Journal of Elementary Education (JELEDUC)
Volume 2(2) 85 – 95, December 2025
E-ISSN: 3063-5330 (Online)
DOI: 10.38040/jeleduc.v2i2.1371
The article is published with Open Access at: https://jurnal.umla.ac.id/index.php/JELEDUC/index

Students' Critical Thinking skills: Analysis of fifth-grade IPAS subjects at MI Muhammadiyah 18 Sumberrejo Bojonegoro

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ABSTRACT

This study aims to analyze students' critical thinking abilities in the Natural and Social Sciences (IPAS) subjects at MI Muhammadiyah 18 Sumberrejo, Bojonegoro Regency. The background of the research is based on the low critical thinking skills of students, as seen from learning outcomes and learning processes that are still dominated by conventional methods. The study uses a qualitative descriptive method with a case study approach through data triangulation, including observations, interviews, and documentation studies of teachers and 53 fifth-grade students. The results of the study indicate that learning has not been student-centered, the use of media is less varied, and the use of technology is not yet optimal, so the five critical thinking indicators (focus, reasoning, inference, situation, and clarity) have not developed optimally. Documentation data also show that 75% of students scored below the Minimum Competency Criteria (KKM). These findings affirm the need for more interactive, contextual, and experiential IPAS learning innovations to enhance students' critical thinking skills. The research concludes that improving the quality of learning strategies is essential so that students can actively participate and develop higher-order thinking skills.

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

Received: 20 November 20205	*Revised: 14 December 2025*	*Accepted: 22 December 2025*	*Published:30 December 2025*

Citation (APA Style):

Khikmah, D. L. et al (2025). Students' Critical Thinking skills: Analysis of fifth-grade IPAS subjects at MI Muhammadiyah 18 Sumberrejo Bojonegoro. *JELEDUC: Journal of Elementary Education 2*(2), 85–95. DOI: 10.38040/jeleduc.v2i2.1371

INTRODUCTION

Basic education plays a strategic role in developing higher-order thinking skills in students, including critical thinking skills that are essential for facing the increasingly complex demands of the times (Karampelas, 2023). The skills of critical thinking belong to an individual as an opportunity to profoundly analyze information, evaluate the evidence impartially, reach sound conclusions, and develop an argument that can be supported (Rendi et al., 2024). Skills in critical thinking are the potential of a person to think intensively using activities like analysis, evaluation, and conclusion making based on the justified evidence. Critical thinking is not only the way of knowing information, but also the process of evaluating the truth, relevancy, and accuracy of such information in order to make the proper decisions. Thus, the critical thinking capabilities of students should be developed within the framework of an in-depth understanding process, in particular, in the modern time of the industry 5.0 society (Harun, 2021).

Not only is technological development in this 5.0 era concerned with automation, but also with the interplay between intelligence and human roles, thus the learning process must be more adaptive, creative, and analytical to students in this generation (H. P.S. Muttaqin et al., 2021). Learning no longer involves memorizing the concepts but requires one to be able to process the information, compare different sources of knowledge, and apply the technology wisely to address the real-life challenges. Thus, the enhancement of critical thinking becomes an essential requirement to ensure that the students can confront the challenges of the global environment, cooperate, and make the right decisions in complicated and dynamic circumstances (Kollo & Suciptaningsih, 2024). These indicators consist of five primary indicators, such as: (1) Focus: comprehending the specified problem, (2) Reason: presentation of factual/evidential grounds behind each step in the process of making a decision or conclusion, (3) Inference: making accurate, concise, and understandable conclusions, (4) Situation: using all available information that is pertinent to the specified problem, (5) Clarity: the ability to present their thoughts clearly, concisely, and understandably, (6) Overview: the ability to evaluate the validity of the conclusions drawn (Agustiani et al., 2022).

The fields of study are Natural and Social Sciences in the Merdeka Curriculum, which is a blend of the two sciences of study, viz., Science and Social Studies, offered in an integrated form to make the students learn the natural, social, and cultural phenomena in a holistic manner (Barlian et al., 2022). Natural and Social Sciences (IPAS) are part of the Merdeka Curriculum that is meant to enable students to learn different phenomena of nature and social life in an integrated way (Rahman & Fuad, 2023). By using a method, which focuses on exploration, observation and practical tasks, students will be motivated to analyze a problem in different ways. Students are also directly trained in critical thinking skills, as it is necessary to analyze information, ask questions, search evidence, and make logical conclusions (Taupik & Fitriani, 2021).

