The Effect of the Application of the Model Problem Based Learning on Critical Thinking Ability in Social Science Lessons in Class IV of Elementary 2 Pesanggrahan

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Abstract. The purpose of this study was to describe the effect of Problem Based Learning (PBL) learning on Students' Critical Thinking Ability between classes that apply the Problem Based Learning model and those that apply conventional models. The research design used was Quasy Experimental Research. This research will be conducted at SD Negeri 2 Pasanggrahan with the sample used, namely class IV consisting of 2 study groups or a class of 40 students. Data collection methods used were tests and observations. The data analysis technique used the t test to determine differences in critical thinking skills in the experimental class after being given treatment. The results of data analysis using the t test obtained results -t count <-t table (-3.426 <-1.997) and a significance value <0.05 (0.001 <0.05). Therefore, it shows that there is a significant difference in students' critical thinking skills between the experimental class and the class using the conventional model.

Keywords: Critical Thinking, Problem Based Learning, Elementary School.

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INTRODUCTION ~ The development of science and technology in the era of the industrial revolution 4.0 rapidly creates competition in future life that students must face. Schools should start cultivating critical thinking skills and collaborating to meet the demands of education. This is in accordance with the characteristics of the super skills of 21st century society, in line with this the Ministry of Education and Culture formulated that learning emphasizes analytical thinking and cooperation in solving problems (Kemendikbud, 2013, p 4).

The results of research from Kay (2008), analyze developments that will occur in the 4.0 era and identify 5 new conditions or contexts in life, each of which requires certain competencies. These conditions include: (1) conditions of global competition (the need for global awareness and independence); (2) global cooperation conditions (need global awareness, ability to work together, mastery of Information Communication and Technology (ICT); (3) growth of information; (4) work and career development (need critical thinking & problem solving, innovation & improvement, and flexibility & adaptable; (5) service-based economic development, knowledge economy (need to be information literate, critical thinking and problem solving). In line with this opinion, it is considered necessary for an educator to facilitate students to be able to keep pace with developments that occurred in the 4.0 era.

According to Somantri (in Sapriya, 2009), social studies education is a selection of social science disciplines and is presented scientifically and psychologically for educational purposes.Susanto (2013), argues that social studies is a science that

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examines various social science disciplines and humanities as well as basic human activities that packaged scientifically in order to provide insight and deep understanding to participants in education, especially at the elementary and secondary levels.

According to Wahab (in Rudy Gunawan 2001), the purpose of social studies learners in schools is no longer solely to provide knowledge and memorize a number of facts and information, but more than that. The students are not only expected to have knowledge, they are also able to develop their skills in various aspects of life, starting from their academic skills to social skills.

According to Ratumanan (in Trianto, 2007) problem-based learning is an effective approach for learning higher order thinking processes. This learning helps students to process ready-made information in their minds and construct their own knowledge about the social world and its surroundings, this learning is suitable for developing basic or complex abilities. In addition to Ratumanan, Arends (in Trianto, 2007) argues that Problem Based Learning (PBL) is a learning approach in which students work on authentic problems with a view to constructing their own knowledge, developing inquiry and higher order thinking skills, developing independence and self-confidence. .

Today education prioritizes competition rather than collaboration, while in the current era education is more directed at creating a climate of collaboration or cooperation between students as a form of living social life. Collaboration skills direct students so that they have a harmonious life, namely living together with others, respecting each other's opinions, increasing job prospects, and increasing commitment to community participation. Collaboration in learning is very important because it can improve critical thinking and can help students to achieve quality final results. (Apriono, 2009, pp. 5-6).

The success of student learning is not only measured by high academic grades but must have creative, innovative abilities, be able to communicate well, think critically, and implement learning outcomes in a work. So that the selection of the right learning model is essentially an effort to optimize thinking skills, especially critical thinking.

According to Syaodih (2019), critical thinking skills will be more easily taught to students by using the right learning model, where the learning model provides a direct learning experience so that students can easily understand and remember the material being studied. In addition, students will better appreciate the process of learning activities and will have an impact on increasing critical thinking skills.

