*25 (3), 2024, 1113-1132*

**Jurnal Pendidikan MIPA**

e-ISSN: 2685-5488 | p-ISSN: 1411-2531

http://jurnal.fkip.unila.ac.id/index.php/jpmipa/

# Learning Readiness toward Critical Reasoning Skill of Third Grade Students in Social Science Learning

**Dwi Cahyaningtyas[1*], Vina Anggia Nastitie Ariawan[2], Akbar Al Masjid[1], Ana Fitrotun Nisa[1], & Berliana Henu Cahyani[1]**

[1]Elementary Education Study Program, Universitas Sarjanawiyata Tamansiswa, Indonesia

[2]SDN Bantarmangu 01, Jawa Tengah, Indonesia

**Abstract: Learning Readiness toward Critical Reasoning Skill of Third Grade Students in Social Science Learning. Objective:** This research aims to analyze the relationship between learning readiness and the critical reasoning skill third grade students in social science learning. **Method:** This research used quantitative research methods with a correlation research type. The population in the study were third grade elementary school students in Jogonalan sub-district. Meanwhile, the research sample used a convenience sampling technique with a sample size of 30 students. The data validity test used construct validity tests, while the data analysis technique used statistical inference tests. **Findings:** The research results show that there are students with good learning readiness but whose critical reasoning skill have not yet developed. Then, there are students with moderate learning readiness but whose critical reasoning skill develop as expected. Lastly, there is a linear relationship between good learning readiness and critical reasoning skill which develop as expected. The learning preparation of third grade students obtained an average score of 82 in the good category, while the critical reasoning skill of third grade students obtained an average score of 80 in the developing category. **Conclusion:** Based on the research results, the researcher concluded that there was a positive relationship between learning readiness and the critical reasoning skill of third grade students in social science learning.

**Keywords:** social science, learning readiness, critical reasoning skill, primary school.

## ▪ INTRODUCTION

Family education is the first education that humans receive starting from the basics (Fanny, 2022). Family education has become a determinant for a child's future. Of course, family education makes parents become teachers. Therefore, parents today must be able to keep up with technological developments and global social changes because a child needs to interpret new things around him. However, this must be in harmony and consistent with what is learned at school. If there is no consistency between the values that students learn or witness at school and in the family, then conflict occurs and this situation causes personality disorders (Yaşaroğlu, 2016). Parent educational attainment, for example, is often a stronger predictor of parental beliefs and behaviors, whereas family income is more closely associated with the provision of material resources (Davis-Kean et al., 2019). A growing number of studies have followed this practice, and accumulating evidence points to parent educational attainment as being the more powerful predictor of children's cognitive and academic outcomes (Davis-Kean et al., 2021)

Furthermore, school education is the second place for children's development. In schools, teachers are the main actors and can be said to be substitutes for parents, who are obliged to continue character education, knowledge and other skills. Teachers in the millennial era must be able to provide character education that shapes students into people who are open and willing to accept differences, because differences are not wrong and

Dwi Cahyaningtyas
*Email: dwicahy085041@ustjogja.ac.id

DOI: http://dx.doi.org/10.23960/jpmipa/v25i3.pp1113-1132
Received: 21 November 2024
Accepted: 06 December 2024
Published: 09 December 2024

cannot be avoided. Values education is an important part of school. In the public school system, there have been efforts to construct and implement values based curricula that reflect naturalistic or social morality (Etherington, 2013). Lastly is society, the realm of education is an important place because of the continuation of a human being at the stage after school education. Society also has educational responsibilities, such as in the realm of family education and school education because society is a collection of individuals and groups bound by the unity of state, culture and religion. Therefore, society must be able to maintain harmony between individuals and groups (Fanny, 2022).

The process of character building for students as the nation's successors needs to be instilled from the moment they are born. Education for students as the nation's successors, this needs to be instilled from birth. Education will provide guidance to all the natural strengths that exist in all students so that they can obtain the highest possible safety and happiness both as individuals and as part of society. In Law of the Republic of Indonesia Number 20 Article 3 of 2003, it is stated that national education functions to develop and shape the character of a dignified national civilization as an effort to educate the life of the nation, develop the potential and skill of students and shape them into individuals who believe, have noble character, are knowledgeable, capable, creative, be independent and become democratic and responsible citizens. Ki Hadjar Dewantara stated that character education is an effort to improve character, mind and body to promote a life in harmony with nature and society (Mery et al., 2022).

In Indonesia Kurikulum Merdeka reorganizes educational units with the objective of enhancing cognitive and non cognitive learning outcomes, ultimately aiming to cultivate the Profil Pelajar Pancasila (Ellianawati et al., 2024). The Profil Pelajar Pancasila is in accordance with the Vision and Mission of the Ministry of Education and Culture (Ministry of Education, Culture, Research and Technology) as stated in the Minister of Education and Culture Regulation Number 22 of 2020 concerning the Strategic Plan of the Ministry of Education and Culture for 2020-2024, that Profil Pelajar Pancasila is the embodiment of Indonesian students as lifelong learners who have global competence and behave in accordance with Pancasila values, with the six main characteristics of faith, devotion to God Almighty and noble character, global diversity, mutual cooperation, independence, critical reasoning and creativity (Rusnaini et al., 2021). One of the Profil Pelajar Pancasila that is the focus of this research is critical reasoning skill.

Students who reason critically are able to objectively process both qualitative and quantitative information, build relationships between various information, analyze information, evaluate and draw conclusions. The elements of critical reasoning are obtaining and processing information and ideas, reflecting on thoughts and thinking processes and making decisions. Critical reasoning is a skill that can help in making decisions independently (Pandu et al., 2023). Critical reasoning can be defined as the process and skill used to understand concepts, apply, synthesize, and evaluate information obtained or information produced. Critical reasoning is the skill to reason that uses the process of analysis and evaluation in a problem, thereby producing the right decision in solving the problem. Critical reasoning is decision making based on evidence and logical reasons (Kaharudin et al., 2023).

