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Profile of Critical Thinking Skills of Junior High School Students

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Abstract: The purpose of this study is to determine the profile of the critical thinking skills of junior high school students in science learning. This type of research is descriptive quantitative with purposive sampling techniques with the subject in this study, namely grade VII students at SMP Negeri 1 Juwangi. The result of the study is that each indicator of critical thinking skills has different results. The interpreting indicator has a value of 67.96 including the enough category, the analyze indicator has a value of 47.65 belonging to the low category, the evaluating indicator has a value of 66.40 belonging to the enough category, the indicator concludes to have a value of 53.12 belongs to the low category, and the explaining indicator has a value of 48,43 belonging to the low category. the average critical thinking skills of learners belong to the low category with a score of 56.57. The low critical thinking skills are caused when the learning process is still conventional so that it is only centered on the teacher and also not optimal learning activities that can improve students' critical thinking skills. Based on the results of the study, it is hoped that researchers can then develop learning tools that can improve students' critical thinking skills in science learning in junior high schools.

Keywords: Critical Thinking Skills; Education; Science Learning

Introduction

The 21st century is a century where science and technology is developing very rapidly, where almost anything can be done by utilizing technology (Pratiwi et al., 2019). Technology itself was created to help people's daily activities and make it easier to do work. The 21st century is the era of information & communication technology which is developing rapidly (Husniah et al., 2019). The use of sophisticated technology in the current era has a positive impact on teachers because it can all be used as a tool during the teaching process (Sumiyati et al., 2021).

Education is currently expected to produce human resources with strong communication and collaboration skills, experts in using technology, creative and innovative thinking skills and the ability to solve problems. In the 21st century, education is becoming increasingly important to ensure students have learning and innovation skills, problem solving and self-control, skills in using technology, information and communication (ICT), as well as being able to work and survive using life skills (Andrian & Rusman, 2019; Mukarramah et al., 2021). There are several competencies that students must have in the 21st century which are often called 21st century skills (21^th Century Skills) and for learning concepts they are often referred to as 21st century learning (21^th Century Learning). 21st Century skills that are considered to be able to strengthen social capital and intellectual capital. US-based Partnership for 21st Century Skills (P21), identifies the competencies needed in the 21st century, namely "The 4Cs" - communication, collaboration, critical thinking, and creativity. (Nuryanti et al., 2018; Andayani et al., 2019). The quality of education in Indonesia is currently still being improved, in order to create human resources that can survive in the 21st century. Basically, these 21st century competencies have

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been adapted into the education system in Indonesia through the 2013 Curriculum. In the 2013 curriculum, science learning at the junior high school level is packaged in an integrated manner to science science (Hidayati et al., 2021).

Science education plays an important role in developing students' knowledge, thinking skills, and attitudes. Through science education students can recognize, respond to and appreciate science and technology, as well as instill the habit of critical, creative and independent scientific thinking and behavior (Jamaluddin et al., 2020). Science learning is believed to be a basic science that has an important role in the development of science and technology. Natural Sciences is a branch of science which systematically studies natural phenomena through a process of discovery, so that learning Sciences must make students have experience in finding a concept that will stimulate the development of students' critical thinking skills (Febrianti et al., 2021). Critical thinking is an organized thinking ability. Critical thinking is one of the skills that students must have in the 21st century (Hidayati et al., 2021). The ability to think critically is an ability that everyone must have and develop because critical thinking skills are needed in facing life's challenges (Azizah et al., 2021). Students also need to have this critical thinking ability so that they can be used in making decisions in everyday life. Someone who has the ability to think critically will be able to analyze the problems faced, find and choose appropriate, logical, and useful solutions (Kurniasih, 2012; Rachmantika & Wardono, 2019)

Critical thinking skills have become one of the goals of education that must be achieved. This is because critical thinking demonstrates higher-order thinking skills and has played a role in moral development, social development, and especially in scientific development (Kartika et al., 2020). The purpose of critical thinking is to examine an opinion or idea, including making judgments or thoughts based on the opinions put forward. These considerations are usually supported by justifiable criteria. Critical thinking skills need to be developed because students' way of thinking will improve so that they are able to examine, evaluate, and grow what they think to solve problems (Nugraha, Suyitno, & Susilaningsih, 2017). To achieve optimal results in the learning process requires the ability to think critically actively by students. The ability to think critically actively by students is needed in the learning process in order to get maximum results, from this statement it means that critical thinking is an ability in learning activities that is very important to be applied and honed by students.

