

The Influence of the Contextual Teaching and Learning (CTL) Learning Model on Students' Critical Thinking Ability in Class VIII Respiratory System Material at SMP Negeri 2 Gunungsari

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ABSTRACT

This research aims to determine whether there is an influence of the Contextual Teaching and Learning (CTL) learning model on students' critical thinking skills in class VIII respiratory system materials at SMP Negeri 2 Gunungsari. The type of research used is Quasi experimental design with a quantitative approach. The population in this study were students in class VIII of SMP Negeri 2 Gunungsari, with the research sample being class VIII A as the experimental class and class VIII B as the control class. The instrument used in this research is test questions in the form of essays. Data analysis was carried out by hypothesis testing (t-test). The results of the research show that the Contextual Teaching and Learning (CTL) learning model on students' critical thinking skills in class VIII respiratory system material at SMP Negeri 2 Gunungsari, with a significant value of $0.000 < 0.005$, means that H_0 is rejected and H_a is accepted so it can be concluded that there is a significant influence. significant impact on the use of the Contextual Teaching and Learning (CTL) learning model on students' critical thinking abilities.

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1. INTRODUCTION

Current global progress requires the world of education to continuously change its thinking [1]. The uncertain future with various difficulties facing humanity in the 21st century has broad and deep implications for various types of teaching plans and learning methods. Education is an opportunity for development, a common way of obtaining information that occurs in all conditions and throughout life [2].

Education is a process for acquiring and developing knowledge, critical thinking abilities, skills, attitudes and experiences of students [3]. Education is also a system for improving the quality of human life in all aspects so that education functions as a tool for improving the quality of every human being. If the quality of education is low, it will have an impact on the intelligence of the nation's future young people [4]. Therefore, to improve the quality of education, good learning is also needed. Good learning will determine the success of the learning mechanism when carrying out teaching and learning activities. The learning process is an internal process that students go through which is

planned, implemented and assessed methodically to help them achieve learning goals effectively and efficiently [5].

Natural Sciences (IPA) is a subject that has an important position in the world of education, because natural sciences can be a provision for students in facing current difficulties [6]. The importance of studying and understanding science education and applying it in everyday life requires creating a learning plan that can be prepared by the teacher. This starts with an in-depth analysis of every aspect that can improve the learning experience, especially for teachers as learning facilitators. As an educator, it is important for teachers to create an interactive learning environment, where students can be directly involved, explore the meaning and significance of the material being studied, and develop creative and critical thinking skills in solving the problems they face [7],[8]. Basically, developing critical thinking skills is essential in learning science. This is because the ability to think critically is a competency that can be obtained by everyone so that they are able to carry out in-depth and efficient analysis in achieving learning goals in accordance with predetermined goals [9].

However, the problem that students often face in current learning is a lack of focus during the learning process in class, especially in science learning. This happens when the learning atmosphere is less interesting and less creative. Previously, research by [10] revealed that a number of science subject teachers still teach and study every learning topic using the lecture method regularly. This can result in a decline in students' critical thinking abilities because they feel bored of just being passive listeners and taking into account what the teacher says.

Based on observations made at SMP Negeri 2 Gunungsari, in the learning process the majority of students were less interested in learning science, due to the lack of innovative methods applied by teachers in teaching science. For example, teachers still do not apply many learning models and methods. Teachers mostly lecture and give exercises or written assignments and provide notes without providing a thorough explanation to students. This causes the teaching and learning process in class to tend to be monotonous so that students are less motivated to learn. This situation can be seen when science lessons are taking place, students look bored, lazy and quite a few of them do not pay attention to the teacher when explaining. This problem can have a negative impact on students, resulting in a lack of students' thinking abilities.

Based on these problems, an interesting, not boring, learning method or model is needed that can provide students with direct experience. The use of the Contextual Teaching and Learning (CTL) learning model is one of various learning approaches that increases students' creativity and enthusiasm in the learning process.

2. METHOD

This research is quantitative research, with a Quasi experimental design type in the form of a nonequivalent control group design. This research uses two variables, namely the Contextual Teaching and Learning (CTL) learning model as the independent variable and critical thinking skills as the dependent variable. This research was carried out at SMP Negeri 2 Gunungsari. The population used in this research was the entire class VIII of SMP Negeri 2 Gunungsari, totaling 32 students.

The sampling technique in this research was carried out using nonprobability sampling or saturated sampling. Saturated sampling is a sampling technique when all members of the population are used as samples or samples that represent the total population, with class VIII A as the experimental group and class VIII B as the control group. And the data collection technique uses a written test in the form of 10 essay questions which are used to measure students' critical thinking abilities.