Critical reasoning skill is a critical thinking activity. Critical reasoning skills enable the skill to analyze and evaluate evidence, identify questions, logical conclusions, and

understand the implications of arguments. Several reasons for the need for critical reasoning skills in students are 1) knowledge based on memorization will not last long, 2) the rapid spread of information so that individuals need skill that can solve complex problems, and 3) modern society is able to combine information from various sources and make a decision. Critical reasoning skills are important for students to have to solve the problems they face, face challenges, be able to make the right decisions so they are able to face the challenges of the era of globalization. Critical thinking skills cannot just be possessed and improved, but need to be given practice and habituation by being faced with real problems that must be solved. Students who are often faced with real problems in life can be stimulated to think so that their critical reasoning character can improve (Rahmawati et al., 2023). Learning to think critically needs to be recognised as a developmental process that students can acquire only gradually. This view of critical thinking as a developmental process is inherent in some definitions such as reasonable reflective thinking focused on deciding what to believe or do. Critical Thinking has three phases analysis, assessment and upgrading thinking, in order to reach newer and better thinking and to develop creativity as a by product of critical thinking (Gunawardena & Wilson, 2021)

Student's thinking skill are empowered by their skill in thinking clearly and rationally. Critical thinking is one of the higher order thinking skill that enable someone to make a decision and conduct an appropriate action. Critical thinking help students to be autonomous and proficient in problem solving. Critical thinking skills are essential and beneficial for every individual, especially in the field of education. Therefore, critical thinking skills are not only needed in school but also in the workplace in the future because these skills can improve one academic performance and success in life (Fitriani et al., 2020). Critical thinking is a kind of mental process where individuals purposefully act, the repetition of the usual patterns and stereotypes are prevented, prejudices, assumptions and all kinds of information presented are tested evaluated, judged and the different aspects, expansions, meanings and results are discussed. It is a way of thinking in which logic, comparison and reasoning are used and as a result, certain ideas, theories or behaviours are reached (Akpur, 2020).

During the reasoning process, students will associate the problem being investigated with their previous knowledge so that new knowledge will emerge which will be integrated with the theory or material being studied. Meanwhile, according to Piaget, the reasoning process is a skill used to prove a certain conclusion in scientific investigation activities. This process includes the skill to relate observed phenomena to scientific theories to predict likely outcomes (Zulkipli et al., 2020). The process of developing students' critical reasoning cannot be done instantly because critical reasoning requires a stimulus that is used by the teacher as a trigger for students to think. Students' critical reasoning skill are greatly influenced by each student's learning readiness so that teachers will easily provide appropriate treatment to improve critical reasoning skill according to the student's stage of readiness. If students have good learning readiness, they can participate in learning actively and easily absorb the lessons taught during the learning process.

Readiness to learn is a condition felt directly by students in the context of carrying out a learning process aimed at changing behavior and trying to increase the potential that exists within students. Learning readiness can also be described as a student's condition

related to certain learning objectives. Learning readiness can be categorized into several types, such as attention, motivation, and increased readiness (Fathoni & Sobandi, 2020). If students have mature readiness, then students will find it easier to deepen the subject matter and concentrate in the learning process. Readiness to learn is something that students need to pay attention to, because thorough preparation makes it easier for them to concentrate on studying (Marlina & Aini, 2023).

In the Kurikulum Merdeka, learning natural sciences is integrated with social sciences to become science. This is done so that students can be motivated to carry out environmental and social management simultaneously. The scope of learning in science subjects is the interaction between living and non-living things in the universe and their interactions, and human life as individual and social creatures who interact with the surrounding environment. Meanwhile, the objectives of learning sciences in this curriculum are to develop interest and curiosity, play an active role, develop inquiry skills, understand oneself and one's environment, and develop knowledge and understanding of scienceas concepts. Science is a science that studies living and non-living things in the universe and examines human life as individuals and social creatures who interact with their environment (Darniyanti et al., 2023).

IPAS is a group of social science material that collects organizing knowledge about social and natural phenomena. In the Kurikulum Merdeka, the social science learning concept contains all aspects related to knowledge to be able to deal with local, national, world regional, social, economic, environmental and ethical issues and assess them critically. Developments in the science and science field in elementary schools should be planned and prepared to motivate and raise questions (BK & Hamna, 2023). Furthermore, students can identify relationships between previously acquired knowledge and can find out how the concepts of science and technology found in the surrounding environment are interconnected in everyday life. Students are categorized as having mastered the learning material if they are able to solve the challenges they face in everyday life. Students can provide suggestions regarding ideas or reasoning, investigate, conduct experiments, communicate, provide conclusions, reflect, as well as implement and follow up related to the inquiry process that has been carried out (Kusumaningpuri, 2024). Consequently, there is a role for social science education in realizing the Profil Pelajar Pancasila as an ideal image for student profiles in Indonesia.

Because the IPAS is a subject that has just been introduced to third grade elementary school students, it is necessary to have a learning readiness, especially to develop students' critical reasoning which is expected to be formed through the science as a subject. Results of previous research by (Mustiko & Trisnawati, 2021) regarding the influence of student learning readiness on student learning outcomes, it shows that there is an influence of learning readiness on learning motivation so that the more prepared students are in participating in learning, the higher their learning motivation. Then research by (Zuschaiya et al., 2021) which aims to determine the effect of learning readiness and numeracy skills on mathematics learning outcomes. The sample in this research was class fifth grade students at MI Islamiyah Bumiayu who were selected using purposive sampling techniques. The method used in this research is a quantitative research method with documentation, questionnaires and test data collection techniques. The research instruments, namely tests and questionnaires, were analyzed using multiple regression analysis. The results of the research show that there is an influence between

learning readiness and mathematics learning outcomes, and there is an influence between numeracy skill and mathematics learning outcomes with a large influence of both of them amounting to 88%. Referring to the results of previous research, the researchers conducted research with the aim of measuring the influence of learning readiness on the critical reasoning skill of third grade students in social science learning.

## ▪ METHOD

### Participants

The population in the study were third grade elementary school students with a total of 30 students. The sampling technique in the research used purposive sampling technique. Purposive or judgmental sampling is a strategy in which particular settings persons or events are selected deliberately in order to provide important information that cannot be obtained from other choice (Hamed Taherdoost, 2016). It is where the researcher includes cases or participants in the sample because they believe that they warrant inclusion (Firmansyah & Dede, 2022). The research sample were 30 students at Jogonalan Subdistrict.

### Research Design and Procedures

One important type of research in education is correlational research, which examines the relationships between various variables without trying to influence those variables. In the world of education, the relationship between various elements such as teachers, students, subject matter, and learning evaluation can be analyzed scientifically and statistically through correlational research methods. Correlational research is research to determine the relationship and level of relationship between two or more variables without any attempt to influence these variables so that variables cannot be manipulated. Correlational research refers to a non-experimental determination method that studies the relationship between two variables with the help of statistical analysis. Correlational does not study the effect of external variables on the variables studied (Hasbi, 2023). Based on this explanation, the researcher used correlation research because the aim was to measure how much influence the social science learning readiness of third grade studentshad on critical reasoning skill. Meanwhile,

### Instruments

Data collection techniques in this research used test techniques and non-test techniques. Test techniques are used to measure students' critical reasoning abilities. The test technique used is a description test with a total of 9 questions. The indicators used in assessing critical reasoning skill refer to the Profil Pelajar Pancasila which is in accordance with recommendations from the government. The following are indicators of the critical reasoning skill of third grade students.

