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Planting Ability to Critical Thinking Students of Primary Schools Through the Problem Based Learning

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Abstract: This study aims to foster the critical thinking character of elementary school students through Problem Based Learning model. This research is quasi experimental or Quasi Experiment research with nonequivalent design control design. The population of this study is the fourth grade students of elementary school. The sample of this research is fourth grade students onbasic school Tiyaran and Kedungsana. The results obtained from the provision of pretest and posttest to measure students' critical thinking skills. The data of the research were analyzed using t-test with the help of SPSS. The results of this study obtained sig value 0.003 with an average value of 66.67 in the control class and 88.42 average value in the experimental class. So that the results obtained that: 1) there are differences in values obtained by students using conventional models using Problem Based Learning model, 2) students' critical thinking ability can be improved by using Problem-Based Learning model.

Key words: problem based learning model, critical thinking

1. Introduction

Education has an important role for human to provide knowledge, attitude, and skill. Through education a broad-minted generation with high quality is produced to face education in the 21st century. One aspect that to be developed is the aspect knowledge. The knowledge developed in learning activities in class is very diverse, one of whict is students' critical thinking skills. Critical thinking is important to be developed indaily life to help students solve problems. Students' critical thinking skills can be taught by giving problems to students to be analyzed, evaluated, and presented. This statement is in line with the opinion of Brookfield (2012, p. 24) explains that critical thinking is the process of finding, and evaluating an idea accordingly or not. Brookhart (2010, p. 10) also explains that critical thinking is reasoned thinking, throws thinking centrally depending what is beliaved or done. So it can be concleded that critical thinking is a high-level thinking ability that is used to analyze, evaluate, and express opinions.

The results of observations carried out in the field, found problems that often occur are students still tend to be passive in participating in learning activities, learning activities are still centeres on the teacher (teacher centered), students' critical thinking skills in understanding the material is still less visible, techers have not used

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innovative learning models that able to stimulate student motivation in learning, the media used to support learning activities is still limited. Another problem that arises is that some students do not want to rewrite the teacher's explanation, students also lack understanding of the material presented by the teacher. The problems that arise can illustrate that students' critical thinking skills are still low. Based on these problems, we need an innovative learning model and in according with the character of children to develop students' critical thinking character. Problem based learning model is one alternative model that can be used to overcome these problems.

Arends (2010, p. 326) explains that the problem based learning model is a student-centered learning model and adapted to existing problems. The steengths of this model are: 1) making students to use their critical thinking skills, 2) developing the ability to analyze and solve problems in daily life, 3) the ability to find solutions, 4) train student cooperation, 5) train communication between students (Levin, 2002, p. 2). This study aims to determine the effect of using the Problem Based Learning model on students' critical thinking skills in problem solving.

2. Methods

This type of research is quantitative research using quasi-experimental methods (Quasi Experiments) using pretest and postest. It was said to be quasi-experimental because the study subjects who were given treatment could not be fully controlled. Quasi-experimental research was chosen because resershers wanted to examine the extent of students' critical thinking skills by using the Problem Based Learning model in learning. This research was conducted in November of the academic year 2018/2019. The subjects of this research are SD Tiyaran and SD Kedungsana. Researchers chose this school for reasons having the same characteristics and problems, they have never used the Problem Based Learning Model in learning activities, and the location is nearby. Therefore the researchers chose the two schools as reserch samples. The research design is briefly presented in Table 1.

Table 1 Research Desain

Class	Pretest	Treatement	Posttest
Kontrol	O_1	-	O_3
Eksperiment	O_2	X_T	O_4

Information:

O_1: Pretest the Control Class

O_2: Pretest the Experimental class

O_3: Posttest the control class

O_4: Posttest the experimental class

X_T: treatment using the Problem Based Learning model

The experimental process is carried out in two classes, namely the experimental class and the control class that have the same characteristics. The implementation of learning in the control class uses conventional learning models and in the experimental class treatment is given in the form of the use of the Problem Based Learning Model. Tests given before the learning activities are carried out while postest is given after the learning activities both in the control class and the experimental class.

The data collection instrument is this study was to use a test in the form of a description item. Test are given before and after treatment is given to measure students' critical thinking skills. The research data obtained were then analyzed using descriptive analysis and inferential anaysis. Description analysis is used to present data

obtained through pretest and postest both in the experimental class and the control class. Data is presented in tabular form so that it is easy to understand. While inferential analysis is used to test hypotheses. Before the hypothesis test is carried out, the prerequisite tests include the normality test and homogeneity test. Noemality test is used to determine whether or not the data to be analyzed is normal.

Homogeneity test in this study used the t test with the help of SPSS 21.0 to find out whether the population was homogeneous or not. The statistical hypothesis is formulated as follows:

H_o: there is no effect of using the Problem Based Learning Model on critical thinking of elementary school students.

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5. Results and Discussion

Critical thinking is important to be developed in daily life to help stdents in solving problems. Cultivation of students' critical thinking skills can be done by providing a problem and providing opportunities for students to analyze and express opinions. Measurement of students' critical thinking skills is done by using pretest and postest conducted in the control class and the experimental class. Pretest is done at the beginning of learning to determine the level of early understanding of students. While the posttest is done at the end of learning to find out the students' critical thinking skills after treatment. The results of the pretest and postest critical thinking skills of students are as in Table 2.