The data that has been obtained is analyzed using statistical tests with the help of SPSS. Then test normality to find out whether the data is normally distributed or not. If the data is normally distributed then proceed with a homogeneity test to determine whether there is a difference in variance between the two samples, namely the experimental class and the control class. After that, it was continued with hypothesis testing (t test) with the aim of finding out whether there is an influence of the Contextual Teaching and Learning (CTL) learning model on students' critical thinking abilities on the respiratory system material.

3. RESULTS AND DISCUSSION

This research was carried out at SMP Negeri 2 Gunungsari in the 2024/2025 academic year. This research involved two classes, namely class VIII A as an experimental class which applied the Contextual Teaching and Learning (CTL) learning model and class VIII B as a control class using conventional learning methods. The total research population was 32 students. This research was

conducted to determine students' critical thinking abilities on respiratory system material. Critical thinking ability data was obtained from the pretest and posttest results and then analyzed using hypothesis testing (t test). The data on the results of critical thinking skills based on the maximum value, minimum value and average value obtained are as follows:

Table 1. Critical Thinking Ability Results Values

Data	Experimental Class		Control Class	
	Pretest	Posttest	Pretest	posttest
Maximum Value	33	98	67	87
Minimum Value	60	70	30	60
Average	43.56	82.37	45	69.68

Based on table 1, the average value of students' critical thinking abilities increased in both classes, namely the experimental class and the control class. However, the increase in the average score in the experimental class was higher compared to the control class with the average posttest score in the control class being 69.68 and in the control class being 82.37.

Next, assess critical thinking skills based on the indicators. In this research, five indicators were used according to Facione, namely analysis, explanation (Explanation), self-regulation, conclusion (Interference), and interpretation. The value of students' critical thinking abilities based on the indicators can be seen in the following table:

Table 2. Average Critical Thinking Ability Indicators (Pretest)

No	Indicators of Critical Thinking Ability	Experimental Class		Control Class	
		Average	Category	Average	Category
1	Analysis	47.91	Enough	44.79	Enough
2	Explain	43.75	Enough	43.75	Enough
3	Self Regulation	44.79	Enough	44.79	Enough
4	Interference	39.58	Not Enough	43.75	Enough
5	interpretation	41.66	Enough	47.91	Enough

Based on table 2, the average value of the indicators of students' critical thinking abilities in the pretest for the experimental class and control class shows quite good. However, the interference indicator in the experimental class is still lacking with an average value of 39.58, which means that students in the experimental class are still lacking in concluding a problem or question.

Table 3. Average Critical Thinking Ability Indicators (Posttest)

No	Indicators of Critical Thinking Ability	Experimental Class		Control Class	
		Average	Category	Average	Category
1	Analysis	82.29	Very Good	70.83	Good
2	Explain	82.29	Very Good	68.75	Good
3	Self Regulation	83.33	Very Good	69.79	Good
4	Interference	83.33	Very Good	69.79	Good
5	Interpretation	80.20	Very Good	68.75	Good

Based on table 3, it shows that the average score of the critical thinking ability indicators of students in the posttest for the control class and experimental class is better than the score of the test takers. Each indicator has a very good improvement, especially in the experimental class. An increase in students' critical thinking skills shows that students can analyze a problem by remembering through observation, not by memorizing. This was obtained from previous research by Lutfiyah Rahmi, et al. The result obtained is that with the Contextual Teaching and Learning (CTL) learning model, students who initially memorize the concept of learning become observers of the reality of life and learn from what they observe. In this way, students do not feel they understand when carrying out memorization activities and students are more critical in thinking [11], [12].

The increase in students' critical thinking skills is due to interactive learning or using interactive learning media which is able to visualize abstracts, provide feedback to students and present clear information making it easier for students when the material is explained [13],[14],[15]. Before conducting the hypothesis test analysis, prerequisite tests are first carried out, namely the normality test and homogeneity test. The following are the results of the normality and homogeneity tests.

Table 4. Normality Test Results

Treatment	Class	Sample	Shapiro-Wilk	Information
Pretest	Experimental Class	16	0,070	Normally Distributed
	Control Class	16	0,089	Normally Distributed
	Experimental Class	16	0,442	Normally Distributed
Posttest	Control Class	16	0,116	Normally Distributed

Based on the normality test in table 4, it can be seen that the significance value for the experimental class pretest is 0.070 and the control class pretest is 0.089. Meanwhile, the significance value for the experimental class posttest was 0.442 and the control class posttest was 0.116. Data is declared to be normally distributed if the significance value is greater than 0.05. Thus, the research pretest and posttest normality tests on the two class samples were declared to be normally distributed because the significance value of both was more than 0.05.