**Table 1.** Critical reasoning skill instrument for third grade students

| No | Elements | Sub-elements | Indicators | Sub-indicators |
|---|---|---|---|---|
| 1. | Obtain and process information and ideas | Ask questions | Asking questions to identify a problem and confirm understanding of a problem regarding | Students ask questions to overcome their doubts in solving problems |

| | | | | |
|---|---|---|---|---|
| | | | oneself and the surrounding environment. | |
| 2. | Obtain and process information and ideas | Identify, clarify, and process information and ideas | Collect, classify, compare and select information and ideas from various sources. | • Students are able to collect information based on images or text<br>• Students are able to classify types of energy<br>• Students are able to compare the condition of an ecosystem in the picture |
| 3. | Analyze and evaluate reasoning and procedures | Analyze and evaluate reasoning and procedures | Explain the reasons that are relevant in solving problems and making decisions | • Students are able to explain problems that arise due to ecosystem damage or energy-wasting behavior<br>• Students are able to explain what must be done to prevent ecosystem damage and save energy |
| 4. | Reflection of thoughts and thought processes | Reflection of thoughts and thought processes | Say what you are thinking and explain the reasons for what you are thinking | • Students are able to express their opinions regarding the behavior shown in the picture<br>• Students are able to explain the reasons for their opinions regarding the behavior shown in the picture |

The first indicator is asking questions which are assessed based on the teacher's observations of students who dare to ask questions related to test questions or material they do not yet understand. For example, students ask about difficult terms in a description test. The second indicator is identifying, clarifying and processing information and ideas. This indicator consists of 3 questions with example questions identifying the biotic and abiotic components contained in the image. Then the third indicator is analyzing and evaluating the reasoning and procedures. This indicator consists of 4 questions with examples of students analyzing ecosystem problems and energy use contained in the picture and writing their opinions regarding ecosystem conditions and energy use. The fourth indicator is reflecting and evaluating their own thinking which consists of 2 questions with examples of students explaining the reasons

related to the problem solving they chose.

Testing the validity of the data in this research uses a construct validity test or a measuring instrument that has several indicators is needed to measure the construct. If there is a measuring instrument that has several aspects and each aspect is measured by several indicators, similar indicators must have a positive association with each other. On the other hand, these indicators should have a negative association with other indicators if they measure different or opposite aspects. Apart from using data validity tests, researchers also carry out reliability tests, which is a coefficient that shows the extent to which an instrument or measuring device can be trusted, meaning that if an instrument is used repeatedly to measure the same thing, the results are relatively stable or consistent (Ida & Musyarofah, 2021). The results of data validity and reliability tests using SPSS 23.0 are shown in table 2 below.

**Table 2.** Validity test on critical reasoning skill questions

| No | Item | Significance | Explanation |
|---|---|---|---|
| 1. | Item 1 | 0.720 | Valid |
| 2. | Item 2 | 0.677 | Valid |
| 3. | Item 3 | 0.833 | Valid |
| 4. | Item 4 | 0.753 | Valid |
| 5. | Item 5 | 0.838 | Valid |
| 6. | Item 6 | 0.802 | Valid |
| 7. | Item 7 | 0.710 | Valid |
| 8. | Item 8 | 0.758 | Valid |
| 9. | Item 9 | 0.824 | Valid |
| 10. | Item 10 | 0.820 | Valid |

The number of students who took the test was 30 so the r table in the data validity test was 0.361 with a significance level of 5%. If the significance value is greater than 0.361 then the data is declared valid, whereas if the significance value is smaller than 0.361 then the data is declared invalid. The results of the Validity Test on Critical Reasoning Skill Questions show a significance value greater than the r table so that all questions are declared valid. Meanwhile, the reliability test result was 0.778 so the critical reasoning ability questions had high reliability.

Meanwhile, students' social and science learning readiness was measured using non-test techniques in the form of filling out a science and natural sciences learning readiness questionnaire. This questionnaire consists of 25 statements developed by researchers by paying attention to indicators of readiness to learn social science. Indicators of student learning readiness include physical readiness, psychological readiness, material readiness, as well as knowledge and attitudes. The physical readiness indicator consists of 7 statements; indicators of psychological readiness, material readiness, and knowledge and attitudes each consist of 6 statements. The instrument for students' social science learning readiness is shown in table 3 below.

**Table 3.** Learning readiness instrument for third grade students

| No | Indicators | Number of Statements |
|---|---|---|
| 1. | Physical readiness | 7 |
| 2. | Psychological readiness | 6 |

| | | |
|---|---|---|
| 3. | Material readiness | 6 |
| 4. | Knowledge and attitudes | 6 |

The number of students who took the test was 30 so the r table in the data validity test was 0.361 with a significance level of 5%. If the significance value is greater than 0.361 then the data is declared valid, whereas if the significance value is smaller than 0.361 then the data is declared invalid. Meanwhile, the reliability test results obtained 0.647, which means the question is in the moderate category.

**Table 4.** Validity test results of the learning readiness questionnaire

| No | Item | Significance | Explanation |
|---|---|---|---|
| 1. | Item 1 | 0.540 | Valid |
| 2. | Item 2 | 0.860 | Valid |
| 3. | Item 3 | 0.363 | Valid |
| 4. | Item 4 | 0.651 | Valid |
| 5. | Item 5 | 0.651 | Valid |
| 6. | Item 6 | 0.651 | Valid |
| 7. | Item 7 | 0.362 | Valid |
| 8. | Item 8 | 0.456 | Valid |
| 9. | Item 9 | 0.392 | Valid |
| 10. | Item 10 | 0.397 | Valid |
| 11. | Item 11 | 0.681 | Valid |
| 12. | Item 12 | 0.774 | Valid |
| 13. | Item 13 | 0.434 | Valid |
| 14. | Item 14 | 0.467 | Valid |
| 15. | Item 15 | 0.422 | Valid |
| 16. | Item 16 | 0.463 | Valid |
| 17. | Item 17 | 0.758 | Valid |
| 18. | Item 18 | 0.856 | Valid |
| 19. | Item 19 | 0.664 | Valid |
| 20. | Item 20 | 0.392 | Valid |
| 21. | Item 21 | 0.497 | Valid |
| 22. | Item 22 | 0.465 | Vaid |
| 23. | Item 23 | 0.398 | Valid |
| 24. | Item 24 | 0.774 | Valid |
| 25. | Item 25 | 0.720 | Valid |

**Data Analysis**

Furthermore, the data analysis technique in this research used statistical inference tests. The first stage is to carry out a prerequisite test in the form of a normality test, then if the results are normal then proceed with the Spearman correlation test, whereas if the normality test results are not normal then proceed with the Pearson correlation test. Then proceed with a data linearity test to measure whether there is a linear relationship between the dependent variable and each independent variable to be tested. Test the research hypothesis using the correlation test were analyzed using the Statistical Product and Service Solutions (SPSS) program.