Table 2 Skor Pretest and Postest Critical Thinking

Class	Total Student	Pretest average value	Postest average value
Control	12	63.75	66.67
Experiment	12	80	88.42

Based on the table above it can be seen that the results of the pretest in the control class are 83.75 and in the experimental class are 80 with 12 students each. While the postest results of critical thinking of students in the control class obtained an average value of 80 and an experimental class of 99.42. then to know the effect of using the Problem Based Learning model on critical thinking, it is necessary to test the hypothesis using the t test. Decision making is based on the level of significance with the following criteria: 1) if the significance value is more than 0.05 then H_o is accepted, and 2) if the significance value is less than 0.05 then H_o accepted.

The problem based learning model is designed in learning activities to train students in solving problems according to real life. This statement is in line with the opinion expressed Tan (2009, p. 15) explaining that Problem Based learning is an effective learning model to make changes and innovation in the world of education by using learning that emphasizes the activeness and creativity of students in problem solving learning. In line with the opinion Arrends (2010, p. 46) explains that probem Based Learning Model is a student centered approach that regulates the curriculum and teaching around problematic situations. So the Problem Based Learning model is a teaching model by examining a real problem that exists in the surrounding enviroment so that it can create active learning and improve students' critical thinking and student skills in solving problems. Each learning model certainly has certain characteristics. Levin (2001, p. 6) explains that the characteristics of the PBL model are as follows: 1) arousing intetest and motivating students by giving problems to explore a deeper understanding of the

concepts being studied, 2) problems needed to make decisons/assessments based on facts, information, logic, and make sense, 3) group cooperation is needed to solve complex problems and find solutions, 4) initial questions should be open, based on knowledge learned before hand and being debated by all students in the group, 5) learning content refers to the objectives learning that relates early knowledge with new concepts and connects new knowledge with learning concept. In line with this opinion Arends (2010, p. 326) mentions the characteristics of the Problem Based Learning as follows: 1) problem or issues, 2) authentic, 3) investigation and problem solving, 4) interdiciplinary perspectives, 5) collaboration, 6) products, artifacts, exhibits and presentations. From some of these opinions it is known that the characteristics of the Problem based Learning model are the exixtence of a problem to be solved, authentic, conducting dscussions is finding solutions to solving problems, and presenting the results of the discussion. Instill critical thinking ability of elementary school students through Problem Based Learning Model.

The PBL model is one of the innovative learning models that can be used to foster students' critical thinking skills. The hypothesis test results obtained are as in Table 3.

Table 3 Hypothesis Test Results

Class	N	Mean	Sig (2-tailed)
Control	12	66,67	0.037
Experiment	12	88,42	0.037

Based on the results of hypothesis testing using the t test above it can be seen that the control class obtained an average value of 66.67 with a significance level of 0.037 and the experimental class obtained an average value of 88.67 with a significance level of 0.037. from the results of this hypothesis it is known that the scores obtained by students differ between classes using conventional models with Problem based Learning models. The difference is seen from the control class and the experimental class. From the data then the data is processed using the t test. T test results in this study indicate the significance value of students critica; thinking skills of 0.003 so that it is known that the Problem Based Learning model influences students critical thinking abilities. Students' critical thinking skills can be seen in the results of the average vaue obtained in the classroom using conventional models and Problem Based Learning models. The average value abtained in the conrol class and experimental class shows the difference.

From the results of this acquisition it can be seen that H_o was rejected and H_a accepted. So the results obtained arre positive and significant use of the Problem Based Learning model of critical thinking of elementary school students. The results show that students who are taught using the PBL model score higher than the class using conventional models.

Acquiring values on critical thinking skills is in ilne with research conducted by Huang (2012, p. 121) explaining that the PBL model is a student-centered learning model and actively involves students in identifying and finding solutions to problems. This study shows that the PBL model can significantly improve students' motivation and ability to understand the subject matter. Kingsbury (2008, p. 10) explains tha the PBL model is successfully used in large groups of students by providing the right problems with facilitators who are enthusiastic in managing learning activities. Bosse (2010, p. 10) explains that in implementing learning activities the teacher has an important role as a facilitator to build cognitive networks and have a significant impact on students.

The results of this study can strengthen this research, which shows that the Problem Based Learning model influences students' critical thinking skills in learning activities. The teacher acts as a fasilitator in holding control

to develop the abilities of the students. Students' critical thinking skills can be developed by giving a problem.

6. Conclusion

Based on the results of the research and discussion above, the conclusions of this study are: 1) there are differences in values obtained by students using conventional models using the Problem based Learning model, 2) students' critical thinking skills can be improved by using the Problem based Learning model.

7. Suggestion

Based on the results of the discussion and conclusions above, the suggestion of this research are as follows: 1) the need for the application of innovative and more diverse learning models in learning activities such as the Problem Based Learning model, 2) the need for time management in implementing learning activities so that learning objectives can be achieved to the maximum, 3) media and teaching aids are needed to support the implementation of learning activities, 4) for teachers or school institutions are advised to use the PBL model because it is proven to be uswd to improve students' critical thinking skills in understanding subject matter.

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