

Profile of Critical Thinking Skills of High School Students in Brebes on Environmental Change Materials

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Abstract

Abstract: Critical thinking is one of the higher-level thinking skills that has been naturally applied in schools and is a way of learning that can be done by teachers. According to Ennis (1985), critical thinking skills are: 1) Providing simple explanations, 2) Building basic skills, 3) Making further explanations, 4) Formulating alternative solutions, 5) Summarizing. With the ability to think critically on the topic of environmental change, it is hoped that students can better understand the environmental conditions around the students themselves and be able to solve every problem faced by the students themselves. The purpose of this study is to describe the profile of critical thinking skills in environmental change materials owned by grade XI students at Brebes High School with a population of 36 students. The sample of this study was carried out using a saturated sample or carried out randomly. The data collection technique was carried out using a test in the form of a critical thinking essay on environmental change material. Non-test data collection in this study was conducted using interviews. The results of the study were then analyzed and classified at the level of critical thinking ability into five categories, namely very low, low, medium, high and very high. This classification is used to interpret the level of mastery of critical thinking skills that students have. The results show the highest indicator value of 46.7% or in the medium category, while the result with the lowest sub-indicator is 38.5%. The conclusion obtained in this study is that students' critical thinking skills are classified at a low level, as evidenced by the average result of the percentage of critical thinking scores that are only 41.48% or are considered low. This result is supported based on the results of interviews with the teaching teacher who said that the students who were the subjects of the research were fairly good at some students in solving problems.

Keywords: Critical Thinking Skills, Biology, Environmental Change

1. INTRODUCTION

The 21st century requires a person to master various skills, as a result of which education is expected to be the main capital to prepare students to master various skills (Zubaidah, 2016). Various skills needed in the 21st century include critical thinking, collaboration, communication, creativity, and problem-solving (Mardhiyah .et al., 2021; Zubaidah, 2018b). Critical thinking is one of the high-level thinking skills that has been naturally applied in schools and is a way of learning that can be done by teachers. This can be seen from the fact that critical thinking skills will determine a person's endurance/competitiveness in competing to be the best because it will increase the competitiveness of the individual, according

to the opinion of the researcher who states that critical thinking skills have been recognized as important skills for the success of studying, working and living in the 21st century (Nurjanah, 2019).

According to Ennis (1985), namely: 1) Providing a simple explanation, 2) Building basic skills, 3) Making further explanations, 4) Formulating alternative solutions, 5) Summarizing. Critical thinking also plays an important role especially in biology learning by involving understanding and analysis, especially students' awareness of the environmental changes that occur around students. With the ability to think critically on the topic of environmental change, it is hoped that students can better understand the environmental conditions around the students

themselves and be able to solve every problem faced by the students themselves.

From the above explanation, it can be the background for conducting preliminary research to find out the extent of students in solving a problem through critical thinking. The purpose of this study is to describe the profile of critical thinking skills in the environmental change material owned by grade XI students at Brebes High School. This research is very important to be carried out as one of the efforts made by researchers to analyze problems in the implementation of biology learning in schools. The results of this research are expected to be the foundation for teachers and researchers in developing appropriate learning models and methods so that they are expected to be able to improve students' critical thinking skills.

2. METHODOLOGY

This type of research is descriptive research. This research was not carried out with changes in the independent variables, but only based on what was already in the school. This research was carried out at Brebes High School. This research was carried out on October 31, 2023. The population in this study is 36 students in grade XI science at Brebes High School in the 2023/2024 school year. The sample of this study was carried out using a saturated sample or carried out randomly. The test conducted in grade XI was chosen to measure the extent of critical thinking skills for environmental change possessed by grade XI students by considering class XI who had received environmental change materials in their class X.

The data collection technique was carried out using a test in the form of a critical thinking essay on environmental change material. Data collection with tests and non-tests is in the form of students' critical thinking instruments using written test questions in an objective form developed by researchers through the validation stage (Kurnia et al., 2023). The number of objective tests is 5 essay questions that are done within 60 minutes. The indicators of critical thinking in this study were carried out according to Ennis (1985), which focused on indicators of providing simple explanations (*elementary clarification*), building basic skills (*basic support*). The collection of non-test data in this study includes interviews, observations and documentation (Asriningtyas et al., 2018). The

data analysis technique used in this study is descriptive analysis.

