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THE IMPACT OF PROBLEM BASED LEARNING ON THE STUDENTS' LEARNING OUTCOMES TOWARD CRITICAL THINKING SKILL IN ELEMENTARY SCHOOL

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ABSTRACT

Problem based learning supports students to have an ability to solve problems in real life, so that students' critical thinking skill is structurally able to appear and is examined well. By problem based learning, students are able construct their own knowledges. This research is held in elementary school using true experimental with test post-test control group design. It uses quantitative descriptive approach. The data of critical thinking skill indicates that problem based learning does not affect significantly toward students' critical thinking. The data of learning outcomes is analyzed by using t-test in 5 % signification level. The calculation result using t-test gains t_{count} = 2, 533. This value is consulted to t_{table} with db = 54 in 5 % signification level, so that it gains t_{table} = 2,005. It gains $t_{count} > t_{table}$ (2,533 > 2,005). Based on its result, it can be concluded that problem based learning affects students' learning result, unlike students' critical thinking skill.

INTRODUCTION

Background

Critical thinking is an activity through a way of thinking about an idea or ideas related to a given concept or problem presented. Critical thinking can also be understood as an activity to analyze the idea or ideas towards more specific, sharply distinguish, select, identify, assess, and develop towards a more perfect. Critical thinking with regard to the assumption that thinking is a potential that exists in humans that need to be developed for optimal performance (Susanto, 2013: 121).

According to Glaser (in Fisher, 2008: 3) defines critical thinking as an attitude would think deeply about the problem-masalh and the things that are within range of one's experience. Paul, Fisher and Nosich (in Fisher, 2008: 4) that critical thinking is a mode of thinking about things, substance or matter whatever in which the thinker improve the quality of his thinking to handle skillfully structures inherent in thinking and implementing the standards intellectual him. Learning outcomes are the changes that happen to students, both involving cognitive, affective, and psychomotor as a result of learning activities. Another opinion by Nawawi (in Susanto, 2013: 5) states that learning outcomes can be defined as the level of student success in learning school subjects stated in the score obtained from the test results to know a particular subject matter.

Results of study concerned with understanding the concept defined as the ability to absorb the meaning of the material or substance being studied (Bloom in Susanto, 2013: 6). Understanding according to Bloom This is how much students are able to receive, absorb and understand the lessons given by the teacher to the student or the extent to which students are able to comprehend and understand what he read, seen, experienced, or felt in the form of research or direct observation which is conducted by a person.

This study was conducted to see the effect of applying the learning model of problem based learning to critical thinking skills and student learning outcomes of primary school. The study was based on relevant theoretical and empirical studies on learning model of problem-basedlearning.Problem Based Learning (PBL) model is a learning model that is based on the many problems that require investigation authentic. Authentic investigation is investigation that requires a real settlement of the problem is also evident. This PBL learning model emphasizes the students in conducting authentic problem-solving activities scientifically. The problem to be faced by the students, adapted to the problems in their everyday lives, so that the learning that occurs will be more meaningful for students.

Problem Based learning model has many advantages which are, students better understand the concepts being taught, because they themselves find the concept, involving students actively in solving problems and require thinking skills of students is higher, the knowledge embedded based schemata of the students, so pembelajara more meaningful, and students can benefit because the problem solved learning directly linked with the real life of students, it can increase the motivation and interest of students to the material being studied.
Learning through Problem Based Learning (PBL) students are directed to build his own knowledge without teacher beforehand to explain it. Students are also accustomed to using the resources of knowledge to solve these problems either from the library, internet, interviews, and observations. At the time of the learning takes place scientific activity occurs when students work in groups. Through the study group also hone communication skills and critical thinking abilities of students.

Empirical studies also show that learning learning model striving towards critical thinking skills and learning outcomes. Sulandari (2013) in his research on the application of PBL models to improve critical thinking skills and student learning outcomes in class V on the subject of adaptation by living beings in SDN Sumbersari 02 Jember concluded that students' critical thinking ability scores increase from Rp 1.60 to 2, 01, while also increasing student learning outcomes in a satisfactory qualification in classical originally amounted to 13.51% to 37.5%. Furthermore, Aini (2012) in his research on the application of methods of problem solving with the media video for improving critical thinking abilities fourth grade students in social studies learning the subject of social problems in SDN Mangliwetan Bondowoso concluded that the percentage of critical thinking skills of students increased initially by 69, 31% to 75.27%.

