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Improvement Of Critical Thinking Ability For Elementary School V Class Students

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Abstract. This study aims to measure the critical thinking skills of fifth grade elementary school students. This type of research is a quasi-experimental design with a pretest-posttest control group design. The population used in this study were all fifth grade students as a sample because it only consisted of 2 classes with a total of 25 people. The data obtained were analyzed using descriptive and inferential statistics. The results of the descriptive analysis obtained: (1) The average results of students' critical thinking skills in the experimental class before applying the problem-based learning model of 52.22 are in the very low category and 51.08 in the control class are in the very low category; (2) The average result of students' critical thinking skills in the experimental class after applying the problem-based learning model was 80.92 in the high category and 76.16 in the control class in the medium category; The results of the infrensial analysis state that (1) There is an effect of applying the problem-based learning model on critical thinking skills which is indicated by a sig value of less than 0.05, namely 0.00 < 0.05, which means rejecting Ho and accepting Ha; (2) There is an effect of applying the problem-based learning model on students' cognitive learning outcomes as indicated by a sig value of less than 0.05, i.e. 0.00 < 0.05, which means rejecting Ho and accepting Ha.

Keywords: Based Learning, Critical Thinking, Learning Outcomes

Preliminary

The role of science in the world of education is very important. In fact, the government has designed education as an instrument to build a better Indonesian nation and state. As stated in the Law of the Republic of Indonesia Number 20 of 2003 article 1 paragraph 1 concerning SISDIKNAS (2007) [1] which states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength. self-control, personality, intelligence, noble character, and skills needed by himself, society, nation and state.

Education is one of the most important functions in helping the development of individuals, individuals, groups, communities, national culture, nation and state. Through education, we hope that all our talents, abilities and possibilities can be developed to the fullest so that we can be independent in the process of personal development as human beings. A country can progress if all its citizens are educated and have the opportunity to earn a decent income. The level of education is one indicator to measure the progress and degree of prosperity of a country and measure the magnitude of the role of every citizen in whole human development activities. One effective way to prepare quality human resources is through education

The progress of a nation is determined by the quality of the nation's education itself and the complexity of life's problems demands reliable and competitive human resources. In addition, education is a forum for activities that can be seen as a printer of high quality human resources[2].

Critical thinking ability is a thought process that can be accepted by the reflective mind which is directed to decide what to do or believe, in this case it is not arbitrary, does not lead to arbitrary conclusions but to the best conclusions [3]. From this understanding, it can be concluded that critical thinking is an ability that must be trained to students as a provision in the future, because by thinking, thinking about what to believe, and how to act. Meanwhile, when a person does not think critically, he will imitate others, adopt beliefs and accept other people's conclusions passively. This is implied in Permendikbud number 69 of 2013 on the quality of Indonesian education, namely a change in learning patterns, from passive learning patterns to active learning.

Active learning means that students build understanding based on experience and relate it to new concepts independently [4]. By applying the Problem-Based Learning Model, students who were initially passive in learning become active students. Students are active in asking questions, discussing, solving problems, and conveying ideas and ideas more openly. Understanding the concept of the material becomes better with Problem Based Learning (PBM). Thus, a good understanding of student concepts will have an influence or increase the achievement of student learning outcomes.

Critical thinking ability is a person's ability to analyze ideas or ideas logically, reflectively, systematically, and productively to help make, evaluate, and make decisions about what is believed or will be done so as to succeed in solving a problem at hand [5].

Critical thinking is a high-level thinking process, because when making decisions or drawing conclusions using active control, namely reasonable, reflective, responsible, and skillful thinking. Not everyone can think critically because strong and basic beliefs are needed so that they are not easily

influenced. Critical thinking skills are needed to analyze problems to the stage of finding solutions to solve these problems.

According to Critical thinking is the activity of analyzing ideas or ideas in a more specific direction, distinguishing them sharply, selecting, identifying, reviewing and developing them in a more perfect direction.

Based on the expert opinion, conclusions can be drawn regarding the notion of critical thinking ability, which is an ability that everyone has to analyze ideas or ideas in a more specific direction. Critical thinking skills are needed to analyze a problem to the stage of finding a solution to solve the problem.

