



Profile of Critical Thinking Skills in Science Learning Class VIII Junior High School on Additive Materials

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ABSTRACT

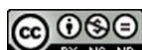
Critical thinking skills have recently been intensified in learners at all levels of education. Learners are expected to have good critical thinking skills in order to face competition in the world of work. The research conducted was descriptive quantitative with the aim of classifying the critical thinking skills of students. The research subjects were students of class VIII Junior High School in Kediri Regency in the 2022/2023 academic year as many as 20 students. Data collection was conducted through interviews and critical thinking skills tests. The critical thinking skills test instrument includes 5 indicators consisting of 15 multiple choice test items. Analysis was carried out on the test results of students on each indicator and categorized into five critical thinking categories consisting of very high, high, medium, low, and very low. The results showed an average achievement score of 42.08%, interpretation ability 23.47%, analysis ability 50.21%, inference ability 62.31%, evaluation ability 41.10%, and explanation ability 33.33%. Based on these results, it is evident that students' critical thinking skills still need to be trained in order to be improved. Thus, teachers need to implement meaningful science learning in order to improve students' critical thinking skills.



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INTRODUCTION

The development of technology and science in the 4.0 Revolutionary Era is increasingly being prepared to face the 21st Century. The Partnership for 21st Century Skills identifies that critical thinking skills are one of those needed to prepare students for education and the world of work (Ratnasari et al., 2019). Exploring skills in the 21st century combines a set of tasks or skills, namely a combination of critical thinking, problem solving, decision making, and collaboration to be complex with collaborative problem solving (Anggraeni & Wahyuningsih, 2022). The conception of critical thinking skills is known as a broad category of skills including ways of thinking, ways of working, tools for working, living in the world, namely citizenship, life and career, and personal social responsibility. The field of education plays a very important role in preparing it so that every learner is required to master proficient abilities. Education is the capital to build quality human resources (Plotnikova & Strukov, 2019). Humans through education will give birth to a good living environment, one of which is with science education (Ekamilasari & Pursitasari, 2021).



Science is one of the subjects that is integrated with other learning. Science includes all objects with life phenomena, natural laws (Dewi et al, 2020). Science is a field of science where students are required to have knowledge, ideas, concepts related to the surrounding environment. Science learning is used to prepare students to be able to solve problems, make decisions, independently in line with critical thinking skills, namely being able to identify, analyze, and evaluate events in nature (Astari & Sumarni, 2020). Science learning objectives implicitly demand to teach thinking skills. The thinking process relates to a way of acting that requires active involvement of the thinker through complex relationships developed through thinking activities. Thinking skills can be divided into critical thinking and creative thinking (Wiyoko, 2019).

Critical thinking is one of the competitions that must be mastered to build quality human resources, as well as other competitions that must be mastered are creativity, information, independence, teamwork, learning independence, communication, and creative individuals (Amarila, 2021). Critical thinking skills are needed in dealing with everyday life and social life, namely solving a problem, and finding a solution (Nandar, 2018).

Indonesia's critical thinking skills are still in the low category based on the Programme for International Student Assessment (PISA), in 2015 Indonesia ranked 62nd with a score of 397 with a total of 72 countries participating, while in 2012 Indonesia obtained a score of 396 (OECD, 2019). This is in line with research written by Adisty et al. (2021) that in the field there are still many students who do not have critical thinking sensitivity to the surrounding conditions, especially in the field of science. Science lessons are not just memorizing a collection of knowledge, concepts and principles of science but also a process of discovery (Amarila, 2021). Science lessons direct students to study themselves and the surrounding nature and can apply them in everyday life (Ramdani et al., 2018).

Based on the results of preliminary field observations of SMP Negeri 2 Pare, the minimum completeness criteria of SMP Negeri 2 Pare students are still not complete, indicated by the acquisition of student scores in daily tests, general tests, and semester tests which are still many students' scores below the KKM. The KKM value for science subjects is 76, while in every test, both daily tests, general tests and semester tests, there are still many students who get scores below the KKM. Based on the results of interviews conducted with students, it was found that 40% of students in one class still seemed confused in understanding the material. Many students still memorize and remember in learning science subjects so that they think that science subjects are difficult. Based on interviews conducted with teachers, it was also found that teachers still apply memorizing and memory questions.

