Profile Of Critical Thinking Skill Of Vocational High School Students On Simulation And Digital Communication Subjects

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**Abstract.** The ability to think critically is one of the skills that students must possess in the 21st century. This study aims to determine the profile of critical thinking skills of SMK students in Simulation and Digital Communication subjects. This research using quantitative descriptive. The sample's of this study were students of class X SMK N 2 Surakarta. The instrument used is a multiple-choice test that developed based on indicators of critical thinking skills according to Facione, namely other aspects of interpretation, analysis, evaluation, inference, explanation, and self-regulation. Based on the results of this study, the average percentage of students' critical thinking skills in the sufficient category. From the results of the percentage of each indicator of critical thinking ability, namely the interpretation indicator of 46.8% with sufficient category, analysis indicator of 49.5% with sufficient category, evaluation indicator of 60.5% with sufficient category, inference indicator of 48, 4% in the sufficient category, 56.5% in the explanation indicator in the sufficient category, and 64.5% in the self-regulation indicator in the high category. The results showed that students' critical thinking skills were still quite or moderate. Students' critical thinking skills need to be improved with innovative learning models and methods that will affect learning motivation and critical thinking skills towards various student problems in teaching and learning activities.

Keywords: critical thinking, Facione, teaching and learning activities, innovative

# INTRODUCTION

One of the 21st-century skills is the ability to think critically. Critical thinking is a set of capabilities (skills) needed for intellectual and personality development. The word critical thinking comes from the Greek word "Kritikos", which means wisdom or sharpness, the ability to judge or make decisions. Critical thinking teaches more how to think than what to think. Critical thinking skills are skills to carry out various analyses, assessments, evaluations, reconstructions, decision-making that lead to rational and logical actions [1]. Another understanding of critical thinking is a person's way of dealing with problems with facts and based on good considerations [2]. There are six indicators of critical thinking skills involved in the critical thinking process. These indicators include interpretation, analysis, evaluation, inference, explanation, and self-regulation [3].

Critical thinking is critical in the learning process in the 21st century. Students' critical thinking skills are needed to solve problems faced by students in the learning process [4][5][6]. With the many problems faced both in education and in society in general, each student must continue to make decisions, solve problems and obtain various types of information throughout their lives. When making a decision, the individual requires critical thinking to be able to find the best solution.

It related to critical thinking; there are several facts about the ability of students in Indonesia. The 2018 PISA study released by the OECD show that the ability of Indonesian students to read achieved an average score of 371, with an average OECD score of 487. Then the average score for mathematics reaches 379 with an OECD average score of 487. This result explains that the mathematical ability of students in Indonesia is ranked 72 out of 78 countries [7].

Furthermore, for science, the average score of Indonesian students reaches 389 with an average score. The OECD is 489. This result explains that the scientific ability of students in Indonesia is ranked 70 out of 78 countries. PISA data for Indonesia related to the ability to read, math, and science shows that the condition of the ability of students in Indonesia is below average or low performance.

The interviews and observations conducted at SMK N 2 Surakarta show that learning on simulation subjects and digital communication is still less effective. The teacher uses an expository learning model where the expository learning model emphasizes delivering material verbally. Hence, students become less active during learning and cause students' critical thinking skills to be less honed. Student daily score data, were in taking the value of the teacher giving essay test questions to measure students' critical thinking skills showed low results. There are 42% of students who pass the minimum graduation criteria (KKM) that have been set, namely 73, and the remaining 58% of students do not pass. It can conclude that students do not understand the learning material to get a less than maximum score.

This article aims to describe the profile of the critical thinking skills of SMK students in one of the subjects. By knowing this profile, it will be easier to map the critical thinking skills possessed by students. It is one of the considerations in determining the most suitable learning strategy for vocational students.

# METHODS

The method used to determine students' critical thinking skills in this study is descriptive quantitative. The research sample was class X SMK N 1 Surakarta Department of RPL, totalling 62 students. Sampling with cluster random sampling technique. Data were obtained through research instruments using multiple-choice questions, which develop from six categories of critical thinking skills according to Facione.

The test results of the critical thinking ability test instrument showed: (1) The validity of the critical thinking instrument was tested on 30 students from class X TKJ at SMK Negeri 2 Surakarta with r table = 0.361. Items are considered valid if the value of rcount > rtable. From the results of the tryout, 25 questions were obtained, which were declared valid; (2) The item reliability test aims to test the questions before they are used to retrieve data whether the questions are reliable and consistent. The reliability test provisions are said to be good if the Cronbach's Alpha value is > 0.05. The result of Cronbach's Alpha value shows 0.808, meaning that it is declared reliable.

The results of the study were categorized according to the criteria for achieving students' critical thinking skills according to Riduwan [8]. The grouping criteria consist of very high, high, sufficient, low and very low criteria.

The categorization of critical thinking ability criteria can be seen in table 1

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| **TABLE 1.** The category of critical thinking skills |
| **No** | **Persentage (%)** | **Category** |
| 1 | 81-100 | Very high |
| 2 | 61-80 | High |
| 3 | 41-60 | Sufficient |
| 4 | 21-40 | Low |
| 5 | 0-20 | Very low |

# RESULTS AND DISCUSSIONS

The study results study show that the condition of students' critical thinking skills is still lacking, when compared to the KKM (Minimum Completeness Criteria) that is set. The KKM set for the SISKOMDIG subject in Surakarta is a score of 73 on a scale of 100. The instrument used is a question on the Digital Communication System subject with Facione's critical thinking ability indicator.

