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ABILITIES AND FACTORS THAT AFFECT THE SCIENCE LITERACY OF PROSPECTIVE MADRASAH IBTIDAIYAH TEACHERS

Rohmat Widiyanto[1*)], Fauzan[2)], Asep Ediana Latip[3)], Nur Luthfi Rizqa Herianingtyas[4)],Tri Suryaningsih[5)], Din Azwar Uswatun[6)]

[1,2,3,4,5]Syarif Hidayatullah State Islamic University Jakarta, Indonesia
[6]University of Muhammadiyah Sukabumi, Indonesia
E-mail: rohmat.widiyanto@uinjkt.ac.id*

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Abstract

The issue of science literacy as a result of the assessment published at the end of 2022 by PISA is an important topic in Indonesia, which includes aspects of content, context, competence and knowledge while Indonesia's position increased by 5-6 compared to the results of the PISA assessment in 2018. This study aims to analyze the science literacy ability of prospective madrasah ibtidaiyah/elementary school teachers at UIN Jakarta, Indonesia which includes aspects of context, content, competence and knowledge. In addition, this study was conducted to investigate factors that can affect the science literacy ability of prospective madrasah ibtidaiyah/elementary school teachers at UIN Jakarta, Indonesia. The type of research conducted is quantitative descriptive. The number of samples in this research was 201 students from semesters 2, 4 and 6 of the Madrasah Ibtidaiyah Teacher Education study program UIN Syarif Hidayatullah Jakarta, Indonesia. The sample collection technique uses the purposive sampling technique. Science literacy ability data is obtained from test results in the form of science literacy test sheets based on the PISA question standard. The data analysis technique uses quantitative descriptive analysis techniques. The results of the study showed that the average science literacy ability of PGMI UIN Jakarta students was included in the medium category with a percentage of 68.67%. If described in each science literacy domain, the science literacy ability in the context aspect is 69.13% with the medium category, the science literacy ability in the knowledge aspect is 68.56% with the medium category, and the science literacy ability in the competency aspect is 65.42% with the low category.

Keywords; Science Literacy, Natural Science Learning (IPA), PISA, Madrasah Ibtidaiyah Teachers

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INTRODUCTION

The issue of science literacy, published at the end of 2022 by PISA, has become a hot topic in Indonesia, covering aspects of content, context, competence, and knowledge, where Indonesia must be satisfied with occupying the 68th position out of 78 countries surveyed(Schleicher, 2019). In the 21st century, science and technology are developing rapidly, so technology can govern everything. To achieve a balance between the development of science and technology, students must understand and be able to take advantage of technological advancements. The characteristics of the 21st century are different from those of the previous century. These differences begin with changes in technology and lifestyles, the relationship between countries getting stronger, and the interaction between citizens getting closer. Thus, a nation is expected to be able to compete and make adjustments to become quality Human Resources (Utami*, Marwoto, & Sumarni, 2022). All changes due to the advancement of science and technology have occurred in every field of life, including education in Indonesia. At this time, the educational process has evolved in curriculum, learning methods, and other supporting facilities. Overall, it can be said that the change is an update to the education system to keep up with the global progress of Science and technology (Wulandari, 2016).

Previously, learning activities were only teacher-centered, but now learning activities must be more student-centered. The vision of 21st century education rests on a paradigm *Learn* Or learning to think that is oriented to logical and rational knowledge, learning to act that is oriented to how to solve problems, independent learning that is oriented to character building, and learning to live together that is oriented towards tolerance and ready to work together is the vision of 21st century education that is more based on the learning paradigm (OECD, 2017a). Science education contributes to developing skills to use knowledge gained in daily life effectively. So that the understanding of science is not only limited to theory, but also how it is used in daily life. Therefore, every individual from an early age must acquire knowledge that includes these competencies through natural science subjects (IPA) (Joshua Adeluo, 2024).