People who have the ability to think critically don't just know an answer. They will try to develop other possible answers based on the analysis and information that has been obtained from a problem. Critical thinking means carrying out the process of reasoning on a problem to the complex stage of the "why" and "how" of the solving.

There are six levels of thinking according to Bloom's taxonomy, namely (a) knowing is a thinking process based on retention and retrieval of some knowledge that has been heard or read; (b) understanding is a more complex thought process that has the ability to translate, interpret, extrapolate, and associate; (c) application is the ability to apply knowledge, facts, theories, etc. to conclude, predict, or solve a problem; (d) analyze (analysis) also think divergently, namely the ability to describe a concept or principle in its parts or components; (e) synthesis is the ability to make a generalization or abstraction from a number of facts, data, phenomena, and others; and (f) evaluating (evaluation) which is also called intellectual judgment, which is broad and deep knowledge about an understanding of what is known and the ability to analyze and synthesize so that it can provide an assessment or evaluation. In other words, the accumulation of all thinking abilities below is the ability to assess (evaluate) [6].

Characteristics of critical thinking

Critical thinking is the key to developing creativity. This can be interpreted that the initial emergence of creativity is because we critically look at the phenomena that we see, hear and feel, problems will appear which will then require us to thinkcreatively. According to Beyer [7], there are 6 (six) characteristics, namely:

character (dispositions)

Someone who has critical thinking skills has a skeptical attitude (not easy to believe), is very open, respects honesty, respects various data and opinions, respects clarity and thoroughness, looks for other different views, and will change his attitude when there is an opinion that he considers good. .

Criteria (criteria)

In critical thinking must have a criterion or benchmark. To get there, you have to find something to decide or believe in. Although an argument can be compiled from several sources of learning, it will have different criteria. If we are going to apply standardization, it must be based on relevance, accuracy of facts, based on credible sources, thorough, unbiased, free from erroneous logic, consistent logic, and careful consideration.

arguments (arguments)

Arguments are statements or propositions based on data. However, in general, an argument is defined as a reason that can be used to strengthen or reject an opinion, position or idea. Critical thinking skills include introduction, assessment, and argumentation activities.

Consideration or thought (reasoning)

is the ability to summarize conclusions from one or several premises. The process will include testing the relationship between several statements or data.

point of view

Point of view is a way of looking at or the basis used to interpret something and which will determine the construction of meaning. Someone who thinks critically will view or interpret phenomena from various different perspectives.

Procedure for applying criteria (procedures for applying criteria)

The procedure for applying critical thinking is very complex and procedural. This procedure includes formulating the problem, determining the decision to be taken, and identifying assumptions or estimates

Characteristics of Critical Thinking

The following are the characteristics of critical thinking, including:

1) Know in detail the parts of the whole
2) Good at detecting problems
3) Able to distinguish relevant ideas from irrelevant ideas
4) Being able to distinguish which is fact, diction or opinion
5) Able to identify differences or information gaps
6) Able to distinguish logical and illogical arguments.
7) Able to draw generalization conclusions from data that is already available with data obtained from the field.

Benefits of Critical Thinking

The benefits of critical thinking are:

Critical thinking can solve problems

Critical thinking can help in decision making

Critical Thinking can distinguish between facts and opinions

Critical Thinking helps to stay calm even in difficult situations.

Critical Thinking Goals

The purpose of critical thinking is to test an opinion or idea, including making considerations or thoughts based on the opinions proposed. These considerations are usually supported by justifiable criteria.

Critical thinking skills can encourage students to find new ideas or thoughts about a world problem. Students will be trained how to select various opinions, so that they are able to distinguish which opinions are relevant and which opinions are irrelevant. By developing critical thinking skills, students are able to help make conclusions by considering data and facts that occur in the field.

