Volume 2 (2) (2019): 95-101

The Indonesian Journal of Social Studies

Available at https://journal.unesa.ac.id/index.php/jpips/index

Problem-Based Learning Effects on Students Learning Outcomes in the Themes of The Potential and Utilization of Natural Resources

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Abstrak

Penelitian ini bertujuan untuk mengetahui pengaruh model pembelajaran berbasis masalah terhadap hasil belajar siswa. Penelitian ini adalah desain kelompok kontrol Nonequivalent. Sampel dalam penelitian ini adalah kelas VII yang ditentukan secara acak. Bahan yang digunakan adalah potensi dan pemanfaatan sumber daya alam. Data yang diperoleh kemudian diuji secara berbeda menggunakan uji-t sampel independen. Hasil penelitian menunjukkan bahwa kedua kelas penelitian mengalami perubahan positif mengenai hasil belajar siswa. Pada kelas eksperimen model pembelajaran berbasis masalah menunjukkan hasil belajar yang lebih baik daripada kontrol kelas. Perhitungan independent posttest t-test sampel menunjukkan bahwa siswa dengan Sig. (2-tailed) 0,019, di mana 0,019 <0,05 berarti ada perbedaan yang signifikan. Adanya perbedaan yang signifikan menunjukkan bahwa ada pengaruh model pembelajaran berbasis masalah terhadap hasil belajar siswa.
Kata kunci: pendidikan, ilmu sosial, pembelajaran berbasis masalah, hasil belajar

Abstract

This study aims to determine the effect of problem-based learning models on student learning outcomes. This study is Nonequivalent control group design. The sample in this study was class VII which was determined randomly. The material used is the potential and utilization of natural resources. The data obtained are then tested differently using the independent sample t-test. The results showed that the two research classes experienced positive changes regarding student learning outcomes. In the experimental class the problem-based learning model shows learning outcomes that are better than class controls. Calculation of the independent sample t-test posttest shows that students with Sig. (2-tailed) 0.019, where 0.019 <0.05 means that there is a significant difference. The existence of significant differences indicates that there is an influence of problem-based learning models on student learning outcomes.
***Keywords**: education, social studies, problem based learning, learning outcomes.*

***How to Cite**:* Musthofa, S., Prasetyo, K. & Purnomo, N.H, (2019). Problem-Based Learning Effects on Students Learning Outcomes in the Themes of The Potential and Utilization of Natural Resources. *The Indonesian Journal of Social Studies, 2 (2): 95-101*

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e-ISSN 2615-5966 (Online)
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INTRODUCTION

Education in the 21st century is closely related to new problems that exist in the real world. Education does not only aim to prepare students for the future, but rather how to create the future. A teacher is considered unsuccessful if the learning used does not affect sustainable learning (long life education) (Rusman, 2012, p. 230). Actual learning is learning where students engage in many activities (Chatib, 2009, p. 112).

Skills in solving problems are very necessary for students in social learning. This is in accordance with the Social Studies learning objectives in the 2013 curriculum which prioritizes students to have the ability to understand concepts related to the lives of people and their environment. Problem solving is a high-level mental process and requires a more complex thought process . This is in accordance with Gagne's opinion (Bell, 1978) that problem solving skills are stages of thinking that are at the highest level among the eight types of learning . The eight types of learning are learning signals, learning stimulus responses, learning circuits, learning verbal associations, learning discrimination, learning concepts, learning rules, and learning to solve problems.

The problem solving skills are important in the learning process . Through problem solving skills, learners learn how to focus their minds on the subject, produce alternative solutions, understand the cause and effect relationships, and estimate results (Dusek & Ayhan, 2014). In this process, students are expected to make plans using knowledge and skills about problems, as well as use the plan for find the most suitable solution (Ulusoy et al, 2012).

The purpose and essence of social studies education explains that the implementation of social studies is directed at preparing, fostering, and forming the ability of students to master the knowledge, attitudes, values, and basic skills needed for life in society (Solihatin, 2009, p. 1). Social studies are good not only viewed from a cognitive point of view. But also affective and psychomotor aspects.

