

Profile of critical thinking skills in student's SMPN 1 Kalipare at topic of substance and its characteristics

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Abstract. One of the 21st century skills that students must possess is critical thinking skills. This research aims to determine critical thinking skills of students at SMPN 1 Kalipare topic of substances and its characteristics. This type of research is quantitative descriptive research. The research was conducted at SMPN 1 Kalipare. The research sample were 83 students of class VIII in 2018/2019 academic year and were assigned random sampling. The instrument used was 15 multiple choice test questions of critical thinking skills. Data analysis was performed with quantitative percentage analysis. The distribution of students critical thinking skills of class VIII at SMPN1 Kalipare who have very high critical thinking skills are 6 students (7,23%), high critical thinking skills are 7 students (8,43%), medium critical thinking skills are 17 students (20,48%), low critical thinking skills are 20 students (24,10%), and very low critical thinking skills are 33 students (39,76%). The results showed the students critical thinking skills of class VIII at SMPN 1 Kalipare about substances and its characteristics included in the low category with a percentage of 47,85%. indicator of critical thinking with the lowest category is reveal the reason with a percentage of 36,90%.

Keyword: 21st century skills, critical thinking skills, substances, characteristics

1. Introduction

21st century skills are skills needed to deal with change and various problems in the future in the form of a pattern of society that has experienced many changes. These changes include the development of the demands of the world of education which are expected to prepare students to master 21st century skills [1]. 21st century skills including 4C (creativity, critical thinking, communication, and collaboration) are new skills that if well prepared will help prepare students for the global era.

One of the 21st century skills must be possessed by students is critical thinking skills. Critical thinking is sensible reflective thinking that focuses on making decisions about what to believe or do [2]. Critical thinking skills are the ability to think logically, reflectively, systematically, and productively which are applied in making judgment and making good decisions [3]. Critical thinking is needed to check the truth of an information, so that it can be decided that the information is worth rejecting or accepting [4]. Critical thinking can not be separated from education and is an important cognitive ability so schools try to improve it [5].

Critical thinking is a key competency that must be possessed to solve the problems needed for individuals to be responsible so they can face the challenges of the present [6]. The process of thinking in education in schools not only emphasizes the accumulation of knowledge of subject matter, but the ability of students to obtain their own knowledge. Students who have critical thinking skills tend to more



quickly identify information, learn problems systematically, formulate innovative questions, utilize ideas or information, can evaluate and modify to produce the best ideas [3].

Indicators of critical thinking include formulating questions, analyzing arguments, asking and answering questions, guiding source credibility, assessing observations, concluding deduction and induction, conducting evaluations, defining terms and assumptions, estimating thinking, and integrating abilities [2]. Indicators of critical thinking include categorizing and clarifying, testing ideas, identifying arguments and reasons, gathering evidence, making hypotheses, assessing the credibility of questions, stating results, evaluating procedures, expressing reasons, self-monitoring and self-assessment [7]. In this research, the analysed indicators of critical thinking is include categorizing, expressing results, uncovering reasons, providing solutions, and concluding induction and deduction.

One of the topic application in science class VII SMP is topic of substances and its characteristics. The topic of substances and its characteristics explains the concepts of mixtures and single substances (elements and compounds), chemical and physical properties, chemical and physical changes in everyday life. The concept of changing the form of this substance is a concept that was studied earlier before studying the concept of more complex chemistry [8]. Topic of substances and its characteristics are related to the daily life of students, for example the petroleum industry, the soap industry, the dairy industry, the sugar industry, etc.

2. Research method

This type of research is quantitative descriptive research. The data obtained are the results of students' critical thinking skills tests. This research was conducted at SMPN 1 Kalipare, Malang Regency. The research sample was students of class VIII at 2018/2019 academic year which is totaling 83 students who were appointed random sampling. The used of instruments was 15 multiple choice test questions of critical thinking skills. The data analysis was performed with a quantitative percentage analysis, so as to determine the category of critical thinking skills of each student. The category of students' critical thinking skills can be seen in table 1. In this research, the analysed indicators of critical thinking is include categorizing, expressing results, uncovering reasons, providing solutions, and concluding induction and deduction on topic of substances and its characteristics [2], [7].

Table 1. The category of critical thinking skills.

Percentage of Achievement	Category
$80 < PP \leq 100$	Very high
$68 < PP \leq 79$	High
$56 < PP \leq 67$	Medium
$44 < PP \leq 55$	Low
$0 < PP \leq 43$	Very low

[9]

3. Results and Discussion

The results of this research indicated taht of the 15 critical thinking questions on the topic of substances and its characteristics that have been carried out in SMPN 1 Kalipare, they have varied categories in each of the aspects tested. Students' answer were spreaded into five categories; very high, high, medium, low, and very low. The distribution of answer categories and number of students can be seen in Figure 1.