Natural Science is the branch of science that studies the universe and all the processes that occur in it, which have implications for daily life. Science subjects have educational value, which can shape the child's personality, so that students can develop knowledge and understanding of the concept of natural science (science that is useful and can be applied in daily life. The purpose of learning Natural Sciences, especially in elementary school, is to provide students with opportunities to cultivate natural curiosity, develop the ability to ask questions and seek answers to natural phenomena based on concrete evidence, and develop an objective way of thinking and critical thinking(Barus, 2022). Science education is widely recognized as a fundamental avenue for cultivating the core competencies required in the 21st century. These competencies are framed around integrating cognitive, social, and intellectual skills, most notably encapsulated in the 4C model: critical thinking, creativity, communication, and collaboration (Stehle & Peters-Burton, 2019). From an operational standpoint, these skills

manifest across four interconnected domains. First, in cognitive engagement, learners are expected to exhibit creative thinking, innovative problem-solving abilities, critical reflection, autonomous decision-making, and proactive learning behaviors. Second, work-oriented competencies emphasize the ability to communicate effectively, collaborate, and function productively in team environments.

Third, global citizenship entails an awareness of local and international responsibilities and identities. Finally, these skills are developed by digital literacy, technological fluency, and access to networked information environments (Firmansyah, Suhandi, Setiawan, & Permanasari, 2022). Training 21st-century skills, especially critical thinking, requires an understing of scienceteracy. Science literacy is one of the essential skills that students must have. Science literacy comes from Latin, namely *Literatura,* marked with letters, literacy or education, and *Scientia, which* means knowing the Sword(Sthele Stephanie, 2019). According to the OECD 2016, science literacy is scientific knowledge and skills to be able to identify questions, acquire new knowledge, explain scientific phenomena, and draw conclusions based on facts, understand the characteristics of science, awareness of how science and technology shape the natural, intellectual, and cultural environment, as well as a willingness to engage and care about science-related issues (OECD, 2017b). Therefore, understanding science literacy is necessary to practice critical thinking skills. Science literacy is one of the essential skills that students must have. Science literacy (*Science Literacy*) derived from Latin, i.e., *Literatura,* which means marked with letters, literacy or education, and *Scientia, which means knowing* (Mukti, 2019).

Scientific literacy has become a central component of science education in the 21st century, especially as societies face increasingly complex scientific and technological challenges. According to the OECD (2017), scientific literacy encompasses acquiring scientific knowledge, engaging in evidence-based reasoning, and identifying scientific questions, evaluating and designing scientific investigations, and interpreting data critically. Furthermore, it involves understanding the nature of science—its principles, methods, and limitations—and an awareness of how science and technology influence the natural world, intellectual developments, and cultural contexts. Critically, scientific literacy also includes a willingness to actively participate in discussions and decisions regarding science-related issues, personally and societally. This multidimensional perspective positions scientific literacy as a key driver of informed citizenship and lifelong learning in a knowledge-based society (OECD, 2017a). The inability to acquire science literacy will have an impact on their future. This results in their unpreparedness to enter the job market in the future, so the opportunity to get the best job that can improve people's well-being is wasted. Their capacity to participate fully in society, local, regional, and international, will not be enough so that it can be under the state for an extended period. On a global scale, the mastery of students' science literacy skills and the quality of science education in Indonesia can be measured by the Inter*national Student Assessment Program* (PISA). PISA *(International Student Assessment Program)* is an international student literacy

assessment program organized by the *Organization for Economic Co-operation and Development* (OECD), which is held every three years and is aimed at 15-year-old students worldwide.

Assessments in PISA determine whether students can generate knowledge and test how well students can extrapolate from what they have learned and apply that knowledge inside and outside of school(OECD, 2017a). The science literacy assessment in PISA 2018 has been changed into three interrelated aspects: context, knowledge, and competency. The questions for the science literacy assessment in PISA are divided into six levels, namely levels 1 to 6, which describe the ability to be measured from the lowest level to the highest level. However, the ability to learn science literacy in this country is still relatively low in terms of science literacy skills. This statement is supported by the PISA 2022 international student assessment program results, which state that Indonesia's science literacy is in the 68th position out of 78 countries, with a science literacy score 4. The results of the PISA assessment also show that when participating in science learning in school, students are not yet able to apply science-related knowledge acquired in real life. The low ability of science literacy can be caused by factors that affect it, including the curriculum and education system, the selection of learning methods and models, facilities to support the learning process, etc.(Kurnia, Zulherman, & Fathurohman, 2014).