Indicator of critical thinking ability

A person can be said to have the ability to think critically if he has several abilities. According to Ennis [8]. there are 12 indicators which are summarized in 5 groups of thinking

skills, namely giving simple explanations, building basic skills, concluding, making further explanations, as well as strategies and tactics. In this study, the indicators of critical thinking skills reviewed can be seen in the following table:

Table 2.2 Indicators of Critical Thinking Ability

No	Aspects of Critical Thinking Ability	No	Sub-Indicator of Critical Thinking Ability
1	Give a simple explanation	1	Focusing the Question
		2	Analyze arguments
		3	Ask and answer questions.
		4	Consider whether the source is trustworthy or not.
2	Building Basic Skills		
	Conclude	5	Observing and considering the results of observations
3	explanation		Conclude
		6	Make and consider value decisions
		7	Make deductions and consider the results of the discussion
			Provide further explanation
4	Provide further	8	Define terms and consider a definition
			Identify assumptions
		9	Set strategy and tactics
5	Set strategy and tactics	10	Consider and think logically about the premises, reasons, assumptions, positions, and other proposals that are not approved by them or which causes them to have doubts without letting the disagreement or doubt disturb their minds. Or Define an action
			Interact with other people

According toEnnis (Maftukhin, 2013)

Learning according to the modern conception is a process of changing behavior in the broadest sense including observation, recognition, understanding, knowledge, interest, appreciation and attitude. Learning is not only related to the intellectual field, but also about all aspects of the body. The result is the ability of a person (student) that is obtained after he has carried out learning activities. Evaluation of learning outcomes is a process to determine student learning outcomes

Through assessment and/or measurement of learning outcomes. According to [9], it is said that learning outcomes are the results of learning activities which are expressed in the form of symbols, numbers, letters and sentences that can reflect the results that have been achieved by each student in a certain period.

Based on some of the opinions above, it can be concluded that learning outcomes are changes in a person's behavior continuously through training and experience or abilities possessed by students after experiencing a learning process that shows the extent to which students understand the subject matter and the achievement of learning objectives carried out. The purpose of writing this article is to find out the critical thinking skills of fifth grade elementary school students

Research Methods

This research uses a quantitative approach with a quasi-experimental type of research (Quasi Experiment), with a pretest-posttest control group design. Which compares the application of problem-based learning models with conventional learning. An ideal sampling method should have the following characteristics: a) Can produce a reliable picture of the entire population. b) Can determine the precision (precision) or the level of accuracy of the research results by determining the standard deviation (standard) from the estimate obtained. c) Simple, so easy to implement. SutrisnoHadi stated that the main requirement in order to draw a generalization is that the sample used in the study must represent the population or the sample must be a small population (miniature population).

The data collection technique used is a test based on learning indicators. The test method in this study was used to determine students' critical thinking skills and Cognitive Learning Outcomes of students who had received learning using the Problem-Based Learning model. Data on critical thinking skills were obtained from the test scores of each class. The data is then categorized based on the criteria for critical thinking skills.

The data that has been collected was analyzed using analysis of covariance (anakova). Statistical analysis was assisted by SPSS 23.0 For Windows software, carried out at a significance level of 0.05 ($p < 0.05$). Before testing the hypothesis by using ANACOVA, a prerequisite test or assumption test was carried out which included tests for normality and homogeneity of the data that had been collected (Arikunto, 2005). The normality test used the One-Sample Kolmogorov-Smirnov test, while the homogeneity test used Leven's Test of

Equality of Error Variances[10] Penghitungan uji dilakukandengan program *SPSS 23.0 for Windows*.

Validity is the level of reliability and validity of the measuring instrument used. The instrument is said to be valid, meaning that the measuring instrument used to obtain the data is valid or can be used to measure what should be measured. Thus, a valid instrument is an instrument that is

truly appropriate to measure what is being measured with the minimum r being 0.3 [11].

Normality test

Normality test is the first step in analyzing the data specifically. Normality test is used to determine whether the data is normally distributed or not. In this study, the One Sample Kolmogorav-Smirnov test was used using a significance level of 5% or 0.05 with the following conditions:

If P-value 0.05 then the distribution is normal

If P value < 0.05 then the distribution is not normal

Homogeneity Test

Homogeneity test is a test of whether or not the variances of two or more distributions are equal. The homogeneity test that will be discussed in this paper is the homogeneity test of variance and the Bartlett test. Homogeneity test was conducted to determine whether the data in the variables X and Y were homogeneous or not. In this study, the calculated F is used with the F table in the F distribution table, with:

If F count < F table, it means homogeneous

If F count > F table, it means that it is not homogeneous

Research Results and Discussion

To provide an overview of the results of students' critical thinking skills in the experimental class, the following is a description of the results of students' critical thinking skills before and after the application of the problem-based learning model. For more details, it is presented in table 4.2 below:

Table 4.2 Recapitulation of Critical Thinking Ability Results Students in Experiment Class

Statistik	Pre-test	Post-test
Sample size	25	25
Mean	52,44	80,92
Minimum	40	75
Maksimum	67	89

The data above shows the results of students' critical thinking skills in the pre-test with a mean value of 52.44 and the mean for the post-test, which is 80.92. Descriptively, it can be said that the students' abilities in the experimental class became better after being given treatment by applying a problem-based learning model.

Data on the categorization of the results of students' creative thinking abilities before and after being taught with the application of problem-based learning models, the results are summarized in table 4.3 as follows:

Tabel 4.3 Distribution of Frequency and Percentage of Students' Critical Thinking Ability in Experiment Class

Interval	Category of student mastery	Pre-test		Post-test	
		Frekuensi	Persentase (%)	Frekuensi	Persentase (%)
90–100	Very high	0	0	0	0
79 – 89	Tall	0	0	20	80
69 – 78	Currently	0	0	5	20
59 – 68	Low	4	16	0	0
0 – 58	Very low	21	84	0	0
Jumlah		25	100	25	100

In table 4.3 it can be seen that the pre-test for the very high, high and medium categories did not have students, while for the low category there were 4 students with a percentage of 16% and the very low category as many as 21 students with a percentage of 84%. Meanwhile, for the post-test in the very high, low and very low categories, there were no students in this category, while for the high category there were 20 students with a percentage of 80% and 5 students in the medium category with a percentage of 20%. From the table, it can be seen that the achievement of the post-test of students is mostly in the high category.

- **Description of Students' Thinking Ability in the Control Class before and after the problem-based learning model was applied**

  To provide an overview of the results of students' critical thinking skills in the control class, the following is a description of the results of students' critical thinking skills before and after the application of the problem-based learning model. For more details, it is presented in table 4.4 below:

Tabel 4.4 Recapitulation of Students' Critical Thinking Ability Results in Control Class

Statistik	Pre-test	Post-test
SampeleZise	25	25
Mean	51,08	76,16
Minimum	41	70
Maksimum	66	81

Data Table 4.4 shows that the data on the results of students' critical thinking skills in the pre-test the mean value is 51.08 and the mean for the post-test is 76.16. Descriptively it can be said that the ability of students in the control class to be better after being given treatment by applying a problem-based learning model.

The data for categorizing the results of students' creative thinking abilities before and after being taught by applying the problem-based learning model the results are summarized in table 4.5 as follows:

Tabel 4.5 Distribution of Frequency and Percentage of Students' Critical Thinking Ability in Control Class

Interval	Category of student mastery	Pre-test		Post-test	
		Frekuensi	Persentase (%)	Frekuensi	Persentase (%)
90–100	Very high	0	0	0	0
79 – 89	High	0	0	7	28
69 – 78	Currently	0	0	18	72
59 – 68	Low	3	12	0	0
0 – 58	Very low	22	88	0	0
Jumlah		25	100	25	100

In table 4.5 it can be seen that the pre-test for the very high, high and medium categories did not have students, while for the low category there were 3 students with a percentage of 12% and the very low category as many as 22 students with a percentage of 88%. Meanwhile, for the post-test in the very high, low and very low categories, there were no students in this category, while for the high category there were 7 students with a percentage of 28% and the medium category as many as 18 students with a percentage of 72%. From the table, it can be seen that the achievement of the post-test of students is mostly in the medium category.

