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Analysis of students' critical thinking skills in natural and social sciences class IV SD Muhammadiyah 1 Ngimbang Lamongan

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ABSTRACT

This study aims to analyze the critical thinking skills of fourth grade students in the subject of Natural and Social Sciences at SD Muhammadiyah 1 Ngimbang. The background of this study is the low critical thinking skills of students which is influenced by the use of media and learning methods that are still conventional and less interactive. This study used a descriptive qualitative approach with data collection techniques in the form of observation, interviews, and documentation studies. The results showed that the dominance of using textbooks as the main media causes learning to take place abstractly and monotonously, so that students become passive and have difficulty in understanding the material. Although the school has technology facilities, its utilization in learning is still minimal. The lack of contextual and interactive learning media causes low student concentration and has an impact on weak critical thinking skills and the application of knowledge in everyday life. This study recommends the use of more innovative learning media and teacher training in the utilization of technology to support critical thinking skills in accordance with the principles of Merdeka Curriculum.

Keywords: Analysis, Critical Thinking, Learning, Natural and Social Sciences, Primary School

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INTRODUCTION

Critical thinking is the ability to think clearly, rationally, and reflectively in dealing with complex situations (Kusuma et al., 2024). Critical thinking skills are the process of gathering various information and analyzing it using the knowledge that students already have to draw the right conclusion (Hamdani et al., 2019). Critical thinking skills have a very important role, both in the academic world and in everyday life. In the academic context, critical thinking skills help improve the student learning process. By thinking critically, students can solve problems more effectively and make wiser decisions (Ariadila et al., 2023). In everyday life, critical thinking skills help a person to develop a systematic mindset. Thus, individuals can adapt well and be able to face various challenges that arise in their lives.(Riyanto, 2023).

The 21st century has become a digital era characterized by rapid advances in information and communication technology. Critical thinking skills belong to the category of high order thinking which is very useful for drawing conclusions or making decisions in the problem-solving process. This process involves in-depth analysis of the issue at hand as well as the information that has been gathered (Anggraini et al., 2022). In the 21st century, every individual is required to master a number of skills that are relevant and in accordance with the demands of the times (Apriliani et al., 2021). One of the factors for low critical thinking skills is the use of inappropriate learning models and media in the teaching and learning process. This situation causes students to experience difficulties in developing critical thinking skills because learning does not involve an effective construction process (Sofri et al., 2020). Students' critical thinking skills are influenced by a number of internal and external factors. Internal factors include physical condition, motivation, anxiety, intellectual development, and social interaction. Meanwhile, external factors consist of learning methods, learning environment, and support from parents (Amalia et al., 2021). Critical thinking skills include five main indicators, namely: problem identification, information analysis, drawing conclusions, providing further explanation, and organizing strategies and techniques to solve a problem (Adisty et al., 2021).

Natural and Social Sciences is one of the subjects contained in the Merdeka Curriculum. Learning Natural and Social Sciences in schools is considered very effective in helping to realize the Pancasila Student Profile, which is an ideal picture for students in Indonesia (Meylovia & Julianto, 2023). Natural and Social Sciences is a curriculum development that combines Natural Science (IPA) and Social Science (IPS) materials in one learning theme (Nuriyanti et al., 2024). Given that science discusses aspects of nature, of course this is closely related to the conditions of society and the surrounding environment. Therefore, this learning is delivered in an integrative manner and creates a more tangible link between the two disciplines (Suhelayanti et al., 2023). Natural and social sciences learning in the Merdeka curriculum provides direction for students to hone critical thinking skills and develop their potential. Thus, this learning can be integrated in everyday life. In addition, natural and social sciences also encourages students to interact directly with the surrounding environment (Santika et al., 2022).

