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Mathematical Literacy Skills: A Survey in Secondary Schools

Arifta Nurjanah[1*], Dimas Candra Saputra[2]

[1]*Program Studi Pendidikan Matematika, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Tidar, Jl. Kapten Suparman No.39, Kota Magelang 56116, Indonesia*

[2]*SMP Negeri 3 Godean*
Jl. Garuda, Kabupaten Sleman 55264, Indonesia

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*Corresponding Author.
Email: arifta.nurjanah@untidar.ac.id

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ABSTRAK

Penelitian ini bertujuan untuk mendeskripsikan kemampuan literasi matematika siswa SMP di Kabupaten Sleman, Provinsi Daerah Istimewa Yogyakarta, Indonesia. Penelitian survey ini melibatkan 428 siswa kelas delapan dari empat belas sekolah yang ditentukan dengan proporsional random sampling. Tes literasi matematika yang digunakan sebagai instrumen telah diuji validitas dan reliabilitasnya. Data dianalisis dengan mengkonversi skor hasil tes menggunakan interval skala untuk mengkategorikan kemampuan literasi siswa. Berdasarkan analisis, kemampuan literasi matematika siswa SMP di Kabupaten Sleman secara umum termasuk dalam kategori rendah dengan sebaran 62,15% siswa dalam kategori sangat rendah, 13,32% rendah, 14,02% sedang, 5,37% tinggi, dan 5,14% sangat tinggi. Kemampuan siswa: 1) pada proses formulate dan employ masuk dalam kategori rendah, sedangkan pada proses interpret sangat rendah; 2) pada konten Quantity dan Uncertainty Data rendah, sedangkan pada konten change and relationship dan space and shape sangat rendah; dan 3) pada konteks Personal dan Occupational masuk dalam kategori rendah, sedangkan Societal dan Scientific sangat rendah. Hasil penelitian ini diharapkan dapat menjadi masukan kepada pihak-pihak terkait untuk peningkatan mutu pendidikan, khususnya dalam pembelajaran matematika.

Kata Kunci: Literasi Matematika; SMP; Survey

ABSTRACT

This study aims to present the abilities of junior high school students' mathematical literacy in Sleman Regency, Yogyakarta Special Region Province, Indonesia. This survey used proportional random sampling to sample 428 eighth graders from fourteen schools. A mathematical literacy task for this study has been tested for validity and reliability. The data were analyzed by converting the test scores using interval scales to categorize the abilities. Based on the analysis, the mathematical literacy skills of students were generally included in the low category, with a distribution of 62.15% of students in the very low category, 13.32% in the low category, 14.02% in the medium category, 5.37% in the high category, and 5.14% in the very high category. They were: 1) in a low category for the formula and employ processes, and a very low category for the interpreting process; 2) in a low category for the Quantity and Uncertainty Data content, and a very low category for the change and relationship and space and shape content; and 3) in a low category for the Personal and Occupational context, and a very low category for the social and Scientific context. The results of this study are expected to be a consideration for related parties to improve the quality of education, especially in learning mathematics.

Keywords: *Mathematical Literacy; Junior High School; Survey*

1. Introduction

Students need to have the skills to deal with various life issues to be prepared to handle the challenges of life in the future. As one of the subjects that students must take from elementary school to higher education, mathematics can be a means to achieve this. Mathematics learning is expected to instill a valuable mathematical mindset for everyday life. The government makes it clear in the Ministry of National Education [1] that learning mathematics aims to equip students with the skills necessary to deal with constantly changing life circumstances and environments. Mathematics learning needs to promote mathematical skills to understand the world and success in life [2]–[5].

The knowledge, ability, and skills to apply mathematics to everyday life are known as mathematical literacy skills. Organization for Economic Co-operation and Development [6] defines literacy skills as a person's ability to formulate, apply, and interpret mathematics in various contexts. It can also be understood as a two-way representation between real-world problems and the world of mathematics learning. This skill encompasses mathematical thinking and the application of mathematical concepts, procedures, facts, and tools used to describe, explain, and predict a phenomenon [7][8]. This ability enables students to recognize the role of mathematics in their lives and assists them in making rational arguments and decisions as constructive, caring, and reflective members of society [9].

The importance of mathematical literacy skills also underlies the efforts of the OECD to organize the Program for International Student Assessment (PISA). PISA is one of the tests with the most global impact on education. The government can utilize the results to track the educational system and as a benchmark for the national development of students' mathematical literacy skills [10]. Based on the PISA framework, mathematical literacy can be divided into three dimensions: process, content, and context [6]. According to the PISA findings [6], most students have weak mathematical literacy abilities. Although there has been an increase, for instance, in Indonesia, it has yet to be distributed equally, particularly among students with high skills [6]. Some parties claim that the low level of students' mathematical literacy abilities indicates a failure of the government-organized educational system and teachers' inability to facilitate students' literacy skills [11]. Given these circumstances, appropriate measures are required to promote students' mathematical literacy [12][13]. The needed initial strategy is a survey of the skills in each region of Indonesia [14]. The study conducted in each area can be used to assess capabilities and make appropriate policies.