- **Description of Students' Thinking Ability in the Experimental Class and Control Class after the problem-based learning model was applied**

To provide a comparative picture of the results of students' critical thinking skills in the experimental class and control class, the following is a description of the results of students' critical thinking skills after the application of the problem-based learning model. For more details, it is presented in table 4.6 below:

Tabel 4.6 Recapitulation of Students' Critical Thinking Ability Results in Experiment Class and Control Class

Statistik	Post-test eksperimen	Post-test kontrol
SampeleZise	25	25
Mean	80,92	76,16
Minimum	75	70
Maksimum	88	81

The data in table 4.6 shows that the post-test results of students' critical thinking skills in the experimental class mean 80.92 and the mean for the control class is 76.16. Descriptively, it can be said that there are differences in students' critical thinking skills in the experimental class and the control class.

Based on the analysis of critical thinking skills, it is known that the category of critical thinking skills of fifth grade students in each elementary school where the research is located. The average score (mean) of critical thinking skills of fifth grade students at SD InpresPolewali, Barru Regency is relatively low. This is also indicated by the percentage of the total score of 76% and is classified as very low. The ability to do induction is an indicator of critical thinking ability that is the most difficult for students to fulfill with the smallest percentage of 8% in the category of doing induction.

The average score (mean) of the pre-test critical thinking ability of fifth grade students at SD InpresPolewali, Barru Regency in the experimental class was 52.44 in the very low category. It is also supported with the number of students in the very low category as many as 21 students with a percentage of 84% and in the low category there were 4 students with a percentage of 16%. While the average score (mean) of the pre-test of students' critical thinking skills in the control class of 51.08 is very low. This is also supported by the number of students who are in the very low category as many as 22 students with a percentage of 88% and in the low category there are 3 students with a percentage of 12%.

The average score (mean) of the post-test critical thinking skills of fifth grade students at SD InpresPolewali, Barru Regency in the experimental class was 80.92 in the high category. Meanwhile, the post-test average score (mean) of students' critical thinking skills in the control class was 76.16, which was classified as moderate. From the post-test results, it turns out that there are differences in the learning outcomes of students' thinking skills in the experimental class and the control class, namely the learning outcomes of students' critical thinking skills are higher than those in the control class.

This is in line with the research conducted by Irwandi et al. (2017) which states that there is an effect of the application of the based learning model on students' critical thinking abilities. In addition, the research conducted by Saiful Amin (2017) which states that there is an effect of applying the learning model based on learning to students' critical thinking skills. This is due to the fact that there are several factors that can affect students' critical thinking skills [12]. Among the factors, the first factor is physical condition. Students cannot concentrate, think quickly, and react to existing responses due to their disturbed physical condition. Second, motivation. Third, anxiety [13]. Anxiety arises automatically if there is an excess stimulus and cannot be handled by students. Fourth, intellectual development. Intellectual or intelligence is a person's mental ability to respond and solve a problem, connect one thing to another, and can respond well to any stimulus. Fifth, teacher and student interaction. A free and safe academic atmosphere is needed by students so that their opinions and decisions can be shown during learning activities [14].

Students' critical thinking skills will also be easier to develop if the development of this ability in each

elementary school where the research is carried out is supported by efforts made primarily by teachers and students [15]. The efforts made by teachers and students to develop critical thinking skills are in accordance with the core learning activities expected in K13. The models, strategies, methods or techniques used by educators in core learning activities must be in accordance with a student-focused approach, learning domain, and subject characteristics. The model, strategy, method or technique chosen must be interactive, inspiring, challenging, fun, motivating, and encouraging student interest so that the knowledge, attitudes, and skills that must be mastered can be discovered by students independently, critically, creatively, and sustainably.Creativity, independence, and critical thinking skills of students are grown through the tasks that students do individually or in groups as part of an integrated part of the student learning experience [16]. The assignments must be in accordance with the individual characteristics of each subject. Fourth, various approaches and methods must be used so that active, creative, effective, and enjoyable learning can be achieved.

Conclusion

Based on the results of research and hypothesis testing in the study, it can be concluded that: The critical thinking ability of fifth grade students at SD InpresPolewali Regency before the problem-based learning model was applied in the experimental class had an average of 52.44 while the control class had an average of 51 .08 is in the very low category. While the post-test for the experimental class has an average of 80.92 in the high category while the control class has an average of 74.16 in the medium category. This indicates that there is an effect of applying the problem-based learning model after the application of the problem-based learning model on the critical thinking skills of fifth grade elementary school students..

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