## ▪ RESULT AND DISSCUSSION

This research aims to examine the relationship between students' learning readiness and the critical reasoning skill of third grade students in social science learning. Researchers used a questionnaire to measure students' learning readiness in learning science. The following is a table of student learning readiness results in terms of readiness categories.

**Table 3.** Learning readiness results

| No. | Interval scores | Percentage (%) | Explanation |
|---|---|---|---|
| 1 | 86-100 | 43 | Very good |
| 2 | 71-85 | 40 | Good |
| 3 | 66-70 | 17 | Moderate |
| 4 | 41-65 | 0 | Poor |
| 5 | 25-40 | 0 | Low |
| | **Average scores** | **82** | **Good** |

Table 3 shows that of the 30 third grade students whose readiness was in the good category, there were 5 students, whereas if calculated the average student learning readiness score was 82, so the researcher concluded that third grade students had good learning readiness in learning social science. Then the researcher classified students' learning readiness in terms of the learning readiness indicators in table 4 below.

**Table 4.** Student learning readiness based on indicators

| No. | Interval scores | Percentage (%) | Explanation |
|---|---|---|---|
| 1 | Physical readiness | 92 | Very good |
| 2 | Psychological readiness | 74 | Good |
| 3 | Material readiness | 78 | Good |
| 4 | Knowledge and attitudes | 81 | Good |

Table 4 explains students' learning readiness scores based on indicators. Referring to the table, physical readiness has the highest score which proves that third grade students at the research school are physically ready to take part in science learning. Then the lowest score was obtained from the psychological readiness indicator which indicated that third grade studentsat the research school were psychologically quite ready to take part in learning. Based on the results of the questionnaire analysis carried out by third grade students, they stated that they were less interested and felt less interested in learning science and technology. Furthermore, regarding material readiness, third grade students scored slightly above psychological readiness with a statement explaining that third grade students did not easily remember science material because it was not relevant to their daily lives. Meanwhile, in terms of knowledge and attitude indicators, third grade studentsare actively involved in learning and teachers have provided learning resources that arouse students' interest in learning. After measuring learning readiness, researchers measured students' critical reasoning skill as listed in table 5.

**Table 5.** Critical reasoning skill

| No. | Interval score | Percentage (%) | Explanatiom |
|---|---|---|---|
| 1 | 86-100 | 37 | Developing as Expected |

| | | | |
|---|---|---|---|
| 2 | 71-85 | 40 | Developed |
| 3 | 66-70 | 10 | Poor developed |
| 4 | 41-65 | 13 | Under developed |
| | **Average scores** | **80** | **Developed** |

Based on table 5, the researcher concluded that 11 of third grade students had critical reasoning skill in the developing stage as expected, while 4 third grade students had critical reasoning skill in the underdeveloped stage or needed special guidance. Students' critical reasoning skill obtained an average score of 80, so the researchers concluded that third grade students had critical reasoning skill in the developing stage. Then the critical reasoning skill reviewed based on sub-elements can be seen in picture 1 below.

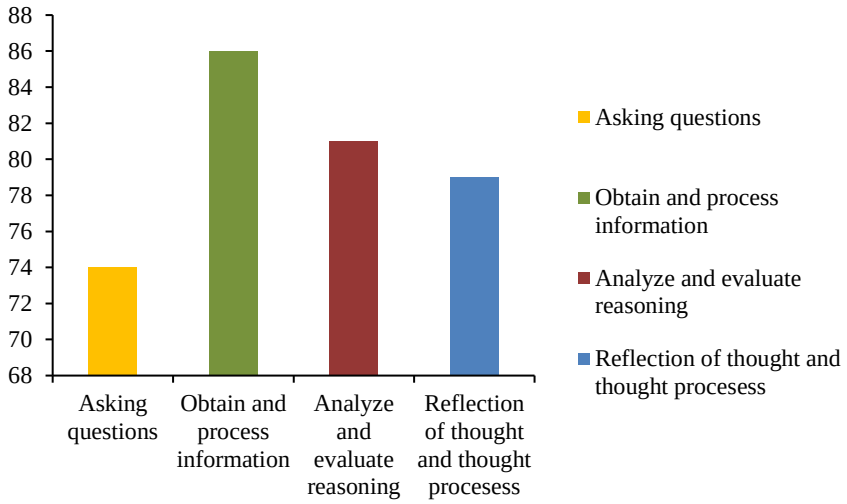


**Figure 1.** Critical reasoning skill of thord grade students

Based on picture 1, the researcher concludes that the sub-element asking questions has a score of 74 and occupies the lowest score even though it is in the developing category. Then the sub-element reflects and evaluates its own thoughts with a score of 79 and occupies the second lowest score. Meanwhile, the sub-element identifying, clarifying and processing information and ideas has a score of 86 with the category developing as expected. After analyzing students' learning readiness and students' critical reasoning skill descriptively, the researcher then carried out statistical inference tests. In this research, data was found in the form of students having good learning readiness, but students' critical reasoning skill were still in the underdeveloped category. This is because students already have readiness to learn, but they need adaptation to work on questions related to critical reasoning. Students feel hesitant to answer because they have never received material and questions with this type of description and including opinions. As stated by (Kearney & Garfield, 2019) who explains that good student learning readiness will indeed influence student learning motivation, but there are things that also influence student learning readiness, namely the student's ability to understand the character of the questions. Students feel hesitant to ask things they don't understand, so the sub-element of asking questions has the lowest score among several indicators. (Cojocariu & Butnaru,

2014) stated that one way to develop students' critical reasoning abilities is by students learning to ask questions.

Based on statistical inference test, the researcher concluded that the normality test obtained a sig value of 0.452 > 0.05 which indicates the data was normally distributed. Then, the researcher carried out a linearity test between learning readiness and critical reasoning skill of third grade students. The linearity test obtained a sig value 0.079 > 0.05 which indicates there was an equal regression line between the student learning readiness variable and the student critical reasoning skill variable in social science learning. Because the results of the normality test were normally distributed, the researcher carried out a Spearman correlation test to measure the existence of a relationship between learning readiness and critical reasoning skill. Based on the results of the correlation test obtained a sig value of 0.000 < 0.05, the researchers concluded that there was a correlation between students' learning readiness and the critical reasoning skill of third grade students in learning social science.