In the middle level of education, the children begin a stage of more mature cognitive development. Children between 9 and 12 years old start revealing the capacity to process the information in a more systematic and rational manner enabling them to comprehend the cause-effect connections in different learning situations (Mifroh, 2020). With this shift, they are able to do simple analyses, build arguments, and compare different information they come across in their day-to-day lives (Rizki, 2024). They are more likely to pose deeper questions, challenge the truth of facts and investigate phenomena that interest them. This scenario presents an excellent opportunity to educators to provoke critical thinking using problem-based learning or group discussions or experimental tasks (Taupik & Fitriani, 2021). Critical thinking is a key competency that should be acquired at a young age in the context of education in the 21 st century. To tackle complex issues, students require mentoring to learn how to resolve problems, make correct decisions, and perceive different sides of the problem (Rahim, 2023). Training children aged 9 -12 in critical thinking can enhance academic success; in addition, it is also significant in the formation of independent, responsible character and the capacity to contribute positively to the society (Kollo & Suciptaningsih,

2024). Schools can enhance the ready-to-adapt-to-social-technological-dynamics of this century with a generation of young and creative students who have the opportunity to enhance their analytical, reflective, and creative thinking processes (Puspitaningrum et al., 2025). Learning that is designed well will make students become active learners and able to assess information objectively and come up with innovative solutions to the problems around them (Asari et al., 2021).

PISA outcomes indicate that the level of critical thinking skills among elementary school students in Indonesia remains low (68) (Fatmawanti & Istihapsari, 2022). A study carried out by (Ayuningtyas & Eka, 2022) established that low critical thinking skills are among the consequences of the absence of varied learning strategies. The other study by (Rahman & Fuad, 2023) highlights that science learning should include activities that will make students observe, guess and problem solving.

Judging by the above explanation, one can conclude that more research on the low critical thinking skills among students should be done. This study aims to analyze critical thinking skills in the subjects of Science and Social Studies at MI Muhammadiyah 18 Sumberrejo, Bojonegoro Regency.

METHODS

The research method used in this study is a descriptive qualitative method with a case study approach through data triangulation. This approach combines various data collection techniques and different sources of information to obtain a comprehensive picture of the critical thinking abilities of fifth-grade students at MI Muhammadiyah 18 Sumberejo. The research was conducted on October 18, 2025, at MI Muhammadiyah 18 Sumberejo, located in Sumberejo Village, Sumberejo District, Bojonegoro Regency. The research subjects included the class teachers and fifth-grade students, consisting of 27 students in class VA and 26 students in class VB.

The data collection techniques in this study include observation, interviews, and documentation studies. Observation is used as a method to collect data through direct monitoring of ongoing activities. Interviews are conducted as part of a preliminary study with the aim of identifying research problems and obtaining more in-depth information from respondents (Sugiyono, 2023). The interview respondents consist of two teachers, namely the teachers of classes VA and VB, as well as four students randomly selected to represent both classes. Meanwhile, documentation studies are used to obtain data regarding conditions and situations at MI Muhammadiyah 18 Sumberrejo, Bojonegoro Regency. The instruments used in the data collection process include observation guidelines, interview guidelines, and documentation guidelines.

RESULTS

Considering the interview results conducted with the fifth-grade teacher of MI Muhammadiyah 18 Sumberejo, some significant information was obtained as follows: (1) MI Muhammadiyah 18 Sumberejo has already introduced the Independent Curriculum in two classes, i.e., IV A and IV B, and there were 53 students in the class; (2) the abilities of students in terms of the subject of the IPS remain relatively low because of the lack of focus in the process of learning. As a result, many students are not yet able to complete the tasks assigned by the teacher properly; (3) The low material mastery among students is influenced by their lack of concentration in learning, resulting in many of them being unable to complete the assigned tasks.

Observations at MI Muhammadiyah 18 Sumberejo indicate that there are several main factors causing the low critical thinking ability of students, particularly in the learning of Natural and Social Sciences. Although the learning process has been carried out according to the planned schedule, classroom practices are still dominated by the use of conventional methods and media. Teachers mostly apply the lecture method and use simple visual media such as pictures and textbooks, resulting in students not yet having opportunities for exploratory or in-depth learning experiences.