About this problem, continuous and gradual efforts are needed to improve the science literacy skills of Indonesian students in order to compete in this era of globalization in the 21st century. Efforts to improve the quality of learning in schools need to be supported by accurate information about the extent of science literacy achievements possessed by students.

Related to the results of the above literacy assessment, it seems that it is also necessary to know how science literacy is in higher education, especially the Madrasah Ibtidaiyah Teacher Education Study Program (PGMI) UIN Syarif Hidayat, Ulla Jaovidta, as a printer of prospective teachers in schools/madrasas. Therefore, it is necessary to conduct research related to the science literacy skills of prospective madrasah teachers/schools in the Madrasah Ibtidaiyah Teacher Education Study Program of UIN Syarif Hidayatullah Jakarta.

RESEARCH METHODS

The research method used in this study is quantitative research. The quantitative research model used is descriptive quantitative. According to Creswell, the descriptive quantitative research method tests objective theories or examines the relationship between variables that can be measured with research instruments and data from statistical analysis results, then describes them in descriptive sentences (*Kresbah.pdf*, n.d.). This method aims to describe phenomena objectively and systematically. The procedure for this research includes the following steps: problem identification, literature review, instrument design, sampling, data collection, statistical analysis, and reporting results. The subjects involved in this study were 201 students of the Madrasah Ibtidaiyah Teacher Education Study Program (PGMI) UIN Syarif

Hidayatullah Jakarta, consisting of semesters 2, 4, and 6, who had taken Natural Sciences (basic science concept) and Natural Sciences (IPA MI/SD) courses based on the context, competence, and knowledge in PISA measurement. The data collection technique is carried out by purposive sampling, which involves collecting data through tests and a questionnair(*Kresbah.pdf*, n.d.). The technical data analysis in this study uses statistical descriptive methods by calculating the average value, standard deviation, frequency, and percentage.

RESULTS AND DISCUSSION

Results

Based on the data analysis carried out in this study, it consists of several stages, namely as follows: 1) giving a score to the answer with a predetermined score, 2) calculating the percentage of science literacy achievement results as follows: Information:

Nx = Value searched

S = Score obtained

Bc = Maximum test score

After the percentage, science literacy achievement is interpreted descriptively based on the classification of students' science literacy achievements, as presented in the following table.

Table 1. Frequency Distribution of Students' Science Literacy Ability

No.	Classification	Score Interval	Frequency	Percentage (%)
1	Very high	>80	10	4,97
2	Tall	70 – 79	24	11,94
3	Keep	60 – 69	71	35,32
4	Low	50 - 59	60	29,85
5	Very low	<49	36	17,91
Entire			201	100,00
Average Score			68,67%	

Based on table 1.1, it can be seen that 10 people are classified as very high category of science literacy with a percentage of 4.97%, 24 people with a percentage of 11.94%, 71 people with a percentage of 35.32%, 60 people with a percentage of 29.85% and 36 people with a very low category of science literacy ability with a percentage of 36 people with a percentage of 36 people with percentage 17.91%. Based on the results, students' overall science literacy ability was 68.67% with the achievement category "Moderate".

Science Literacy Test Results Context, Competency & Knowledge Aspects

The results of students' science literacy abilities based on three aspects of science literacy, namely context, knowledge, and competency, can be seen as follows: The assessment measured by context aspects is focused on several personal, local/national, and global

indicators. The average score in Table 1.2 shows that the students' science literacy ability level in the context aspect is relatively low. Students' literacy ability in answering questions about personal context is 67.67%, local/national items are 68.35%, and global items are 69.48%.