The weakness of learning activities identified in the field is that the learning process emphasizes the cognitive rather than affective and psychomotor aspects and the learning process places students as recipients of information in one-way learning (student centered) rather than involving students in the learning process so that students are less active in the learning process. In addition, there is a tendency to return to the idea that children will learn better if the environment is created naturally. Learning will be more meaningful if the child experiences what he is learning not

about knowing it. Learning that is more oriented to mastery of the material has proven to be successful in short-term memory competitions but fails to equip children to solve problems in long-term life (Depdiknas, 2006, p. 13). In connection with these problems, teachers should apply one of the learning models that can make it easier because they can map out more creative and imaginative concepts and attract student activity.

Problem Based Learning (PBL) is learning that uses authentic problems is not structured and is open for students to develop problem solving and critical thinking skills. It is very important to use because it can stimulate students' thinking to solve problems in everyday life, not only in class. The PBL model can be done in steps, namely orienting students to problems, organizing students to learn.

According to Kardi and Nur (2000, pp. 12-13) that problem-based teaching is a very effective strategy to teach critical thinking processes. The advantages of the problem-based learning model according to (Susanto, 2014, p. 89) are that students can organize their own knowledge, develop higher skills, make students independent and increase self-confidence. Problem solving can develop students' ability to think critically and develop their ability to adapt to new knowledge.

On assessment, especially when compared to conventional based teaching; a.) Problem Based Learning encourages a more in-depth approach; b.) Problem Based Learning promotes more flexible learning methods and Problem Based Learning students tend to use libraries and library resources in learning; c.) Problem Based Learning develops greater knowledge and memory skills; d.) students tend to show stronger knowledge application skills; e.) from the teacher's perspective, Problem Based Learning seems to be a very satisfying teaching method (Forsythe, 2002).

According to Robert Enis (in Alec Fisher 2009), critical thinking is reasonable thinking and reflection that focuses on deciding what to believe or do. Woolever and Scott (in Gunansyah 2015), also argue that critical thinking is a complex thought process because it is an extension of basic thinking skills. According to him, what distinguishes critical thinking from other types of thinking is that it encourages consideration of decisions, the ability to judge authentically, accurately and requires sufficient knowledge and argumentation.

According to Susanto (2013), the following are indicators of each aspect of critical thinking, namely: (1) Provide a simple explanation, which includes; focusing questions, analyzing questions, and asking and answering questions about an explanation or statement. (2) Build basic skills, which consist of considering whether the source is reliable and observing and considering a report on the results of observations. (3) Concluding which consists of deductive activities or considering the results of the deduction, inducing or considering the results of the induction, and making and determining the value of the consideration. (4) Provide further explanation, which consists of identifying terms and definition considerations in three dimensions, as well as identifying assumptions. (5) Regulating strategies and techniques, which consist of

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determining actions and interacting with others.

According to Ibrahim (in Istianah, 2013) says that to lead to learning that can develop critical and creative thinking skills, it must depart from learning that makes students active. In this regard, in using the Problem-Based Learning model, it is necessary to present controversial issues originating from the physical environment and social environment of students, therefore these problems are expected to increase interest and make students active in expressing opinions.

Departing from the above background, the authors are interested in conducting research on "The Influence of the Application of Models on Problem Based Learning Critical Thinking Skills and Collaboration Skills in Social Science Subjects in Class V Elementary School".

METHOD

This study uses a quantitative research method of experimental type, namelyquasi-experimental research. Experimental research is the most purely quantitative research. Because all the principles and rules of quantitative research can be applied to this method. Experimental research is laboratory research, especially in controlling things that affect the course of the experiment, this method is validation or testing (Krathwohl in Sukmadinata 2011, p. 57).