Based on PISA data for 2018, Indonesia's average score in reading, mathematics and science is ranked 73 out of 78 countries, while science achievements at the national and subnational levels, Indonesia ranks 128 out of 146 countries/regions and an average the average score is 396 (OECD, 2019). This indicates that Indonesian students' ability to understand science concepts (IPA) is still low. The science teaching system in Indonesia, which in general has not trained critical thinking skills, is suspected to be one of the causes. Therefore, teachers need to put more effort into training students to think critically in learning, especially in learning science (A'yun et al., 2020). Based on research by Maslakhatunni'mah et al. (2019), the results of junior high school students' critical thinking skills in science subjects are still relatively low in terms of the acquisition of scores per indicator which is still low, namely the explanation indicator of 16.75% in the very low category, interpretation 50.20% in the low category, Analysis 62.75% in the sufficient category, Evaluation 41.18% in the low category, and Inference 33.33% in the very low category.

Students' ability to think critically is an important thing that must be possessed to build students' knowledge and cognitive reasoning (Diharjo et al., 2017). In this case the teacher has an important role in carrying out the learning process, teachers are required to be creative, innovative not monotonous in the learning process. In fact, the teacher in the ongoing learning process still uses conventional learning. Not only that, teachers must also be able to see the problems being faced by their students. Not only creative, active in the learning process but the role of the teacher is very necessary to foster self-confidence in students because the teacher has a role that can influence the learning process to take place. Teachers must be able to create an active atmosphere in the classroom, not only focused on the teacher but also students to students and students to learning resources (Wafi & Arif, 2020). In addition, the teacher must also create an interesting learning atmosphere so that students can be motivated and interested in learning the material to be taught. Based on the results of interviews conducted with science teachers at SMP Negeri 1 Juwangi, the critical thinking skills of class VII students in science learning have never been measured. From the description above, the researcher wants to know the critical thinking skills of class VII students of SMP Negeri 1 Juwangi in learning natural sciences, especially in the material Layers of the Earth and Disasters.

Method

This type of research is descriptive qualitative, the data obtained objectively describes the level of critical thinking of class VII students of SMP Negeri 1 Juwangi. The subjects in this study were class VII C students of

SMP Negeri 1 Juwangi, Boyolali for the 2021/2022 academic year with a total of 32 students. The material used in this study was even semester material, namely Earth Layers and Disasters. The sampling technique in this study was purposive sampling technique. Class VII C was chosen by the researcher because this class had never measured the level of students' critical thinking skills. Research data was collected by interview techniques and tests carried out directly. The instruments used in this study were teacher interview sheets and instruments for critical thinking skills which consisted of 5 essay questions on Layers of the Earth and Disasters which had been validated by expert lecturers.

There are several aspects or indicators to measure critical thinking skills. In this study the indicators of critical thinking skills used were adopted from Facione (2016) which consisted of 5 indicators namely, interpreting, analyzing, evaluating, concluding, and explaining. The data analysis technique used in this study is a descriptive analysis technique by describing and summarizing the results of the measurement data for critical thinking skills in the sample used. Grouping the level of students' critical thinking skills is classified into 5 categories according to Widoyono (2011), namely as follows, very high, high, sufficient, low, and very low. The basis for categorizing scores or scores of students' critical thinking skills can be seen in Table 1.

Table 1. Basic Categorization of Critical thinking Skills

Interval Skor	Category	Information
$X > 84$	A	Very high
$70 < X \leq 84$	B	High
$57 < X \leq 70$	C	Enough
$41 < X \leq 56$	D	Low
$X \leq 41$	E	Very low

Result and Discussion

Thinking skills are abilities that are very necessary in facing life's challenges. These skills include critical thinking skills, creative thinking, and problem solving abilities (Kalelioğlu & Gülbahar, 2013). Critical thinking skills are needed in science learning in junior high school for solving problems, as well as making solutions. Critical thinking skills play an important role in preparing students to be able to solve a problem, explain reasons and make an evaluation of the information obtained. Critical thinkers are able to analyze data or information in a systematically arranged manner based on logic in observing an event, fact or data. So far, critical thinkers have not simply accepted true statements because the truth of these statements is what many people consider. Science skills in discovering new concepts from learning activities can be honed through critical thinking (Maslakhatunni'mah et al., 2019). In this study aims to determine the level of students' critical thinking skills in the material Layers of the Earth and Disasters.