Sleman Regency is one of the potential areas in Yogyakarta Province, Indonesia, with many students. Here is being developed as an education center for the community's conditions, regional potential, and socioeconomic situation [15]. Meanwhile, one of the visions is to be competitive: a society with a competitive advantage to face competition in the future. The embodiment of this vision is related to mathematical literacy skills. However, there currently needs to be more information available regarding the mathematical literacy skills of students in the Sleman Regency. Therefore, it is necessary to research the mathematical literacy abilities of junior high school students in Sleman Regency. With this level of mathematical literacy ability, policymakers can consider which aspects need to be developed to support the success of education and learning precisely [16]. It also can be a consideration in curriculum development to improve the quality of education. This research can also provide information to teachers, so teachers consider it when preparing learning activities.

Several previous studies are relevant to this research. For example, a quantitative survey-type analysis to describe the mathematical literacy abilities of junior high school students in Makassar City [14]; a study that describes the growth of lower and upper secondary school students' mathematical literacy proficiency in Yogyakarta, Indonesia [11]. Additionally, a survey of the mathematical literacy of senior high school students in Yogyakarta [17]. This research will add to the description of the results of mathematical literacy based on the process, content, and context domains, especially for junior high school students in Sleman Regency. Moreover, the analysis will also be enriched by considering the school category.

2. Method

This study was a survey with a quantitative approach. All eighth-grade students of state junior high schools in Sleman Regency, Yogyakarta Province, became the population in this study. The minimum sample size was determined using the Yamane formula so that fourteen out of fifty-four schools were sampled. By using the proportional random sampling technique, five schools in the high-performing (H), four schools in the middle-performing (M), and five schools in the low-performing (L) were determined as samples for this study. One eighth-grade class from each school was randomly selected to be the subject of the study. The total number of students sampled in this research was 428.

The students' mathematical literacy abilities in this study were based on the three domains of PISA: process, content, and context. The process domain consists of formulate, employ, and interpret. The content domain includes four ideas: Quantity, space and shape, change and relationship, and uncertainty and data. Context domains include Personal, educational, Societal, and Scientific. The process assesses how students solve everyday life problems according to mathematical modeling. The content assesses how students can recognize mathematical concepts contained in contextual questions. The context assesses how students can determine problem solutions according to the situation of the problem. The mathematical literacy test, in the form of essay questions arranged based on the domains, was used to measure students' mathematical literacy abilities. Overall, this test consists of 12 essay questions.

Content validity is used to guarantee the validity of the instrument. A Cronbach Alpha value of 0.784 was obtained, indicating that the instrument is reliable. The students' responses to the mathematical literacy test were scored following the scoring criteria, and then the scores were analyzed using descriptive statistics as part of the data analysis process. The test scores were converted to classify mathematical literacy skills using the interval scale proposed Ebel & Frisbie [18] (see Table 1).

Table 1. Guidelines for determining mathematical literacy score categories

Score Intervals	Category
$M_i + 1{,}5Sd_i < X \leq M_i + 3Sd_i$	Very high
$M_i + 0{,}5Sd_i < X \leq M_i + 1{,}5Sd_i$	High
$M_i - 0{,}5Sd_i < X \leq M_i + 0{,}5Sd_i$	Middle
$M_i - 1{,}5Sd_i < X \leq M_i - 0{,}5Sd_i$	Low
$M_i - 3Sd_i < X \leq M_i - 1{,}5Sd_i$	Very low

Notes: $M_i = \frac{1}{2}$ (the ideal highest score – ideal lowest score), the ideal average score;
$Sd_i = \frac{1}{6}$ (the ideal highest score – ideal lowest score), the ideal standard deviation

3. Result and Discussion

The description of students' mathematical literacy skills is divided into four topics: mathematical literacy skills in general; and based on process, content, and context domains. Analysis was also carried out based on school categories to provide a more comprehensive perspective. The results of the study are described as follows.

3.1. Students' Mathematical Literacy Ability in General

Based on the results of the data analysis of the 428 junior high school students in Sleman Regency who were sampled in this study, an average score of 6.442, in general, was obtained. Based on the scale interval in Table 3, this average is in a low category. However, judging from the school categories, the average mathematical literacy ability is different. The average in high-performing schools is 11.185, which is in the medium category. Meanwhile, the middle- and low-performing schools were in the very low category, 4.331 and 3.180, respectively.