Furthermore, the results of the analysis were carried out percentage calculation according to Purwanto (2004) as follows

$$NP = \frac{R}{SM} \times 100\%$$

Information:

NP = Sought/expected percentage value

R = Total score of critical thinking skills indicator

SM = Maximum score of critical thinking skills indicator

The classification of critical thinking skills is divided into five categories, namely very low, low, medium, high and very high. This classification is used to interpret the level of mastery of critical thinking skills that students have. The category is adapted from Azwar (2014),

Table 1. Categories of Students' Critical Thinking Ability Level

No.	Category	Score Percentage (%)
1	Very low	$X \leq 24.95$
2	Low	$24.95 < X \leq 41.65$
3	Keep	$41.65 < X \leq 58.35$
4	Tall	$58.35 < X \leq 75.05$
5	Very high	$75.05 < X$

Source : Azwar (2014)

3. RESULTS AND DISCUSSION

The data obtained from this study includes test data on critical thinking essay questions with environmental change material on learning outcomes in phase E of the Independent Curriculum. After the results are obtained, then an assessment and analysis of the results are carried out based on the assessment rubric that has been made and after that the average score of all students from each essay question is made, then the data is classified based on the level of thinking ability into five categories, namely very low, low, medium, high and very high. It can be seen below the average score table with its critical thinking indicators.

Table 2. Results of the percentage of students' critical thinking skills

No.	Indikator Kemampuan Berpikir Kritis	Sub Indikator Kritis	Kemampuan Berpikir	Perolehan persentase skor	Keterangan
A	Memberikan penjelasan sederhana	1. Memfokuskan pertanyaan		46,7 %	Sedang
		2. Menganalisis argumen		43,7%	Sedang
		3. Bertanya dan menjawab pertanyaan tentang suatu penjelasan atau tantangan		38,5%	Rendah
B	Membangun keterampilan dasar	4. Mempertimbangkan kredibilitas suatu sumber		39,3%	Rendah
		5. Mengobservasi dan mempertimbangkan hasil observasi		39,3%	Rendah
		Rerata persentase skor		41,48 %	Rendah

Based on the table above, it shows that grade XI science students at Brebes High School have a low level of critical thinking ability. This is evidenced by the average percentage of critical thinking essay questions which only obtained 41.48% or the low category.

The sub-indicator "Focusing questions" shows the highest indicator with a percentage of 46.7%. This result is caused by some students who can focus on questions from a problem and some other students find it difficult to make questions from the problems provided. This result also proves that students' ability to focus questions in answering a problem is still better than other indicators. The skill of making simple explanations is a basic skill for students to be able to think critically (Sundari et al., 2018)

Meanwhile, the sub-indicator "Asking and answering questions about an explanation or challenge" is the indicator with the lowest percentage. The low ability to ask and answer questions, an explanation or challenge when compared to other indicators proves that students are not used to actively asking and answering a problem in environmental change material. Such results show that there are problems in learning that cause low critical thinking of students, although there have been many learning practices that have been used so far, but they do not improve students' critical thinking skills and the learning process is not optimal (Saputri et al., 2019).

Based on the results of interviews with the tutors, the students who are the subjects of this research are still fairly good at some students in solving problems which are then strengthened by the results of this research. The average result of the percentage of critical thinking essay questions that only obtained 41.48% or was rated low. This low result needs follow-up in the form of further research in the form of development that can improve students' critical thinking skills.

4. CONCLUSION

The conclusion obtained in this study is that the critical thinking ability of grade XI science students at Brebes High School is classified at a low level, as evidenced by the average result of the percentage of critical thinking scores that only get 41.48% or are considered low. This result is supported based on the results of interviews with the teaching teacher who said that the students who were the subjects of the research were fairly good at some students in solving problems

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