Table 5. Homogeneity Test

<i>Test of Homogeneity of Variances</i>			
Critical Thinking Ability			
<i>Levene Statistic</i>	df1	df2	Sig.
1.505	1	30	.229
<i>Pretest Results</i>			
<i>Test of Homogeneity of Variances</i>			
Critical Thinking Ability			
<i>Levene Statistic</i>	df1	df2	Sig.
.142	1	30	.709
<i>Posttest Result</i>			

Based on the results of the homogeneity test of critical thinking abilities of students at SMP Negeri 2 Gunungsari in table 5, the pretest significance value in the experimental class and control class is 0.229, while the posttest significance value is 0.709. Therefore, the pretest and posttest homogeneity tests in both classes were declared homogeneous because the significance value was greater than 0.05. Based on the results of the normality and homogeneity tests above, it can be concluded that the data collected meets the requirements for hypothesis testing (t test). The following are the results of the hypothesis test (t test).

Table 6. Hypothesis Test (t-test)

		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
Assess critical thinking skills	Equal variances assumed	.142	.709	4.596	30	.000	12.688	2.761	7.049	18.326
	Equal variances not assumed			4.596	29.998	.000	12.688	2.761	7.049	18.326

Based on the table 6 above, it can be seen that the sig. (2-tailed) which is 0.000. Thus it is stated that the significance value is $0.000 < 0.05$, then H_0 is rejected and H_a is accepted, which means that there is an influence of the Contextual Teaching and Learning (CTL) learning model on students' critical thinking abilities in class VIII respiratory system material at SMPN 2 Gunungsari. This is because the Contextual Teaching and Learning (CTL) learning model is a very effective learning model used to improve students' thinking abilities because CTL provides students with the opportunity to build their own knowledge.

The Contextual Teaching and Learning (CTL) learning model can also help students to understand learning very easily, because this learning model emphasizes problem solving by connecting the knowledge that students have by applying it to their daily lives. This model is also able to support improving critical thinking skills and students are able to develop their potential. This

is in line with the opinion [16],[17] in their research stated that the CTL approach is very supportive of improving critical thinking skills in the learning process so that it allows students to combine the knowledge they have in presenting real-world problems or situations.

Apart from the results of the t-test analysis, this is also confirmed by the average pretest and posttest scores from the experimental class and control class. The average pretest score in the experimental class was 42.5 and in the control class it was 45. Then the posttest results showed an increase in the average score for each sample. The experimental class had a posttest score with an average of 82.37, which is in the very good category, while the posttest score for the control class was 69.68, which was in the good category. Therefore, by showing the posttest results, there are significant differences between the two samples, namely the experimental class and the control class.

The test results of students' critical thinking abilities by the experimental class which used the Contextual Teaching and Learning (CTL) learning model were much higher compared to the control class which used conventional models or methods. This is in line with research by [18] found that the Contextual Teaching and Learning (CTL) approach had a positive influence where the Contextual Teaching and Learning (CTL) approach was better than conventional and there was an increase in students' critical mathematical thinking patterns. So this shows that the Contextual Teaching and Learning (CTL) learning model influences students' critical thinking abilities. This is in accordance with research conducted [19] where in research that has been carried out it was found that there is an influence of the CTL model on students' critical thinking abilities, in other words that the CTL model has a significant influence on critical thinking in science learning. The Concept of Change of Form Object.

The Contextual Teaching and Learning (CTL) learning model is a learning method that focuses on problems or events that students often experience in everyday life. In this way, students will more easily connect the lesson material with real situations. The Contextual Teaching and Learning (CTL) learning model encourages students to acquire knowledge and skills based on their own findings, not just by memorizing. This learning process can support students to improve critical thinking skills [18], [20].

4. CONCLUSION

Based on the results of the research and the results of the data analysis that has been carried out, it can be concluded that there is an influence of the Contextual Teaching and Learning (CTL) learning model on students' critical thinking abilities in the respiratory system material in class VIII of SMP Negeri 2 Gunungsari. Due to the significant influence of the Contextual Teaching and Learning (CTL) learning model on students' critical thinking abilities with a significance value of $0.000 < 0.05$, which means H_0 is rejected and H_a is accepted.

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