

## **Critical Thinking Skill Profile of Seventh Grade Junior High School Students in Surakarta**

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**Abstract.** According to the criteria of the 21st century, it now requires human resources to have 4C skills, namely; critical thinking, creativity, communication and collaboration in order to produce superior human resources. Indonesia is in the making of major improvements to the national education system nowadays related to 4C, starting from the implementation of the 2013 curriculum which focuses on activeness to students. One of the 21st century skills used for student-centered learning is critical thinking skill. This research aimed to analyze the critical thinking skills profile of seventh grade junior high school and was conducted by a descriptive research method. The subject of this research was 52 students in Surakarta. The data of this research was collected using a test based on 6 indicators of critical thinking skills authorized by Facione. The result of the research showed that the average of percentage of student's critical thinking skill achievements is 35,125%. The result indicates that the critical thinking skills of students are categorized in low level, therefore teachers are expected to be able to design the process of learning activities that can empower students' critical thinking skills. Besides, learning activities are expected to use the latest technology so that students are more interested in learning.

**Keywords:** critical thinking skills profile, 21st century, descriptive research

### **1 Introduction**

Humans and education are two aspects that cannot be separated. Education is one of the basic needs for humans, with the education that humans get preparing themselves to live their life. Progress of new forms of information and communication technology today also changes in competence that students must know in the 21st century [1] such as writing, reading, and numeracy competencies become critical thinking, creativity, communication, and collaboration skill [2]. The challenge of education today is to be able to produce individuals who are able to compete in the 21st century. The resources at the present time can be realized by implementing 21st century skills or often referred to as 4C. The 21st century skills consist of critical thinking skills, creative thinking skills, communication skills and collaboration skills. At present, Indonesia is in the making of major improvements to the national education system, starting with the implementation of the 2013 student centered curriculum. One of the 21st century skills used for student-centered learning is critical thinking skills [3].

One of the weaknesses of the learning process implemented by teachers is the lack of efforts to develop students' thinking abilities [4]. Every learning process in any subject the teacher encourages more so that students can master a number of subject matter. The problem that often arises in schools is the weakness of the learning process, so the learning objectives cannot be achieved. This is because the learning process in the classroom is directed at the child's ability to memorize and hoard information without being required to understand the information he is remembering to connect with everyday life. The teacher always requires students to learn, but does not teach how students should learn and solve problems properly in contextual way [5]. One way for students to connect the information obtained with everyday life and can decide what to do if there is a problem based on the information obtained is by doing critical thinking learning.

Quality of education levels in a country can be seen from the indicators of students' critical thinking skills [6], so that critical thinking is an important and vital topic to examine and develop in the era of modern education due to 4C and the 21st century skills. Whereas in reality, the teaching and learning process generally does not encourage the achievement of critical thinking skills. There are two factors that cause critical thinking not to develop during education. First, the curriculum is generally designed with broad material targets so that teachers are more focused on completing the material. Second, that learning activities in the classroom that have been carried out by the teacher are nothing but the delivery of information (lecture method), by activating the teacher more, while students are passive listening and copying, where the teacher occasionally asks questions and occasionally students answer. Then the teacher gives examples of questions, followed by giving exercises that are routine and lack of training in critical power; finally the teacher gives an assessment. Critical thinking itself is reflective thinking that focuses on making decisions about what is believed and what needs to be done next [7]. Critical thinking is also defined as an intellectual process and the skills of analyzing, evaluating, conceptualizing, applying, and synthesizing information collected to act or determine conclusions [8], [9], [10]. Besides that critical thinking can also be defined as metacognitive skills to produce logical solutions to problems found with indicators including interpretation, analysis, inference, evaluation, explanation and self-regulation [11], [12], [13]. The specific purpose of learning critical thinking in science education and other disciplines is to improve students' thinking skills and at the same time prepare them to succeed in living their lives. Critical thinking is an ability that influences the life of a future person, this is due to critical thinking skills make a person a good decision maker in learning science [14].

There are 6 indicators of critical thinking skills [15], namely: (1) Interpreting, namely students' skills in interpreting an event, data, or experience; (2) Analyzing, i.e. the students' skills in conducting an investigation of a link between the cause and effect of a statement or event; (3) Inferring, namely the students' skills in making conclusions based on data, events, events and statements that are relevant to the evidence and reason; (4) Evaluating, namely students' skills to judge the truth of information obtained by using inductive and deductive thinking; (5) Explaining, that is the students' skill to explain an event or phenomenon based on strong concepts, methods and considerations in detail; (6) Self-regulation, i.e. the students' skills to ensure that he has understood an event.

