Teachers' Perception on Critical Thinking Skills of Vocational High School Students

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Abstract. This study aims to identify the critical thinking skills of SMK students based on the teachers' assessment. It is one of the needs analyses of our research, which the attention to develop a teaching industry learning model in order to improve the critical thinking skills of SMK students. This research includes descriptive analysis with the subjects of SMK teachers that focuses on their industrial electronics expertise competencies in the 2021/2022 academic year. Data on the students 'skills were collected through questionnaires which were distributed to teachers of productive, adaptive, and normative subjects. Determination of the sample used proportional random sampling. The results showed that most teachers thought that the dominant students did not have good critical thinking skills. For this reason, further action is needed in the form of developing learning models that can help teachers in the learning process in stimulating students to think critically.

Keywords: critical thinking; teaching industry; vocational high school

1 Introduction

Vocational education is an educational institution that prepares students to adapt quickly to the world of work [1]. This adaptability is part of their ability to think critically about environmental conditions. Moreover, the alumni of vocational high schools also have to face job market competition challenges which require them to have better skills in many aspects [2]. The 21st century is the century of information disclosure that leads to globalization. Learning in this century emphasizes the ability of students to be creative, always think critically, be able to connect knowledge with the real world, have good communication skills, master information technology, and be able to collaborate with others [3].

In all aspects of education, the learning process contains two different transmissions, namely those related to what to think and how to think. A second aspect is a form of thinking that criticizes what is believed to be [4].

Education in the 21st century expects graduates of educational institutions to think, act, and live their daily lives. One of the expertise that students must possess in the 21st century is skills in higher-order thinking [5]. The skills include critical thinking and creative thinking skills [6]. The students' thinking level can be divided into essential and higher-order thinking. Basic level

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thinking only uses limited abilities in ordinary and mechanical things. On the other hand. higher-order thinking requires students to have ability to interpret, analyze, or even manipulate previous information so that it is not becoming monotonous [7].

Critical thinking skills are one of the skills in a person to analyze things more deeply, give arguments, formulate conclusions, make decisions, and assess the impact of decisions to be taken [8]. Critical thinking skills can be trained and taught through learning in schools. This also supports the government's efforts to improve students' 21st-century thinking skills [9]. In addition, critical thinking skills are essential to be empowered because they can affect students' cognitive learning outcomes [10].

The critical thinking ability of students who are still weak is felt by educators at various levels of education. Satwika et al. [11] describe that many students in universities both in Indonesia and other countries are still weak in optimizing critical thinking skills. According to Janssen et al. [12], many attempts have been taken to improve the skills and the student-centered teaching method is one of teachers' efforts to develop the skills.

Critical thinking skills are also related to students' ability to analyze arguments, make conclusions using reasoning, assess, evaluate, and make decisions or solve problems [13], [14]. Critical thinking skills can be empowered through learning in schools, especially in vocational education, as a provision for graduate competitiveness [15], [16]. For this reason, optimizing learning critical thinking skills in the classroom is very important because it can affect student learning outcomes [17], [18].

Based on this background, several indicators of critical thinking for vocational students will be analyzed more deeply in developing a teaching industry learning model in the vocational high school electronics industry expertise program. The indicators studied are interpretation, analysis, conclusion, explanation, and self-regulation.

2 Research Methods

This research is a descriptive study with research subjects of SMK teachers on industrial electronics expertise competencies in the 2021/2022 academic year. Data on students' critical thinking skills were collected through questionnaires distributed to teachers of productive, adaptive, and normative subjects. Determination of the sample used proportional random sampling. The variables observed in this study were students' critical thinking skills. Several essential indicators of measuring necessary thinking skills include interpreting, analyzing, drawing conclusions, evaluating, explaining, and self-regulating [16], [19].

Data on students' critical thinking skills were collected through a questionnaire. The teacher answered a series of statements related to students' critical thinking skills with 4 (four) alternative answers. Alternative answer choices are the number of students who apply critical thinking skills in class. The data were analyzed descriptively with percentages to describe the level of achievement of each indicator of critical thinking skills.

3 Results and Discussion

3.1 Interpretation ability

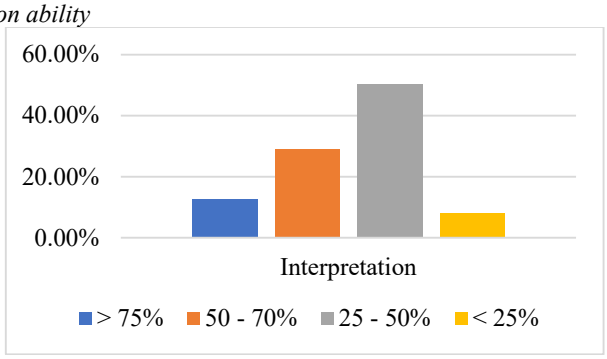

Fig.1. Interpretation ability of the students

Based on Figure 1, information is obtained that the dominant teacher states that only 25-50% of students can interpret the material well. However, more than 10% of teachers say that students' ability to interpret the material is more than 75%. The results of this study are in line with the findings of Karsimen et al., [20], which suggests that in physics learning, the overall score of science process skills with indicators of interpreting in physics learning, dominant students are in the medium category. Less than 10% are in the High category and Very High. The same thing was also expressed by Seventika et al. [10], who found that the dominant vocational students of the computer and network engineering expertise program in the Indramayu district had low interpreting skills.