Problem Formulation

Based on the background above, the formulation of the problem in this research is there any difference in the effect of applying the learning model of problem based learning to the learning outcomes of primary schoolstudents?

Objectives

Based on the formulation of the problem has been stated above, the study aims to assess the differences in the effect of applying the learning model of problem based learning to the learning outcomes of primary schoolstudents.

Benefits

Based on the research objectives, the results of the study are expected bermanfaa

1) Provide relevant information learning model that can be an alternative in developing the critical thinking skills of elementary school students.
2) As input and consideration in future studies.

METHODS

Research type

Type of research used in this study is an experimental research. In the experimental study conducted by comparing the experimental variables are treated with one or more variable control or comparison that did not receive treatment.

The study

Determined the study deliberately place SDN Antirogo 01 Jember.

Determination of Respondents research

Study respondents determination method is a way to determine the study subjects. The respondents in this study is the fourth grade students of SDN kesuluruhan Antirogo 01. Total graders were 28 students IVA, IVB class while as many as 28 students. Determination of the respondents using the method of population is to take the whole subject graders IVA and IVB. Before the establishment of the experimental class and control class, first tested the homogeneity of theanalysis. t-testHomogeneity of the population aims to determine the level of prior knowledge possessed.

$$t_0 = \frac{M_1 - M_2}{\sqrt{MK_d \frac{1}{n_1} + \frac{1}{n_2}}}$$

Description:

t_0 = t observation
M1 = average group 1
M2 = average group 2
MKD = mean square in = JKD: dbd
JKK = sum of squares group
JKD = sum of squares in
DBK = degrees of freedom group
dbd = degrees of freedom in
n_1= number of samples group 1
n_2= number of samples of group 2

The analysis of the results t the observation can be explained as follows.

1) If $t_0 \geq t_{table}$ with level siginifikansi 5% then H_0 rejected that showed a significant mean difference.
2) If $t_0 < t_{table}$ with level siginifikansi 5% then H_0 is accepted that showed a significant mean difference.

The observation result is expressed homogeneous if **(t_0 < t** table), after diketahuai observations homogeneous then the next is to conduct the draw to determine the control class and experimental class. Determination of the experimental class and control class was done by random or random. Randomization determination of experimental and control groups are intended to reduce "bias subject" and increase the "validity interval" research design. Beginning with the homogeneity of the two groups of population to be studied is the class IVA and IVB Class. Homogeneity test was performed using the value of daily tests. Calculation of homogeneity test on these two classes using the t test(t-test)because in this study there are only two groups of variables.

Research Design

Research type experiments in this study using a type ofresearch true experimentaldesign,which is a kind of experiment is considered good because it meets the requirements. The pattern of this study using pre-test post-test control group design. Determination of the experimental or control group conducted randomly or randomly. Afterwards, both groups were given the initial test(pre-test)to measure the initial conditions of each group. Then the experimental group was given treatment,namely the application of PBL models, whereas the untreated control group. Once completed, the two groups (experimental and control) was given another test(post-test).If depicted in the diagram, the implementation of the experimental pattern is as follows.

E:	O_1	X	O_2
C:	O_1		O_2

Figure 1. Patterns of pre-test post-test control group design

Description:
E: experimental
C: groups:a control group
O_1:observation or pre-test were performed before treatment
O_2 : observation or post-test administered after the treatment performed
X: treatment given in the experimental group
Source: Masyhud (2012: 135)

Data Collection Techniques

will study data obtained using test method. The test is a series of questions or exercises and other tools used to measure the skills, knowledge, intelligence, ability or talent possessed by individuals or groups (Arikunto, 2006: 150). Types of tests used in this study is a pre-test and post-test.

a. pre-test is a test used to determine the initial ability of students. Pre-tests carried out before treatment or before using Problem Based Learning (PBL) in the learning process.
b. post-test is a test used to assess how much the student learning outcomes achieved after the learning process. Post-test was conducted after the learning process by applying a Problem Based Learning (PBL).

Data Analysis Methods

According Arikunto(2006: 311) analysis of data on the effect of the application of PBL models for learning outcomes and the ability of students' critical berpfikir fourth grade, then the t-test in SPSS program using the formula.

$$t_{test} = \frac{M_x - M_y}{\sqrt{\left(\frac{\sum x^2 + \sum y^2}{N_x + N_y - 2}\right)\left(\frac{1}{N_x} + \frac{1}{N_y}\right)}}$$

Description:

M_x = the value of the average score of the experimental class

M_y = the average value control class score

$\sum x^2$ = the sum of squared deviations experimental class score

$\sum y^2$ = the sum of squared deviations of control class score

N_x = number of samples the experimental class

N_y = number of samples in the control classthe hypothesis and hypothesis testing conditions can be explained as follows.

a. Hypothesis

H_a = no effect of the application of PBL models for learning outcomes and the ability of critical berpfikir fourth grade students.