Primary school students in the high grades, especially those between the ages of 9 to 12, are in a very important stage of cognitive development. At this age range, children begin to show more complex and logical thinking abilities compared to previous ages (Salsabilla, 2024). They begin to be able to think critically about their surroundings, question the information they receive, and try to understand the reasons behind an event or phenomenon. Their curiosity is very high, which is shown through various questions and exploration of new things (Syifa et al., 2024). Children at this age tend to no longer receive information passively, but actively seek clarity, test opinions, and assess various alternatives before arriving at a conclusion. The strengthening of critical thinking skills in students aged 9-12 years is very relevant to the demands of 21st century education, which

emphasizes the ability to think analytically, creatively, and solutively. In addition, critical thinking skills are also the main foundation for the formation of independent and responsible character, and become one of the main pillars in the progress of a nation (Damayanti et al., 2024).

Based on research results from Musahrain et al., (2024) stated that students' critical thinking skills in learning science were still in the low category with a presentation of 34.26%. The low level of critical thinking skills in science subjects is influenced by several factors, including the lack of problem-solving-based exercises, less interactive learning methods, and the lack of use of learning media that can stimulate students' critical thinking skills. Therefore, it is necessary to improve students' critical thinking skills in science learning. Based on the research results Maslakhatunni et al., (2019) stated that the high score obtained in the analysis indicator was 62.75%, and another high score was the interpretation indicator with a presentation of 50.30%, followed by an evaluation indicator with a presentation of 41.18%, the self-regulation and inference indicators obtained the same percentage score of 33.33%, while the lowest score in this study was obtained in the explanation indicator, namely 16.47%. So it can be concluded that the ability to think critically in students is still low because students are still not trained in the indicators of critical thinking skills in learning.

Based on the explanation above, it can be concluded that it is necessary to conduct further research on the low critical thinking skills of students. The purpose of this study was to analyze critical thinking skills in natural and social sciences subjects at SD Muhammadiyah 1 Ngimbang, Lamongan Regency.

METHODS

The research method used in this research is descriptive qualitative method with case study data triangulation which combines various data collection techniques and existing data sources to obtain an overview of the critical thinking skills of fourth grade students at SD Muhammadiyah 1 Ngimbang. This research was conducted in November 2024 at SD Muhammadiyah 1 Ngimbang, a school located in Ngimbang Village, Ngimbang Sub-district, Lamongan Regency with research subjects namely 1 fourth grade teacher and fourth grade students as many as 5 out of 24 students.

Data collection techniques in this study are observation, interviews, and documentation studies. Observation data collection technique is a technique or way of collecting data with ongoing activities (Hardani et al., 2020). Interview is one of the data collection techniques used when conducting preliminary studies. This method aims to identify the problems being studied and to explore more in-depth information from respondents (Sugiyono, 2019). Documentation studies were used to obtain data about the existing situation at SD Muhammadiyah 1 Ngimbang, Lamongan Regency. Data collection instruments in this study were observation guidelines, interview guidelines and documentation study guidelines.

RESULT

Based on the documentation study of the UTS scores of fourth grade students of SD Muhammadiyah 1 Ngimbang, it is known that 75% of the 24 students (18 students) obtained scores below the KKM (75), while only 25% (6 students) reached the KKM. This shows that the majority of students have not met the standards, especially in critical thinking skills. Therefore, a benchmark is needed to categorize the level of students' critical thinking skills based on the scores obtained.

From the observations at SD Muhammadiyah 1 Ngimbang, it was found that there are several main factors that influence the low critical thinking skills of students, especially in the learning of Natural and Social Sciences. Although in general the learning process has been running in

accordance with the established plan, the implementation in the classroom still relies heavily on conventional methods and media. Teachers tend to rely on lectures and the use of visual media such as pictures and textbooks, which makes students not get explorative and in-depth learning experiences. The learning media used has not been able to provide concrete and interactive learning experiences. This is closely related to the importance of critical thinking skills. SD Muhammadiyah 1 Ngimbang actually has adequate technology facilities and a good internet connection. However, the utilization of this technology in the learning process is still very limited and has not been optimally integrated with the subject matter of natural and social sciences. Teachers have not fully used technology as a tool to develop digital-based and interactive learning methods.