Students' critical thinking skills are needed in learning which aims to understand and master the material provided by the teacher so that student learning outcomes are also optimal. Based on the background in the field, it is necessary to conduct research on the analysis of critical thinking skills with instruments to measure students' critical thinking skills. Another function of this analysis is as input for educators in designing appropriate learning in improving critical thinking skills (Nuryanti et al., 2018) in the field of science education in additive material Class VIII at the junior high school level.

RESEARCH METHOD

This type of research is descriptive qualitative, namely the data obtained objectively describes the level of critical thinking of VIII grade junior high school students. The subjects in this study were VIII grade junior high school students with a total of 20 students. The material used in this study is even semester material, namely Additives in food. The sampling technique in this study was purposive sampling technique. Class VIII was chosen by the researcher because this class has never measured the level of critical thinking skills of students. The research data were collected by interview and test techniques which were conducted directly. The instruments used in this study were teacher interview sheets and critical thinking skills test instruments consisting of 15 multiple choice questions about additives that had been validated by expert lecturers.

There are several aspects or indicators to measure critical thinking skills. In this study, the critical thinking skills indicators used were adopted from Facione (2020) which consisted of five indicators, namely, interpreting, analyzing, evaluating, concluding, and explaining. The data analysis technique used in this research is descriptive analysis technique by describing and summarizing the results of critical thinking skills measurement data on the sample used. The grouping of students' critical thinking skills level is classified into five categories according to Wijayanti and Siswanto (2020), namely as follows, very high, high, sufficient, low, and very low. The basis for categorizing the score or value of students' critical thinking skills can be seen in Table 1.

Table 1. Basic criteria categories of critical thinking skills

Interval	Category
81,25-100,00	Very High
62,50-81,25	High
43,75-62,50	Medium
25,00-43,75	Low
< 25,00	Very Low

RESULTS AND DISCUSSION

Learning material for additives in food and beverages in Integrated Science learning at the junior high school level is found in Basic Competencies 3.6 explaining various additives in food and beverages, addictive substances, and their impact on health and 4.6 making a paper on the impact of abuse of additives and addictive substances on health. Indicators of critical thinking skills include interpretation, analysis, inference, evaluation, explanation, and self-regulation. The questions presented in the test are arranged in accordance with the indicators of students' critical thinking skills on the material of additives in food and beverages.

The results of the trial of students' critical thinking skills were obtained in the form of data on students' answers in the form of multiple choice with options A-D and then analyzed. The results of the trial of students' critical thinking skills are in table 2.

Table 2. Results of critical thinking skills indicator scores

Critical Thinking Skills Indicator	Persentase	Category
Intepretation	23,47%	Very Low
Analysis	50,21%	Medium
Inference	62,31%	Medium
Evaluation	41,10%	Low
Explanation	33,33%	Low

Table 2 shows the results of critical thinking skills possessed by students based on multiple choice tests. The first indicator, namely interpretation, has a percentage of achievement of 23.47% in the very poor category, the second indicator, namely analysis of 50.21% in the moderate category, the third indicator, namely inference of 62.31% in the moderate category, the fourth indicator of evaluation of 41.10% in the poor category, and the fifth indicator, namely explanation of 33.33% in the poor category.

The first indicator of critical thinking skills in interpretation is an aspect where students can understand and express the meaning of various kinds of experiences, situations, and so on (Maslakhaturunni'mah et al., 2019). In the first question students are given a graph about the misuse of food coloring on health, a different question student is given readings about natural sweetener and artificial sweetener test experiments by linking the caramelization process and the last question on this indicator students are asked to understand a canned food on sardines can last a

long time in canned packaging. On average, the answers given by students to the questions on the critical thinking ability indicators were quite clear and in accordance with the topic, but most of the students' answers were still inaccurate. The interpretation aspect can explore students' curiosity in responding, observing, finding something they encounter so that students can get used to not easily admire something that suddenly appears in front of them but first digest what they experience by thinking critically (Fahmi et al., 2021).