In high-performing schools, some students achieved the highest score on the mathematical literacy test, while in the middle- and low-performing schools, students who got the highest scores only achieved a score of 19 out of a maximum score of 24. Meanwhile, the lowest score in all school categories was zero. More complete descriptive data about mathematical literacy skills, in general, can be seen in Table 2.

Table 21. Students' mathematical literacy ability in general

Descriptive Statistic	School Category			Total
	H	M	L	
Average	11.185	4.331	3.180	6.442
Standard deviation	5.915	3.811	3.190	5.804
Ideal highest score	24	24	24	24
The highest score	24	19	19	24
Ideal lowest score	0	0	0	0
The lowest score	0	0	0	0
The number of students	157	121	150	428

Students' mathematical literacy abilities can be classified into five categories. Overall, from all schools, only 5.14% of students can reach the very high category. Similar to the number of these students, those who reached the high category were only 5.37%. Meanwhile, more than half of the students (62.15%) were still in the very low category. 13.32% of students fall into the low category, and 14.02% of others fall into the medium category.

In high-performing schools, students' abilities are evenly distributed. Students in the very high category are 12.74%, students in the high category are 14.01%, and students in the medium category are 17.20%. Most students' abilities in this school category are in the medium (30.57%) and very low (25.45%) categories. In middle- and low-performing schools, most students' abilities are very low. In middle-performing schools, students in the low category made up 78.51%, followed by students in the low category at 13.22%, moderate by as much as 7.44%, and very high by as high as much as 0.83%. There are no students who achieve high ability in this school. In low-performing schools, 87.33% of students fall into the very low category, 9.33% fall into the low category, and 2.00% fall into the medium category. There is the same number of students in the high and very high categories in low-performing schools, namely 0.67%. This percentage data is illustrated in Figure 1.

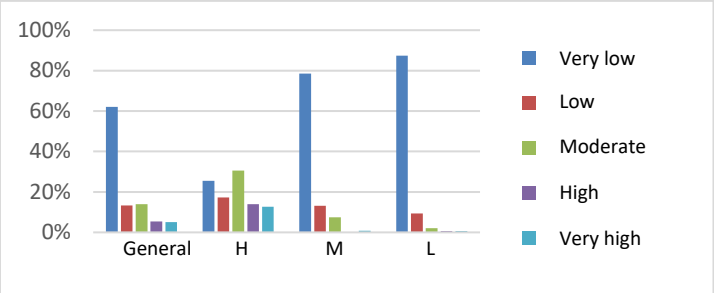

Figure 1. Percentage of students' mathematical literacy ability by school category

3.2. *Students' mathematical literacy ability in the process domain*

The dimensions of the process of mathematical literacy skills in this study are divided into three: formula, employ, and interpret. From a total of 12 questions, each dimension consists of four questions. Each question has a maximum score of two so each dimension has an ideal maximum score of 8. Judging from each process dimension, the average student's ability in mathematical literacy has not yet reached the high and very high categories. In high-performing schools, the average student is in the medium category in the formula and employ processes, while the interpreting process is still low. In each process dimension, students' mathematical literacy ability in middle-performing and low-performing schools is almost the same. The average student in all process dimensions is still in the very low category. The average is less than two from a maximum score of 8. Table 3 shows the data.

Table 3. Data on students' mathematical literacy ability in the process domain

Process domain	Students' mathematical literacy ability						Total	
	H		M		L			
	Average	Category	Average	Category	Average	Category	Average	Category
Formulate (1a,2b,3,4b)	3.962	Middle	1.339	Very low	1.213	Very low	2.257	Low
Employ (2a,4a,5a,8)	4.045	Middle	1.793	Very low	1.180	Very low	2.404	Low
Interpret (1b,5b,6,7)	3.178	Low	1.198	Very low	0.840	Very low	1.799	Very low

In all school categories, more than 60% of students fall into the very low category in all process domains, namely 64.49% in the formula process, 64.25% in the employ process, and 74.30% in the interpret process. The complete percentage of student categories in the process domain is shown in Figure 2.