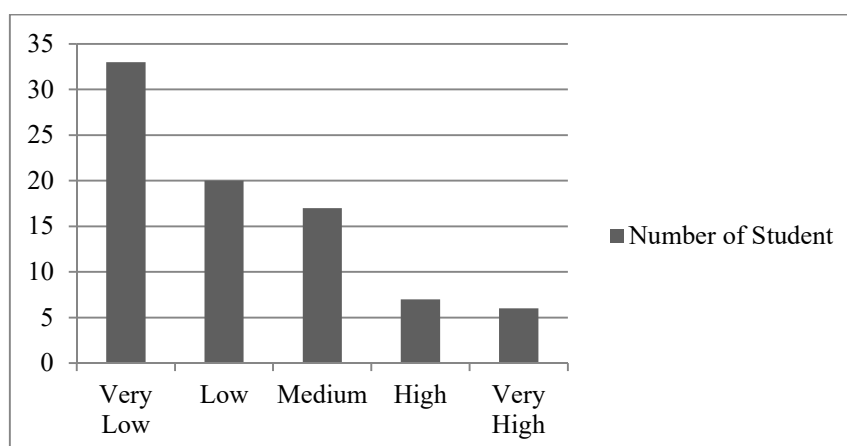


Figure 1. The distribution of answer and number students.

Based on Figure 1, the distribution of students who have very high critical thinking skills is only 6 students (7,23%), high critical thinking skills are 7 students (8,43%), medium critical thinking skills are 17 students (20,48%), low critical thinking skills are 20 students (24,10%), and very low critical thinking skills are 33 students (39,76%).

The results of this study also showed the results of students' critical thinking skills of each indicator. The results of students' critical thinking skills for each indicator can be seen in Table 2.

Table 2. Results of students' thinking abilities for each indicator.

Indicators	Result (%)	Category
Categorize	55,95	Low
States the results	39,88	Very Low
Reveal the reason	36,90	Very Low
Provide solutions	44,64	Low
Conclude deductively and inductively	61,90	Medium
Average	47,85	Low

Based on table 2, the distribution of the results of the ability to think critically categorizing is a low category with a percentage of 55.95%. The critical thinking ability of the indicator states the results are very low category with a percentage of 39.88%. The ability to think critically the indicator reveals the reasons is very low category with a percentage of 36.90%. The ability to think critically indicators provide solutions is a low category with a percentage of 44.64%. The critical thinking ability of the indicators concluded is a moderate category with a percentage of 61.90%.

The results of students' critical thinking skills in class VIII of SMPN 1 Kalipare are included in the low category with a percentage of 47.85%. The results of this study are in accordance with previous research which states that subjects aged 13-15 years, the cause and effect mindset has more developed towards the ability to manipulate information [10]. This can be seen in some students who have been able to apply theory to solve problems in everyday life.

Lack of critical thinking skills can have an adverse impact on further education, so critical thinking skills need to be improved [11]. Students who have critical thinking skills tend to more quickly identify information, learn problems systematically, formulate innovative questions, utilize ideas or information, can evaluate and modify to produce the best ideas [3]. This is in line with Piaget's cognitive development stage which states that junior high school students aged 12-15 are at the formal operation stage. At this stage, junior high school students can already think abstractly, logically, deductively, inductively, and can draw conclusions from available information [10].

The reason for the lack of critical thinking skills is that learning critical thinking skills has not been the focus of the skills developed. Schools are still focused on achieving a high mastery of student

knowledge [6]. Science learning tends to memorize rather than develop thinking power so that students are weak in conveying ideas, weak in analyzing, and dependent on others [12].

There are still many students who find it difficult to apply the knowledge and concepts they know to solve problems indicating that students must practice a lot in applying the concepts or knowledge they have so that their critical thinking skills can be empowered. Students' critical thinking skills can be trained and honed in the learning process [13]. The ability to think critically has increased through the use of the model of Problem Based Learning and Discovery Learning assisted with mind maps [14], [15]. Someone who is critical will always try to find mistakes or mistakes and sharp in conducting analysis [16]. Suggestions that can help to follow up on this research is to apply appropriate learning to develop students' critical thinking skills. Learning models that can be applied by teachers in the classroom are Problem Based Learning, Project Based Learning, and Inquiry Learning.

4. Conclusion

Based on the results of the study it can be concluded that the critical thinking skills of students SMPN 1 Kalipare class VIII on the topic of substances and its characteristics are included who have very high critical thinking skills is only 6 students (7,23%), high critical thinking skills are 7 students (8,43%), medium critical thinking skills are 17 students (20,48%), low critical thinking skills are 20 students (24,10%), and very low critical thinking skills are 33 students (39,76%). So, The results showed the students critical thinking skills of class VIII at SMPN 1 Kalipare about substances and its characteristics included in the low category with a percentage of 47,85%. The reason for the lack of critical thinking skills is that learning critical thinking skills has not yet become the focus of the skills developed.

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