

Critical Thinking Skills of 10th Grade Students and the Effect on Learning Achievement

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Abstract: Students think that chemistry was a difficult subject. Students' learning achievement influence of several factors. Critical thinking skills can influence the students' learning achievement. This research aims to identify the critical thinking skills of tenth-grade students. They are high, medium, and low critical thinking skills that can be identified using the Cornell Critical Thinking Test (CCTT). Survey method as the research method. The data was collected by the test in three schools with high, medium, and low grades. The result showed that there were 35.5% with high critical thinking skills, 45.2% with medium critical thinking skills, and 19.3% with low critical thinking skills (high grade school); 25% with high critical thinking skills, 56.25% with medium critical thinking skills and 18.75% with low critical thinking skills (medium grade school); 18.75% with high critical thinking skills, 37.5% with medium critical thinking skills and 43.75% with low critical thinking skills (low grade school). This research can be used as a reference to improve students' critical thinking skills.

Keywords: critical thinking skills, Cornell critical thinking test, learning achievement

INTRODUCTION

Critical thinking is an important aspect of education. The 21st Century Partnership Learning Framework reveals that critical thinking is one of several capabilities that must be owned by 21st century human resources (Mukminan, 2014). Critical thinking skills are considered as one of the intellectual capital that is very important for everyone (Liliyasi, 2001) who influences moral, social, psychic, cognitive, and scientific development. Critical thinking skills influence reflective thinking and give an effect on reasoning to decide what is believed (Ennis, 1993). Critical thinking skills even rank first in the list of required skills (Fajrianti et al, 2016).

Critical thinking skills can be trained and developed. The teachers as a facilitator design and apply various learning strategies to train and stimulate students, critical thinking can be developed. Providing assessments to students aim to train and detect the development of students' critical thinking skills. Training critical thinking skills is very important because it can develop students' attitudes and perceptions to obtain and integrate abilities, enhance their knowledge, actualize the importance of knowledge, and develop beneficial thinking behaviors (Marzano, 1992). Critical thinking skills as abilities that can create powerful thinkers and problem solvers. Good critical thinking skills will make individuals show fewer mistakes in doing tasks while less skilled individuals will make more mistakes. Critical thinking skills play an important role in analyzing arguments, problems based on the credibility of data and information sources, giving an assessment of thoughts, problem correctly, being able to solve problems logically in various situations and making decisions based on consideration of relevant evidence and facts (Ritdamaya & Suhandi, 2016).

Giving continuous assessment, it is expected that students' critical thinking skills will increase. Students' critical thinking skills can be utilized in processing information, analyzing and concluding correctly in solving problems. It will make students easier to solve their

problems and will affect students' learning achievement. It is necessary to identify students' critical thinking skills to optimize their learning achievement.

METHOD

This result was conducted in three different levels of senior high school. SMA A was a high-quality school, SMA B was a medium quality school, and SMA C was a low-quality school. The subjects in this research were students of class X MIPA 4 at SMA A, students of class X MIPA 5 at SMA B, and students of class X MIPA 2 at SMA C. The research was conducted at even semester in the academic year of 2018/2019. This research is qualitative research with case study method. Data were collected by test. Researchers used the Cornell Critical Thinking Test (CCTT) Level X. The critical thinking skills test instrument used in this study was a standard instrument from Ennis, Millman, and Tomko (2005) as the main figures and researchers' references on critical thinking skills. The CCTT level X was already being tested in the term of validity. Moreover, CCTT Level X was chosen by several researchers (Dhina & Mubaroq, 2012; Nugraha & Kirana, 2015; Putri, 2018; Suhendi, et al, 2018) to measure students critical thinking skills. The instrument is CCTT Level X in the form of multiple-choice that tests the ability to induce which has been translated into Indonesian by linguists. The ability to induce includes the ability to make generalizations, conclude explanations, investigations based on criteria and assumptions (Nugraha & Kirana, 2015). Data were analyzed with qualitative descriptive analysis technique.

RESULTS AND DISCUSSION

The process of thinking is an important process for the cognitive development of students. Glaser argues that critical thinking as an active process of deeper thinking (Fisher, 2009). It is skilled in conceptualizing, analyzing, synthesizing, and evaluating information based on observation (Scriven & Paul, 1987). Critical thinking skills, students will have the ability to solve their problems with a large perspective.

Robert H. Ennis, Jason Milman, and Thomas M developed Cornell Critical Thinking Test (CCTT) Level X (for students level 4-14 or equivalent to students aged 10-20 years old) to measure critical thinking skills. It contained 5 indicators of critical thinking skills, aspects of induction, deduction, credibility, observation and identification of assumptions (Ennis, 1991).

In this research, researchers used CCTT Level X of the induction category. It consists of 25 multiple-choice. The examples of questions in this aspect:

First question:

All of X's belong to Y.

None of Z's belongs to Y.

Then is this true?

At least some of X's is Z.

Students will choose the answer between yes, no, or maybe.

Second questions:

All of the second-level children are outside in the playground.

Then is this true?

All of the children who are outside in the playground area on the second-level.

Students will choose the answer between yes, no, or maybe.

The calculation of the score using the correct answer is reduced by half of the wrong number (R-W/2). CCTT doesn't have a standard category to determine the level of someone's critical

thinking skills. To find out the profile of the induction critical thinking skills in this study according to Arikunto (2005) that has been modified.

Based on the data of this research, it was obtained the categories of induction critical thinking skills can be seen in table 1.

Table 1. Categories of Students' Critical Thinking Skills at SMA A, SMA B, and SMA C

No.	School	Categories of Critical Thinking Skills		
		High (%)	Medium (%)	Low (%)
1	SMA A	35.5	45.2	19.3
2	SMA B	25	56.25	18.75
3	SMA C	18.75	37.5	43.75

Based on table 1, it shows that most of the students at SMA A and SMA B have induction critical thinking skills in the medium category with a percentage of 45.2% and 56.25%. This shows that the readiness of students is still in terms of the ability to generalize, conclude, and investigate. Most of the students at SMA C have low induction critical thinking skills with a percentage of 43.75%. It shows that the readiness of students is still low in terms of generalization, inference, and investigative abilities.

Research conducted by Suhendi et al (2018) on students class X in SMA Bandung shows that the critical thinking skills of induction are mostly in the medium category (63.9%), while the low category is 19.4% and good category is 16.7%. Critical thinking skills may affect students' learning achievement. This research can be used as a reference to identify students' critical thinking skills.

CONCLUSION

There are 35,5% with high critical thinking skills, 45,2% with medium critical thinking skills, and 19,3% with low critical thinking skills (high grade school); 25% with high critical thinking skills, 56,25% with medium critical thinking skills and 18,75% with low critical thinking skills (medium grade school); 18,75% with high critical thinking skills, 37,5% with medium critical thinking skills and 43,75% with low critical thinking skills (low grade school). Critical thinking skills may affect students' learning achievement.

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