Analysis of Junior High School Students’ Critical Thinking Skills Profile in Surakarta

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Abstract. This research aims to analyze the initial profile of critical thinking skills junior high school students in Surakarta. This research is descriptive quantitative research, using the test method. A sample of 8th grade study with 150 students assigned by purposive sampling technique. The instrument used to measure critical thinking skills is a test of critical thinking skills. Data analysis is carried out in a quantitative percentage. Based on the results of the analysis, shows that the results of critical thinking skills in school are: reasoning (57%), reflection (70.74%), and making decision (50.46%). Based on these results, the average school critical thinking skill is 59.4%. The results of this study indicate that critical thinking skills in Surakarta junior high school students are in the sufficient ability category. These results indicate students’ critical thinking skills must be a serious concern because of the low achievement in several indicators.

Keywords: Analysis; Critical thinking skills, Junior high school.

1. Introduction

Permendiknas No.22 of 2006 concerning Content Standards provides an understanding that Natural Sciences (IPA) is related to how to systematically find out about nature, so that the Science is not only mastering a collection of knowledge in the form of facts, concepts, or principles only but it is also a process of discovery [1]. Natural Sciences learning emphasizes direct experience to develop competencies so that students are able to understand the environment through the process of finding out and doing, this will help students to gain a deeper understanding.

Learning in the 21st century according to the Partnership for 21st Century Learning [2] was developed with input from educators, education experts and business leaders to define and illustrate the skills, knowledge, skills and support systems that students use to succeed in work, life and citizenship. Skills in learning and innovation are skills that students must prepare and possess to face life and an increasingly complex work environment. There are four aspects, namely creativity and innovation, critical thinking and problem solving, communication and collaboration. In line with this, Etheridge in Charlotte West [3] who is members of the Association of International Educators stated that recent research confirms that the skills sought by entrepreneurs to become prospective employees are people who think critically, are able to solve complex problems, have inter-cultural competencies, and have the ability to be creative and innovative.

Critical thinking skills are skills that are essential for life, work, and function effectively in all other aspects of life. Critical thinking has long been a primary goal in education since 1942. Research and opinions about it have been the topic of discussion in the last ten years [4]. According to Ennis [5], critical thinking is a reflective way of thinking that is reasonable or based on reason that is focused on determining what must be believed and done. The science education system is generally only oriented towards products in the form of test scores so that students do not use their thinking skills. Therefore, this paper presents an analysis of junior high school students’ critical thinking skills profile.
A sample of 8th grade study with 150 students in Surakarta, Indonesia assigned by purposive sampling technique. The rest of this paper is organized as follow: Section 2 describes the proposed research method. Section 3 presents the obtained results and following by discussion. Finally Section 4 concludes this work.

2. Research Method
This research is a descriptive research, which is research conducted to determine the value of the independent variable, without making comparisons or relating to other variables. The study was conducted junior high school student in Surakarta. The sample of this study was 150 students in grade 8th. This study used purposive sampling technique. The instrument used is a matter of testing critical thinking skills that are developed based on the critical thinking dimension according to Ennis which consists of reasoning, reflection, and making decision. Data obtained from analysis of student answers, by scoring according to rubric assessment. The scores obtained by students are then converted to percentage forms.

3. Results and Discussion
This study was conducted to analyze the initial profile of students’ critical thinking skills in junior high school in science learning. Critical thinking is a reasonable reflective thinking focused on deciding what to believe or do. The emphasis is on reasonableness, reflection, and the process of making decisions [6].

The initial profile of students’ critical thinking skills is based on three dimensions. First dimension reasoning that shows students' skills in the process to take a conclusion from the available information. reasoning is the line of thought adopted to produce assertions and reach conclusions in task solving [7]. Second, the reflection represent further consideration by students where there is a phase to find out further through research or investigation. Learners who think they are actively aware of and control their learning by accessing what they know, what they need to know and how they bridge that gap [8]. The use of reflective thinking may be a precursor to stimulating critical thinking [9]. Third, making decision, what is meant by making decision here is the decision to solve the problem. The questions used to measure the profile of students’ critical thinking skills in the form of multiple choice questions. The result of student initial profile test is presented in Figure 1.

![Figure 1. The percentage of Student’s Critical Thinking Skills](image-url)

Figure 1 shows that there is only one dimension that get good criterion that is on dimension of reflection acquisition equal to 70.74 %, while the other dimension are still in sufficient criterion that is the reasonable equal to 57 % and making decision 50.46 %. Meanwhile, if it is averaged from all three
dimensions, critical thinking skills of students are 59.4%. The analysis of the result which refers to the critical thinking level criteria is presented in Table 1.

| Percentage (%) | Criteria     |
|----------------|--------------|
| 81-100         | Very high    |
| 61-80          | High         |
| 41-60          | Sufficient   |
| 21-40          | Low          |
| 0-20           | Very low     |

Table 1 shows the results of the analysis based on the criteria of critical thinking skills of 8th grade students. It can be seen that students' critical thinking skills are sufficiently qualified. This result shows the same as previous studies that also shows that the sufficient criteria for critical thinking skills in Indonesia. The critical thinking was proven in several studies on national scale.