The learning media used are also not yet able to provide concrete and interactive stimulation, even though such learning experiences greatly influence the development of critical thinking skills. On the other hand, MI Muhammadiyah 18 Sumberejo actually has adequate technological facilities and good internet access. However, the use of technology in learning is still limited and has not been optimally integrated with Natural and Social Science materials. Teachers have not utilized technology as a means to create digital and interactive-based learning that can encourage active student participation.

Based on the results of a documentation study of the midterm scores of fifth-grade students at MI Muhammadiyah 18 Sumberejo, it was found that 75% of the 53 students (28 students) scored below the Minimum Competency Criteria (KKM) of 75, while only 25% (25 students) met the KKM. This indicates that the majority of students have not yet met the learning targets, particularly in relation to critical thinking skills. Therefore, a reference or criteria is needed to categorize students' levels of critical thinking ability based on these scores.

DISCUSSION

One of the primary competencies that students require to meet learning challenges and real-life situations is the critical thinking skills. This skill not only concerns the way an individual comprehends information, but also the way he or she analyzes, evaluates, and makes judgment with the help of logical evidence (Ariadila et al., 2023). Problem-solving skills are tightly connected with critical thinking since this mode of thinking enables people to develop solutions in a logical and orderly manner (Rendi et al., 2024). Critical thinking skills involve having the skill of assessing the information critically in three different steps, including analysis, argumentation and determining the degree of validity of the information. Such a person is able to grasp the underlying problems, pose appropriate questions, and see a problem in different ways. Furthermore, a critical thinker is also able to evaluate the accuracy of information, be unbiased, and make accountable reasoning (Manurung et al., 2023). Within the field of education, the development of critical thinking skills must become a learning process in which students are required to take active questions, inquire and discuss, challenge their ideas, and find solutions to the problems that they encounter (Husna et al., 2024). The increase in critical thinking ability of students will be further achieved by engaging students in problem-solving exercises. Students get to know how to relate the knowledge they possess to the requirements of the task, process information properly, and settle on the best actions to take to resolve the task (Nisa et al., 2025).

Critical thinking skills are very essential in IPAS learning particularly in activities that involve analysis and problem-solving. They must be capable of analyzing information conveyed in different natural and social processes, examine the connections between elements in an event and ponder on different possibilities prior to reaching conclusions (Simamora et al., 2022). Critical thinking enables students to learn concepts of IPAS in a way that is meaningful and applicable by linking them to real-life contexts, besides benefiting by having an understanding of the concepts (Zibar et al., 2025). Critical thinking skills, therefore, are not only useful in ensuring that students get improved learning outcomes, but also provide them with the skills of higher order of thinking that they require in real life. Such skills will provide the base on which students will become independent, creative learners who are prepared to embrace changes in the future (Robbani, 2025).

Critical thinking skills are one of the primary concerns in the learning process to enable the students tackle different issues that occur in the classroom and the real life (Abdullah & Munawwaroh, 2024). There is only a chance that critical thinking skills develop when students have access to receiving information that is verifiable, relevant, and factual (Nafisa & Afida, 2025). This suggests the significance of the learning strategy that will allow students to gain a deeper insight into other sources of knowledge (Asari et al., 2021). Learning has ceased to be focused on the imparting of theory by the teacher, but requires student participation. Interactive learning means that it is

possible to make students ask questions, analyze the phenomena under study, and gain a great sense of curiosity. This strategy has been found to increase the ability of students to think critically about the issues which come up during learning tasks (Adella & Marta, 2022). Learning media usage has become a significant phenomenon in the digital era and can be used to create more qualitative learning processes. The digital media does not just act as a support, but it also increases the involvement of the students, improves their learning motivation, and maximizes the growth of their cognitive skills (Hariyasasti, 2025). Learning media that is based on technology can be used to develop an efficient and meaningful learning experience (Melati. E. et al., 2023). Therefore, proper application of media in learning can play an important role in enhancing the ability of students to think critically. The media allows students to be trained to think logically, evaluate the information they are getting, make responsible decisions, and acquire the intellectual skills to solve many problems on their own (Jannah & Atmojo, 2022). The indicators consist of 6 major indicators, which are:

Criteria	Indicators
Focus	Thinking about the problem presented.
Reason	Giving factual/evidential explanations behind every action in arriving at a decision or conclusion.
Inference	The making of accurate conclusions.
Situation	Applying all pertinent details about the problem
Clarity	The capacity to make their thoughts clear, concise, and comprehensible
Overview	The ability to evaluate the validity of the conclusions drawn

(Agustiani et al., 2022)

Students are not only made to engage in critical thinking processes that require not only personal capabilities but also the directive in which the learning environment is constructed and operated. Learning is best achieved through a classroom setting that would enable students to pose questions, share views, and critically analyze information. Thus, educators should develop learning plans that put students at the forefront of learning processes and give them room to build their own knowledge (Prasetiyo & Rosy, 2020). Problem-based learning, group discussions, and independent concept exploration are one of the approaches that may be employed. Students are trained through these activities to observe, diagnose problems, make correlations and evidence-based conclusions. This does not only improve critical thinking but also makes students confident in decision making and problem solving (Kesi et al., 2024). Besides developing an active learning environment, the skill must be taught at a young age through purposely engaging methods, including discussions, comparison of concepts, and finding links between bits of information (Fatmawati et al., 2025).Besides the active learning environment, teachers must also provide the students with an opportunity to explore the idea, compare concepts, and find connections between bits of information (Fatmawati et al., 2025). Simple case analysis, an evidence-based discussion, and observing phenomena in their actual form are activities that can enhance the comprehensiveness of understanding a problem among students (Feriyanti et al., 2025). In these activities, the students do not just get the information but are also involved in the process of processing, structuring and analyzing the information that they obtain. In this way, it makes the learning process both meaningful since students learn to think systematically, purposefully, and independently (Rahmadani et al., 2023).

Students who attain good skills in critical thinking will find dealing with problems in different circumstances easier including dealing with IPAS learning. They will be better able to analyze solution steps, decide in the most relevant ways, and explain why the decisions were made. It is a process that enables students to become more adaptable and less disheartening when encountering different difficulties in comprehending natural and social phenomena (Dewi, 2021). Problem-based models and contextual strategies in IPAS learning have demonstrated to promote critical thinking skills since they prompt students to think critically and correlate it with actual experiences. Consequently, the learning innovations with the emphasis on active thinking processes, contextual approaches, and problem-solving should be introduced to enhance the outcomes of critical thinking and learning among students (Khasanah et al., 2025). On the whole, an education that aims at training critical thinking skills is vital in terms of making students become self-sufficient creative learners capable of overcoming the challenges posed by life. Studies on the critical thinking skills of students are required to present an actual picture of their preparedness and as a benchmark of teachers to enhance the quality of classroom learning (Rahmadani et al., 2023). Through critical thinking students are able to find alternative solutions having many different options and be more cautious in perceiving the problems they are working with. This skill is highly valued in IPAS learning since IPAS is a discipline that involves a combination of science and social concepts in real-life (Riatmo et al., 2025).

The IPAS learning is aimed to assist students to build scientific reasoning, problem solving based on the phenomena, and making logical connections between concepts. The introduction of IPAS learning into schools, however, continues to have several challenges, on the part of the teachers and the students. The approaches to IPAS by many students are that it is a complicated and uninterested topic and thus their motivation to learn is usually low (Ramadhan et al., 2024). Thus, students should be able to acquire a comprehensive and situational knowledge of IPAS concepts to make the process of learning easier. The role of the teacher here is quite decisive, where the teacher acts as a facilitator, who directs, guides, and sets up a learning environment that promotes the development of the critical thinking of students (Risandy et al., 2024). Knowing the fundamentals of IPS (social science and natural science), including natural phenomena, the environment, energy, or social interactions, becomes a starting point of students in addressing a range of issues that happen in their everyday life. It is the process of exploring real problems that can best spur the development of critical thinking skills (Azizah et al., 2020).

The understanding of concepts in IPAS does not just determine the learning success of students, but also contributes to the future skills of analyzing information, making conclusions and decisions using the data. So, educators should maximize the potential of students by engaging them in investigations and discussions and in basic experiments (Ramdani et al., 2020). These and many other challenges make innovation in presenting IPAS material a need. Educators should apply various models of learning, strategies, and learning media that have the potential to make the learning process more meaningful to students (Meylovvia & Julianto, 2023). Learning media has gained a strategic role in the digital era. Information and communication technology is fast growing enabling delivery of science subjects to be more interactive, engaging and easy to comprehend. Learning media are also used to deliver instructional messages, which assist teachers in developing a more efficient and meaningful teaching and learning process among students (Hidayat et al., 2024).

