The critical thinking ability profile of grade X SMA N 2 Kudus

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Abstract. This study aims to describe the critical thinking ability of grade X students of SMAN 2 Kudus on physics subjects. The design of this study uses quantitative descriptive methods. The research was conducted at SMAN 2 Kudus with a sample of class X research taken by cluster random sampling. The instrument used was a test of critical thinking skills. Data analysis was carried out in a quantitative percentage. The results showed that critical thinking skills of class X students of SMAN 2 Kudus were in the low ability category with an average percentage of 22.91 %.

1. Introduction
Curriculum 2013 based on Minister of Education and Culture No.24 of 2016 describes the structure of the high school curriculum which aims to prepare Indonesian people to have the ability to live as individuals and citizens who are faithful, productive, creative, innovative and affective and able to contribute to the life of society, nation, state, and world civilization [1]. The implementation of the 2013 curriculum on physics learning, especially at the high school level, is a form to celebrate God's blessings on His creation. The 2013 curriculum is expected to be able to implement 21st century learning. In 21st century learning, students are expected to have 4 distinctive skills, namely: critical thinking and problem solving, creativity and innovation, communication, collaboration. Physics learning is expected to train students to problems solve. The ability to solve problems can be improved by training students' critical thinking ability [2]. Critical thinking is a logical and sensible thought focused on making decisions about what is believed and done [3]. Critical thinking is a logical and sensible thought focused on making decisions about what is believed and done [3]. Critical thinking cannot be separated from education and is a very important cognitive ability so the school tries to improve it [4]. Critical thinking skill becomes an indispensable ability of students to be able to deal with changing circumstances or challenges in the learning process. Critical thinking is not easy but can be learned and trained [5]. critical thinking skills are not innate born and develop naturally but require training and teaching by the teacher, so students have the provision to deal with problems both now and in the future. Students may not be able to think critically if their teacher is not able to integrate critical thinking in their daily practice, added that critical thinking is the same as high-level thinking skills from Bloom's taxonomy including Analysis, Synthesis, and evaluation [7]. Facione [5] (2011) classified critical thinking skill into several indicator: (1) Interpretation; (2) inference; (3) evaluation; (4) explanation; (5) analysis; (6) self-regulation. The interpretation aspect requires students to be able to categorize and explain the meaning of terms. The analysis aspect is related to researching ideas,
identifying and analyzing arguments. The evaluation aspect refers to the skill to assess opinions. The inference aspect consists of the skill to look for evidence and alternatives. The explanation aspect is the skill to express results, justify procedures, and present data. Finally, the self-regulation aspect deals with the skill to monitor students’ self-learning. Each student has different critical thinking skills, depending on the practice that is often done to develop students' critical thinking skills. Physics learning found in school is in fact only limited to theoretical and lack of developing critical thinking skills. Based on explanation above, this study aims to determine the critical thinking skills of high school students of class X.

2. Methods
This study uses a descriptive qualitative method, namely research directed at exploring data from the actual conditions. The data in question is data on critical thinking skills of class X students of SMA N 2 Kudus in physics lessons. Descriptive research explains or describes what is happening [8], there is no manipulation or alteration of independent variables so that they can describe the actual conditions [9]. The study was conducted in SMA N 2 Kudus. The study sample was class X students in the 2017/2018 school year totaling 32 people who were determined by cluster random sampling. The instrument used is a matter of critical thinking ability test. Data analysis was carried out by quantitative percentage analysis.

3. Results and Discussion
Critical thinking ability measured in this study consists of 6 indicator: 1) Interpretation, 2) Inference, 3) Evaluation, 4) Explanation, 5) Analysis, 6) Self-regulation [10]. Each item is adjusted to indicators that refer to the mastery of critical thinking skills at predetermined indicators. Each question is a stand-alone part and not part of the other problem. So that it is not a prerequisite for solving the next problem. The questions tested for students amounted to 12 and were given to 32 students of class X with working time of 90 minutes. The form of the test is in the form of multiple choices and is accompanied by the reasons then the student test results are analyzed by the researcher. The results of tests of critical thinking skills are presented in table 1.