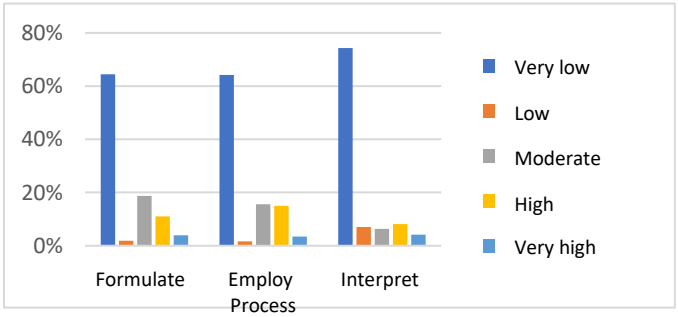

Figure 2. Percentage of students' mathematical literacy ability on the process domain

In the formula process (see Figure 3), the average student overall is 2.257, which is included in the low category. Most high- and middle-performing school students have very low abilities, namely more than 80% of students in each category, followed by students with moderate abilities, namely 10.74% in middle-performing schools and 11.33% in low-performing schools. In high-performing schools, the number of students with high, medium, and very low abilities is almost the same, around 25–32% of all students. Meanwhile, 10.19% of students in high-performing schools already have very high formula skills.

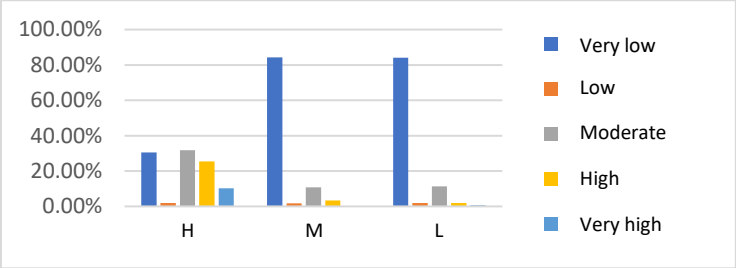

Figure 3. Percentage of students' mathematical literacy ability on the formulate process

In the employ process, the average student overall is 2.404, which is included in the low category. Most students in middle-performing schools (76.03%) and low-performing schools (88.00%) still have very low abilities. Nearly one-third of students in high-performing schools still have very low mathematical literacy skills. Meanwhile, there were several students in the middle- and low-performing schools who were able to reach the high and very high categories. 0.83% of students in middle-performing schools and 0.67 in low-performing schools got the very high category, 5.79% in middle-performing schools, and 3.33% in low-performing schools achieved the high category. While in high-performing schools there were 8.28% of students were in the very high category, and 33.12% were in the high category. Figure 4 illustrates the percentage of students' literacy skills in the employing process.

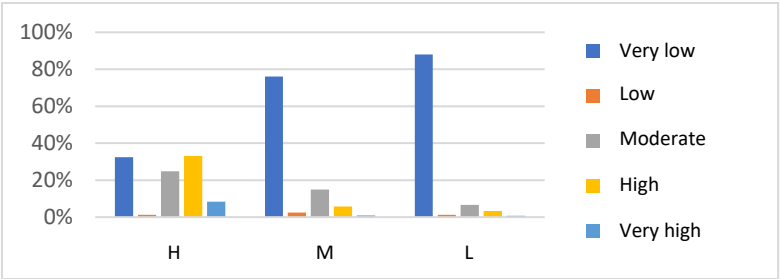

Figure 4. Percentage of students' mathematical literacy ability on the employ process

In the interpreting process, the average student overall is in the very low category, 1.799. Almost all students in the middle- and low-performing schools still have very low abilities, with 86.78% in the middle- and 97.33% in low-performing schools. 2.66% of other students in low-performing schools are only able to achieve in the low and medium categories; no students in this category have reached the high category. In high-performing schools, many students (42.68%) still have very low mathematical literacy skills. Only 10.19% of students in category A reached the very high category, and 18.47% of students in the high category. The complete percentage of students' mathematical literacy abilities in the interpretation process is presented in Figure 5.

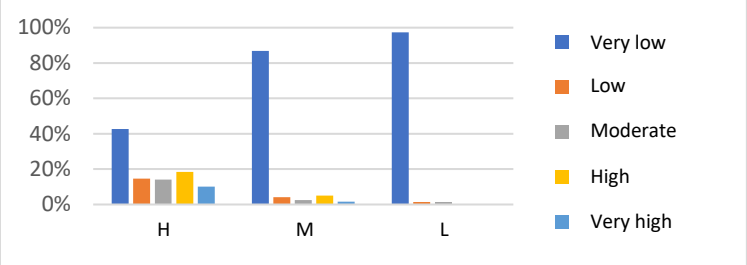

Figure 5. Percentage of students' mathematical literacy ability on the interpret process

3.3. Students' mathematical literacy ability in the content domain

Mathematical literacy skills in this study are divided into four content domains: Quantity, Change & Relationships, Space & Shape, and Uncertainty Data. Data on students' mathematical literacy abilities in terms of the four content domains can be seen in Table 6.