Based on observations made directly on the characteristics of fourth grade students of SD Muhammadiyah 1 Ngimbang during the learning process, it was found that the level of student activeness in participating in learning activities was still relatively low. This is especially evident when learning is done with a one-way approach, where the teacher only relies on textbooks as the only learning media used in the classroom. In this condition, the classroom atmosphere tends to be monotonous and does not arouse students' interest in learning. The absence of visual media or concrete learning aids makes it difficult for students to understand the concepts presented, especially on abstract materials such as concepts in natural and social sciences subjects. As a result, student participation becomes passive and less enthusiastic in participating in learning activities. They tend to only be recipients of information without active involvement in the process of thinking, discussing, or exploring the subject matter in depth.

Learning media used to support the implementation of the curriculum at SD Muhammadiyah 1 Ngimbang is still limited to conventional media such as textbooks, educational magazines, and computer devices. A less supportive learning environment and monotonous presentation of materials make students quickly lose focus, lack motivation, and do not show active involvement in classroom activities. The rigid and unpleasant learning atmosphere not only affects interest in learning, but also inhibits students' ability to analyze, evaluate and develop a deep understanding of the material studied. Most students have not been able to achieve the learning outcomes set out in the curriculum, as indicated by grades that are below the Minimum Completion Criteria (KKM). These low learning outcomes indicate that there needs to be a systematic effort to reform learning strategies, one of which is through the development of media that is more interactive, contextual, and able to bridge the gap between teaching materials and student learning experiences..

DISCUSSION

Based on a documentation study of student grades in the fourth grade natural and social sciences subject at SD Muhammadiyah 1 Ngimbang, Lamongan Regency, it is known that 75% of the 24 students, 18 students, scored below the Minimum Completion Criteria (KKM). Only 25% of students scored above the KKM. This data shows that most students have not achieved the expected academic standards. Furthermore, analysis of the critical thinking skills indicators shows that 75% of students have not met these indicators, while only 25% of students are able to demonstrate critical thinking skills as expected. This finding illustrates that many students still do not have high-level thinking skills.

This finding is in line with research conducted by Istiyono et al., (2019), which shows that the critical thinking skills of elementary school students in Indonesia are still relatively low. This is due to the limited assessment instruments and learning approaches applied in the classroom. In addition, a study by Fauziyah & Sudrajat (2020) revealed that teachers often prioritize the achievement of cognitive scores rather than the development of critical thinking skills, so students

lack the stimulus to improve critical thinking skills Zubaidah (2018) emphasizes the importance of instilling critical thinking skills early on through learning methods that encourage active student involvement, such as through group discussions, problem-based learning, and reflection. In the context of learning Natural and Social Sciences, Putra & Ariyanti (2021) shows that the application of problem-based learning models can significantly improve the critical thinking skills of elementary school students, because it encourages students to analyze problems in depth and formulate logical solutions. Research by Wulandari & Permana (2022) also found that the application of contextual learning strategies that involve students' direct experience with the surrounding environment can significantly improve concept understanding and foster critical thinking skills. Therefore, there is a need for innovation in learning strategies that are not only oriented to the end result, but also to the students' thinking process through an active, contextual, and problem-solving-based approach. This step is expected to improve students' critical thinking skills and have an impact on improving overall learning outcomes.

