An Analysis of Critical Thinking Skills Students of Batik 1 Senior High School Surakarta in the 2022/2023 Academic Year

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Abstract. Critical thinking is a pivotal skill that underpins academic success and readiness for contemporary life and work complexities. This research examines the students' critical thinking abilities at Batik 1 Senior High School in Surakarta for the 2022/2023 academic year. A representative sample of 100 students was randomly selected across all grades to participate in this study. They were evaluated using a critical thinking assessment, which measured their proficiency in argument identification and evaluation, problem-solving, and decision-making. Contrary to proficiency expectations, the findings indicate that the student's overall critical thinking skills trend towards the lower end of the spectrum. At the same time, they demonstrate an essential capacity to engage with arguments and make reasoned decisions; their problem-solving abilities need to be more inventive approaches. These results point to an opportunity for Batik 1 Senior High School Surakarta to bolster its critical thinking curriculum. The school could benefit from integrating enhanced learning strategies that promote innovative problem-solving and reasoning to elevate students' critical thinking capabilities to meet the demands of an increasingly digital and complex world.

Keywords: education; critical thinking; high school.

INTRODUCTION

Critical thinking is an essential skill for navigating the complexities of the 21st century [1, 2]. The author aptly states, that in today's rapidly changing world, the ability to think critically is more important than ever. Critical thinking skills are essential for success in various fields, from business and science to education. In education, fostering critical thinking skills enables students to become independent learners, problem solvers, and effective communicators. It empowers them to move beyond rote memorization and develop the ability to analyze information, evaluate arguments, and make informed decisions. As the author asserts, critical thinking is a process that helps us to distinguish the good, the bad, and the ugly, and allows us to make the best of what we have to work with.

However, a comprehensive understanding of the current state of critical thinking skills among SMA 1 Batik Surakarta students is crucial to tailoring and refining these approaches and ensuring their effectiveness. This need aligns with the growing emphasis on measuring and improving critical thinking skills in educational settings, as highlighted by research [5], which identifies critical thinking as a key competency for future-ready graduates.

Furthermore, previous studies within Indonesia have shed light on the importance and potential challenges of developing critical thinking skills among high school students. Research [6] conducted in several Indonesian high schools revealed that while students demonstrated some basic essential thinking abilities, they often needed help with higher-order skills such as problem-solving and evaluation. Similarly, a study [7, 8] identified a need for more student engagement in critical thinking activities due to traditional teaching methods and limited resource access.

These findings underscore the need for a focused investigation into the specific strengths and

weaknesses of critical thinking skills among Batik 1 Senior High School Surakarta students. By drawing on established research and the school's unique context, this study can provide valuable insights and inform targeted interventions to elevate the critical thinking development of its students.

METHODOLOGY

This study is a quantitative research using a descriptive approach. The descriptive approach objectively depicts the condition or a particular phenomenon. This research method was chosen to describe the critical thinking ability of high school students at Batik 1 Senior High School Surakarta for the 2022/2023 academic year. This study's population comprises all Batik 1 Senior High School Surakarta students, totalling 870 individuals. The sample for this research is 100 randomly selected students. The sample selection was conducted using a simple random technique. The research instrument employed in this study is a critical thinking test. This critical thinking test consists of 30 items measuring students' critical thinking ability: 1) Identification and evaluation of arguments, 2) Problem-solving, and 3) Decision making. The researcher developed this critical thinking test, referencing existing critical thinking theories. The test has been validated for its reliability and validity. The data for this study were collected using a test method. The critical thinking test was administered directly to the research sample. The data from the critical thinking test were analyzed descriptively and quantitatively. Data analysis was performed using descriptive statistics, such as mean, median, and standard deviation.

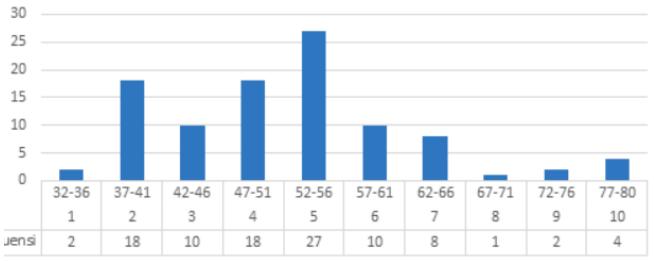
Table 1 – Score Range [9]

Score Range	Category
X>M+ 1,50 s	Very High
M+ 0,50 s <X≤ M+ 1,50 s	High
M-0,50 s<X≤ M+ 0,50 s	Medium
M–1,50 s <X≤ M–0,50 s	Low
X≤ M-1,50 s	Very Low

Notes: M – Ideal Average Score; s – Standard deviation; X – Total Score obtained by students; Score = (Score Obtained / Max Score) *100.