Problems in the field show that the social studies learning outcomes are still not optimal, which includes the attitudes, knowledge, and skills of students. Social studies learning in schools is often considered not interesting to learn by students. The process of social studies learning tends to be only verbal without involving actual facts that cause learning to be less meaningful. The lack of significance of social studies in schools is influenced by several factors including the limitations of applying the media, not being oriented towards solving actual problems that occur in the surrounding environment, and not making the environment as effective as a learning laboratory (Maryani, 2007).

The alternative solution that can be used to overcome the above problems is by applying a problem-based learning model in social studies learning. Problem-based learning is learning that focuses on real-life problems as a source of learning. This is in line with Arends (2007) that the learning be rbasis problem teaches learners face problem real the hope of building a knowledge of his own, develop and inquiry, and build its independence and self-confidence (Sujiono, Handoyo, & Ruja, 2017) .

The problem-based learning model in social studies learning is considered very in accordance with the character of social studies education which departs from environmental problems. Problem-based learning will also improve the skills of students (Hassan et al., 2012), especially skills in problem solving (Bigelow, 2004). According to Arends (2008) there are 5 phases that must be done as in the following table 1:

Table 1. The syntax of the problem-based learning model

Phase	Teacher activity
Orient student to the problem	The teacher explains the goals, processes, and motivations of students involved in selected

	problem solving activities
Organize student for study	The teacher helps students define and organize learning tasks related to the problem (setting topics, assignments, etc.
Independent assistant and group investigation	The teacher helps students to gather appropriate information, experiments to get explanations and problem solving, data collection, hypotheses, and problem solving
Develop and present artifacts and exhibits	The teacher assists students in planning and preparing appropriate works such as reports and helping them share assignments with friends
Analyze and evaluate the problem solving process	The teacher helps students to reflect or evaluate their investigations and processes used

Arends (2008)

Problem-based learning is one of the models in learning recommended in the implementation of the 2013 curriculum. Based on Minister of Education and Culture No. 65 of 2013 concerning Process Standards, the learning model recommended in the implementation of the 2013 Curriculum is Inquiry Based Learning, Discovery Learning Models (Discovery Learning), Project Based Learning Model, and Problem Based Learning Model (Problem Based Learning). By applying the problem-based learning model in schools, it is expected to be able to improve students' skills especially in problem solving skills.

Problem-based learning is learning that uses small groups to solve problems. This can encourage students to be more active, think critically, and work together in finding information to obtain solutions to a problem. Through small groups of students are expected to be able to solve a problem that is beyond its development capacity with the help of teachers or people who are more capable (Arends, 2007). In improving the ability of students to solve problems, problem-based learning can use group discussion methods. The discussion method is often used by teachers in the learning process to improve students' thinking and communicating skills (Suprijono, 2016, p. 208).

Several studies on problem-based learning models have been carried out. There is the influence of the use of problem-based learning models on problem-solving abilities (Suwandi et al., 2016), social skills (Andayani et al., 2018), and student interests (Imami, 2018). While the use of the PBL model is assisted by the discussion method (Yusuf, 2017), syndicate group discussion (Sunardi, 2015), and environmental media (Wibawa, 2015) both influence students' critical thinking skills. However, none of the previous studies identified specifically the effect of problem-based learning models on student learning outcomes and problem solving skills.

This study seeks to test learning models that are considered to have a positive influence on students' skills in solving problems in social studies subjects in class VII of MTs Darussalam Ngoro Jombang. The use of problem-based learning models is a method used by researchers to see the effect of its application on learning outcomes and problem solving skills of students.

Based on the above background, the researcher can solve the following problems. 1) Is there an effect of problem-based learning models on student learning outcomes in the material potential and utilization of natural resources? 2) Is there a problem-based learning model influence on problem solving skills in potential material and natural resource use?

METHOD

This research is classified into experimental research design with Nonequivalent control group design. More details can be seen in the following table.