Based on the results of research at SD Muhammadiyah 1 Ngimbang, it was found that the low level of students' critical thinking skills was influenced by the dominant use of conventional learning media, even though the technology facilities at the school were adequate. As a result, the natural and social sciences learning carried out has not been able to provide concrete and meaningful learning experiences for students. In the context of constructivism theory, the theory initiated by Vygotsky emphasizes that effective learning must involve social interaction and support from the environment, including the use of relevant learning media. When teachers only rely on abstract media, students will have difficulty in building their knowledge independently (Wardani et al., 2023)

Research conducted by Yuliani & Hartanto (2020) showed that contextual-based learning media, such as interactive videos and simulations, are more effective in developing critical thinking skills of elementary school students. Meanwhile, Pratiwi et al., (2021) proved that the application of technology, such as Augmented Reality (AR), is able to increase students' learning motivation and critical thinking skills by visualizing abstract concepts more realistically. However, the utilization of learning technology is highly dependent on teachers' readiness and ability to integrate it into the learning process. Ramadhani et al., (2020) revealed that although many teachers have access to technology, many of them are not able to utilize it optimally. This is due to limitations in training and digital literacy. Therefore, it is crucial to provide continuous training support for teachers to optimize the use of interactive media. Supriadi & Hermita (2021) also proved that the use of interactive media based on animation and simulation in science learning can improve students' critical thinking skills through analysis, synthesis, and evaluation activities.

Observations of the characteristics of fourth grade students at SD Muhammadiyah 1 Ngimbang show that students tend to be less active in the learning process when the teacher only relies on textbooks as the only media. This situation causes learning to be monotonous, less interesting, and one-way, resulting in low student participation and hindering their understanding of the material being taught. This shows that the use of learning media that is not varied and too abstract can make it difficult for students to connect new information with their real experiences. This is in line with the view of Jean Piaget, the main figure in the theory of constructivism, who argues that students at primary school age are at the concrete operational stage, where they tend to learn more effectively through direct experience and the use of concrete media, compared to abstract symbols or texts. Direct involvement in learning will make students understand the material faster and have a strong memory. Students are also trained to interact socially better, because students are encouraged to discuss a lot with peers and elders (Ulya, 2024).

Research conducted by Maulana et al., (2021) emphasizes that relying on textbooks in the learning process is not enough to stimulate students' interest and activeness. Therefore, teachers are advised to utilize contextual and interactive learning media so that students can actively participate. Fauziyah & Wahyuni (2020) showed that the use of multimedia-based media such as animations and learning videos significantly improved learning outcomes. In addition, as expressed by Suryani et al., (2019), Learning models that use a scientific approach with the support of visual media are proven to be more effective in helping students understand abstract concepts.

In addition, active learning approaches such as Discovery Learning have been proven to improve students' cognitive and affective engagement. Research conducted by Prastowo & Firmansyah (2020) showed that if this model is combined with interactive visual media, students can improve their conceptual understanding and develop a high inquisitive attitude. In the context of learning in primary schools, it is important for teachers to pay attention to students' learning styles. A study conducted by Wulandari & Sugandi (2022) confirmed that when teachers provide visual and kinesthetic learning media, students understand the material more easily and are more active during the learning process. Therefore, the results of this study confirm the importance of diversifying learning media that are more contextual and interactive to support student engagement and understanding. The use of technology and innovative learning approaches not only increases student participation, but also makes the learning process more enjoyable, meaningful and effective.

Furthermore, observations made at SD Muhammadiyah 1 Ngimbang show that the learning media used, such as books, magazines, and computers, have not been able to support the curriculum, especially in the subjects of natural and social sciences. This has an impact on the low level of student concentration which affects critical thinking skills and difficulties in applying the knowledge that has been learned in everyday life. This finding is in line with research conducted by Putri & Zulkardi (2019), which argues that the use of monotonous and less interactive learning media contributes to the low active participation of students in the learning process, this having a negative impact on learning outcomes.

An unsupportive learning environment can have a major effect on student motivation and attention. Nugroho & Mutiani (2020) explained that a less conducive classroom atmosphere can reduce learning enthusiasm and hinder students' cognitive development. This is in line with the opinion of Susanti & Yulianti (2016), which states that constructivism-based learning can improve critical thinking skills, if facilitated with relevant media and in accordance with student needs.