The subject matter of Earth Layers and Disasters is a basic competency that must be achieved by students, namely KD 3.10 Explaining the layers of the earth, volcanoes, earthquakes, and risk reduction actions before, during and after a disaster according to disaster threats in their area and KD 4.10 Communicate efforts to reduce the risk and impact of natural disasters as well as self-rescue measures in the event of a disaster according to the type of disaster threat in the area. The material used to measure students' critical thinking skills in this study only focused on the Earth's Layers of the Hydrosphere and its Disasters, because the time allotted for face-to-face research was very limited. In measuring critical thinking skills using tests given after learning activities because the focus in this research is to find out the profile of students' critical thinking skills. There are 5 indicators used to measure critical thinking skills in this study, namely interpreting, analyzing, evaluating, concluding, explaining. This indicator is the adoption of Facione (2016).

There are 5 critical thinking skills questions in the form of essay questions and each item is adjusted to the indicators of critical thinking skills being measured. Question number 1 is for measuring interpreting indicators, number 2 is for measuring analyzing indicators, number 3 is for measuring evaluating indicators, number 4 is for measuring indicators concluding, and number 5 is for measuring indicators explaining. The critical thinking skills test is carried out directly at SMP Negeri 1 Juwangi. students were given 20 minutes to work on the questions and the results of students' answers to the critical thinking skills questions were then analyzed by the researcher to measure the score or value of students' critical thinking skills. The results of the critical thinking skills test are presented in table 2.

Table 2. Student Critical Thinking Skills Test Results

Critical Thinking skills indicator	Value	Category
Interpret	67.96	Enough
Analyze	47.65	Low
Evaluate	66.40	Enough
Conclude	53.12	Low
Explain	48.43	Low
Average	56.71	Low

From table 2 it can be seen that the results of the analysis of critical thinking skills as a whole, the average student's critical thinking is included in the low category with an average value of 56.71. Each indicator of critical thinking skills has different results. The interpreting

indicator has a value of 67.96 which has an adequate category, the analyzing indicator has a value of 47.65 which has a low category, the evaluating indicator has a value of 66.40 which has a very sufficient category, the concluding indicator has a value of 53.12 which has a low category, and the explained indicator has a value of 48.43 which has a sufficient category. The average results of the critical thinking skills of class VII students at SMP Negeri 1 Juwangi belong to the low category where the results of interviews conducted by the teacher show that students' critical thinking skills tend to be low and seen from the cognitive value of students who are still lacking because there are still many students who the value is the same as the KKM (Minimum Completeness Criteria) or below the KKM.

Critical thinking skill indicator 1, namely interpretation, is an aspect where students can understand and express the meaning of the meaning of various kinds of experiences, situations, and so on (Maslakhatunni'mah et al., 2019). In the first question students are given a comparison of two different situations in everyday life, then students are asked to understand the two situations then explain why the two situations are different and what are the different causes of the two situations. On average, the answers given by students to the questions on indicators of critical thinking skills were clear enough and appropriate to the topic, but most of the student answers were still incomplete. The interpretation aspect can explore students' curiosity in addressing, observing, finding something they encounter so that students can get used to not easily admiring something that suddenly appears in front of them but to digest in advance what they experience by thinking critically (Hidayati et al. al., 2021).

Critical thinking skills indicator 2 namely analyzing is an aspect in which students can identify information in a statement, question, or concept to find the implicit meaning and the interrelationships of a problem. In this indicator question, students are presented with information about human activities, then students are asked to analyze disasters that will occur as a result of these human activities, and students are also asked to explain how these disasters can occur. On average, the answers given by students on this indicator were clear enough, but they were still not in line with the intent of the questions. Many students' answers simply rewrote the information in the questions without giving answers about the disaster that would occur and why the disaster occurred. In line with the opinion of Maslakhatunni'mah et al. (2019), some students have not been able to find a solution or the right way to solve the problem.

Critical thinking skill indicator 3, namely evaluating, is an indicator where students are able to assess statements or opinions received either from themselves or from others, for example assessing the quality of arguments with inductive or deductive considerations (Hidayati et al., 2021). In this indicator question students are presented with a problem in everyday life, students are asked to assess the behavior or activities of a person's behavior based on valid results and evidence then students are asked to provide solutions from the results of the assessment on these problems. Judging from the average answers given by students, the answers given were quite clear and in accordance with the intent or topic of the question, but there were still many students who were incomplete in writing answers. From this it can be seen that students are included in the sufficient category in this indicator in line with the results of Agnafi's research (2019) students are quite capable of making an endeavor or concluding in overcoming a problem. Students are quite capable of testing and estimating logical reasoning from facts, data, descriptions or representations.

