Influence of Problem Based Learning (PBL) ModelTowards Critical Thinking Ability Class VI SDN 14 Tanjung Medan

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Abstract. This study aims to determine: (1) The influence of students' critical thinking ability taught with the Problem Based Learning (PBL) model compared to the critical thinking abilitytaught with the Direct Intruction Class VI model of SD Negeri 14 Tanjung Medan for the 2021/2022 Academic Year; (2) The interaction of the Problem Based Learning (PBL) learningmodel and critical thinking in the face of students' critical thinking skills. The sample was carried out in two classes, class VI1 as many as 36 students as an experiential class with a Problem Based Learning (PBL) model and class VI2 as a control class as many as 32 students who were taught with the Direct Intruction model. Data collection instruments using critical thinking tests in the form of Multiple Choice as many as 15 items. This research method is quasi-experimental with data analysis techniques using a 2-line Anova test with a significant level of $\alpha = 0.05$.. The results of this study obtained that: (1) The ability to think critically based on the learning model was obtained that the Fhitung value $= 7,558$ and the probability value or significant value of the learning model was $0.010 < 0.05$.; (2) There is an interaction between learning models and critical thinking and critical thinking; $(0.008 < 0.05)$. For other researchers, it is recommended that before conducting the PBL model treatment, it should be socialized to class VI children and teachers in the school where the research is being studied.

Keywords: Problem Based Learning Models, and Critical Thinking.

1 Introduction

The industrial revolution 5.0 affected various fields, including the field of education. Education is faced with global and digital-based challenges. In facing these challenges, it requires not just conceptual science, but the ability to apply knowledge and various skills in thinking. In carrying out the response, the improvement of critical thinking skills in students must be driven by stimulus. This is in line with behavioristic learning theory. Experts in behaviorism argue that learning is a change in behavior as a result of experience. Learning is the result of the interaction between stimulus (S) and response (R). According to this theory, in learning, what is important is the existence of inputs in the form of stimulus and outputs in the form of responses (Suryono and Hariyanto, 2012: 59).[1] Throughing is one of the coqnitive strategies in solving more complex problems and demanding higher patterns. Critical thinking essentially develops elements of rational and empirical thinking based on scientific knowledge (Winarno, 2013:97-98)[2]

The critical thinking ability of Class VI students of SD Negeri 14 Tanjung Medan in the PPKn subject is still considered very low. This is evidenced based on the results of an interview with a Class VI teacher at SD Negeri 14 Tanjung Medan stating that questions related to interpretation, analysis, evaluation, and inference are still many students have not shown satisfactory results. According to Facione (in Fithriyah et al, 2016:582) there are six indicators of critical thinking ability involved in the critical thinking process. These indicators include interpretation, analysis, evaluation, inference, explanation, and self-regulation.[3]

Problem Based Learning according to Tan (in Rusman, 2011: 229) Problem-Based Learning is an innovation in learning because in PBL students' thinking ability is really optimized through a systematic group or teamwork process, so that students can empower, hone, test, and develop their thinking skills on an ongoing basis. The steps of this PBL model are: 1. Formulating the problem. 2. Analyze the problem. 3. Formulate hypotheses. 4. Collecting data. 5. Hypothesis testing. 6. Formulate problem-solving recommendations. *Project-based Learning* is a learning model that uses real-world problems as a context for students to stimulate higher-level thinking in real-world problem-oriented situations. The steps of this PjBL model are as follows: (1) student orientation to the problem; (2) organizing students to study; (3) guiding individual/group experiences; (4) develop and present works; and (5) analyze and evaluate the problem-solving process. (Rusman, 2012: 241).[4]

The formulation of the problem in this study is: Is the critical thinking ability of students taught with the Problem Based Learning model higher than the critical thinking ability taught with the Direct Instruction model in class VI at SDN 14 Tanjung Medan? Is there any interaction between the Problem Based Learning model and critical thinking and the critical thinking skills of Grade VI students of SDN 14 Tanjung Medan?

Based on observations in the field, it is still classified as the ability to think critically and think critically, students are also low, so it needs to be improved. To improve it is necessary to apply a wide variety of learning models. One of them is the learning model that is predicted to have a greater influence and have a greater relationship with critical thinking skills is the PBL model.. To what extent this can affect the need for research with the title, "The Influence of Problem Based Learning (PBL) Models on Critical Thinking Ability grade 6SDN 14 Tanjung Medan".