H_0 = no effect of the application of PBL models for learning outcomes and the ability of critical berpfikir fourth grade students.

b. Testing the hypothesis, as follows.

If t ≥ 0.05 then H_0 is rejected

if t <0.05 then H_0 accepted

c. hypothesis testing results Decision

(1) nihil hypothesis$H_0$is rejected and the alternative hypothesis$(H_a)$is accepted, if the result of t test showed a value greater than t table with a significance level of 0.05.

(2) Null hypothesis$H_0$is received and the alternative hypothesis$(H_a)$is rejected, if the results of t-test showed a smaller value than t table with a significance level of 0.05.

RESULTS AND DISCUSSION

The research was conducted in SDN Antirogo 01 Jember. Respondents in this study are 56 students consisting of two classes, namely the class IVA and IVB class SDN Antirogo 01 Jember. In this study, IVA classes totaling 28 students as a class experiment that get learning by applying the model PBL and IVB classes totaling 28 students as classroom learning control gain without applying the model of PBL.

Before determining the experimental class and control class homogeneity test. Homogeneity test data obtained from the value of daily tests on the previous theme. Value daily tests are then tested using t-test because it only consists of two classes. Calculation of the t-test is done in two ways: by counting manually and using SPSS. From the results of the t test above, can result $t_{0.}$ amounted to 0.678The results are then consulted with t_{table} = 1.991. From these results it can be seen that the $t_0 < t_{table}$ (0.678 <1.991) so that the state of research conducted both before class is homogeneous. Furthermore, by using the technique of a draw to decide the control class and experimental class.

Thus there is no significant mean difference between class IVA and IVB, it shows the level of prior knowledge of students before being given treatment is homogeneous. The next step is to do the draw for the experimental class and control class. Based on the results of the draw is the class as an experimental class IVA and IVB class as the control class.

Data were analyzed in the form of different grades pre-test and post-test on the experimental class (IVA) and grade control (IVB) is analyzed to test the hypothesis. As the basis of analysis in this study, the proposed formulation of statistical hypothesis as follows.

H_a = no effect of the application of PBL models for learning outcomes and critical thinking skills students fourth grade.

H_0 = no effect PBL models for learning outcomes and critical thinking skills students fourth grade.

Analysis of the data to answer the formulation of the problem posed in this study, then performed statistical analysis t-test. T-test calculations done in 2 ways, namely to calculate manually and using SPSS.

Based on the calculation result of learning by t-test formula obtained by$_t$= 2, 533, this value is consulted with t_{table} with db = 54 at the significance level of 5% in order to obtain t_{table}= 2.005. Obtained t_{count}>t_{table} (2.533> 2.005).

Based on the calculation of critical thinking skills with t-test formula obtained by$_t$= 2, 133, this value is consulted with t_{table} with db = 54 at the significance level of 5% in order to obtain t_{table}= 2.005. Obtained t_{count}>t_{table} (2.133> 2.005).

ER calculation results PBL model application for learning outcomes and different students' critical thinking skills. From the test results on the relative effectiveness of data analysis ER = 39.19%. These results indicate that the application of PBL models more effective by 39.19% as compared to without implementing PBL models. The result of the effect of applying PBL relative effectiveness against critical thinking skills by 24.12% as compared to without implementing PBL models. Values influence the effectiveness of the application of PBL, can be an alternative choice in learning.

Based on this analysis null hypothesis$(H_0)$is rejected and the alternative hypothesis(H_a).So a significant difference between the results of student learning and critical thinking skills students fourth grade when applying the model PBL compared with no use of applying PBL. There are differences in the effect of the application of PBL models for learning outcomes and critical thinking skills.

This research is an experimental study that aims to determine the effect of applying different PBL models for learning outcomes and students' critical thinking skills. The research was conducted in SDN Antirogo 01 Jember.

Prior implemented learning process, carried out using the homogeneity test result data daily tests. Homogeneity test is done manually using the t test and the statistical program SPSS 14:00 with a significance level of 5%. From the results of the t test,results can be obtained t_0 at 0.678. The results are then consulted with t_{table} = 1.991. From these results it can be seen that the $t_0 < t_{table}$ is 0.678 <1.991, so the state of research conducted both before class is homogeneous.