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| **TABLE 2.** The results of the critical thinking skill test on the Siskomdig Subject |
| **Score** | **Frequency** | **Persentage (%)** |
| 40 – 44 | 6 | 9.7 |
| 45 – 49 | 9 | 14.5 |
| 50 – 54 | 13 | 21.0 |
| 55 – 59 | 11 | 17.7 |
| 60 – 64 | 21 | 33.9 |
| 65 – 69 | 2 | 3.2 |

Based on table 2, obtained 100% of students were tested using the SISKOMDIG questions characterized by this critical thinking ability. None of them has been completed according to the KKM that has been set.

**Figure 1.** Diagram of the results of the critical thinking skill test on the Siskomdig Subject

The critical thinking ability of students when viewed from each indicator can be shown in table 3.

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| **TABLE 3.** Category of students' critical thinking skills for each indicator (Facione) |
| **Indicator** | **Persentage (%)** | **Category** |
| Interpretation | 46,8 | Sufficient |
| Analysis | 49,5 | Sufficient |
| Evaluation | 60,5 | Sufficient |
| Inference | 48,4 | Sufficient |
| Explanation | 56,5 | Sufficient |
| Self-regulation | 64,5 | High |

Table 3 shows the different percentage scores of each indicator of critical thinking ability. Self-regulation is the indicator with the highest percentage value, 64.5%, while the lowest percentage value is obtained by the interpretation indicator, 46.8%. Meanwhile, the value achieved by the analysis indicator is 49.5%, the evaluation indicator is 60.5%, the inference indicator is 48.4%, and the explanation indicator is 56.5%.

The results of students' critical thinking skills measured based on these six indicators can be explained as follows:

Interpretation is communication that aims to understand and appreciate the meaning of various objects. Every object, whether it is a book, poetry, situation, data and much more, can be an object of interpretation. The interpretation indicator in this study obtained a percentage of 46.8% with a sufficient achievement category. This interpretation indicator students can explain the meaning of events by connecting the causes and impacts that will occur. However, in this indicator, some students are still confused about solving the problems presented.

The analysis is an activity to identify the relationship between statements, questions, concepts to be grouped according to specific criteria in order to find meaning and relationships. The analysis indicator gets a percentage of 49.5%, but on this indicator students are quite able to identify the relationship between the actual concept of the problem. Some students have not been able to find a solution or the right way to solve the problem. Testing the indicators of students' critical thinking skills is done by giving questions about digital citizenship material. In this indicator, students are expected to be able to identify the intentions that occur with logical and appropriate reasons and be able to provide further explanations. However, some students still look confused in expressing their arguments and analyzing the causes—the result of an event.

Evaluation means assessing the credibility of someone's statement, such as comparing the results of the activities made. The evaluation indicator obtained a percentage result of 60.5% with a sufficient category. Some students have been able to assess the right statements and solve problems according to the problems presented, but some students have not been able to express and conclude their opinions into a statement.

Inference means identifying elements to form hypotheses and conjectures by drawing reasonable conclusions. Inference indicator obtained the percentage result is 48.4% with sufficient category. This indicator shows students capable enough to identify and solve problems until finding a conclusion. Drawing conclusions on this indicator is done so that students are able to interpret what has happened and been observed [9].

The explanation is presenting a reasonable and coherent result of one's opinion. It is to strengthen an opinion or argument, conceptual, methodological, and contextual considerations are needed. Explanation indicators obtained percentage results that are equal to 56.5% with sufficient category. Students are quite able to explain the results in accordance with the problems presented. There are still some students who have not been able to answer the questions by explaining according to the existing statements, according to the material, and complete with explanations.

Self-regulation means monitoring one's cognitive activity, significantly improving analytical skills by evaluating questions, correcting or validating one of one's results, one of the reasons or one's results. The self-regulation indicator obtained a percentage result of 64.5%, so that this indicator is in the high category. This self-regulation indicator is related to the student's ability to control himself and manage its existence in the face of problem-solving. Students can control their faces problems by applying their skills in analyzing and evaluating the results that have been developed by themselves. In this self-regulation indicator, students are faced with questions related to their ability to express their ideas to solve problems. This indicator is high because students are very able to describe and conclude their opinions to solve a problem able to answer questions and solve existing problems, according to the material, according to his opinion. Self-regulation is self-reflection, making self-assessments, and correcting mistakes according to themselves.

The ability to think critically is one of the factors that make students successful in learning. The better the ability, the students will find it easier to solve the problems encountered in learning. However, if the ability is lacking, students will have difficulty in mastering learning problems. Critical thinking can predict a student's general cognitive ability. In addition, students can also understand well between theory and practice As explained by[10][11][12][13]. This will facilitate students in learning [14]. Clarity of concepts, in theory, will provide mastery in practice [6].Overall ability in theory and practice will provide superior competence to students in the learning process.

# CONCLUSION

Based on the results of the research and discussion described previously, in general, students' critical thinking skills in the aspects of interpretation, analysis, evaluation, inference, and explanation are included in the medium category. Meanwhile, the high category is only the self-regulation indicator. It shows that students are still not trained in indicators of critical thinking skills in learning.

After reviewing the results and conclusions drawn from this study, suggestions are proposed teachers in learning activities to empower indicators of critical thinking skills both through the preparation of teaching materials, learning models, and learning methods so that students' critical thinking skills can increase.

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