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Elementary Clarification Analysis (Critical Thinking Skill) Elementary School Students Based on Grade and Learning Method

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ABSTRAK

Kemampuan berpikir kritis penting dimiliki siswa, namun data terkait kemampuan berpikir kritis siswa SD pada tingkat dasar masih kurang. Tujuan penelitian ini untuk menganalisis kemampuan elementary clarification pada kemampuan berpikir kritis siswa Sekolah Dasar dalam pembelajaran SAINS yang didasarkan pada tingkat kelas dan metode mengajar. Penelitian ini merupakan penelitian survey pada 226 siswa kelas empat hingga kelas enam dari tujuh Sekolah Dasar. Instrumen penelitian menggunakan angket. Teknik analisis data menggunakan analisis kuantitatif deskriptif dan uji regresi linear berganda. Hasil penelitian menunjukkan siswa Sekolah Dasar sudah mampu menerapkan keterampilan berpikir kritis elementary clarification dalam pembelajaran SAINS, namun kemampuan siswa dalam memfokuskan sebuah masalah masih perlu ditingkatkan. Didasarkan usia siswa diketahui bahwa kemampuan berpikir kritis elementary clarification siswa pada kelas yang lebih tinggi mendapatkan nilai yang lebih baik. Kesimpulan penelitian adalah model pembelajaran berpengaruh terhadap kemampuan berpikir kritis elementary clarification. Metode pembelajaran melatihkan berpikir kritis (berbasis masalah) mampu meningkatkan kemampuan berpikir kritis siswa.

ABSTRACT

It is important for students to have critical thinking skills, but data regarding the critical thinking skills of elementary school students are still lacking. The purpose of the study was to analyze elementary clarification skills on critical thinking skills of elementary school students in learning science. This research is based on grade level and teaching method. This research is a survey research on 226 fourth to sixth grade students from seven elementary schools. The research instrument used a questionnaire. The data analysis technique used descriptive quantitative analysis and multiple linear regression test. The results showed that elementary school students were able to apply elementary clarification critical thinking skills in science learning, but students' ability to focus on a problem still needed to be improved. Based on the grade of the students, it is known that the critical thinking skills of elementary clarification students in higher grades get better grades. The conclusion that the learning model had an effect on critical thinking skills in elementary clarification. The learning method to train critical thinking (problem-based) is able to improve students' critical thinking skills.

1. INTRODUCTION

The quality of education today needs attention to face future challenges, especially to answer society's needs, which are constantly evolving due to advances in science and technology. Advances in science and technology require humans to have the skills to adapt to current conditions, one of which is in the world of education. One of the abilities that humans must have to adapt to the progress of the times is the skills to think critically; critical thinking is one of the four primary skills in the 21st century (Ekici, 2017; Tang et al., 2020; Kawuryan, 2022), namely communication, collaboration, critical thinking, and creativity. Critical thinking skills must be possessed by students, so that students are able to develop reasoning and be able to compete in the global world. Critical thinking ability is the ability to determine what someone believes and will do. Critical Thinking has two main steps: carrying out a reasoning process associated with decision-making or solving problems (Dwyer & Walsh, 2020; Spector & Ma, 2019). Critical

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thinking is an skills needed by a person from childhood to adulthood. It needs to be developed in learning because critical thinking is a person's basis for making decisions (Changwong et al., 2018; Palavan, 2020). Critical thinking is an organized process that allows students to evaluate evidence, assumptions, logic, and language that underlie other people's statements. Critical thinking is an active and skilled process of interpreting and evaluating observation and communication activities or information and argumentation. Critical thinking is also a mental process of conceptualizing, applying, analyzing, synthesizing, and evaluating carefully (Kumala et al., 2018; Young & Lee Warren, 2011). Whether or not an idea is appropriate. Critical thinking is positive analytical thinking to define a problem, start a study on any intended subject, and decide and make a retrospective evaluation that allows us to understand the events happening around us (Kırbaşlar & Özsoy-Güneş, 2015). Critical thinking is reasoned and reflective thinking that emphasizes making decisions about what to believe and do. Indicators of critical thinking skills can be seen through the behavioral aspects expressed in the definition of critical thinking. Critical thinking divided indicators into five abilities, namely: providing elementary Clarification, essential support; inference; advanced Clarification; strategy, and tactics (Ennis, 1985; Turan, 2019). Elementary Clarification is concerned with identifying the focus of the problem; essential support is concerned with identifying and assessing the accept skills of a reason.