Table 6. Data on students' mathematical literacy ability in the content domain

Content domain	Students' mathematical literacy ability						Total	
	H		M		L			
	Average	Category	Average	Category	Average	Category	Average	Category
Quantity	3.554	High	1.777	Low	1.560	Low	2.353	Low
Change & Relationship	2.083	Low	0.479	Very low	0.180	Very low	0.963	Very low
Space & Shape	2.433	Low	0.934	Very low	0.860	Very low	1.458	Very low
Uncertainty Data	3.115	Middle	1.140	Very low	0.633	Very low	1.687	Low

The ideal maximum score for each content domain that students can achieve is 6. However, based on Table 6, the average student's mathematical literacy ability in each content is still far from the ideal maximum score. Students' mathematical literacy skills in Quantity content in all school categories tend to be better than in other content. The average student in high-performing schools is in the high category for the Quantity content, medium category for data uncertainty content, and low category for other content. In middle- and low-performing schools, students' ability in Quantity content is in a low category, while the other content is still in the very low category.

Based on the distribution of students' mathematical literacy abilities in terms of content, Change & Relationship, content has the lowest achievement. 71.96% of students in this content are in the very low category, while in the data uncertainty content, it is 53.27%; in the Space & Shape content, it is 53.97%; and in Quantity, 41.82% of students are included in the very low category. The percentage of mathematical literacy skills in other content domains can be seen in Figure 6.

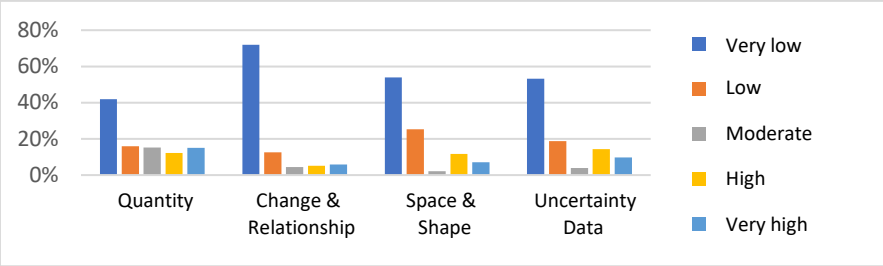

Figure 6. Percentage of students' mathematical literacy ability on the content domain

In Quantity content (see Figure 7), the average student score is 2.353, which is included in the low category. Judging from the distribution of scores on Quantity content based on school categories, students' ability in high-performing schools tends to differ considerably from that of students in the middle- and low-performing schools. In high-performing schools, there are 35.67% of students can reach the very high category, and 19.75% of students fall into the high category. While in the middle- and low-performing schools, less than 5% of students reached the very high category, and less than 9% achieved the high category. More than half of the students in categories B and C are still in the very low category.

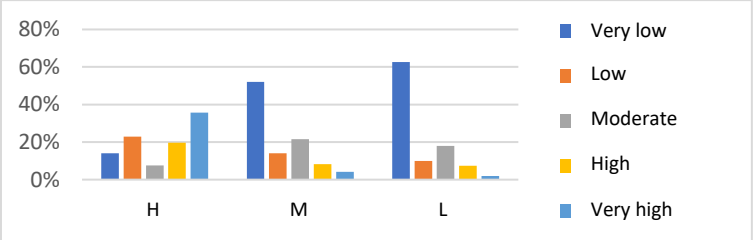

Figure 7. Percentage of students' mathematical literacy ability on the quantity content

In the Change & Relationships content, the average ability of students' mathematical literacy is in the very low category (0.963), see Figure 8. Students' abilities in change and relationship content from high-performing schools differ significantly from those from middle- and low-performing schools. Most middle- and low-performing students have very low abilities in Change & Relationship content, with 80.99% in middle-performing schools and 92.67% in low-performing schools. Even in low-performing schools, no student could reach the high and very high categories on this content. In high-performing schools, 45.22% of students are still in the very low category; the rest are spread almost evenly in other categories.

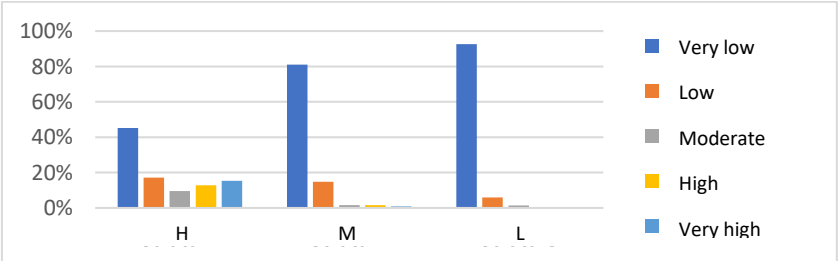

Figure 8. Percentage of students' mathematical literacy ability on the *change & relationship* content

The ability of students' mathematical literacy in Space & Shape content is in the very low category (1.458). The distribution of student's abilities in the middle- and low-performing schools in space & space content was almost the same in all categories, namely very low (64.46% and 66.67%), low (24.79% and 24.67%), moderate (0.83% and 1.33%), high (9.92% and 6.00%), and very high (0.00% and 1.33%). High-performing schools have a different distribution: 17.83% of students have reached the very high category, and 18.47% have achieved the high category. Other percentage data in this content can be seen in Figure 9.