Learning readiness is very important as a basis for the learning process because without maximum learning readiness it will have an impact on the learning process. If students are ready to carry out learning, it will have an impact on learning achievement in accordance with the predetermined phases. On the other hand, if students are declared not ready to learn, this will affect the learning process and reduce their learning motivation (Jumasrin, 2019). Along with that, (Kokkalia et al., 2019) states that learning readiness is a factor that needs to be considered for students' academic development. Readiness to learn in elementary school students will influence the acquisition of skills, knowledge and attitudes that will provide students with preparation for learning and fulfilling life skills in the next stage.

Factors that shape learning readiness include equipment and physiological growth such as completeness of body parts, sensory organs, and intellectual capacity. The physical development of elementary school students includes biological growth, for example the growth of the brain, muscles and bones. If a student's physical development develops well, it will affect their motor skills. Likewise, for students whose physical development is impaired, this will impact the child's motor skills. These basic motor skills act as a foundation for skills. Apart from that, many skills depend on basic skill. Motor skills play an important role in every activity. Good motor skills can make a person do all their activities well. If these motor skills are impaired, it will hinder other skill, such as the skill to socialize and the skill to carry out daily tasks or activities (Fikriyah, 2021). The results of this research show that the physical readiness of third grade students is in the very good category, meaning that in terms of physical readiness, all students have a complete physical condition, even though while taking part in the lesson, some are in an unhealthy condition and there are students who are left-handed.

Meanwhile, psychological readiness is a student's emotional mental readiness which is characterized by students being able to convey feelings with the right words and language, students being able to make eye contact when speaking, students being able to behave politely, not showing aggressive behavior, being willing to join in activities with peers, and willing to share equipment and toys with friends (Fitria, 2023). In this research, students' psychological readiness in learning is seen from students' anxiety and interest in participating in social science learning. If students have poor psychological readiness, they tend to have no interest in participating in learning, easily forget the material that has

been given, and feel pressure in participating in learning. It's different if they have good psychological readiness, they easily accept learning and try hard to actively participate in learning.

In this research, students' psychological readiness received the lowest score in students' learning readiness. This is shown by the results of filling out the questionnaire which states that students feel less interested in learning science and science, easily forget the material they have studied, and find it difficult to understand the material given. Researchers conducted simple interviews with students to ask why they were not interested in studying science. Almost all students answered that the science material was not easy to understand because there were many foreign terms that they did not know, especially for natural science material which had scientific terms. Based on the research findings, (Çökük & Kozikoğlu, 2020) explains that students' unpreparedness in receiving learning is characterized by students often not coming in if there is lesson material they don't like, students not having the desire to complete assignments, students expecting the teacher to provide assistance in completing assignments, students not being interested in answering every question prompted by the teacher. This unpreparedness for learning can occur because students enter a new environment so they need time to adapt. Third grade students also showed similar behavior because the social science material was new material for them so they needed to adapt to learn it.

Students with positive attitudes will be more motivated to learn, while students with negative attitudes will hinder learning. This is in line with Cudney and Ezzell (2017) who states that motivation is an important factor in education because it encourages students to produce meaningful work and fosters a desire for lifelong learning. Learning motivation is an internal encouragement of a person to learn to reach optimal learning achievement. Students with high learning motivation will put aside undesired feelings to get satisfaction in the learning process (Atma et al., 2021).

Then, students' material readiness in learning science and science received a score that was not much different from students' psychological readiness. Material readiness is related to students' psychological readiness, so it appears that the results of filling out the student learning readiness questionnaire have almost the same scores. Material readiness is related to students' academic readiness in learning. Academic readiness is a student's skill to read, write and calculate according to phase achievements (Halmatov, 2018). Third grade students already have the skill to read and write, but they do not yet have such good reading comprehension skills that this affects learning which requires critical reasoning to solve simple problems. Furthermore, (Halmatov, 2018) explained that although academic readiness is an important factor to support successful learning, there are several indicators that are more important for increasing students' academic readiness, such as students' skill to share their difficulties with the teacher and students' skill to adapt in learning new material. In this study, third grade elementary school students already had academic skill in the good category as demonstrated by their courage to ask questions about things they did not understand.

Knowledge and attitude readiness are learning activities carried out by students. Knowledge and attitude readiness is demonstrated by the use of media and learning resources that students use to solve problems, students read material independently, and discuss with friends to find solutions to problems. Based on the research results, knowledge and attitude readiness received the second highest score. Students think that

social science learning at school involves a lot of activities or active student participation. Students have the opportunity to access material using media, varied learning activities, and involving students in the use of technology. Such learning activities are in accordance with Ki Hadjar Dewantara's educational philosophy, which emphasizes that education provides direction to all the natural potential that children have so that they are able to achieve the highest safety and happiness, both as individuals and as part of society (Arzfi & Jamna, 2024).

In the Kurikulum Merdeka , as an effort to achieve learning goals, teachers need to carry out learning by involving three student learning styles known as visual, audio, kinesthetic learning styles, or a combination of both or three learning styles. Learning by paying attention to students' learning styles is one way to make it easier for students to understand the material provided. For example, for students with a visual learning style, the teacher can present material on printed slides because students like to observe writing and images independently. Then, students with an audio learning style can provide learning using learning videos or the teacher explains the material directly on slides because they like to optimize their hearing. Meanwhile, students with a kinesthetic learning style can learn by doing quizzes or simple games to fulfill their desire to move (Munna & Kalam, 2021). Therefore, to support students' learning readiness, the teacher's role in presenting learning is very influential. Learning by implementing innovative learning strategies or models, varied learning media, and actively involving students will have an impact on students' psychological and material readiness.

Basically, social science learning for elementary age children is still integrated and has not been separated in detail, such as physics, biology and chemistry subjects which prioritize integration and interconnection. This is because IPAS is the key to developing knowledge by using a scientific approach as a basis for the learning process. The social science learning process for elementary age students is oriented towards complex and meaningful nature and concepts, because children have curiosity, so they can develop knowledge, skills, awareness and be equipped to protect or maintain and preserve the natural environment. Science learning is the science of studying events that occur in nature by observing and experimenting to give rise to theories so that children have initial ideas that are conceptualized and cognized, based on the experience of various processes, such as investigation, preparation and presentation to grow ideas. Because elementary school students generally have a spirit of play but also a sense of curiosity, it is the teacher's job to collaborate between a spirit of play and curiosity. If both can be accommodated, it will be easier for the teacher to convey the content of the material in the learning process. With this, it makes students active in studying, researching and investigating the truth of a theory in systematic stages using critical and rational thinking (Harahap et al., 2019).