3.2 Analysis ability

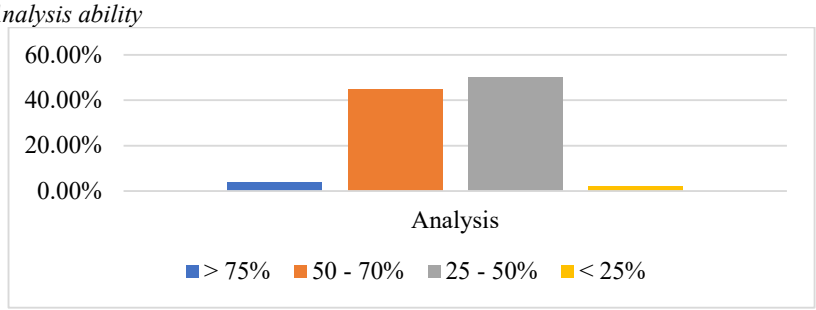

Fig.2. Analysis ability of the students

Based on Figure 2, information is obtained that the dominant teacher states that 25-50% of students can analyze the material. Some even think that students with analytical skills reach 70% of students. Analytical ability is one aspect that can improve student achievement. Daro'aeni et al. [21] revealed that analytical skills contributed 5.55% effectively to high school students' learning achievement on the subject matter of colloids. To improve students' analytical skills, Suryani et al. [22] explained the need to apply a posing learning model equipped with worksheets.

3.3 Inference ability

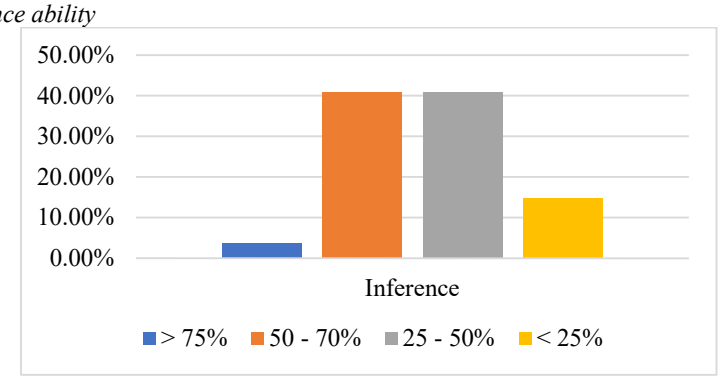

Fig. 3. Inference ability of the students

Based on Figure 3, information is obtained that the dominant teacher states that 25-70% of students can conclude the material. Many even think that there are still few students who can make conclusions on the material being studied. The ability to conclude continues to be taught by the teacher in each lesson. This is also a process that is expected to occur in implementing 2013 curriculum learning. The research results by Wardani et al. [23] concluded that the scientific reasoning ability of vocational students in physics learning is still relatively low. This is because students' reasoning is still at the lowest levels in each pattern of scientific reasoning. To improve students' ability to conclude, Ariyanti et al. [24] explained that teachers' have a significant role in guiding students to make conclusions through the application of a contextual teaching and learning (CTL) model based on education for sustainable development (ESD) in learning.

3.4 Evaluation ability

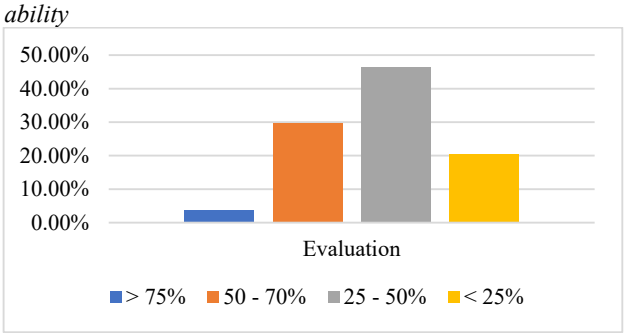

Fig.4. Evaluation ability of the students

Based on Figure 4, information is obtained that the dominant teacher states that 25-70% of students can evaluate. Even 20% of respondents think that few students can still determine the learning material. In line with these results, Hayudiyani et al. [8] concluded that students with high initial abilities could go through the material interpretation stage well in each lesson. Furthermore, they perform analysis, evaluation, inference, and explanation as well as self-regulation well;