Table 2. Context Aspects of Science Literacy Results Data

Aspects	Items	Percentage	Middle Value	Category
Context	Personal	67,67	69,13%	Medium (adequate)
	Local/National	68,35		
	Global	69,48		

Furthermore, the survey measured in context aspects focused on several indicators of PISA science literacy knowledge, consisting of content, procedural, and epistemic items.

Table 3. Data on Science Literacy Results: Aspects of Knowledge

Aspects	Items	Percentage	Middle Value	Category
Knowledge	Fill	67,34	68,56%	Keep (Enough)
	Procedural	68,86		
	Epistemic	68,78		

Based on the table above, it can be seen that students' literacy ability in answering questions in the knowledge aspect of content items is 67.34%, procedural items are 68.86%, and epistemic items are 68.78%. So the average percentage of students' science literacy ability in answering questions in the aspect of knowledge is 68.56%, which is included in the "medium" category.

Finally, the assessment measured by context aspects is focused on several indicators, namely the ability to explain phenomena scientifically, evaluate and design scientific investigations, and interpret scientific data and evidence. The following table will present data from the results of students' science literacy skills in the competency aspect.

Table 4. Data on Science Literacy Outcomes Competency Aspects

Aspects	Items	Percentage	Middle Value	Category
Competence	Explaining Scientific Phenomena	66,74	65,42%	Low
	Evaluating, Conducting and Designing Investigations	64,36		
	Interpreting Data, Hypotheses and Creating Scientific Evidence	65,32		

Based on the table above, it can be seen that students' literacy ability in answering questions on the competency aspect of the item explains scientific phenomena with a percentage of 65.42%, in the evaluation and design items of Investigation with a percentage of 66.74%, and in the items of data interpretation and scientific evidence with a percentage of 64.36%. So the average percentage of students' science literacy ability score in answering questions in the competency aspect is 65.32%, which is included in the "Low" category.

Factors Affecting Science Literacy Ability

Based on the results of the questionnaire on factors affecting science literacy, the following data were obtained: Internal factors originating from within students (individuals) can affect students' science literacy skills related to learning interests, learning motivation, and science learning habits. The results of the questionnaire regarding internal factors that affect students' science literacy skills can be seen in the following table.

Table 5. Data on Internal Factors Affecting Science Literacy

Indicators	Sub-indicator	Percentage	Average Score	Category
Interest	Feeling happy during study and lecture	58,68%	61,33	Low
Motivation	Enthusiastic and enthusiastic attitude in learning and lectures	63,82%		
Study Habits	Showing readiness to learn both mentally, physically and mentally in learning and learning	64,73%		

Based on the table above, it can be seen that the factors that affect the ability of science literacy to answer questionnaires on the interest indicator show a percentage of 58.68% with a low category, the motivation indicator shows a percentage of 63.82% with a low category and the learning habits indicator shows a percentage increase of 64.73% with a low category. This means that internal factors that affect science literacy ability are in the low category, with a percentage of 61.33%.

In addition, external factors come from outside the individual. They can affect students' science literacy skills related to learning models and methods applied by lecturers, campus facilities and infrastructure, and parental (community) support. The results of the questionnaire regarding external factors that affect science literacy ability can be seen in the following table.

Table 6. Data on External Factors Affecting Science Literacy

Indicators	Sub-indicator	Percentage	Average Score	Information
Learning Models and Methods	Implementation of Learning Strategies on Campus	60,87	61,77	Low
Campus Facilities and Infrastructure	Availability of campus facilities and infrastructure to support science literacy skills	60,18		
Community support for Education	Attention in the family environment for education	62,72		

Based on the table above, it can be seen that the factors that affect students' literacy ability in answering questionnaires on the indicators of learning models and methods show a percentage increase of 60.87% with the low category, the indicator of school facilities and infrastructure shows a percentage increase of 60.18% with the low category and the parent support indicator shows a percentage increase of 62.72% with the low category. So, internal factors that affect students' literacy ability are in the low category with a percentage of 61.77%.