Currently, elementary school students are a generation that was born when technology already existed, so they are often associated with the term digital native. Internet access and technology have become something close to students, making it easier for them to find out various information and traditions. However, the presence of technology does not mean students can use it in learning. They prefer to access platforms related to fun or entertainment such as watching videos on YouTube or playing online games. In an effort to survive and compete in global competition in the 21st century, which is the century of globalization, elementary school students need skills, one of which

is thinking skills. Someone always needs firm reasoning because in public activities particularities or events will occur. continues to provide ideas that offer decisive reasoning. Critical thinkers will be able to interact with these phenomena and in turn they will act and deal with them. Therefore, critical thinking needs to be taught as early as possible by considering a person's age and level of skill as a basis for solving problems throughout his life. Critical thinking capacity is the skill to analyze a source logically, reflectively, sequentially and productively. It also includes the skill to differentiate between related and unrelated sources, to identify and evaluate assumptions, and to use a variety of decision-making strategies aligned to evaluation standards (Armansyah, Muhammad Nurwahidin, 2022)

Critical reasoning skill that are prepared continuously will become a tendency, so that when students are faced with a problem, they can make choices quickly, firmly and effectively. This reasoning skill is a provision for students to compete in the era of globalization because it will affect students' daily lives, so critical thinking skills are very important. Looking at the study above, critical thinking skills are very crucial in developing a person's critical reasoning skills and producing quality learning (Mulasi et al., 2024). This research analyzes the critical reasoning skill of third grades students using a description test. The researcher presents several questions that are in accordance with the critical reasoning indicators in the Profil Pelajar Pancasila which is the embodiment of student character through the Kurikulum Merdeka . The results of the research show that the average critical reasoning skill of students obtained a score of 80 in the developing category.

Primary school students' critical reasoning skill have sub-elements in the form of asking questions, identifying information, analyzing information, and reflecting on thinking. The sub-element of asking questions received the lowest score. This is shown in the attitude of students who are still hesitant to ask questions about the problems or difficulties they face in analyzing problems. Asking questions is a good action that can support students' achievement of understanding at a higher level. This is because students will be trained to think critically. If you want this action to be carried out again, then when the student asks questions, reinforcement can be given. Several things that cause students to experience obstacles in asking questions are (1) students don't know what to do, so they don't know how to start a conversation, (2) students know that they will be assessed, and (3) students face unfamiliar situations and feel uncomfortable (Kalsum et al., 2021). Social science learning is the first lesson students are familiar with so they face unfamiliar situations and are not prepared, therefore students' questioning skills still need to be developed.

Then students' critical reasoning skill in the form of identifying, clarifying and processing information and ideas received the highest score. This skill is tested by presenting the teacher with a picture and then identifying the use of energy and the biotic and abiotic components in the picture. Most students were able to answer the questions correctly. Identifying images is tailored to the characteristics of third grade students who are in the concrete operational stage. At this stage students tend to think literally and have difficulty understanding abstract concepts which are often the basis of critical thinking. Teachers must be creative in bridging this gap by designing learning activities that transform abstract concepts into real experiences (Irwan et al., 2024). The sub-element analyzing and evaluating reasoning and procedures received the second highest score.

The teacher presents the problem in the picture and asks students to analyze the problems that arise when facing the situation in the picture and solutions to overcome the problem. Students with good academic skills can analyze the problem in detail and explain further the problems that arise.

The sub-element analyzing and evaluating reasoning and procedures received the second highest score. The teacher presents the problem in the picture and asks students to analyze the problems that arise when facing the situation in the picture and solutions to overcome the problem. Students with good academic skills can analyze the problem in detail and explain further the problems that arise. These results are in accordance with research results (Sidiq et al., 2021) which show that the analytical aspect of students' critical thinking skills has the highest score. Providing questions oriented towards critical thinking skills influences students' analytical skills which can help them to map problems and provide information as capital to solve a problem. Apart from improving analytical skills, critical thinking skills also facilitate students in concluding a problem. Conclusion skills are very useful for students, especially when they learn to make decisions related to problem solving strategies. Mastery of critical thinking skills can provide enormous benefits for students, especially in the field of education related to social science learning.

This research analyzes the relationship between learning readiness and the critical reasoning skill of third grade students in social science learning. The results of the analysis show that there is a positive relationship between learning readiness and the critical reasoning skill of third grade students in science learning. The results of this study are in line with the research results (Roslinda et al., 2022) which shows that the influence of learning readiness has a positive relationship simultaneously with an influence of 43.2%. In this research, students' learning readiness is not always linear towards critical thinking skill or vice versa. In this research, several subjects were found with linear critical thinking skill and learning readiness, approaching the linear line and away from the linear line. Students with linear skill tend to have critical thinking skill and high learning readiness. Students with skill that are close to linear tend to have high critical thinking skill but have moderate learning readiness. Students who have the skill to stay away from linear lines have high critical thinking skill but have low learning readiness. This is in accordance with the results of research conducted by researchers, there are students with good learning readiness but the students' critical reasoning skill are quite developed. Then there are students with moderate learning readiness but whose critical reasoning skill develop as expected. Meanwhile, there are students with good and linear learning readiness with students' critical reasoning skill developing as expected.

Students with moderate learning readiness but critical reasoning skill develop as expected due to students' psychological readiness, namely that they easily forget the science material and feel uninterested in learning science. Students with good learning readiness but have quite developed critical reasoning skill because the students have good physical and psychological readiness but the implementation of learning is not good because the subject missed learning activities in class so that the subject experienced difficulty in continuing his learning. Apart from that, there are subjects whose academic skill have not yet developed because these students are hampered by not being able to read fluently. Meanwhile, filling out the questionnaire is done by the teacher reading each statement to the students. This makes a new finding that there is an unequal relationship between learning readiness and students' critical reasoning skill because there are other

factors, namely the level of understanding of concepts and students' cognitive skill. On the other hands, the importance of supporting teachers to develop students critical reasoning skill by stating that the teachers play an important role in improving students' critical reasoning skill (Hursen, 2021).

## ▪ CONCLUSION

Based on the results of the analysis that has been carried out, the researcher concludes that there is a positive relationship between learning readiness and the critical reasoning skill of third grade students in science learning. Third grade students ' learning readiness obtained an average score of 82 in the good category. Judging from students' learning readiness, students' physical readiness received a high score, indicating that students have good physical readiness to take part in science learning, while psychological readiness received the lowest score, which shows students' lack of interest in taking part in science learning. Meanwhile, students' critical reasoning skill obtained an average score of 80 and were in the developing category. The sub-elements of identifying, clarifying and processing information and ideas obtained the highest score which shows students are able to identify information in images. Then, the sub-element asking questions gets the lowest score followed by the sub-element reflecting on the results of thinking. This indicates that students are not ready to learn and still feel unfamiliar with the science material. Apart from that, students are not used to giving reasons for the answers they write so they still need encouragement from the teacher. The research results also show that there are students with good learning readiness but whose critical reasoning skill have not yet developed. Then, there are students with moderate learning readiness but whose critical reasoning skill develop as expected. Lastly, there is a linear relationship between good learning readiness and critical reasoning skill which develop as expected. The researcher recommends that future researchers conduct experimental research to improve learning readiness and critical reasoning skill in students at higher levels. Then researchers can then measure the correlation between learning readiness and critical reasoning skill of elementary school students.