Table 2. Pretest-Posttest Group Design Control

The group	Pretest	Treatment	Posttest
Experiment	O_1	X_1	O_2
Control	O_3	X_2	O_4

Description:

O_1 : Pretest experiment class
O_3 : Pretest control class
X_1 : PBL
X_2 : GI
O_2 : Posttest experimental class
O_4 : Posttest control class

In this study the independent variable is the problem-based learning model (PBL) . While bound Variabel there this study is the result of learning. The sample of this study after going through the initial observation stage with the school, where two classes that have academic abilities are almost the same. After going through the initial observation stage, the class VII A was obtained as the experimental class and class VII B as the control class.

The location of the research activities was carried out at MTs Darussalam Ngoro, Jombang Regency with research subjects of students of class VII A and VII B. When this research was conducted in semester II (even) the Learning Year 2018-2019 which lasted approximately 2 weeks (3x meetings) . During this period, the activities carried out were preceded by giving a pretest, treating the two research classes, observing the activities of students during the treatment given, and ending with the giving of posttest.

The data collection technique in this study was a test. In this study the test was given to the material potential and utilization of natural resources through pretest and posttest. Tests are given to students at the beginning (pretest) and at the end (posttest). Testing the hypothesis in this study using independent samples t-test.

RESULT AND DISCUSSION

Learning Outcomes

Description of learning outcomes data includes preliminary knowledge data (pre-test) conducted before treatment and final knowledge data (post-test) at the end of learning. Based on the table 3, it shows that the results of the students' *pretest* knowledge on the material potential and utilization of natural resources in the experimental class were 9 students (30%) with good categories and 21 students (70%) with sufficient categories . In the control class it can be seen that a number of 5 students (16.7 %) with good categories , 23 students (76.7%) with sufficient categories, and 2 students (6.7%) with less categories . The data shows that the two classes are mostly students with enough categories meaning that the differences are not too far away.

Table 3. *Pretest* Value Frequency Distribution

Interval	Category	Experiment Class	Class Control
		Freq.	Freq.
81 -100	Very good	0	0
61 – 80	Well	9	5
41 – 60	Enough	21	23
21 – 40	Less	0	2

1 – 20	Very less	0	0
total		30	30

Referring to the table 4, it shows that the *posttest* results of the students' knowledge on the material potential and natural resource use p have an experimental class of 9 students (30%) with very good categories, 16 students (53%) with good categories , and 5 students (17%) with sufficient categories . In the control class it can be seen that a number of 3 students (10 %) with very good categories, 16 students (53%) with good categories, and 11 students (37 %) with the Enough category.

Table 4. Distribution of *Postest* Value Frequency

Interval	Category	Experiment Class	Class Control
		Freq.	Freq.
81 -100	Very good	9	3
61 – 80	Well	16	16
41 – 60	Enough	5	11
21 – 40	Less	0	0
1 – 20	Very less	0	0
total		30	30

Normality and Homogenity

The normality test is done to test whether the data generated from the study are normally distributed or not. The normality test in this study used the Kolmogorov-Smirnov formula and in the calculation using the SPSS 16 program. To know the normal sample data is to compare the sig value with a significance level of 0.05. If the value is sig. > 0.05, the sample data is normally distributed and if the value is sig. <0.05, the data sample is not normally distributed.

Table 5. Test the normality of the *pretest* data

Pretest Data Normality Test *Kolmogorov-Smirnov*	Class Group	
	Experiment Class	Control Class
Statistics	0. 145	0. 135
Sig.	0. 108	0. 169
Conclusion	Normal	Normal

The calculation results of the *Kolmogorov-Smirnov* normality *test* through SPSS 16 showed that the experimental class *pretest* result was sig =0.108> 0.05 , indicating that the data came from populations that were normally distributed. While the *pre-test* results in the control class sig = 0.169 > 0.05 , it also shows that population data in the control class is also normally distributed .