Discussion

Science Literacy Ability Test Context Aspect

The context aspect shows the ability of learners to engage with scientific issues in daily application. This is limited to the school environment and the broader one. The results of the study showed that the science literacy ability of students in the overall context aspect was 69.13%, with the category of "moderate" achievement. This shows that PGMI students of UIN Syiarif Hidayatullah Jakarta have been involved with science issues related to personal life, family, and friend groups (personal context), society (national context), and life around the world (global context).

Based on the research results, lecturers do not apply science-based learning models and methods in the learning process on campus, so students cannot be involved with scientific issues and are less able to apply scientific materials or knowledge in their daily lives. Therefore, students' science literacy skills in the context aspect are low. The more often teachers apply context learning, the higher the students' knowledge of the context and vice versa, because the context aspect will support students' knowledge and skills. This is in line with research (Jong, 2008), which states that in the learning process, if you always associate concept knowledge with context knowledge, it will make it easier for students to understand the concepts learned, so that the material learned tends to be easy to remember. This is because the learning strategy does not require students to memorize, but is a learning strategy to stimulate students to build knowledge independently(Setiawan & Sudana, 2018).

To improve students' science literacy skills in the context of aspects, lecturers can apply

various learning models, such as problem-based learning models (*Problem-Based Learning*). PBL is a collaborative, constructivist, contextual approach to learning that uses real-life problems to initiate, motivate, and focus knowledge construction.

This learning model will stimulate students to be interested and focus on exploring a problem and finding solutions to it to improve their thinking and problem-solving skills. This is in line with Cucu stating that the learning model, *Problem-Based Learning,* is applied to stimulate students to think at a higher level in problem-oriented learning, including learning how to solve contextual problems with the knowledge they have. So that later students will easily face problems that occur in daily life. This proves that *Problem-Based Learning* can provide a deeper understanding of theoretical and practical analysis (Munawaroh, 2020). It is generally agreed that PBL begins with an open problem with various possible solutions or answers (Ghufron & Ermawati, 2018). This is evidenced by research conducted by Eviani (2014), which showed an increase in students' science literacy in science learning using a problem-based learning model of 0.69, which is included in the high category. This proves that applying a problem-based learning model can significantly affect students' science literacy knowledge. The findings of this study were also revealed by Utami et al. (2022), explaining that students' science literacy skills are in the low category with a percentage of 51.09% in the context aspect (59.13%), process aspect (44.43%), and content aspect (49.73%). According to Utami et al., students' low science literacy skills in the context aspect are caused by a lack of understanding of the concepts and processes taught by teachers in schools.

Science Literacy Ability Test Knowledge Aspect

The knowledge aspect measures the concepts necessary to understand scientific phenomena and all the changes made to nature through human activities. The science literacy ability test on the knowledge aspect aims to illustrate how students can apply their knowledge in relevant life contexts. Based on the results obtained in the research, the ability of science literacy in the overall aspect of knowledge is 68.56% with the achievement category "Medium/low". This shows that PGMI students of UIN Syarif Hidayatullah Jakarta have not mastered the facts, concepts, ideas, and theories about the universe and how to get these ideas. Students are also unable to understand the function and role of questions, observations, theories, hypotheses, models, and arguments in science, as well as how the process of scientific inquiry is formed. The results of this research on this aspect of knowledge are also explained by the research on the low content aspect, with a percentage of 67.34%. Based on these results, it can be seen that students still do not understand the lecture material. Although science learning on campus generally emphasizes mastery of content aspects, students' mastery of science concepts is still relatively low. The many demands for teachers to complete learning materials by the existing curriculum force students to reaccept science concepts they may not fully

understand. The lack of understanding of such concepts leads to many misconceptions about the concepts of science, so mastery of the material is limited to memorization, ultimately making concepts easy to forget. Activities in science learning should emphasize hands-on processes such as experiments or scientific investigations to improve students' skills, creativity, and reasoning power.