The elementary clarification aspect consist of several parts, such as focusing question, analyzing arguments, dan ask and answer questions that require an explanation. This study focuses on one of the indicators Critical Thinking, namely elementary Clarification (giving a simple explanation) (Huang et al., 2017; Tang et al., 2020). Which includes the skills to focus on questions, analyze arguments, and ask and answer an explanation or challenge. Elementary clarification critical thinking skills are the basis for using critical thinking skills before the next stage and need to be trained in developing critical thinking skills, especially for elementary school students (Hu et al., 2016; Ilhamdi et al., 2020; Mahapoonyanont, 2012). Through the skills of elementary Clarification, students will be more critical in investigating a real problem through the skills to analyze, ask, answer, and focus on problems so that students can understand the factors and problems that exist well. The importance of awareness of every educator in Indonesia to apply and teach critical thinking processes to their students in every learning process. Therefore, a strategy is needed to improve students' abilities, teachers can relate the material contained in books to everyday life, so that students are more interested in learning. Teachers are required to always innovate in using various techniques in delivering material. There is also a need for cooperation between the education office related to the local government to take part in educating educators. By conducting counseling and training for educators to be able to maximize the critical thinking learning process in the classroom (Suryanti, Arifin & Baginda, 2018; Young & Lee Warren, 2011). Especially in the elementary clarification indicator, which is one of the basic indicators in the critical thinking learning process.

There are some previous study related to critical thinking aims to test an opinion or idea by making considerations or thoughts based on the opinions proposed. Previous study state that critical thinking can support students' intellectual development and brain performance in perseverance and self-discipline (Shaleha et al., 2019). Someone who can think critically will be able to compile an answer related to a problem sensibly. In this case, critical thinking can be related to reasoning or our skills to reason, using reason to solve problems with reasoning (Eileen Gambrill, 2017; Kirmizi et al., 2015). By thinking critically, a person will be able to filter the information received from various sources to adapt to the situations experienced in making an appropriate decision (Heidari & Ebrahimi, 2016; Yaldiz & Bailey, 2019). Also, a person tends to think systematically, is full of curiosity, mature in thinking, and can think independently (Shaleha et al., 2019), develop creative self-confidence (Álvarez-Huerta et al., 2022), and improve learning outcomes (Chukwuyenum, 2013; Khasanah et al., 2017; Yerimadesi et al., 2019). Previous study state that critical thinking skills significantly correlates with student competence, this skills is related to academic performance until there is a relationship between critical thinking and academic success (Barka et al., 2020; Changwong et al., 2018; Erikson & Erikson, 2019). Analysis of students' critical thinking skills is very important. This is the basis for teachers, parents and the government to develop students' critical thinking skills. However, the reality still far from expected, research only refers to general and advanced thinking skills. Based on this, there is no research that analyzes students' critical thinking skills on aspects of elementary clarification in elementary school students. Therefore the researcher interesting to determine the critical thinking skills of elementary school students, especially in elementary clarification three indicators consisting of focusing questions, analyzing arguments and ask and answer questions that require an explanation. This study also aims to analyses the relationship between the grade of students and the methods used by teachers in learning on the critical thinking skills of elementary school students.