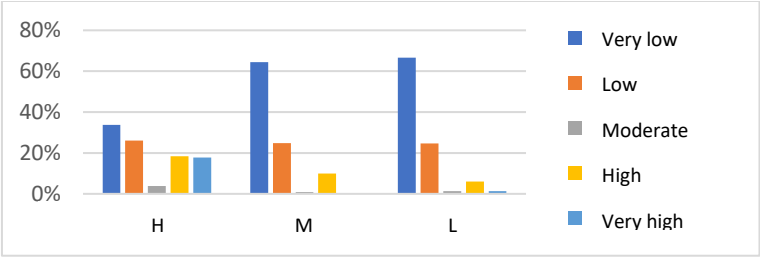

Figure 9. Percentage of students' mathematical literacy ability on the space & shape content

The mathematical literacy ability of students on data uncertainty content has an average of 1.687, which is included in the low category. The ability of students in each of the three school categories varies in this content. For example, in the very low category, there are 22.29% of students in high-performing schools, 58.68% in middle-performing schools, and 81.33% in low-performing schools. Students with a minimum level of high ability in high-performing schools total around 50%, middle-performing schools about 11%, and low-performing schools about 7%. Complete data on the percentage of capabilities in the content of Uncertainty Data is presented in Figure 10.

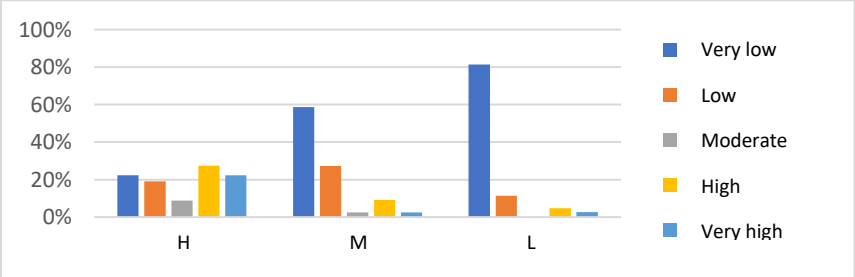

Figure 10. Percentage of students' mathematical literacy ability on the uncertainty data content

3.4. Students' mathematical literacy ability in the context domain

Mathematical literacy skills in this study consist of four context domains, including Personal, Societal, Occupational, and Scientific contexts. The ideal maximum score for each context is six. Based on the survey results, the average mathematical literacy ability in all contexts is not satisfactory. In high-performing schools, the average students' mathematical literacy skills for the four contexts tested were in the moderate category. While in middle- and low-performing schools, the average student is still in the very low category for all four contexts. Complete data on students' mathematical literacy abilities in terms of context domains are presented in Table 7.

Table 7. Data on students' mathematical literacy ability in the context domain

Context Domain	Students' mathematical literacy ability						Total	
	H		M		L			
	Average	Category	Average	Category	Average	Category	Average	Category
Personal	2.854	Middle	1.322	Very low	1.080	Very low	1.799	Low
Societal	2.529	Middle	0.860	Very low	0.813	Very low	1,456	Very low
Occupational	3.166	Middle	1.289	Very low	0.927	Very low	1.851	Low
Scientific	2.637	Middle	0.860	Very low	0.413	Very low	1.355	Very low

The distribution of students based on their categories in all contexts tends to be even. The number of students in the very low category in all contexts is around 50%. The number of students in the low category in all contexts ranges from 14–23% of students. Students in the very high category comprised 5—9% of the total. Complete data can be seen in Figure 11.

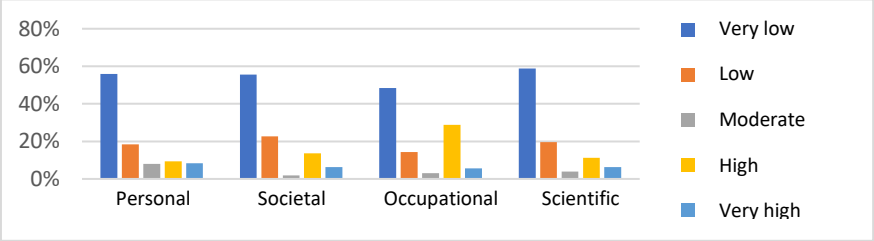

Figure 11. Percentage of students' mathematical literacy ability on the context domain

Judging from the school category, the distribution of student abilities in different personal contexts shows a significant difference from high- performing to middle-performing to low-performing schools (see Figure 12). In high-performing schools, 21.02% of students reach the very high category, while in middle-performing schools there were only 2.48% of students, and in low-performing schools, there were none. Students with very low abilities in high-performing schools were 24.20 percent; in middle-performing schools, they were 66.94 percent; and in low-performing schools, they were 80 percent.