3.1. Reflection

In the reflection dimension students show the highest percentage. In this dimension there are several aspects, namely actively finding out, connecting loopholes, and wise. The calculation results show that actively find out the percentage of 70.7%, then to connect the percentage gap of 65.7% and for the wise aspect shows the figure of 81%. These results are presented in Figure 2.

![Figure 2. Percentage of Students' Critical Thinking Skills on Reflective Dimensions](image-url)

Student activities that show that the student is actively looking for, namely, students often ask if they do not know, love reading, including examining whether the source of information that he uses is trusted. In the indicator students often ask and enjoy reading shows a percentage of 75% while in the indicator examines reliable sources the percentage shows 63%. This shows that students tend not to check the source of information they get. When students get information, they are immediately accepted without consideration. So that this will be dangerous in the present and future. Today, because technological advances are advancing, information will spread quickly. This information must be known whether the source can be trusted or not, the information is correct or not. If students are not accustomed to researching the source of information used it will be difficult to deal with an increasingly advanced age. For example in Figure 3.
In question number 9 in Figure 3, shows that the source of information used is preferably derived from the library rather than on the internet, when writing reports about a study. The library provides many books so that it becomes a trusted source rather than on the internet. For junior high school students when searching for sources on the internet do not know how to find out if the source is valid or reliable. While for other answer options can be searched using the internet. Missals find out about the price of smartphones so they must find the latest information. Of the 150 students who answered correctly there were 94 students. So that there are still many students who are still unable to determine a reliable source of information. But overall the reflective dimension of the students is good because it is included in the high criteria.

In the aspect of connecting the gap, the indicator understands the concept and analyzes. In the indicator, understanding the concept shows a percentage of 52%, while the indicator analyzes 79%. Understanding the concepts included in the criteria is sufficient because the concepts are only memorized without being understood so that students are easily forgotten. As for the indicators of analysis, it shows a good percentage, because the analysis carried out is related to everyday life and not memorization. In the wise aspect, students are expected to be able to consider opinions that are not in accordance with their opinions. Based on the calculation, 81% of students answered correctly. So students are wise enough to consider the opinions of others.

3.2. Reasoning

In the reasonable dimension contains several aspects namely logical aspects and draw conclusions. In the logical aspect the indicator provides an explanation while in the concluding aspect the indicator deduces and induces [10]. Figure 4 shows students’ critical thinking skills in a reasonable dimension for each aspect.

![Figure 4. Percentage of Students' Critical Thinking Skills in Reasonable Dimensions](image)

The logical ability of students shows quite good results 63% when compared to the ability to draw conclusions. Figure 5 is an example of a given problem for logical aspects. In this problem there were 51 students answering correctly from 150 students who answered.
In the problem shown in Figure 5, students still find it difficult to reason which is the fact and which is the opinion. This is because students are still familiar with memorization. In the aspect of drawing conclusions students can do it by inducing or deduction. Figure 6 is an example of a question to draw conclusions.

Based on Figure 6 many students find it difficult to draw conclusions. This is indicated by only 31 students who answered correctly. Many students choose the answer option a, namely Adi and Doni are classmates.

3.3. Making Decision
In the making decision dimension, it consists of 4 aspects. First aspect of understanding the problem. In understanding the problem students must first find the problem at hand. After finding a problem, the child can understand the problem. The second aspect is planning problem solving. In this aspect students are required to be able to look for some problem solving. In carrying out aspects, students choose the solution that is most likely to solve the problem. Then the aspect of checking again, here students must re-examine the problems that have been resolved. Whether it really has solved the problem or will cause new problems. Figure 7 shows the results of student scores on the making decision dimension.

Based on Figure 7 it can be seen that the highest percentage is found in aspects of carry out the plan. Students are adept at implementing the plans that have been made. But the aspect of planning a low solution is only 20.75%. This shows that students are less able to plan some solutions that allow a problem. Figure 8 is a sample question about planning a solution.
In Figure 8, it can be seen that the most possible solution to overcome the problems faced by Dita is to consume nutritious foods. But many students who answered Dita had to eat on time and not snack haphazardly. The answer is wrong because, the answer is not a solution but a preventive measure that should be done by Dita. In this case only 21% of students or 31 students answered correctly.

In the looking back aspect, the percentage is 52.6%, this shows students have sufficient ability to check the problems that have been resolved. While the understand the problem aspect the percentage of students is 46%. The ability to find and understand a problem still needs to be considered again. Because students in everyday life will certainly encounter problems. When students do not know about the problems they are facing, students will find it difficult to solve the problem.

4. Conclusion
Based on data processing that has been done, shows that critical thinking skills of junior high school students in Surakarta are classified as sufficient. This was shown by students who met the critical thinking skills indicator still 59.4%. This must be a serious concern because students' critical thinking skills are needed in the 21st century.

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