2. METHOD

This study aimed to analyses students' critical thinking skills in the elementary clarification aspects of science learning based on students' grade and teacher's method. The type of research in this study is descriptive quantitative, using a quantitative research approach. The data obtained will be reported in the descriptive form to provide a complete and in-depth picture of social reality and various phenomena in society as research subjects (Creswell & Creswell, 2018; Khasanah et al., 2017). The method used in this study is a survey, with sampling using probably sampling technique with simple random sampling, namely taking a random sample from a population without considering the existing strata because the population is considered homogeneous. The subjects in this study were students in grades four, five, and six of elementary school. The location of this research is seven elementary schools spread over nine cities and twenty nine districts in East Java, namely SDN 2 Jarakan, SDN Gempolan, SD Negeri 5 Ngreco, SD Negeri Miji 3 Kota Mojokerto, SDN Pakis LIMA Surabaya, SDN Bandungrejosari 01 Malang, dan SD Negeri 03 Sisir . The instrument in this study used a critical thinking skills test, with online data retrieval using google form. In this study, the test consisted of ten questions about science material in the form of descriptive questions about the importance of maintaining the balance of nature and conserving natural resources. The way living things adapt to the environment, the water cycle, and its impact on events on earth was developed by themselves by the researcher and addressed to the fourth, fifth, and sixth graders of elementary school. The test is assisted by one of the teachers from each elementary school to help coordinate the students. The method used by researchers in collecting data is as follows: 1) the test is distributed to respondents, 2) giving directions on how to fill out the test to respondents, 3) collecting test answers from respondents. The critical thinking skills test was conducted to obtain information about elementary school student's level of critical thinking skills with the indicators included in Table 1.

Table 1. Students Critical Thinking Test on the Elementary Clarification Aspect

No	Critical Thinking Skills	Indicator
1	Focusing Questions	a. Identify or formulate questions b. Identify or formulate criteria for judging possible answers c. Given the situation
2	Analyzing Arguments	a. Identify conclusions b. Identify the stated reasons c. Identify unstated reasons d. Identifying and dealing with irrelevance e. Finding the structure of an argument f. Make a summary
3	Ask and answer questions that require an explanation	a. Asking about the reason for an event b. Asking about the purpose of an event c. Asking about examples and not examples d. Ask about how to apply to an event e. Show the differences and the reasons why f. Asking about the truth of a fact g. Confirm a statement h. Looking for additional/alternative information

From the results of the tests carried out, researchers can relate the values obtained with the reference guidelines for students' critical thinking skills so that it can be seen how the level of students' critical thinking skills. Prior to data collection, the validity and reliskills of the instrument were tested. The reliskills validity test was conducted at a public elementary school in Gondanglegi District. The validity and reliskills test results show that the instrument is valid and reliable. Furthermore, data analysis was carried out after collecting data using descriptive quantitative data analysis techniques using SPSS 26 crosstab data description.

3. RESULT AND DISCUSSION

Result

The results that has been carried out in 7 elementary schools spread across East Java, regarding students' critical thinking skills in the elementary clarification aspect show that students in East Java have

high critical thinking skills with an average score of 63.07. This research was conducted using a sample of 226 students in grades IV, V, and VI from 7 elementary schools spread across 9 cities and 29 regencies in East Java. In this study, the method used by researchers in collecting data was through a test to measure the level of students' critical thinking skills in the elementary clarification aspect. The results of the critical thinking skills test related to elementary clarification based on grade are show in Figure 1.

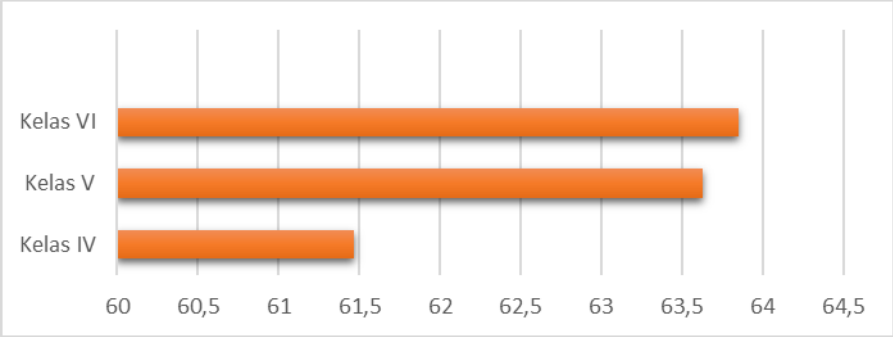

Figure 1. Elementary Clarification Skills Based on Grade

Based on Figure 1, the average grades of the higher grades (grade VI) have higher average grades when compared to the fourth and fifth graders. Class VI students have an average score of 63.85, while fifth grade students are 63.63, and fourth grade students have an average of 61.74. This value is the average value obtained from the total average value of each class from all elementary schools which is higher, meaning that the thinking skills of more mature students gets a higher critical thinking skills score. If it is observed in the aspect of teaching methods in each school it can be described in Figure 2.

