the discussion result, and (5) Analyzing and evaluating the process of solving the problem (Sujana & Jayadinata, 2018). PBL helps students to identify problems and gather information from learning source and discuss them with their groups to find solutions of problems. PBL is learning models by applying critical thinking process and problem solving skills. PBL can improving students' critical thinking skills (Sumianto, 2017). The use of PBL can improving student activities in learning process (Vebrianto, 2021).

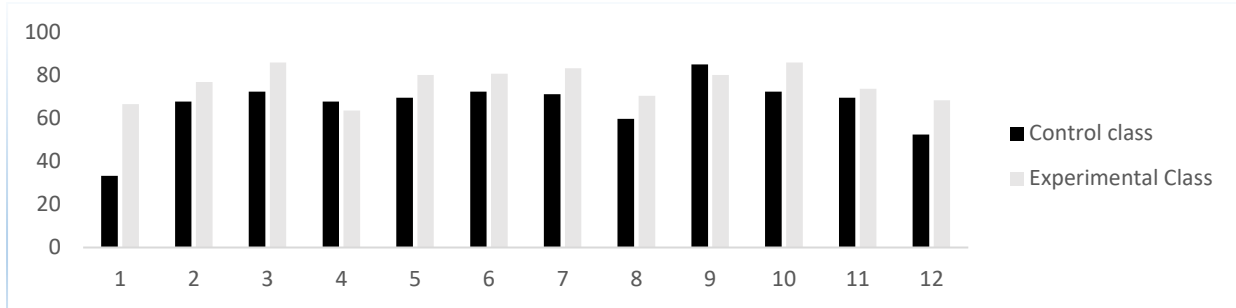


Figure 1. The average of critical thinking indicators

Figure 1, it can be seen that the experimental class is better to improving critical thinking skills. The use of PBL-based LKPD can improve students' critical thinking skills when compared to conventional learning. LKPD is a media that can be used to helps student dan teachers in the learning process (Amalia & Sulastry, 2020). The use PBL based-LKPD can direct students during learning, besides that can develop the analyze ability and find solutions to problems solving. The learning process becomes more interesting and challenging, because students can explain their opinion well (Purnama, 2019).

Before testing the hypothesis, the normality and homogeneity tests were first carried out. The result of the independent t test of students' critical thinking skills, shown in Table 1.

Table 1. Result of Independent t test

	Normality test	Homogeneity test	Sig (Independent t test)
Pretest	0,068 (normal)	0,340 (homogeny)	Sig. 0,009
Posttest	0,054 (normal)	0,199 (homogeny)	

Table 1, the independent t-test obtained Sig. (0,009) < α (0,05) then H_a is accepted. So, this result show the difference in average about critical thinking ability between the experimental class and control class. The use PBL-based LKPD can have an effect on improve critical thinking skills. The difference can be seen from the pretest and posttest scores of the experimental class and control class, (Shown in picture 2).

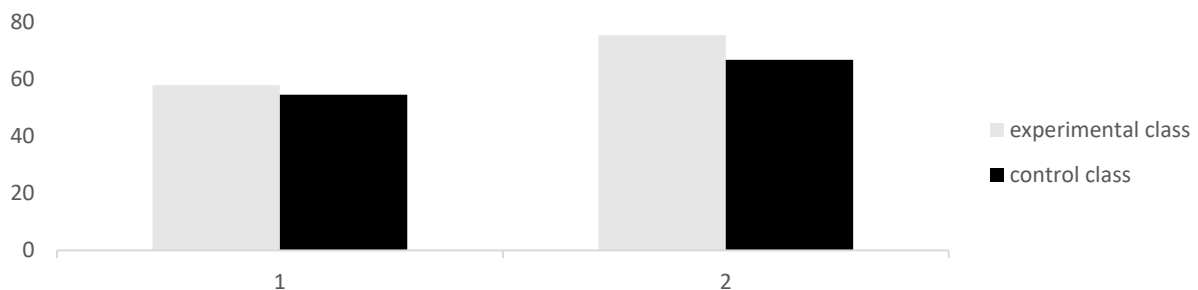


Figure 2. Improving Pretest and Posttest Scores

Figure 2. that the posttest score of the experimental class is higher than the control class. This is because, experimental class in the learning process using PBL-based LKPD. Learning focuses on students, this causes an increases in students enthusiasm in learning. Thus the use PBL-based LKPD has a correlation in improving students' critical thinking

ability. The following are the result of the correlation analysis of two variable (shown in table 4).

Table 4. Result of Correlation Analysis

		Correlation
Experimental Class	Pearson Correlation	,779**
	Sig. (2-tailed)	,000
	N	26

Based on table 4, the result of correlation analysis obtained sig (0,000) < α (0,05), so the two variable have a correlation. And the correlation will have a positive and negative affect. The affect can be seen in table 5.

Table 5. Result of Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	35,748	6,659		5,368	,000
PBL-based LKPD	,592	,097	,779	6,085	,000

Table 5 it can be seen the regression analysis obtained Sig. (0,000) < α (0,05) then H_a is accepted, with the regression equation is $Y = 35,748 + 0,592X$ positive values, so, if the use of PBL-based LKPD increases, the ability to critical thinking will also increase. The percentage of the affect or coefficient determination (R^2) of PBL-based LKPD on students' critical thinking as shown in table 6.

Tabel 6. Result of Coefficient Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,779 ^a	,607	,590	6,600

The value of R^2 is 0,607, so the contribution given from the use PBL-based LKPD on students' critical thinking skills is 60,7%. The use of PBL-based LKPD ha a better effect on improving student's critical thinking ability when compared to conventional learning. LKPD is a basically a media that functions to make easier for students to learn and PBL is a leaning model with steps that help students to more easy solve problems. With the use PBL-based LKPD, students will enjoy and be challenged in learning process.

The PBL model's ability to pique students' interest and inspire them to learn was its primary strength. The PBL model's emphasis on the students' ability to express their opinions or give solutions to problems in front of the class was its second strength. The pupils' ability to use their knowledge to research issues and complete the tasks assigned by the teacher was their third strength. The pupils' increased engagement in the learning process was the last strength (Apriadiadewi, 2017). So, PBL-based LKPD can improve students' critical thinking skills, because the learning process provided authentic facilities, guiding students to explore, evaluation, and synthesis new idea to solve problems.

The use PBL-based LKPD can have a positive effect on students' critical thinking skills. Almost all students have been able to analyze and identify problems encountered with critical thinking, but some of them still cannot determine the right alternative solution to a problems.

Conclusion

Based on results of the research, the use of PBL-based LKPD can give positive effects the critical thinking skills of VII grade students at MTs Al Uswah Bergas on environmental pollution material. The effect of PBL-based LKPD can help to improving students' critical thinking and activities in the learning process.

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