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2. Method

This research was conducted with a quasi-experimental type. Pseudo-experiential research is carried out to determine the influence of a treatment on the character of the subject under study. This research was carried out at SD Negeri 14 Tanjung Medan Jl. Beringin Tanjung Medan Village, Kampung Rakyat District, South Labuhanbatu Regency, Zip Code 21463 North Sumatra. The research time has been carried out on the implementation of the learning process or in the process of teaching and learning activities in the even semester of the 2021/2022 academic year, which is precisely in April to June 2022. The research samples are class VI-A and class VI-B. Class VI-A as an experimental class taught with a Problem Based Learning model with a total of 36 students. Meanwhile, the control class is taught with a direct learning model selected by class VI-A with a total of 32 students. Class determination is carried out by cluster random sampling and the selected class is class VI of SD Negeri 14 Tanjung Medan.

3 Result and Discussion

The results of the study Both classes of samples were given pretests to see if the two classes were normally distributed, homogeneous and had the same initial ability can be seen inTable 1 below.

Table 1. Student Critical Thinking Pretest Data

PBL Class			Direct Introduction Class		
Score	**F**	**Percentage**	**Score**	**f**	**Percentage**
20-31	2	6%	33-41	10	31%
32-43	6	17%	42-50	2	6%
44-55	8	22%	51-59	8	25%
56-67	11	31%	60-68	7	22%
68-79	5	14%	69-77	3	9%
80-91	4	11%	78-86	2	6%
Total	36		**Total**	32	
Average of pretest	58	100	**Average of pretest**	53	100

Table 1 shows that the average critical thinking pretest of students taught with the PBL learning model was 58 and those taught with the Direct Introduction learning model was 53. From the average, it can be said that the two classes have a difference in initial critical thinking ability of 5.

In order for the data from the study to be analyzed with parametric statistics, it is necessary to test assumptions or prerequisites. The first condition tested is normality. The purpose of the Normality Test is to see the distribution of student pretest data in both classes of normally distributed samples or not. The results of the data normality test can be seen in Table 2. Such results were obtained using the Kolmogrov-Smirnov test with the help of SPSS 26.

Table 2. Normality Test Results Data Pre Test Critical Thinking Pre Test Scores Students

Class	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	DF	Significant	Statistic	DF	Significant
Experiment	.140	36	.073	.948	36	0.90
Control	.133	32	.158	.936	32	0.58

The caption from Table 2 shows the Kolmogorov-Smirnov values of each of the above data of students' critical thinking variables are normally distributed. The homogeneity test of the result data obtained an analysis of the significant value of pretests of students' critical thinking learning outcomes can be seen in Table 3 below.

Table 3. Homogeneity Test of Students' Critical Thinking Data

No.	Score	Significant Score	Description
1	Critical Thinking	0,338	Homogen

From Table 3 it can be stated that the data on students' critical thinking scores were declared homogeneous with significant values of 0.338 > 0.05. Thus it can be concluded that the variance of students' critical thinking data is homogeneous.

The treatment carried out in both classes is the application of learning models. The learning model applied is different in each class. In class VI-1 (experimental class) a Problem Based Learning (PBL) learning model is applied. This model begins with the orientation of the problem. At this stage the teacher acts as a motivator, where the teacher motivates students to be actively involved and enthusiastic in solving a given problem. The next phase is that the teacher guides individual and group investigations and facilitates the needs of students in the investigation. Next, the teacher directs the students in planning and preparing the appropriate work in the problem solving report. The report is used as material to present the results of solving the problem. A summary of the data postes critical thinking of students in both classes can be seen in the table below.

Table 4. Data Postes Critical Thinking Students

PBL Class			Direct Introduction Class		
Score	f	Percentage	Score	F	Percentage
40-51	2	6%	33-42	4	13%
52-63	6	17%	43-52	4	13%
64-75	8	22%	53-62	10	31%
76-87	11	31%	63-72	4	13%
88-99	5	14%	73-82	9	28%
100-111	4	11%	83-92	1	3%
Total	**36**	**100**	**Total**	**32**	**100**
Average	**78**		**Average**	**60**	

Table 4 shows that the average critical thinking postes of students taught with the PBL learning model were 78 and those taught with the Direct Introduction learning model were 60. From this average, it can be said that students' critical thinking skills using the PBL learning model are better when compared to the Direct Introduction model.