In the context of natural and social sciences learning, the use of interactive digital media shows a positive impact on students' concept understanding and critical thinking skills. According to Damayanti et al., (2020), the application of interactive digital media in primary schools substantially improved learning outcomes and student engagement. The research shows that a technology-based approach can be a solution to overcome learning challenges that arise from a lack of variety in learning media. Furthermore, Sari & Wahyuni (2021) stated that the use of educational technology such as learning videos, interactive applications, and digital simulations can increase students' concentration and motivation to learn. The application of project-based learning model is proven to be effective in developing critical thinking skills. Research Wuandari & Mulyani (2022) revealed that the application of the project-based learning model with the support of digital media can improve analytical skills and student engagement in natural and social sciences learning.

In the context of implementing the Merdeka Curriculum, which emphasizes contextual and student-focused learning, innovation in the selection of learning media and methods is needed. Research conducted by Ningsih & Widiastuti (2022) shows that the implementation of a blended learning model, which combines online and offline learning, can increase the active engagement of

primary school students. Therefore, the use of innovative learning approaches that utilize technology and interesting media becomes very important to create a learning atmosphere that supports the achievement of competencies, especially in natural and social sciences lessons that demand higher order thinking skills.

Based on the explanation above, it is necessary to develop innovative media to improve the quality of learning. One relevant solution is the utilization of Augmented Reality (AR) media that is able to present learning materials visually, interactively, and contextually. Augmented Reality (AR) media can help students understand abstract concepts more concretely and encourage active involvement in the learning process. Thus, the use of Augmented Reality (AR) media is expected to foster students' critical thinking skills. The development of Augmeted Reality (AR) media also supports 21st century learning which demands the integration of technology in basic education (Zubaidah, 2018).

CONCLUSION

The low level of students' critical thinking skills in natural and social nciences subjects is caused by the dominant use of conventional and less varied learning media. Although schools already have facilities such as computers, their utilization has not been maximized due to limited teacher competence in integrating technology into the learning process. As a result, students have difficulty in concentrating, understanding the material, and applying knowledge in real life. Learning tends to be one-way, where students passively receive information rather than actively engaging in analysis, discussion, and problem-solving activities that stimulate higher-order thinking. The lack of interactive and engaging media also leads to reduced learning motivation and enthusiasm among students, which further affects their academic performance and cognitive development. This finding is reinforced by various previous studies which show that the use of contextual, visual, and technology-based learning media can significantly improve students' learning motivation, engagement, and critical thinking skills. For example, digital simulations can help students visualize complex scientific phenomena, while Augmented Reality (AR) media can provide immersive learning experiences that bridge the gap between abstract concepts and real-world applications. Interactive learning videos and digital games have also been shown to increase student participation and encourage independent learning, which is essential for cultivating critical thinking. To overcome these problems, it is suggested that teachers can develop the ability to use technology-based interactive learning media, such as learning videos, digital simulations, and Augmented Reality media. This requires not only access to adequate digital tools but also a shift in pedagogical mindset teachers must be willing to move from traditional teaching methods to more student-centered approaches. Schools also need to provide ongoing training to improve teachers' digital literacy and support the optimal implementation of the Merdeka Curriculum, which emphasizes differentiated learning, creativity, and the development of 21st-century skills This study has several limitations. First, the scope of the research is limited to one elementary school so that the results cannot be generalized to a wider area. Second, the approach used is descriptive qualitative so that it has not quantitatively measured the effect of using interactive learning media on critical thinking skills. Future research should consider expanding the study to include multiple schools in different regions and adopt a mixed-methods or experimental design to quantitatively assess the effectiveness of specific types of media in improving critical thinking outcomes. Moreover, longitudinal studies are needed to examine the long-term impact of integrating technology into the classroom on students' cognitive and affective development. Based on the analysis of the research results, it is necessary to develop Augmented Reality (AR) media to improve critical thinking skills of grade IV students in elementary schools.

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