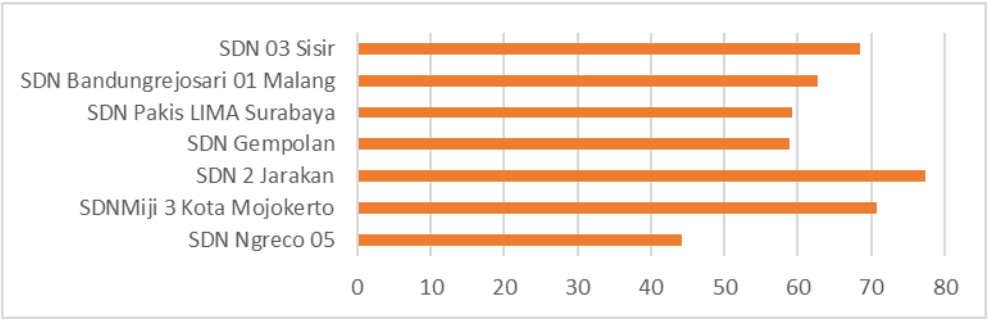

Figure 2. Critical Thinking Skills in Each School

Based on Figure 2. the results of the critical thinking skills test conducted in 7 elementary schools, show that SDN 2 Jarakan has the highest average score among 6 other elementary schools with an average score of 77.40 in the high category, while the average score is 77.40 in the high category. The lowest average is owned by SD Negeri 05 Ngreco with an average of 44.16 in the medium category. Based on the results of observations and interviews that have been carried out, it is known that SDN Jarakan uses the lecture, discussion and question and answer methods with a larger portion. Question and answer activities are carried out by practicing questions that refer to analytical activities (HOTS). The methods used in other elementary schools such as SDN ngreco 05, SDN Pakis lima Surabaya and SDN Gempolan stated that the method used in some of these elementary schools used more of the lecture method with the addition of discussion and question and answer methods. At SDN Bandungrejosari 01 Malang, SDN 03 Sisir and SDN Miji 3 Mojokerto stated that the methods used in learning varied such as lecture methods, question and answer and balanced discussions. If the critical thinking skills of elementary clarification 7 elementary school students in East Java are described based on three categories of critical thinking skills, elementary clarification is shown in Figure 3.

Based on Figure 3. the thinking skills of elementary clarification students at SDN 05 Ngreco. In the indicator focusing on the question getting the lowest score, it is shown that students experience problems when faced with questions that require making a comparison and characterizing a problem, where students tend to mention several meanings rather than a comparison, while on the indicator asking and answering an explanation or challenge students have been able to describe a question from a problem and then provide an answer even though in general students at SDN 05 Ngreco get a low average critical

thinking skills compared to other classes. At SDN Miji 3 Mojokerto the highest indicator is asking and answering an explanation or challenge because in the implementation students have been able to make a question out of a problem and then provide answers. As for the lowest average value on the indicator of analyzing arguments, this happens because students are less able to focus on the questions given, on average students are not able to provide strong argument analysis related to questions given to students. Critical thinking skills in SDN 2 Jarakan is different from the others where the highest indicator is the skills to analyze arguments. In this aspect, students get the highest score compared to other schools, this is shown during learning activities, students are able to provide a fairly detailed explanation of the problem given and students are able to understand the problem well. While the value of the items at SDN 2 Jarakan on the indicator of asking and answering an explanation or challenge, students have difficulty when faced with a fact and an order to make a question or answer that is in accordance with the statement, student answers tend to provide an explanation rather than a question.