Critical thinking skills should be possessed by all students, therefore students need to be trained to think critically early on, especially at the elementary school level, the best time to get students to think critically is when in elementary school [16]. Therefore learning to empower students' critical thinking skills also can be done on junior high school students. In advance, finding the best way to naturally enhance students' critical thinking skills is needed.

Generally junior high school students aged 12-14, where at that age students have entered the cognitive level of concrete operations. This cognitive cognitive level of operation is the stage where the child has been able to identify things that are concrete but not enough to be able to identify things that are abstract.

## 2 Method

Qualitative descriptive method is used in this study. This research was conducted in two junior high schools in Surakarta, consisted of 52 students as samples of study taken from population. The data collection technique used was test, consisting of 6 items outlined based on indicators of critical thinking skills compiled by Facione. The type of data obtained in the form of data in the form of scores, where the minimum score is 1 and the maximum score is 4. The data is then analyzed using qualitative descriptive analysis techniques. Perth calculation is done in 2 ways, first by calculating the average score of critical-calculated skills using the formula:

$$Mean = \frac{\Sigma f. x}{f}$$

With:

Mean = Average score

$\Sigma f.x$  = Total score per indicator of students' critical thinking skills

f = Total amount of students

After the Perth score is done by calculating the average score or mean, the second step is to calculate the percentage of the average score using the formula:

$$\% = \frac{Mean}{Max} \times 100\%$$

With:

% = Percentage of score

Mean = Average score

Max = Maximum score

The percentage score obtained based on two steps of calculation is then converted into a qualitative value and interpreted based on the following categories:

**Table 1.** Category of qualitative value

No.	Percentage of score (%)	Category
1	>80	Very high
2	>60 – 80	high
3	>40 – 60	Moderate
4	>20 – 40	Low
5	<20	Very low

[17]

### 3 Results and Discussion

#### 3.1 Results

The mean score of critical thinking skills of junior high school students in Surakarta for each indicator of critical thinking skills based on test results can be seen in **Table 2**.

**Table 2.** Interpretation of students' critical thinking skills

No.	indicator of critical thinking skills	Mean	Percentage (%)
1	Interpretation	1,21	30,25
2	Analysis	1,46	36,5
3	Inference	0,93	23,25
4	Evaluation	1,82	45,5
5	Explanation	1,07	26,75
6	Self-Regulation	1,94	48,5
	Average score	1,405	35,125

Table 2 shows that the average critical thinking score or mean score of students in junior high school in Surakarta shows that their critical thinking skills are still in the low category because the average score obtained is only 35.125%. Based on the average score or mean score of students' critical thinking skills of each indicator shows that the highest score is the aspect of self-regulation and the lowest score is the summing aspect. Data obtained in **Table 2** if shown in the form of a histogram will be visualized as **Figure 1**.