Critical thinking skills in the second indicator analysis is an aspect where students can identify information in a statement, question, or concept to find the implied meaning and relevance of a problem. In this indicator question, students are presented with information about human activities, then students are asked to analyze consuming food according to BPM standards regulated by candy number 33 regarding the limits of using recommended food additives, in the question presented food and beverage packaging then students are asked to analyze how much packaging should be consumed. The average answer given by students on this indicator is quite clear, but still not in accordance with the purpose of the question. Many students' answers only answer the answer options without explaining how to solve the problem. In line with the opinion of Wahyuni et al. (2021), some students have not been able to find the right solution or way to solve the problem.

Indicator of critical thinking skills evaluates is an indicator where students are able to assess statements or opinions received both from themselves and 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 pattern of food *mugbang* habits lately, who like to go to cafes to drink coffee. Judging from the average answers given by students, the answers given are quite clear and in accordance with the purpose or topic of the question, but there are still many students who are incomplete in writing the 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 effort or conclusion in solving a problem. Students are quite capable of testing and estimating logical reasoning from facts, data, descriptions or representations.

The critical thinking skills indicator concludes, is an indicator where students can make a conclusion in solving a problem, recognize and obtain the elements needed to draw a reasonable conclusion, for example making conclusions and assessing the credibility of statements. In this indicator question, students are presented with an article about an additional incident of the number of food cases confiscated by BPOM. In addition, students are also presented with several events of the impact of often consuming banned preservatives, students are asked to summarize the information that occurs and the causes of reading and observing the picture, then students are asked to provide solutions in reducing the risk of events occurring. The average student answer on this question is still incomplete and does not match the information contained in the picture in the question. Many students only answer as needed without being given an explanation, so that the answers given are not in accordance with the question. In line with the results of research by Putri et al. (2021), the indicator of critical thinking ability to conclude is still low because students have not been able to identify and solve problems to find conclusions. Drawing conclusions on this indicator is done so that students are able to interpret what has happened and observed.

The fifth critical thinking skills indicator, namely explaining, is an indicator where students can explain statements and opinions that have been expressed so that they become a strong opinion (Shavelson 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 regarding the information. On average, students' answers did not match the information contained in the question 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. According to Nugraha

et al. (2017) critical thinking skills in answering explanation indicators can add insight or knowledge through reading, observing and discussing.

The low level of students' critical thinking skills is caused by the lack of activities that can hone students' critical thinking skills. Based on the results of teacher interviews, students also tend to be passive in the learning process because during question-and-answer sessions the average student is only silent. According to Siburian et al. (2018), students who are less able to think critically because learning still prioritizes 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 given by the teacher (Kusumaningrum et al., 2021). Critical thinking skills of junior high school students need to be improved because low critical thinking skills can have a negative impact because critical thinking skills are one of the abilities that students must have to survive in the 21st century. In line with the opinion of Jaya et al. (2020), students need to be trained in critical thinking skills so that students are able to make choices according to their thinking analysis and draw conclusions intelligently. Students who are accustomed to being given the opportunity to think critically or think at a higher level will get used to distinguishing between facts and opinions, something wrong and right, opinions and facts, knowledge, and beliefs (Fijar et al., 2019). 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).

Teachers must be able to find the right learning method to retrain students' critical thinking skills. The right learning method will affect students' enthusiasm in learning and will affect students' critical thinking skills (A'yun et al., 2020). In addition to using the right learning methods, creating an atmosphere that supports students to think critically can also help train students' critical thinking skills. In line with Nuraida (2019) there are several strategies that teachers can do 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 processes.

CONCLUSION

The results showed that the critical thinking skills of VIII grade junior high school students were in the low category with an average value of 42.08. The low level of critical thinking skills is due to the learning process that is still conventional so that it is only centered on the teacher and also not maximizing learning activities that can improve students' critical thinking skills. Based on the results of this study, it is hoped that further researchers can develop learning tools that can improve students' critical thinking skills in science learning in junior high school (Pratiwi et al., 2019). Teachers play an important role in improving critical thinking skills by using appropriate learning strategies and methods. These strategies and methods can train students' critical thinking skills so that students will get used to using these skills (Rachmantika & Wardono, 2019). 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 critical thinking indicators.

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