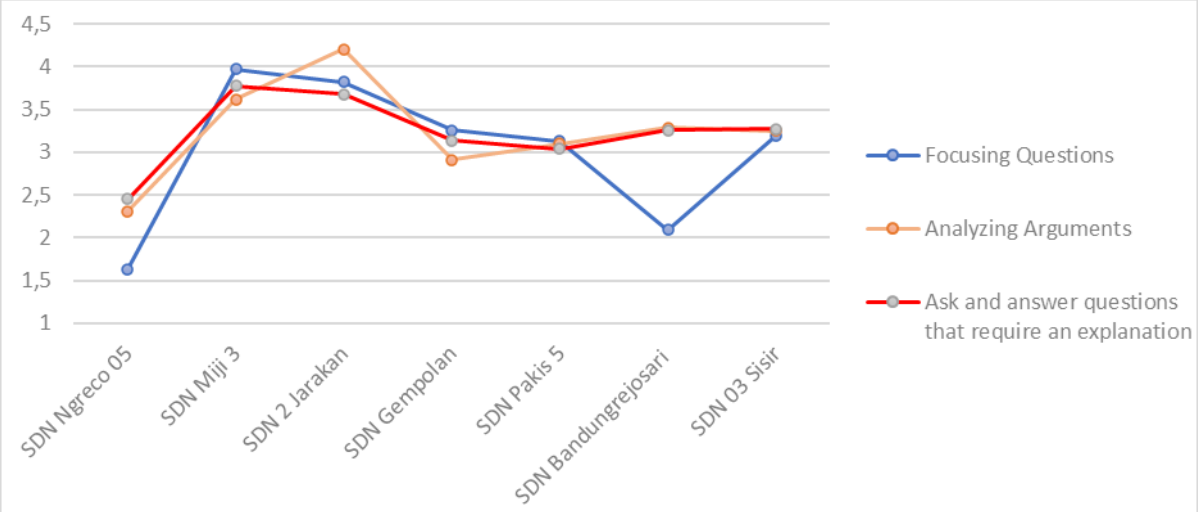

Figure 3. Aspects of Critical Thinking Skills In Elementary Clarification at 7 Elementary Schools

At SDN Gempolan, researchers found that if students had a fairly good skills to focus on a question, students were able to understand the command of a given question so that this indicator got the highest score compared to other indicators. However, on the indicators of analyzing the arguments students have difficulty in providing explanations that are in accordance with the pictures given where students are not able to strengthen the arguments given, besides that students seem to give explanations without paying further attention to the commands given in the questions, so that the answers and questions are not related. At SDN Pakis V Surabaya got the highest score on the indicator of focusing questions, based on analysis of student answers, the researchers found that if students were able to provide answers in accordance with the instructions given to each question, so that students' skills to understand questions was good. However, on the indicator of analyzing arguments, students tend to give arguments that are less appropriate and tend to be weak. At SDN Bandung Rejosari 1 Malang shows the indicators of asking and answering an explanation or challenge to get the highest score because students are able to give good questions according to the picture given. For indicators focusing on questions, students get the lowest score this is because in the learning process students are less able to understand the questions, where students' answers are not in accordance with the questions given. The last analysis in SDN 03 Sisir, the researchers found that students had the highest average score on the indicator of asking and answering an explanation or challenge. This is because during learning students have been able to ask questions that are quite good and in accordance with the picture given, while the indicator focuses on the questions students tend to answer questions that are not in accordance with the questions given so as to get the lowest score on the indicator. In general, the 7 research schools based on the data show critical thinking skills, elementary clarification based on predetermined indicators, showing the average score for focusing questions is 3.01. The skills to analyze arguments is 3.24 and the skills to ask and answer questions that require explanation get an average of 3.23. Based on this, it can be seen that the highest score is in the aspect of analyzing arguments, the skills to ask questions, answer questions and the last is to focus questions. This is indicated by the skills of students in 7 elementary schools which shows

that students in general are better able to ask and answer questions compared to other aspects as evidenced by students' answers.