Critical thinking skills indicator 4, namely concluding, is an indicator where students can make a conclusion in solving a problem, recognize and obtain the elements needed to draw reasonable conclusions, for example making conclusions and assessing the credibility of statements. In this indicator question students are presented with a picture of an event that can cause a natural disaster, students are asked to conclude information about the disaster that will occur and the causes of the disaster obtained from observing the picture then students are asked to provide solutions in reducing the risk of natural disasters that will occur. happen. The average student answer to this question is still incomplete and does not match the information contained in the image on the question. Many students only answered as needed without being given an explanation, so the answers given were not in accordance with the question questions. In line with the research results of Maslakhatunni'mah et al. (2019) the indicators of critical thinking skills conclude that they are still low because students have not been able to identify and solve problems until they find a conclusion. Drawing conclusions on this indicator is done so that students are able to interpret what has happened and is observed.

The fifth critical thinking skill indicator, namely explaining, is an indicator where students can explain statements and opinions that have been expressed to become a strong opinion (Maslakhatunni'mah et al., 2019). In this indicator question students are presented with some information then students are asked to make statements and examples that make sense about that information. The average student answers did not match the information contained in the questions and some students only gave statements without giving examples. Some students also answered quite clearly but the

answers were still lacking. It can be seen that the indicators of students' critical thinking skills are still low so they need to be improved again. According to Agnafi (2019) critical thinking skills in answering explanation indicators can increase insight or knowledge through reading, observation and discussion.

The low critical thinking skills of students are caused by a lack of activities that are able to hone students' critical thinking skills. Based on the results of teacher interviews, students also tend to be passive in the learning process because during the question and answer session the average student is just silent. In the opinion of Agnafi (2019) students who are less able to think critically because in learning they still prioritize the process of remembering and understanding. Students are still focused on memorizing a concept in learning and the concepts obtained are only sourced from books and teachers. This is in line with the results of interviews conducted with teachers, that students only listen to material from the teacher and then record the material provided by the teacher. The critical thinking skills of Juwangi 1 Public Middle School students need to be improved because students' low critical thinking skills can have a negative impact because critical thinking skills are one of the skills that students must have to survive in the 21st century. In line with the opinion of Maslakhatunni'mah et al. (2019) students need to be trained in critical thinking skills so that students are able to make their choices according to an analysis of their thoughts and draw conclusions intelligently. Students who are accustomed to being given the opportunity to think critically or think at a higher level will be accustomed to distinguishing between facts and opinions, something that is wrong and right, opinions and facts, knowledge and beliefs.

It will be difficult for students to have critical thinking skills if the learning process does not apply a learning model that trains students' critical thinking skills (Ridho et al., 2020). The teacher plays an important role in improving critical thinking skills, because by using the right learning strategies and methods where these strategies and methods can train students' critical thinking skills so that students will get used to using these skills. In line with the opinion of Hidayati et al (2021) the development of critical thinking skills is carried out by teachers by training critical thinking skills and facilitating learning activities with indicators of critical thinking.

Teachers must be able to find appropriate learning methods in order to train students' critical thinking skills again. Appropriate learning methods will affect students' enthusiasm for learning and will affect students' critical thinking skills. In addition to using appropriate learning methods, creating an atmosphere that supports students to think critically can also help train students' critical thinking skills. In line with Nuraida's opinion (2019) there are several strategies that teachers can take to encourage the development of students' critical thinking skills, namely a teacher must create a challenging atmosphere to facilitate the development of students' critical thinking skills processes.

Conclusion

The results showed that the critical thinking skills of Class VII students at SMP Negeri 1 Juwangi, Boyolali were included in the low category with an average score of 56.71. Each indicator of critical thinking skills also has a different value, the interpreting indicator has a value of 67.96 in the sufficient category, the analyzing indicator has a value of 47.65 in the low category, the evaluating indicator has a value of 66.40 in the sufficient category, the conclusion indicator has a the value of 53.12 is in the low category, and the indicator explains that it has a value of 48.43 in the low category. The low level of critical thinking skills is caused when the learning process is still conventional so that it is only centered on the teacher and also not maximal learning activities that can improve students' critical thinking skills. Based on the results of this study, it is expected that further researchers can develop learning tools that can improve students' critical thinking skills in learning natural sciences in junior high schools.

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