RESULTS AND DISCUSSION

This research aims to analyze the level of critical thinking skills of students at Batik 1 Senior High School Surakarta regarding alcohol. Research data were obtained from the results of a critical thinking skills test using essay questions. After obtaining the test results, the data were analyzed and categorized into levels of critical thinking skills. The acquisition of data on the frequency of students' critical thinking skills can be seen in the following diagram.



Figure

Based on the histogram, it can be observed that the frequency of students' critical thinking abilities varies across different score ranges. For instance, in the lower score range, only 1 student falls within the 67-71 interval, while the 72-76 interval contains 2 students, and the 77-80 interval includes 4 students. The remaining score intervals reflect significantly lower frequencies of critical thinking scores among the students.

Table 2 – Aspects of Critical Thinking Skills

Aspects of Critical Thinking Skills	Average Score	Median
Identification and Evaluation of Arguments	55	54
Problem-Solving	58	57
Decision Making	50	49

The data from the table shows that students' critical thinking skills, assessed on three key aspects, display a tendency towards the lower end of the performance spectrum. Specifically, the average Score for Identification and Evaluation of Arguments is 55, with a median close to 54, suggesting that while some students may perform moderately well, a significant portion score below this average. Problem Solving skills have an average score of 58 and a median of 57, indicating a slight improvement in

this area but still room for growth. The most concerning aspect is the decision-making aspect, where the average Score dips to 50 and the median to 49, revealing a need for considerable enhancement in this critical area of thinking skills. These figures highlight areas where educational strategies could be focused to bolster students' critical thinking capacities. Overall, the table provides a concise statistical summary of students' competencies in critical thinking across different dimensions.

The results indicate that students possess some basic critical thinking abilities, yet there is a clear need for improvement, especially in decision-making. These findings could imply that current teaching strategies may need to sufficiently prioritize and effectively develop critical thinking skills, necessitating a shift towards more interactive and problem-centred learning approaches. Including tasks that encourage critical analysis, such as debates or case studies, could be beneficial. The proximity of the median scores to the averages also suggests that targeted support for students who score below the median could have a meaningful impact on raising the overall level of critical thinking among students. By addressing these educational gaps, we can aspire to enhance academic performance and prepare students to tackle real-life challenges with analytical and reflective thinking skills, which are invaluable in today's fast-paced and complex world.

Table 3 – Categorization of Critical Thinking Skills of Students at Batik 1 High School Surakarta

Level Critical Thinking Skills	%
Very High	0
High	4
Medium	21
Low	62
Very low	9

Table 3, Categorization of Critical Thinking Skills of Batik 1 Senior High School Surakarta Students" provides a classification of students' critical thinking skills levels. It shows that none of the students fall into the 'Very High' category of critical thinking skills. A small percentage, 4%, demonstrate 'High' critical thinking skills. A more significant segment, 21%, displays 'Moderate' critical thinking skills, which could be considered average. Most of the students, 62%, have 'Low' critical thinking skills. Finally, 9% of the students are in the 'Very Low' category. This categorization suggests that the critical thinking skills of most students are below the moderate level, with a significant portion showing low abilities in this area. According to [10], one of the causes is that teaching too focused on memorizing facts without understanding the basic concepts can hinder the development of critical thinking skills. Meanwhile, authors [11] suggest that another cause of students' low critical thinking is the need for more opportunities to engage in practical experiments, making it difficult for students to understand abstract concepts in chemistry, affecting their critical thinking abilities. On the other hand, authors [12] explain that an unsupportive learning environment, such as overly large classes or a lack of learning resources, can affect students' critical thinking ability.

Critical thinking is a trainable skill encompassing indicators such as analysis, evaluation, and inference [13]. However, according to [14], students' critical thinking skills can be enhanced through problem-based learning and the development of evaluation skills and self-regulation. Furthermore, authors [15] suggest strategies for improving students' critical thinking in chemistry education, which can involve using the Discovery Learning teaching model. Another strategy is the development of Discovery-based learning modules/teaching materials in chemistry, which is believed to be able to enhance students' critical thinking skills in chemistry [16].

CONCLUSIONS

Based on the results of this study, the critical thinking ability of students at Batik 1 Senior High School Surakarta City is in the low category, necessitating efforts to maximize their critical thinking capabilities. Therefore, several recommendations to enhance the critical thinking skills of students at Batik 1 Senior High School Surakarta include:

1) Increasing the intensity of learning activities oriented towards developing critical thinking, such as problem-based, project-based, and inquiry-based learning.

2) Developing curricula and learning materials more focused on critical thinking development.

3) Providing training and mentoring for teachers to improve their skills in developing students' critical thinking abilities. These recommendations are expected to enhance students' critical thinking skills at Batik 1 Senior High School Surakarta so that they may graduate ready to face the challenges of the digital era.

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