The result of the calculation of *the Kolmogorov-Smirnov* normality test through SPSS 16 obtained the result of *post-test* experimental class is sig = 0.099> 0.05, it indicates that the data came from a normal distributed population. While the *post- test* results in the control class sig = 0.066 > 0.05 , it also shows that population data in the control class is also normally distributed.

Table 6. Test the normality of posttest data

Pretest Data Normality Test*Kolmogorov-Smirnov*	Class Group	
	Experiment Class	Control Class
Statistics	0.147	0.154
Sig.	0.099	0.066
Conclusion	Normal	Normal

The homogeneity test in this study was carried out by comparing the significance value of the *levene's statistic results* using *software* help SPSS 16. The criteria in this test is if the significance value is> 0.05 then the data is assumed to be homogeneous and vice versa if the significance value is <0.05, it is assumed that the data is not homogeneous. The data from the homogeneity test results from the test results of students' knowledge are as follows.

Table 7. Homogeneity test of the pretest

Levene Statistics	df1	df2	Sig.	Conclusion
0.425	1	58	0.517	Homogeneous

The results of the calculation of the *Levene Statistic* homogeneity test through SPSS 16 obtained the *pre-test* results learners in the control class and experimental class sig = 0.517> 0.05. its canbe concluded that the data *pre-test* in the experimental class and the control class comes from a population that has a level of similarity in variance (homogeneous).

Table 8. Test *posttest* homogeneity

Levene Statistics	df1	df2	Sig.	Conclusion
0.108	1	58	0.743	Homogeneous

The results of the *Levene Homogeneity* (tabel 8) test homogeneity calculation through SPSS 16 *posttest* results learners in the experimental class and the control class is sig = 0.743> 0.05. its can be concluded that the data *post-test* experimental class and the control class comes from a population that has a level of similarity in variance (homogeneous).

Independent sample t-test

Testing of the effect of problem-based learning models on student learning outcomes in the material potential and natural resource utilization using inferential analysis of t-test through the help of SPSS 16 program. Testing this hypothesis is done to determine the increase in student learning outcomes between before and after the implementation of problem-based learning models in the experimental class and the investigation group (GI) model in the control class.

Table 9. Test the independent sample pretest t-test

Mean		T	Df	Sig. (2-tailed)
Eksperimen	Kontrol			
57,20	52,60	1,810	58	0,076

Based on table 9 in the table is known that the t value is 1, 810 and t_{table} with a significance level (5%) 0.05, degree of freedom (db) = (n-2), the obtained $t_{(0:05)\ (58\ )\ table}$ = 2.002 . Then the results of the value of $t_{count} > t_{table}$, which shows the results 1,810 <2,002 . The significance level of 5% (0. 05) has a significance value of α> 0.05, which is (2-tailed) 0.076 > 0.05. So it can be concluded that there was no significant difference in the results of the *pretest* between the experimental class and the control class before being given treatment.

Table 10. Test independent sample t-test post test

Mean		T	Df	Sig. (2-tailed)
Eksperimen	Kontrol			
73,33	66,90	2,406	58	0,019

Based on tabel 10 output in the table, it is known that the value of $t_{count\ is}$ 2, 406 and t_{table} with a significance level (5%) 0.05, degree of freedom (db) = (n-2), then obtained $t_{(0.05)\ (58\ )\ table}$ = 2.002 .Then the results of the value of $t_{count} > t_{table}$, which shows the results 2, 406 > 2.002 . The significance level of 5% (0.05) has a significance value of α <0.05, which is sig (2-tailed) 0. 019 <0.05. So that it can be concluded that there are significant differences in learning outcomes between the experimental class and the control class after being given treatment.

CONCLUSION

Based on the results of the hypothesis test, it was concluded that there were significant differences between students who learned using a problem-based learning model with students who studied using cooperative model group investigation type. This can be seen from the differences in learning outcomes and problem solving skills of students. Students who use problem-based learning models are better than the cooperative model group investigation type. This is because in the problem based learning model there are clear and systematic stages regarding the steps in solving problems.

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