In this design, a group of subjects taken from a certain population were randomly divided into two groups, namely the experimental group and the control group. The experimental group was subjected to certain treatment variables within a certain period of time, then both groups were subjected to the same measurement. The differences that arise are considered to be sourced from the treatment variable (Suryabrata, 2014, p. 104). This design can be described as follows:

Table 1 Research Design *One Group Pretest-Posttest Design* (Suryabrata, 2014, p. 102)

Group	*Pretest*	*Treatment*	*Posttest*
Exp. Group	T_1	X_1	T_2
Contr. Group	T_1	X_2	T_2

Note.

T_1 : *Pre-Test*

T_2 : *Posttest*

X_1 :*Treatment* uses amodel *problem based learning*

X_2 :*Treatment* uses conventional methods

Data collection techniques in this study used tests, namely *pretest* and *posttest* and observation sheets. The stages are through three stages, namely (1) the planning stage, (2) the implementation stage, and (3) the final stage. The data analysis technique used the t-test to determine the difference in critical thinking skills in the experimental class after being given treatment.

RESULTS AND DISCUSSION

To determine students' critical thinking skills, pretest andassessments were carried out *posttest*. The test given is in the form of critical thinking questions as many as 7 essay questions. The test was used in 2 classes as research subjects, namely the experimental class and the control class. The following is the average value of the *pretest* and *posttest* in the control class and the experimental class.

Table 1 Average Value *pretest* and *posttest*

	Average	
	Pre-Test	Post-Test
Grade Control	60.71	72.64
Class Experiments	61.03	83.61

Based on the averageresults *pretest* and *posttest* obtained in the experimental class and the control class The table above shows an increase between the results of the pre-test and post-test.

Before testing the hypothesis, the researcher first conducted a normality test and a homogeneity test. The normality test was carried out on the results of the *pretest* and *posttest* of the experimental class and control class students. The normality of the data can be seen from the significance value. If the probability or significance value is more than 0.05 (p>0.05), then the data is normally distributed. The normality test was carried out on the data of thevalues of *pretest* and *posttest* the experimental class and the control class, which are presented in the following table.

Table 2 Normality Test for Pretest Data Posttest

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Kelas	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	Kontrol	,109	34	,200*	,961	34	,264
	Eksperimen	,107	33	,200*	,964	33	,327

Table 3 Normality Test for Data

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Kelas	Statistic	df	Sig.	Statistic	df	Sig.
Posttest	Kontrol	,144	34	,071	,951	34	,132
	Eksperimen	,135	33	,134	,941	33	,071

Based on the results of the normality test on the pretest questions using the Kolmogorov-Sminov test, the control class significance value was 0.200 and the experimental class significance value was 0.200. While the results of the normality test on the *posttest* using thetest *Kolmogorov-Seminov* , the significance value for the control class was 0.071 and the significance value for the experimental class was 0.134. This shows

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that thevalue data *pretest* and *posttest* from the control class and the experimental class are normally distributed and meet the requirements for parametric analysis of the research data. The homogeneity test of the data distribution was carried out on the pretest and posttest value data presented in the table as follows.

Table 4 Homogeneity Test *Pretest*

Pretest			
Levene Statistics	df1	df2	Sig.
,001	1	65	,976

Table 5 Homogeneity Test *Posttest*

Posttest			
Levene Statistics	df1	df2	Sig.
1,953	1	65	,167

Based ontest *Levene 's* for the similarity of variance above , the significance of the *pretest was 0.976*. While thevalue *posttest* obtained a significance of 0.167. It can be concluded that the data about the *pretest* and *posttest* above in the experimental group and the control group have identical (homogeneous) abilities (variations). After the two samples come from a population that is normally distributed and has the same variance. Furthermore, hypothesis testing will be carried out using the t-test technique with theformula *Independent Samples Test* in the SPSS 22 data processing program. The t-test test for data distribution is presented in the following table.

Table 6 Average Statistical Results of Critical Thinking Ability

	Kelas	N	Mean	Std. Deviation	Std. Error Mean
Selisih	Kontrol	34	11,88	13,841	2,374
	Eksperimen	33	22,58	11,565	2,013

From table 6 it appears that there is a difference in the average score between the experimental class and the control class. However, whether this difference is significant at 0.05 needs to be tested by testing the mean difference between two independent samples as shown in the table below.