Science Literacy Ability in Competency Aspects

The competency aspect measures the student's mental process when answering questions or solving problems, and contains explanations or evidence for discovering the truths produced by science. The results showed that the percentage of students' science literacy ability in the overall competency aspect was 65.42%, in the "low" category. This proves that the competency aspect has the lowest category compared to the context and knowledge aspects. Utami et al. also explained the results of this research on the competency aspect in the research title Analysis of Science Literacy Ability in Students Reviewed from the Aspects of Content, Process, and Scientific Context. The research results on the competency aspect were obtained with a percentage of 55.90%, where this achievement is included in the "low" category. According to Utami et al., students' low science literacy skills in competence are due to learning in schools that lack emphasis on the process. Important aspects of the process for students to understand when solving the problem(Utami* et al., 2022). This aligns with Yuyu's (2017) opinion that process or competence concerns how students can solve the problems presented and apply their knowledge when directly involved in real life.

Internal Factors Affecting Science Literacy Ability

Students' interest in science learning can affect science literacy skills. This can be seen from the results of the questionnaire filled out by students, which showed a percentage of 58.68% in the low category. Interest is accepting the relationship between oneself and something outside oneself(Photo, Liu, & Kaleka, 2021). Suppose students do not have a great interest in learning. In this case, it is difficult to expect to get good learning outcomes and vice versa. If students have a great interest in learning, the results will be better, because students with a great interest in learning will focus their attention more than other students. This allows these students to study more actively, ultimately leading to the expected learning outcomes. A sense of interest in learning will encourage students to be active and diligent in learning to achieve success.

Students' motivation in science learning can also affect their science literacy skills. Based on the questionnaire results, the percentage was 63.82% in the low category. Having a good motivation to study science will show good results. According to the statement, Scunk

(Retariandalas, 2017) says that motivation can affect what we learn, when, and how we learn. Students who have the motivation to study a topic tend to engage in activities that they believe will help them learn, such as paying attention to lessons with focus and attention, organizing or memorizing the material being studied, recording the material being taught to read and learn during homework activities, checking their level of understanding and asking questions when they do not understand the material. So that students who have high learning motivation will succeed in the learning process, and the learning outcomes obtained will be better. Thus, it can be concluded that a low level of student motivation to learn can affect learning success (Senjaya et al., 2020).

Students' learning habits are also a factor that can affect science literacy skills. Based on the study results, students' learning habits obtained a percentage of 64.73%, in the low category. Diligent study habits, perseverance, and substantial effort will produce balanced results, but poor study habits are also feared to produce poor results. Bright & Dikibujiri (2018) and Julius & Evans (2015) show the relationship between student performance and learning habits. Students with good study habits have excellent academic achievement; However, students with negative study habits have poor academic performance.

External Factors Affecting Science Literacy Ability

The learning models and methods lecturers apply during teaching and learning activities can affect students' science literacy skills. Based on the results of the questionnaire on factors that affect science literacy ability in learning models and methods, 60.87% were obtained in the low category. This shows that teachers' use of learning models and methods has not run optimally and effectively. According to Fathurohman, the low science literacy of students is influenced by various factors, one of which is teachers' selection of learning models(Kurnia et al., 2014). The selection of the right learning model and method is an important thing that lecturers must pay attention to in teaching and learning activities, so that the learning objectives that have been prepared can be successfully achieved and achieve maximum results. The chosen learning model and method must have good implications and increase student activity(Budiman, 2021). This is in line with. Learning methods support an effective learning process, increase interest in learning, and make learning easier for students. The learning models and methods used by teachers in the varied science learning process will make students more enthusiastic in following the learning process, and automatically, students will receive the subject matter well, so that the learning process can take place effectively and produce good results.