| No. | Indicator of Critical Thinking Skills | Percentage of Achievement (%) |
|-----|--------------------------------------|--------------------------------|
| 1.  | Interpretation                       | 14.06%                         |
| 2.  | Inference                            | 50.00%                         |
| 3.  | Evaluation                           | 12.50%                         |
| 4.  | Explanation                          | 25.00%                         |
| 5.  | Analysis                             | 10.93%                         |
| 6.  | Self- Regulation                     | 25.00%                         |
|     | Average                              | 22.91%                         |
Based on table 1, a graph of critical thinking skills can be show as follows:

![Graph showing critical thinking skills](image)

**Figure 1.** The histogram of indicator critical thinking skills

Table 1 and Figure 1 show the highest results of the critical thinking skill test found on indicator 1, which is an interpretation of 14.06%; on indicator 2, Inference, which gets a result of 50%; on indicator 3 which is evaluation of 12.5%; on indicator 4, Explanation of 25%; on indicator 5, which is an analysis of 10.93%; and on indicator 6, Self-Regulation of 25%. The average percentage of achievement of correct answers critical thinking skills of students of SMAN 2 Kudus is less than 50%, which is only 22.91%. This shows that the category of students' critical thinking skill is classified as low.

The results of the highest critical thinking skill test were found in indicator 1, namely Interpretation of 14.06% but the results included in the low category. The low yield is possible because students are poorly trained in interpreting data. On indicator 2, namely Inference obtains 50% of the results are classified as low. It is possible for students to be less trained in making conclusions from a problem. On indicator 3, evaluation 12.5%, these results are classified as low, this is possible because students are not trained in giving judgments. On indicator 4, namely explanation, the results are 25%, the results are classified as low, allowing students to not understand the problems. On indicator 5, namely analysis, get the lowest result, which is equal to 10.93%, this is possible because students are not used to analyzing a problem. On indicator 6, namely self regulation, obtained a yield of 25%. It is possible for students not to be used to formulating alternative solutions to a problem.

Critical thinking is one stage of high-level thinking. Students' critical thinking skills are needed in the learning process to generate high curiosity, so students will continue to seek information and think about how to solve the problems they face. Critical thinking is needed to check the truth of information, so that it can be decided that the information deserves to be rejected or accepted [9]. People who think critically will evaluate and then conclude something based on facts to make a decision [11]. One of the characteristics of people who think critically will always look for and explain the relationship between problems faced with other relevant experiences.

The results of the analysis show that the average results of critical thinking of class X students are classified as low at 22.91%. Based on the answers to students' questions, it is known that most students are still confused in applying the knowledge and concepts that they already have to apply in solving problems in the critical thinking problems they encounter. Students even though they know a concept, students may not be able to apply how to use it [12]. The low ability of students' critical thinking is due to lack of activity and training, limited resources, biased perceptions, time that limits the
environment in developing critical thinking skills [12]. Too much memorization and a little thinking, a little mastering the concept. In addition, lack of basic knowledge results in students being unable to solve problems.

In learning activities do not prioritize memorization because it does not improve critical thinking ability[13]. Learning should make students able to analysis, synthesis, evaluate information to solve problems and make decisions. In addition, training that is lacking in evaluating can also result in students' critical thinking skills[14]. There are several questions that can be used to involve students in evaluating: What do you think about it? Do you think that? What is the basis of your knowledge? What is meant ?. Predicting activities can also train students to think critically to make decisions. The ability of students to be competent is influenced by the learning experience obtained by students. If the students' learning process is often given training or activities to carry out critical thinking activities, the students will have good development of critical thinking skills. Therefore, the teacher must find a learning method that can involve students in training students' critical thinking skills.

4. Conclusion
The results showed that the ability to think critically in class X of SMAN 2 Kudus was still low. This is because students who fill each indicator of critical thinking are no more than 50%. The results of this study provide an overview to the teacher and researchers about the condition of critical thinking skills of class X students of SMAN 2 Kudus. The results of this study can be used by teachers and researchers to design and develop learning activities that can facilitate students to practice critical thinking so students are accustomed to doing critical thinking in everyday life.

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