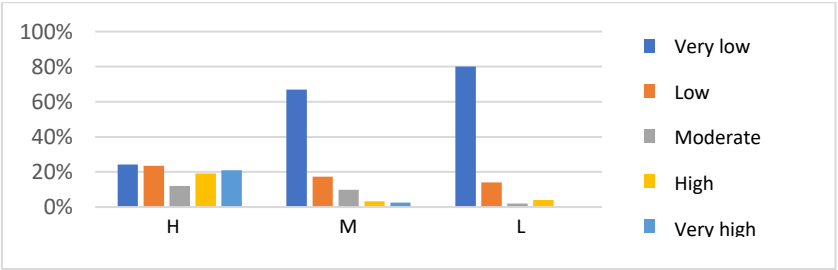

Figure 12. Percentage of students' mathematical literacy ability on the personal context

In Societal content, the distribution of students in the middle-performing and low-performing schools is almost the same for each category. For example, in the low category, 26.45% of students in middle-performing schools and 24.67% in low-

performing schools; in the very low category, there were 66.12% of students in middle-performing schools and 68.00% of students in low-performing schools. In high-performing schools, 42.68% of students had reached the high and very high categories. However, 53.50% of other students are still in the category of students in the low and very low categories. The rest (3.82) fall into the medium category. Figure 13 depicts the percentage of data viewed from Societal content.

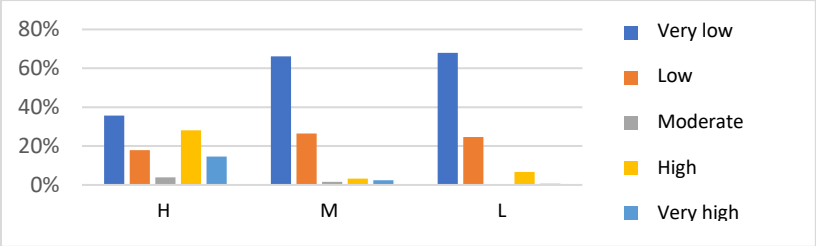

Figure 13. Percentage of students' mathematical literacy ability on the societal context

In the Occupational context, more than 60% of students were able to achieve the minimum high category; the rest were in the very low (17.83%), low (15.92%), and moderate (4.46%) categories. In middle- and low-performing schools, most students are still in the very low category (59.50% and 71.33%). In comparison, students who can achieve the minimum high category are only around 20% in middle-performing schools and 16% in low-performing schools. Other percentage data are presented in Figure 14.

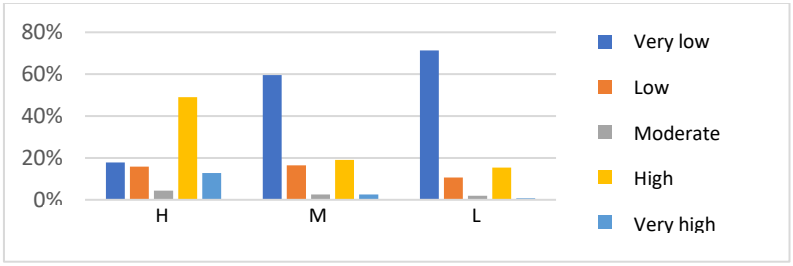

Figure 14. Percentage of students' mathematical literacy ability on the occupational context

In the Scientific context, there are also quite large differences in the distribution of students' abilities. In high-performing schools, about 50% of students in the low and very low categories, while in middle-performing schools, there are 80% more students, and in low-performing schools, there are around 95% of students in both categories. Data on the percentage of students' mathematical literacy abilities in a Scientific context are presented in Figure 15.

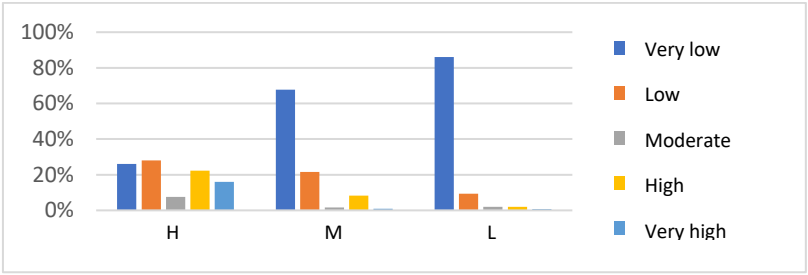

Figure 15. Percentage of students' mathematical literacy ability on the scientific context

3.5. Discussion

According to the analysis's findings, the average mathematical literacy ability of junior high school students in Sleman Regency is generally still in the low category, as seen by their score of 6.442. This average is still far from the ideal maximum score (24). The findings of this research are consistent with surveys conducted on high school students in Yogyakarta [17] and on state junior high school students in Makassar City [14] that the mathematical literacy ability is in a low category.