Discussion

Based on the results, it shows the highest value on the indicators of questions and answers questions, then analyzes the arguments and the lowest is the focus of the questions. This is due to the indicator of analyzing arguments if you like cognitive level which is at cognitive level 4 (analyzing) while in the aspect of compiling questions and focusing on cognitive level 6 (creating) (Anderson, L.W., & Krathwohl, 2010; Candra & Retnawati, 2020). Cognitive level shows the stages of students' abilities. The higher the level of students' cognitive abilities, the more developed their thinking abilities. This is caused by the skills to think critically interacts with high cognitive levels or HOTS(Mulyanto et al., 2018; Yazar Soyadı, 2015). So that the development of HOTS will also develop critical thinking skills. HOTS consist of critical thinking skills and creative thinking skills (Antara & Dewantara, 2022; Rahman & Manaf, 2017). In addition, based on results, it shows that the critical thinking skills of students in each elementary school is different with the highest score at SDN2 Jarakan. This happens because the methods used by teachers vary in each school. The results show that the method used at SDN2 Jarakan is frequently using the HOTS question-and-answer method in learning. HOTS questions in learning are in line with the indicators from elementary clarification such as focusing questions, answering and giving questions and providing arguments. Questioning are important for developing critical thinking skills especially HOTS question (As'ari, 2014; Nappi, 2017; Santoso et al., 2018). Factors that influence the development of critical thinking skills such as educational factors, student factors, personal factors, and child rearing factors. Where the most influential sub-factor on the development of children's critical thinking skills lies in the teaching method. So it can be seen that differences in learning patterns will affect students' critical thinking skills (Hu et al., 2016; Ilhamdi et al., 2020; Mahapoonyanont, 2012). Learning models such as problem-based learning models, inquiry models, elaboration learning can improve student's critical thinking skills (Priawasana et al., 2020; Purwanita et al., 2019; Sriarunrasmee et al., 2015).

Critical thinking ability is influenced by several things, one of which is grade and the method used by the teacher in teaching. The learning method used by the teacher greatly affects the student's learning ability. The results of this study are in accordance with previous research which shows that critical thinking skills are influenced by the method used by the teacher (Palavan, 2020). In the aspect of student grade, it is known that grade level affects students' critical thinking skills. Correct and appropriate learning can develop students' thinking skills, one of which is the ability to think critically. Teachers who teach using critical questions or HOTS can familiarize students with critical thinking (Budiman & Jailani, 2014; Santoso et al., 2018). Habituation for someone will become a culture for the student. If students have a critical thinking culture, it will cause students to get used to using their critical thinking skills. In general, the results can be used as a basis for teachers, parents and the government as basic data in knowing students' critical thinking skills. The results of the research that has been found, it can be concluded that elementary school students in East Java have been able to apply critical thinking skills in science learning, but the skills to focus on problems is still low. So there needs to be encouragement and innovation from educators to improve students' abilities, especially in focusing on a problem, through the teaching process provided (Changwong et al., 2018; Siburian et al., 2019). It is hoped that this innovation and support will be able to encourage students to be more active and proficient in critical thinking, especially on the elementary clarification indicators (giving simple explanations). Through the skills to provide simple explanations, students will be more critical in investigating a factual problem through the skills to analyze, ask, answer, and focus problems so that students are able to understand the factors and problems that exist well (Li et al., 2013; Nosich, 2016).

The limitation of this study is that this study was only conducted in a few elementary schools with a limited research sample. The result data cannot be generalized widely. The research was also carried out in a relatively short time. So that similar research is still needed with a wider research sample and a longer research time to obtain a more comprehensive one. Some recommendations to improve critical thinking skills, especially elementary clarification skills in several ways through the development of critical thinking learning, for example by practicing giving questions to students, using problem based learning can be done through the use of learning strategies, curriculum development based on critical thinking skills, teachers train their critical thinking skills, modeling the critical thinker behavior by the teacher (As'ari, 2014; Palavan, 2020).

4. CONCLUSION

This study focuses on basic clarification which is one of the students' critical thinking skills. The ability to think on the basic clarification aspect is weakest on the indicators that focus on questions and the best on the question argumentation analysis aspect. The weakness of this study is that it only measures one indicator out of 5 critical thinking indicators so that it cannot fully describe students' critical thinking skills. In addition, the research method uses a survey. The survey method is less accurate to measure students' critical thinking skills. Recommendations for further researchers, can measure critical thinking skills more than one indicator and use measurement methods not only surveys but also interviews and tests.

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