After the learning was completed, ppkn postes questions were given which consisted of students' critical thinking questions to students both in PBL and Direct Introduction classes. The PPKn postes questions in the form of multiple choices totaled 15 questions. Postes are given during two hours of learning. The matter of postes is synonymous with pretests. This is done to see if there is an improvement or improvement after the student is taught with PBL or Direct Introduction. Meanwhile, the normality test for students' critical thinking postes value data obtained results in the following Table 5:

Table 5. Normality Test Results Student Critical Thinking Postes Value Data

Class	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	DF	Significant	Statistic	DF	Significant
Experiment	.140	36	.073	.948	36	0.90
Control	.133	32	.162	.961	32	0.288

The caption from Table 5 above shows the Kolmogorov-Smirnov values of each of the above data of the students' critical thinking variables are normally distributed. The data requirement is called normal if the probability or p of > 0.05 on the Kolmogorov-Smirnov test. The table above shows that the p value > 0.05, then from each of the data the critical thinking variables of the students above are normally distributed.

Table 5 above explains that the scores of critical thinking postes of students taught with the PBL learning model are declared to be normally distributed with a sigifikan value of $0.090 > 0.05$. For the normality value of critical thinking data, direct introduction class students obtained a significant score of $0.288 > 0.05$. Thus it is concluded that the entire data of students' critical thinking scores are normally distributed or meet the requirements of the normality test.

Data Homogeneity Test The homogeneity test of the result data obtained an analysis of the significant value of postes of PPKN learning outcomes and the value of critical thinking can

be seen in Table 6 below.

Table 6. Homogeneity Test of Student Learning Outcomes and Critical Thinking Data

No.	Data Nilai	Siginifant Score	Description
1	Critical Thinking	0,585	Homogen

From Table 6 it can be explained that the data on students' critical thinking scores were declared homogeneous with significant values of $0.585 > 0.05$. Thus it can be concluded that the variance of data on student learning outcomes and critical thinking is homogeneous.

The requirements for hypothesis testing with parametric testing have been met, that is, the group data are normally distributed and have a homogeneous variance. Hypothesis testing this study uses a two-lane ANAVA with a factorial of 2x2, hypothesis testing is calculated with the help of SPSS version 26. Hypothesis testing data can be seen in the following table:

Tabel 7. Output SPSS Hasil Perhitungan ANAVA Tests of Between-Subjects Effects Dependent Variable: Critical Thinking

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	828.320[a]	3	276.107	15.192	.000
Intercept	119095.380	1	119095.380	6553.050	.000
Model_Pembelajaran	137.365	1	137.365	7.558	.010
Motivasi_Belajar	146.111	1	146.111	8.040	.008
Model_Pembelajaran * Motivasi_Belajar	342.861	1	342.861	18.865	.000
Error	581.569	32	18.174		
Total	149122.000	36			
Corrected Total	1409.889	35			

a. R Squared = .588 (Adjusted R Squared = .549)

Based on the SPSS output of anava calculation results in Table 7 on the ability to think critically based on the learning model, it was obtained that the Fhitung value = 7.558 and the probability value or significant value of the learning model was $0.010 < 0.05$. Thus it can be stated that there is a significant difference between the average critical thinking ability of students taught with the Problem Based Learning learning model compared to the Direct Introduction learning model

Based on the SPSS output of anava calculation results in Table 7 it is obtained that Fcount = 18.865 and a significant value of 0.000 with a = 0.05. Then it can be seen that the value of the sig. $0.00 < 0.05$ so hypothesis testing rejects Ho and accepts Ha. Thus, it can be concluded that there is an interaction between learning models and critical thinking in influencing students' critical thinking ability.

4 Conclusion

Students' critical thinking ability taught with the Problem Based Learning (PBL) model is higher than the critical thinking ability of students taught with the Direct Introduction model

in Class VI of SD Negeri 14 Tanjung Medan for the 2021/2022 Academic Year. There is an interaction between the learning model and the critical thinking ability of students of SD Negeri 14 Tanjung Medan for the 2021/2022 Academic Year. The interaction can be seen from the significant difference between the average critical thinking ability of students taught with the Problem Based Learning learning model and the Direct Introduction learning model.

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