Adequate facilities and infrastructure can affect science literacy. Science learning requires media, information technology, and other educational facilities so students can learn directly and connect science materials with real-life contexts. Based on the questionnaire results, facilities and infrastructure on campus obtained a percentage of 60.18%, which is in the low

category. If you look at each questionnaire statement, the lowest result is about the absence of an integrated science laboratory on campus, so it does not help students apply material that requires scientific investigation. The availability of laboratories is expected to optimize the science learning process on campus(Simatupang & Sitompul, 2018). School facilities and infrastructure are the main supporting components of the implementation of science learning. School resources and infrastructure are very effective in supporting learning at school and student academic achievement(Akomolafe & Adesua, 2016). This is in line with the opinion (Maiyo & Siahi, 2015) that the absence of educational facilities in the learning process at school will result in failure in the learning process and outcomes. Inadequate school facilities and infrastructure will hinder learning from running optimally. For example, learning that should be carried out with a practicum is constrained by a lack of a school laboratory space or supporting practicum tools. Therefore, paying attention to the completeness, effectiveness, and best management of school facilities and infrastructure is needed to support the learning process(Ribeiro, 2011).

Parental support for education can also affect students' science literacy skills. This can be seen in the questionnaire results, which showed parental support of 62.72% in the medium category. This indicates that the support given by parents to PGMI students of UIN Syarif Hidayatullah Jakarta has not been maximized. The family environment is the first and most important educational center for children. Parents are essential in guiding young children (Linda Wati, 2017). Tutoring, support, and guidance are efforts to overcome learning difficulties experienced by students. This is inseparable from the characteristics of students and the problems that always arise in the learning process. The learning process can run without a guidance process, but with tutoring, learning activities can achieve optimal learning success(Palupi, Ngatman, & Susiani, 2021). Learning guidance and support can be in the form of appreciation, emotional, instrumental, informational, and attention in students' daily lives so that they will feel appreciated, loved, cared for, and supported(Sakirudeen & Sanni, 2017).

The results of students' science literacy abilities based on three aspects of science literacy, namely context, knowledge, and competency, can be seen as follows: The assessment measured by context aspects is focused on several personal, local/national, and global indicators. The average score in Table 1.2 shows that the students' science literacy ability level in the context aspect is relatively low. Students' literacy ability in answering questions about personal context is 67.67%, local/national items are 68.35%, and global items are 69.48%. Students' science literacy skills are analyzed based on three main aspects: context, knowledge, and competency. The assessment measured through context aspects is focused on three indicators, namely personal, local/national, and global contexts. Based on the data shown in Table 1.2, students' average science literacy ability in the context aspect is relatively low. In detail, students' ability to answer questions on personal context indicators was 67.67%, local/national context was 68.35%, and global context was 69.48%.

These results show that students' understanding of science literacy is still partial and has not been fully integrated conceptually or practically. The low context aspect reflects the challenge of students in relating science knowledge to real problems in personal, social, and global lives. This shows that science learning has not fully touched the contextual relevance dimension essential in developing scientific literacy. When compared to the other two aspects. The knowledge aspect, which includes mastery of scientific concepts, facts, and theories, as well as the competency aspect, which involves the ability to think scientifically, analyze data, and draw conclusions-there is a tendency for students to focus more on memorization and procedural skills, but not optimally in the application of this knowledge in real-world situations.

These three aspects are complementary components and cannot be separated in forming complete science literacy. Without an understanding of context, science knowledge becomes less meaningful; without competence, knowledge cannot be processed critically; and without knowledge, context and competence have no solid scientific basis. Thus, science literacy is not only cognitive ability, but also the ability to think reflectively, critically, and applicably in dealing with various social science issues.

CONCLUSION

This study investigates the science literacy levels of 201 prospective madrasah teachers enrolled in the PGMI program at UIN Syarif Hidayatullah Jakarta. Utilizing a quantitative descriptive approach, the findings reveal that students' overall science literacy is moderate (68.67%), with notable weaknesses in scientific competencies (65.42%). Internal factors such as interest, motivation, and learning habits, as well as external factors like instructional models, school infrastructure, and parental support, are all rated low. These results indicate systemic limitations in current teacher training practices, particularly in fostering inquiry skills, critical thinking, and real-world application of science concepts. The study highlights the pressing need to reform science education within Islamic teacher training institutions by adopting integrative and contextually grounded pedagogies aligned with 21st-century competencies

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