Based on this research, high-category schools achieve moderate mathematical literacy skills, whereas medium and low schools still fall into the extremely low category. This shows that there is a sizeable gap between high schools and medium and low schools. This condition reinforces the results of the 2018 PISA survey that there is still a large gap in the abilities of students who have the best and lowest performances [9]. This difference typically corresponds to the capacities that students develop over time [9]. Therefore, this gap between schools needs to get important attention for the advancement of comprehensive education [19]–[21].

Based on the process domain, students' mathematical literacy abilities in the formula and employ processes are in a low category, while the interpreting process falls into a very low category. This is possible because the interpreting procedure necessitates more advanced student skills than the other two processes. Students are required to identify and simplify the real-world problem situation, then make mathematical models (the formula process) and use mathematical concepts (the employing process) in the interpreting process [22][23]. Other mathematical skills are crucial for achieving high levels of mathematical literacy. This is in line with the PISA declaration that to be successful in working on mathematical literacy tests, students must be able to do mathematical reasoning and use concepts, procedures, facts, and mathematical tools to describe and predict phenomena [9]. The required mathematical performance is more than the ability to apply mathematical concepts and procedures acquired at school. Mathematical literacy requires students' expertise in applying what they know and their mathematical knowledge in various situations in real life, including new and unfamiliar situations [9].

Students' mathematical literacy skills in Personal and Occupational contexts are in a low category, while social and Scientific are in the very low category. Personal is a context that focuses on the activities of oneself, family, or peer group. Occupational is a context that focuses on situations or problems in the world of work. Social is a context that focuses on one's community, whether local, national, or global. Scientific is a context that deals with the application of mathematics to topics related to science and technology. In this case, the Personal context is the context that is closest or most familiar to students, while the Scientific context is the context that is most distant or foreign to students. This allows for an impact on students' understanding of the context of the problem given, the context of the problem that is closer becomes easier to understand.

In addition, researchers discovered that students at low-category schools lacked even the motivation to complete the questions. When faced with the test, some students appeared unenthusiastic and felt unable to solve the problems given. When they discover questions that appear lengthy and seem unfamiliar to them, they are pessimistic. Even other students left their answers blank without making any significant effort. This shows that in improving students' mathematical literacy skills, several other, more fundamental factors need to be an important concern for teachers [24][25].

This research has provided information about the level of mathematical literacy ability based on its domains among junior high school students in Sleman Regency. Different levels of education and regions may produce different outcomes. Tests were the only method used in this study's data collection. Interviews may provide more in-depth results about the variables being measured [26][27]. Other variables, such as health and psychological conditions, as well as student honesty, may also affect test outcomes when data is collected.

The results of this study are expected to be input for related parties to improve the quality of education, especially in learning mathematics. The low level of students' mathematical literacy skills and the importance of this ability has implications for the need for proper handling. Teachers, the government, and even parents need to work together to find solutions to these problems. The teacher's role is in facilitating students' ability to develop mathematical literacy skills. They can refer to theories and research results that can provide insight into developing mathematical literacy skills, for example by applying contextual tasks [28], mathematical modelling [29], different types of the mathematical task [30], realistic mathematics education [31], or problem-based learning [32], and so on. Teachers can also find innovations in developing mathematical literacy skills according to the needs of their students.

The government's role is needed in facilitating teachers and schools to be able to improve students' mathematical literacy skills. Further research is needed, for example, to investigate the causes of low mathematical literacy and the real solutions that can be offered to overcome these problems. In addition, it is also hoped that the results of this study can encourage further research to get around the various limitations of this study.

4. Conclusion

Based on the results of the research, the following conclusions were obtained: Junior high school students in Sleman Regency typically fall into the low category for mathematical literacy ability, with 62.15% of students falling into the very low category, 13.32% falling into the low category, 14.02% falling into the medium category, 5.37% falling into the high category, and 5.14% falling into the very high category. The mathematical literacy skills in the formulae and employing processes are in a low category and very low for interpreting processes. For Quantity and Uncertainty Data, students' abilities are included in the low category, while for the content of Change & Relationship and Space & Shape, they are included in the very low category. The Personal and Occupational contexts are in a low category, while the Societal and Scientific contexts are in the very low category.

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