The research results obtained through observation, interviews, and document studies indicate that the critical thinking skills of fifth-grade students in Science learning at MI Muhammadiyah 18 Sumberejo Bojonegoro are still considered low. This low ability is related to the learning process, which is not yet student-centered, as teachers tend to use monotonous and less varied methods. In Science learning, students are rarely actively involved, either in asking questions or giving responses, so the indicators of critical thinking skills have not been fulfilled. In addition, many students experience difficulties when asked to solve problems in the context of IPAS. They are not yet able to explore various alternative solutions based on their own reasoning.

Research results from (Yulianti et al., 2025), which revealed that students' low problem-solving skills are influenced by a lack of interest in learning as well as weak thinking abilities. Thus, the aspect that needs to be the main focus in IPAS learning is the development of students' critical thinking skills. IPAS learning has great potential to stimulate this ability, because through investigative activities, analysis of phenomena, and problem-solving based on science and the surrounding environment, students are required to use higher-order thinking processes, which are an important part of critical thinking skills.

The problem-solving process is one of the important indicators of critical thinking skills. Through IPAS learning, students are trained to find solutions independently, enabling them to apply these solutions to various contextual problems in daily life. This reasoning is based on the constructivist theory proposed by Jean Piaget, which developed from the cognitive learning approach (Mifroh, 2020). The constructivist approach to IPAS learning is intended to enhance the knowledge of students about the science, environmental and social concepts in a holistic way. The model is closely associated with discovery-based learning and meaningful learning, where the key focus is to nurture the thinking process of students. In constructivism, it is common to provide the students with the opportunity to actively create knowledge through teacher-designed learning experiences based on the corresponding curriculum (Suryana et al., 2022).

Merdeka Curriculum is the refresher of the Indonesian education system that aims at reinforcing the competencies and character of students. This curriculum was designed to respond to the needs of the contemporary world where technological, economic, and social changes take place very fast. As such, the learning orientation has ceased to focus solely on the process of content mastery but also on the students capacity to understand, process as well as apply the information in the most effective manner (Kollo & Suciptaningsih, 2024). The development of 21 st -century skills that are critical thinking, creativity, collaboration, communication, and digital literacy is one of the primary goals of the Independent Curriculum. These skills will be needed in order to ensure that the students are able to confront the challenges of the global environment and cope with different novel situations. This curriculum focuses on flexible and student-centered learning and promotes meaningful learning experience (Utari & Muadin, 2023). When considering learning, teachers are facilitators who aid students to gain reasoning capabilities and problem solving. Learning is focused on linking concepts to real life in a manner that the students are able to understand the relevancy between the learning and the surrounding. The strategy equips a student with room to discover their capabilities, collaborate, and gain knowledge via exploratory tasks (Utari & Muadin, 2023). Enhancing 21st-century skills is also aligned to the six dimensions of the Pancasila Student Profile particularly in critical reasoning dimension. This dimension focuses on the significance of the capacity of students to analyze information, identify pattern, make decisions, and offer responsible reasoning. The Merdeka Curriculum therefore does not just equip students with the required expertise to become academically competent but also to become adaptive and independent people who are capable of taking the challenges of the future (Palihah & Andriany, 2024).

CONCLUSION

Through the outcomes of the studies carried out in the form of observation, interviews, and documentation studies, one can make a conclusion that the critical thinking skill of fifth-grade students in IPAS learning remains relatively low. This poor ability can be seen in the indicators that have not been met like understanding problems, giving evidence-based reasons, making accurate conclusions, and using information wisely, and articulating ideas. In fact, IPAS learning can tremendously enhance the ability of students in critical thinking since it involves activities that entail investigation, analysis of phenomena, and resolution of problems as influenced by the surrounding environment. The potential has, however, not been exploited. These barriers are also strengthened by low interest towards learning, inadequate learning media and less varied teaching strategies.

Critical thinking skills of students can really be improved through problem-based learning models, group discussions, and the application of digital media, in a constructivist approach. This falls in line with the requirements of the Merdeka Curriculum which focuses on reinforcing 21 st century competencies, particularly in the area of critical thinking. Therefore, it is a critical point to enhance the quality of IPAS learning and shape the students who will be independent, adaptive, and able to confront real life challenges.

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