Table 7 Results of t-test of Critical Thinking Ability

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Selisih	Equal variances assumed	1,057	,308	-3,426	65	,001	-10,693	3,121	-16,926	-4,461
	Equal variances not assumed			-3,436	63,610	,001	-10,693	3,112	-16,912	-4,475

Based on table 7, it can be seen that there is an effect of applying the PBL model given to the experimental class. It can be seen that the value of –t count < -t table or t count > t table (-3,426 < -1.997) and a significance value < 0.05 (0.001 < 0.05), this indicates that it is H_1H_1 accepted and H_0H_0 rejected. Therefore, it H_1H_1 shows that there is a significant difference in students' critical thinking skills between the class that applies the PBL model and the class that applies the accepted conventional model.

Furthermore, the Normalized Gain Test (g) is used to find out how to increase critical thinking skills before and after learning using the PBL model. The normalized gain test results can be seen from the following table.

Table 8 Gain Test

	Rata-Rata		N-Gain	Interpretasi
	Pretest	Posttest		
Kelas Kontrol	60,71	72,64	0,23	Rendah
Kelas Eksperimen	61,03	83,61	0,56	Sedang

From table 8 shows that there is an increase in critical thinking skills in students in the control class and in the experimental class. In the control class the gain value is 0.23 this indicates an increase in critical thinking skills at a low level. While in the experimental class the gain value is 0.56, this indicates an increase in critical thinking skills at a moderate level.

The treatment in this study was given in stages with four meetings, the material taught was about social problems in the area. It aims to explore the material from the basic competencies to be achieved in learning. Furthermore, data collection in this study was carried out through the results of the pretest and posttest scores for critical thinking skills in social studies on social issues in their area. The results of the pretest and posttest were then analyzed using the normality test to determine whether the data population was normally distributed or not and the homogeneity test was to determine whether the samples had the same variance or not. After it was known that the two groups between the control class and the experimental class being tested were normally distributed and homogeneous, then the t-test (*independent sample t-test*) was used to test the hypothesis by using the difference between the pretest and posttest scores for critical thinking skills in the control class and the experimental class.

The results of research and calculations that have been carried out by researchers, it can be seen that the control group has an average *pretest of* 61.12, while the average *posttest results* reaches 72.64. The experimental group had an average *pretest* result of 61.03 and an averageresult of *posttest* 83.61. From the average value, it can be assumed that the average value of each group, both the experimental class and the control class, has a different value. These assessments are the average *pretest* andaverages *posttest* that have a significant increase in the results of the critical thinking ability

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test that are given treatment (*treatment*). The treatment was in the form of applying themodel *Problem Based Learning* to the fourth grade students of SD Negeri 2 Pasanggrahan, Purwakarta, West Java.

From the t-test analysis, it can be seen that the significance level of the difference between the pretest and posttest scores in the control class and the experimental class is 0.000 ($p < 0.05$), H_0H_0 which means that there is no significant difference in students' critical thinking skills between classes that apply the model. PBL and classes that apply the conventional model. Thus, it is H_1H_1 accepted, which means that there is a significant difference in students' critical thinking skills between the class that applies the PBL model and the class that applies the conventional model.

CONCLUSION

Based on the discussion above, it can be concluded that there is a significant difference between the critical thinking abilities of fourth grade students at SD Negeri 2 Pasanggrahan, Purwakarta, West Java, between classes that apply the PBL model and classes that apply conventional learning models. This can be seen from theresults posttest in the control class which are lower than in the experimental class. Then, in calculating the Gain test that occurred in the experimental class, there was an increase in the results of moderate critical thinking skills, while in the control class there was an increase in low critical thinking ability test results. In addition, the research findings reveal that the improvement of problem-solving skills and making conclusions through critical thinking processes. One problem-based learning practice that specifically encourages students to think critically is when the teacher provides activities when asking questions, discussing problems, and making solutions related to topics in the subject. The reflection process given at the end of the lesson helps students to understand more deeply and avoid conceptions of the knowledge that has been obtained by students.

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