## ▪ REFERENCES

Akpur, U. (2020). Critical, reflective, creative thinking and their reflections on academic achievement. Thinking Skills and Creativity, 37 (July). https://doi.org/10.1016/j.tsc.2020.100683

Armansyah, Muhammad Nurwahidin, S. (2022). *Aksiologi kemampuan berpikir kritis* [axiology of critical thinking ability]. 2(4), 87–94.

Arzfi, B. P., & Jamna, J. (2024). *Implementasi teori belajar humanistik dalam pembelajaran berdiferensiasi ipas di sekolah dasar* [implementation of humanistic learning theory in differentiated ipas learning in elementary schools]. Mitra PGMI: Jurnal Kependidikan MI, 10(1), 39–49. https://doi.org/10.46963/mpgmi.v10i1.1639

Atma, B. A., Azahra, F. F., & Mustadi, A. (2021). Teaching style, learning motivation, and learning achievement: do they have significant and positive relationships? Jurnal Prima Edukasia, 9(1), 23–31. https://doi.org/10.21831/jpe.v9i1.33770

BK, M. K. U., & Hamna, H. (2023). *Implementasi model pakemi integrasi blanded learning dalam meningkatkan hasil belajar sains ipas siswa di sekolah dasar*

[implementation of the pakemi model integrating blended learning to improve social science learning outcomes for elementary school students]. Tolis Ilmiah: Jurnal Penelitian, 5(1), 44. https://doi.org/10.56630/jti.v5i1.329

Cojocariu, V.-M., & Butnaru, C.-E. (2014). Asking questions – critical thinking tools. Procedia - Social and Behavioral Sciences, 128, 22–28. https://doi.org/10.1016/j.sbspro.2014.03.112

Çökük, K., & Kozikoğlu, İ. (2020). A Correlational study on primary school students' school readiness and adaptation problems. International Online Journal of Education and Teaching (IOJET), 7(2), 523–535. http://iojet.org/index.php/IOJET/article/view/831

Cudney, E. A., & Ezzell, J. M. (2017). Evaluating the impact of teaching methods on student motivation. Journal of STEM Education, 18(1), 32–50.

Darniyanti, Y., Rahmayati, I., & Filahanasari, E. (2023). *Pengembangan modul pembelajaran berbantu canva mata pelajaran ipas untuk mendukung merdeka belajar kelas iv di sekolah dasar* [development of canva-assisted learning modules for ipas subjects to support independent learning for 4th grade in elementary schools]. Jurnal Basicedu, 7(3), 1507–1517. https://doi.org/10.31004/basicedu.v7i3.5631

Davis-Kean, P. E., Tighe, L. A., & Waters, N. E. (2021). The role of parent educational attainment in parenting and children's development. Current Directions in Psychological Science, 30(2), 186–192. https://doi.org/10.1177/0963721421993116

Etherington, M. (2013). Values education: why the teaching of values in schools is necessary, but not sufficient. Journal of Research on Christian Education.

Ellianawati, E., Mekua, M., Subali, B., Linuwih, S., & Bien, N. Van. (2024). Development of visual, auditory, kinesthetic (vak) based student worksheets with liveworksheets to train science literacy. Jurnal Pendidikan Progresif, 14(2), 751–766. https://doi.org/10.23960/jpp.v14.i2.202455

Fathoni, M.R.N., & Sobandi, A. (2020). *Dampak fasilitas belajar dan kesiapan belajar dalam upaya meningkatkan hasil belajar siswa* [the impact of learning facilities and learning readiness in efforts to improve student learning outcomes]. Jurnal Pendidikan Manajemen Perkantoran, 5 (2), 129-139.

Fanny, A. M. (2022). *Sinergitas tripusat pendidikan pada program penguatan pendidikan karakter (PPK) di sd dalam pandangan Ki Hajar Dewantara* [the synergy of the tripusat education in the character education strengthening program (ppk) in elementary schools according to Ki Hajar Dewantara]. EduStream: Jurnal Pendidikan Dasar, 4(2), 176–183. https://doi.org/10.26740/eds.v4n2.p176-183

Fikriyah, S. N. (2021). *Analisis perkembangan fisik-motorik siswa kelas 3 di sekolah dasar negeri tajem* [analysis of physical-motor development of 3rd grade students at tajem public elementary school]. Edunesia : Jurnal Ilmiah Pendidikan, 2(1), 200–207. https://doi.org/10.51276/edu.v2i1.121

Firmansyah, D., & Dede. (2022). *Teknik pengambilan sampel umum dalam metodologi* [general sampling techniques in methodology]. Jurnal Ilmiah Pendidikan Holistik (JIPH), 1(2), 85–114.

Fitria, Y. (2023). *Menakar kesiapan sekolah dengan kemunculan perilaku delinkuen pada siswa sekolah dasar* [measuring school readiness with the emergence of delinquent behavior in elementary school students]. Journal on Education, 06(01), 4682–4689.

Fitriani, A., Zubaidah, S., Susilo, H., & Al Muhdhar, M. H. I. (2020). PBLPOE: A Learning model to enhance students' critical thinking skills and scientific attitudes. International Journal of Instruction, 13(2), 89–106. https://doi.org/10.29333/iji.2020.1327a

Gunawardena, M., & Wilson, K. (2021). Scaffolding students' critical thinking: a process not an end game. Thinking Skills and Creativity, 41(July 2020), 100848. https://doi.org/10.1016/j.tsc.2021.100848

Halmatov, M. (2018). Assessment of psychological readiness situation of students starting to primary school. International Education Studies, 11(5), 85. https://doi.org/10.5539/ies.v11n5p85

Hamed Taherdoost. (2016). Sampling methods in research methodology: how to choose a sampling technique for research hamed taherdoost to cite this version : HAL Id : hal-02546796 Sampling Methods in Research Methodology ; How to Choose a Sampling Technique for. International Journal of Academic Research in Management (IJARM), 5(2), 18–27.