3.5 Explanation ability

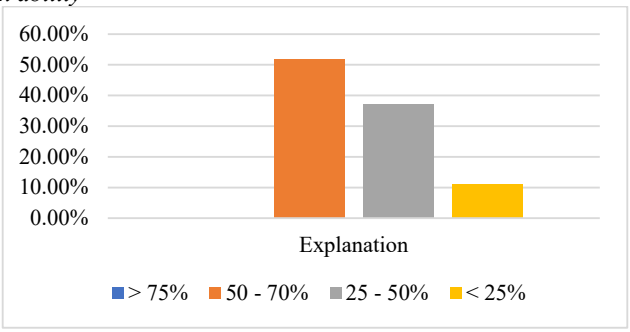

Fig.5. Explanation ability of the students

Based on Figure 5, information was obtained that more than half of the teachers stated that 50-70% of students could explain, but there were a number of teachers who said that there were still few students who have lack abilities to explain. Rosa revealed that female students have better abilities than male students. This can be seen from cognitive skills, predicting, observing, and the ability to explain [25]. Nuraini developed a module based on Predict, Observe, and Explain (POE) accompanied by a Roundhouse Diagram (RD) to improve the ability to explain. The results proved that the module effectively empowered students' ability to explain [26].

3.5 Self-regulation

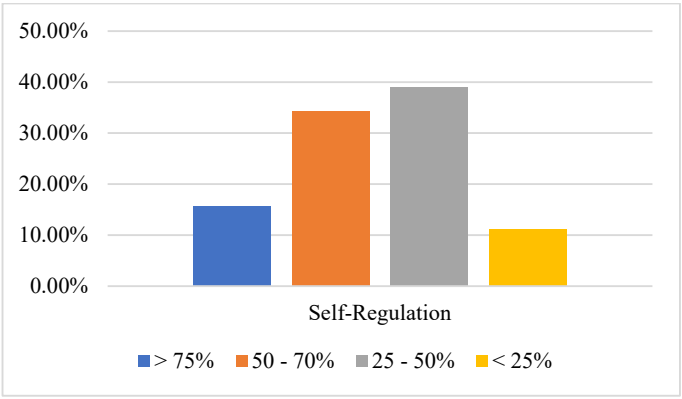

Fig.6. Self-regulation of the students

Figure 6 shows that although most teachers revealed that only 25-50% of students could control themselves well, many other teachers also stated that many of their students had good self-regulation. The research of Situmorang & Latifah [27] explains that students' self-regulation is influenced by parental education, which strengthens their self-concept. This is especially true for students at the junior secondary level. The analysis of Friskilia & Winata [28] shows that students' self-regulation has a positive and significant influence on their learning outcomes, both partially and simultaneously.

The research results by Hartiningtyas et al. [29] show that self-regulated learning (SRL) has a significant relationship with vocational maturity reaching 26.1%. Students who have a high

SRL can be seen as independent in learning. He knows what to do to learn effectively and achieve the expected goals.

3.6 Students Critical Thinking

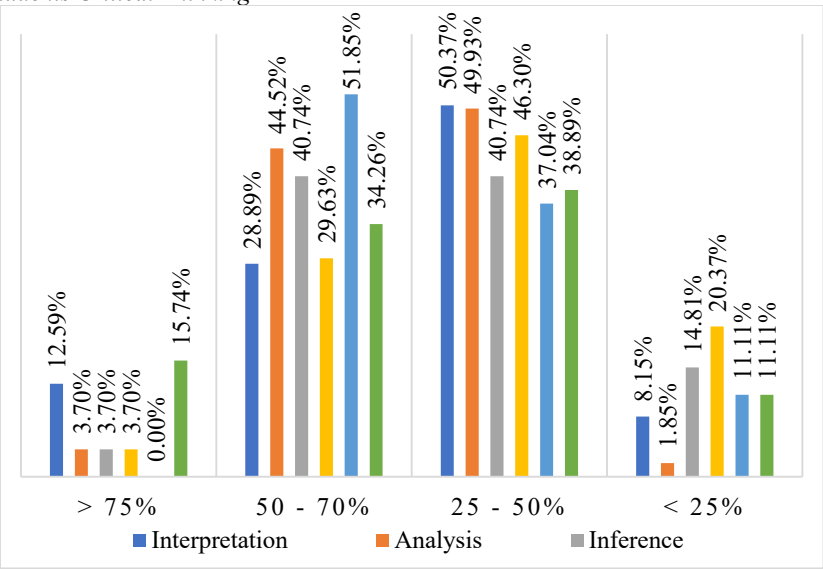

Fig.7. students critical thinking based on indicator

Based on Figure 7, it can be seen that most teachers still think that only 25-50% of students have good critical thinking skills. There were 20.37% of teachers considered that students' critical thinking skills on evaluation indicators were still very weak. However, more than 10% of teachers believe that more than 75% of students have critical thinking skills on self-regulation and interpretation.

4 Conclusion

Based on the results and discussion above, it can be concluded that the dominant students have not applied critical thinking skills well. This could be due to teachers' ability and competence that should be strengthened and increased in order to stimulate their students to be able to think critically in the learning process. Based on these conclusions, the researcher will develop a teaching industry-based learning model to bring learning closer to the actual industrial environment. The teachers will be given guidelines for use and trained to use the model so that it is hoped that students' critical thinking skills can be even better.

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