After the second class is declared homogeneous, then domethod cluster random sampling with the technique of a draw to decide the control class and experimental class. The result is class as an experimental class IVA and IVB class as the control class. In experiments conducted classroom learning by applying the model PBL while the control class performed without applying the model of learning by PBL. Data studied were grade student test score results IVA and IVB in the form of the pre-test and post-test.Seelisih between pre-test and post-test was used as a reference for the calculation of the t-testanalyzes. T test performed using manual calculation and statistical program SPSS 14:00 with a significance level of 5%.

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This problem based learning is an instructional model that involves students to be active to solve a problem and solving them together in groups or independently with the systematic to find the best solutions to problems faced.

Based on analysis of data obtained from the assessment tool that has been provided, showing that the indicator provides an explanation of a problem and create and determine the conclusion in the classical got a low score. This happens because the students have not been used to initiate the learning of a problem is given, consequently many are wondering students and the classroom atmosphere becomes noisy and not conducive to return. Students are also not used to create and determine the conclusion of a problem that has been given by the teacher. Most students do not understand what it was concluded that the teacher should explain slowly.

Indicators of critical thinking skills of students is relatively easy to understand indicators to observe and consider the observations (pictures). This is because students are keen to observe the image problems taped by the teacher on the board so that they began to hone his mind about the picture and could eventually answer the questions that exist in the worksheet.

Model problem based learning can make learning more interesting. This is evident in the learning process in the experimental class (IVA) is more interesting than in the classroom learning process control (IVB). Model problem based learning can attract the attention of students in participating in the learning process so that students are motivated to be more active in participating in learning especially in the phase or activity to observe and gather information. Students are enthusiastic in observing and collecting information on the current discussion. It thus also have an impact on current students worked LKS (Student Worksheet), students more easily answer the questions contained in the worksheets based on the information they get through the discussion group. Through learning to apply problem based learning to develop critical thinking skills students need to learn to be independent in solving learning problems. This is in accordance with the opinion Arends (2013: 102) PBL aims to help learners to develop thinking skills, problem solving and intellectual, to study the role of adults to experience it in real or simulated situations, and become independent learners and autonomous.

The findings of this study are Some students there are not accustomed to answering questions with long answers the description or more than one, with the application of the model slowly PBL students are getting used to answering questions with long answers the description or more than one. Additionally, some students there ability to have a voice in the form of a question on an image remains low and impressed sheepish because of the lack of an opportunity to do just that, with the implementation of the model PBL is students begin to demonstrate the ability mengeluarkn its opinion in due time learning process the opportunity to submit questions to an image very open and all students are given the opportunity so enthusiastic they are not directly presented itself.

CONCLUSION

Based on the analysis and discussion that has been described in chapter 4, it can be concluded that there is a significant influence in the implementation of problem based learning models have different effect on the ability of critical thinking and learning outcomes. Data show that the critical thinking skills of problem-based learning does not have a significant influence on the students' critical thinking skills. Learning outcomes data were analyzed using t-test formula at a significance level of 5%. The results of calculations with the formula t-test obtained t_{count}= 2, 533, this value is consulted with t_{table} with db = 54 at the significance level of 5% in order to obtain t_{table}= 2.005. Obtained t_{count}>t_{table} (2.533> 2.005). These results indicate that the thinking skills in students does not develop instantaneously but necessary process of habituation in each of the learning process. In contrast to the study results, especially the cognitive learning or intellectual learning outcomes. The cognitive learning involves understanding the material to be learned even without any habituation. This shows that there are differences in the effect model of problem based learning to critical thinking skills and learning outcomes.

Recomendations

1. Usage PBL models can work well in a study would require a maximum of teacher preparation and mature. It involves a good lesson planning, instructional media ready for use and control of the media and improve themselves in organizing the classroom to the maximum so that the learning process goes smoothly. Mastery of the material that will be taught to be preferred to facilitate the learning process.

2. For teachers should be looking for an alternative model of innovative learning and fun to make students feel comfortable at the time of the learning process and have no difficulty in understanding the subject matter and always active to issue an opinion and answer questions from the teacher.
3. For other researchers suggested that I can further research in view of the impact on critical thinking skills and student learning outcomes in order to obtain results that can be generalized to all the learning conditions.

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