Harahap, R., Hasibuan, A. T., Sirait, S., Yuliawati, F., & Lubis, N. (2019). *Dalam pembelajaran ipa bagi siswa usia dasar* [in science learning for elementary school students]. Magistra, 10(2), 166–184.

Hasbi, A. Z. (2023). *Penelitian korelasional* [correlational research]. Al Furqon: Jurnal Agama, Sosial, Dan Budaya, 2(6), 784–808.

Hursen, C. (2021). The effect of problem-based learning method supported by web 2.0 tools on academic achievement and critical thinking skills in teacher education. Technology, Knowledge and Learning, 26(3), 515–533. https://doi.org/10.1007/s10758-020-09458-2

Ida, F. F., & Musyarofah, A. (2021). *Validitas dan reliabilitas dalam analisis butir soal* [validity and reliability in item analysis]. Al-Mu'Arrib: Journal of Arabic Education, 1(1), 34–44. https://doi.org/10.32923/al-muarrib.v1i1.2100

Irwan, I., Arnadi, & Sahlan. (2024). Environmental factors of developing critical thinking skills of primary school students. Indonesian Journal of Education, 4(3), 788–803. https://doi.org/10.25688/2076-9121.2024.18.1-1.03

Jumasrin, J. (2019). *Variabel-variabel relasional kesiapan belajar peserta didik di tingkat sekolah dasar* [relational variables of student readiness to learn at the elementary school level]. Shautut Tarbiyah, 25(1), 84. https://doi.org/10.31332/str.v25i1.1361

Kaharudin, L. O., Wunasari, A., & Nurmayanti, N. (2023). *Pengaruh pembelajaran berbasis projek terhadap kemampuan bernalar kritis* [the influence of project-based learning on critical thinking skills]. Jurnal Basicedu, 7(5), 3063–3071. https://doi.org/10.31004/basicedu.v7i5.5368

Kalsum, U., Chastanti, I., & Harahap, D. A. (2021). *Analisis keterampilan bertanya siswa pada pembelajaran ipa di sekolah dasar* [analysis of students' questioning skills in science learning at elementary school]. Jurnal Basicedu, 6(1), 433–441. https://doi.org/10.31004/basicedu.v6i1.1921

Kokkalia, G., Drigas, A., Economou, A., & Roussos, P. (2019). School readiness from kindergarten to primary school. International Journal of Emerging Technologies in Learning, 14(11), 4–18. https://doi.org/10.3991/IJET.V14I11.10090

Kusumaningpuri, A. R. (2024). *Implementasi pembelajaran berdiferensiasi pada pembelajaran ipas fase b kelas iv sekolah dasar* [implementation of differentiated learning in ipas phase b learning for 4th grade elementary school]. Jurnal Didaktika Pendidikan Dasar, 8(1), 199–220. https://doi.org/10.26811/didaktika.v8i1.1321

Marlina, I., & Aini, F. Q. (2023). *Perbedaan pembelajaran berdiferensiasi berdasarkan kesiapan dengan gaya belajar terhadap hasil belajar siswa* [the difference in differentiated learning based on readiness with learning styles on student learning outcomes]. EDUSAINTEK: Jurnal Pendidikan, Sains Dan Teknologi, 11(1), 392–404. https://doi.org/10.47668/edusaintek.v11i1.1017

Mery, M., Martono, M., Halidjah, S., & Hartoyo, A. (2022). *Sinergi peserta didik dalam proyek penguatan profil pelajar pancasila* [synergy of students in the strengthening project of pancasila student profile]. Jurnal Basicedu, 6(5), 7840–7849. https://doi.org/10.31004/basicedu.v6i5.3617

Mulasi, S., Rijal, S., & Aiyub, A. (2024). *Internalisasi konsep burhani dalam pembelajaran: strategi peningkatan nalar kritis siswa* [internalization of burhani's concept in learning: strategies for enhancing students' critical thinking]. An-Nawa: Jurnal Studi Islam, 6(1), 23–40. https://doi.org/10.37758/annawa.v6i1.963

Munna, A. S., & Kalam, M. A. (2021). Teaching and learning process to enhance teaching effectiveness: literature review. International Journal of Humanities and Innovation (IJHI), 4(1), 1–4. https://doi.org/10.33750/ijhi.v4i1.102

Mustiko, A. B., & Trisnawati, N. (2021). *Pengaruh keterampilan mengajar guru, kesiapan belajar dan motivasi sebagai variabel intervening terhadap hasil belajar siswa* [the influence of teacher teaching skills, learning readiness, and motivation as intervening variables on student learning outcomes]. Journal of Office Administration : Education and Practice, 1(1), 42–52. https://doi.org/10.26740/joaep.v1n1.p42-52

Pandu, R., Purnamasari, I., & Nuvitalia, D. (2023). *Pengaruh pertanyaan pemantik terhadap kemampuan bernalar kritis dan hasil belajar peserta didik* [the influence of trigger questions on students' critical thinking skills and learning outcomes]. Pena Edukasia, 1(2), 127–134.

Rahmawati, E., Wardhani, N. A., & Ummah, S. M. (2023). *Pengaruh proyek profil pelajar pancasila terhadap karakter bernalar kritis peserta didik* [the influence of the pancasila student profile project on students' critical thinking character]. Jurnal Educatio FKIP UNMA, 9(2), 614–622. https://doi.org/10.31949/educatio. v9i2.4718

Roslinda, F., Sulistyaningsih, D., & Suprapto, R. (2022). *Pengaruh self-regulated learning terhadap kemampuan berpikir kritis matematis siswa* [the influence of self-regulated learning on students' mathematical critical thinking skills]. Prosiding Seminar Nasional UNIMUS, 5, 677–690.

Rusnaini, R., Raharjo, R., Suryaningsih, A., & Noventari, W. (2021). *Intensifikasi profil pelajar pancasila dan implikasinya terhadap ketahanan pribadi siswa* [intensification of the pancasila student profile and its implications for student

personal resilience]. Jurnal Ketahanan Nasional, 27(2), 230. https://doi.org/10.22146/jkn.67613

Zulkipli, Z. A., Mohd Yusof, M. M., Ibrahim, N., & Dalim, S. F. (2020). Identifying scientific reasoning skills of science education students. Asian Journal of University Education, 16(3), 275–280. https://doi.org/10.24191/ajue.v16i3.10311

Zuschaiya, D., Wari, E., Agustina, Y., & Lailiyah, S. (2021). *Pengaruh kesiapan belajar dan kemampuan berhitung terhadap hasil belajar matematika* [the influence of learning readiness and arithmetic ability on mathematics learning outcomes]. Jurnal Pembelajaran Matematika Inovatif, 4(3), 517–528. https://doi.org/10.22460/jpmi.v4i3.517-528