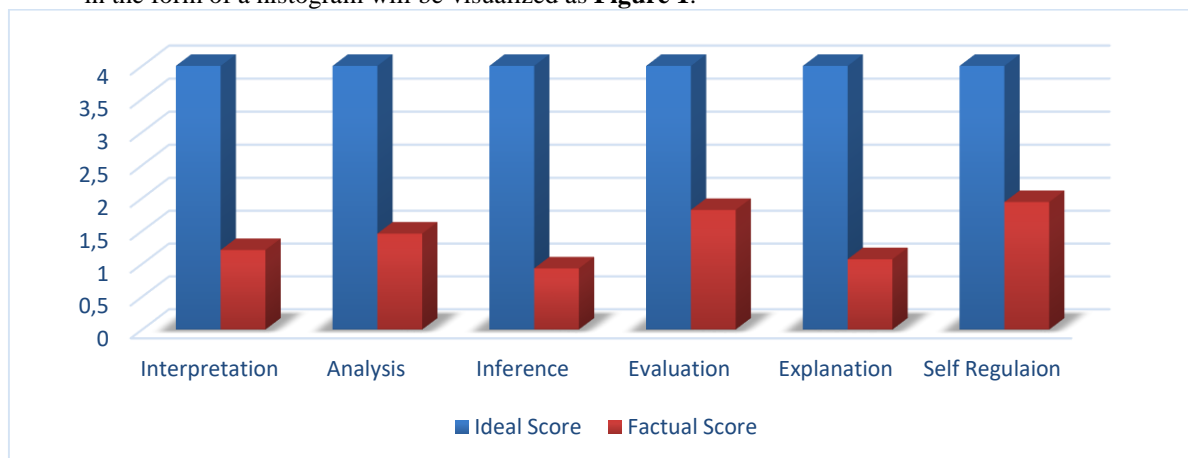


Fig. 1. Pattern of students' critical thinking skills

#### 3.2 Discussion

The results of this study show that the critical thinking skills of junior high school students in Surakarta are still low because the average obtained from all indicators is only 35.125%. The mean results were obtained from the analysis of test questions. These results are also consistent with research conducted by Nuryanti et al. [18] and Utami et al. [19], where the results of their research showed that the critical thinking skills of junior high school students in Central Java were relatively low using open-ended test.

The percentage of interpreting aspect is 30.25% in the low category, the analyzing aspect is 36.5% which is in the low category, the inferring aspect of 23.25% is in the low category, the evaluating aspect is 45.5% which is in the moderate category, the explaining aspect is 26.75% which is in the low category, and the self-regulation aspect is 48.5% which is in the moderate category. Aspects with a relatively low percentage are aspects of interpretation, aspects of analysis, aspects of conclusions and aspects of explanation, while the aspects of evaluation and aspects of self-regulation only fall into moderate categories. There are 4 aspects of indicators that are still low, whereas 4 indicators are very important in the process to foster critical thinking skills to get meaningful learning.

Low thinking skills will cause students to be less able to master the learning methods in a straightforward manner and only master the appropriate material in the textbooks. Yet at this time critical thinking is an important and vital topic in the era of modern education. The specific purpose of learning critical thinking in science education and other disciplines is to improve students' thinking skills and at the same time prepare them for success in living their lives. High critical thinking skills in junior high school students will not only make them reach the competency standards set in the curriculum or that will be achieved in the learning process, but they will also be able to design and navigate their lives in the future filled with challenges, competition, and uncertainty. Another benefit that students will get from critical thinking skills is to make students more independent, confident, and able to solve problems wisely [20].

The way that teachers can do to hone a skill of critical thinking students is through activities to find information from various sources both through experience, communication and observation so that an active intellectual process occurs [21]. However, in carrying out these various efforts the teacher can experience obstacles which is a long process so that students who are not accustomed to learning become unpleasant. Here the role of the teacher is very important that is to motivate learning [22]. To improve students' critical thinking skills can be done by students conducting discussions to express opinions and exchange ideas each other, so students can think independently, be confident in expressing ideas, and can accept differences of opinion so that they can collaborate to find solutions from problems [23][24]. The low results of critical thinking skills of junior high school students in Surakarta can be subject to internal and external factors. Internal factors that may affect are gender, the environment, motivation, and intellectual level (IQ), while external factors that can affect students' critical thinking skills, for example, originate from the learning process at school in the form of learning models / methods / approaches used, competence teachers, and facilities and infrastructure in schools.

Facilities and infrastructure that are very important in science learning is the presence of laboratories and complete equipment. Science is very closely related to experiments or practicum and understanding of science materials of students can be built one of them through practical activities [25]. Often at school the practical tools are incomplete and cause the intensity of the practice to be low. The low intensity of the practicum can be helped by the use of media that can show the practicum in a virtual form. In today's digital era students are more interested in learning that relies on technology and the atmosphere of learning in the classroom is more interesting so students pay more attention when learning. One of the technology-based learning that can be done to cover the lack of infrastructure in the laboratory is to use a virtual laboratory.

## 4 Conclusion

Critical thinking skills are skills that must be possessed by students in the 21st century, so students are able to solve all problems in their lives and be able to keep up with the competition that occurs in the global era. Besides that critical thinking can also make students become someone who is good at making decisions of the problems. Based on research conducted using critical thinking skills, junior high school students in Surakarta still show that their critical thinking skills obtained was in the low category of 35.125%. The possibility of this can occur due to factors from within and from outside that affect student learning processes.

To improve students' critical thinking skills, teachers must innovate in learning. One of them is by using learning approach or by using a learning model that can improve students' thinking skills. In addition to teachers who have to innovate, schools also have the responsibility to complete all the facilities needed by students so that learning can take place well.

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