Mathematical Literacy of Indonesian Elementary School Students: A Case Study of Bandung School

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Abstract

Improving mathematical skills is one of the critical goals of school education. The study aimed to try to figure out how the mathematical literacy skills of students in elementary schools based on OECD indicators and the results of the minimum competency assessment (MCA). This research uses a quantitative approach with a descriptive method. A purposive and convenient sampling was undertaken, and one hundred thirty-two participants were in grade 5 at an elementary school in Bandung. The data showed that the average mathematical literacy score was 56.84, indicating a low score. 63% (N=83) of students displayed low achievement outcomes, those students are positioned at a knowing level in the minimum competency minimum (MCA) and only master 1-2 indicators in the OECD. The results indicate that the mathematical literacy outcomes of the grade 5 students in Bandung fall far behind the governmental goal. On the other hand, this study is severely subjective to the limited sample, and a larger sample is suggested in the future to give a snapshot of students' mathematical literacy achievement.

Keywords: mathematical literacy skills, minimum competency assessment (MCA), OECD, elementary school

1. Introduction

Mathematics has unique characteristics, namely that it is a science like fine music and arts, has an aesthetic beauty that cannot be achieved by ordinary people, and has an extraordinary impact on life (Henn, 2007). This view shows that mathematics is a unique science and has a big impact. Mathematics is an important subject in education (Subrahmanyam, 2021) which helps improve students' thinking skills (Siaw et al, 2020). Mathematics can encourage various abilities in students, such as abstract, analytical, critical, and logical thinking, which requires a good understanding and mastery of mathematical material (Cresswell & Speelman, 2020), and the key to mastering the material is understanding mathematical connections (Hardi et al, 2022). Mathematics is very related and has become the basis of STEM (Brewster & Miller, 2023., & Roberts, 2022). Many people consider mathematics very important in the future and the workplace (Murphy, 2022), and students also perceive that mathematics is fundamental in today's world (Escalera-Chávez et al, 2021). This is because learning mathematics is about developing a connection between mathematics as the development of mathematical concepts and skills (Bordie, 2022). So, knowledge and skills in mathematics will be relevant to the development of the times and the future. Mathematics is still considered very difficult for students to understand, including in elementary schools (Markovits & Forgatz, 2017), and students even tend to avoid this subject. These students' difficulties are based on the fact that mathematics is a deductive and abstract science taught to students in a formal context, even though the development phase of elementary school students is at the concrete operational stage.

The context of the development of this era involves various aspects and skills that must be possessed, which must undoubtedly be taught in schools. The skills that are in demand and must-have for students in the 21st century are critical thinking and problem-solving, creative thinking, communication, and collaboration (Illene et al, 2023., Özer & Kuloğlu, 2023., & Nahar et al, 2022), and other additional skills such as the use of technology, cultural awareness, global citizenship (Göksün & Kurt, 2017), character education (Anugerahwati, 2019), including information literacy and information and communication technology (Yurt, 2023) as part of the tools to work in the 21st century (Byhee,

2010).

Literacy is an important skill that children must master in school life (Georgiou et al, 2017), and it should be taught from the start of elementary school. Literacy is essential to access all areas of academic content at all levels of education (Kennedy & McLoughlin, 2023., & Spooner et al, 2015), and it is also significantly related to life skills (Chui et al, 2023., & Howell, 2022). Now, literacy skills are not only reading and writing, but far from it, which is about mastering something. Literacy is closely related to language skills (using the context of reading, writing, and speaking) to construct, integrate, and understand the meaning of something (Frankel et al, 2016). Literacy skills are closely related to individuals' ability to reason, formulate, solve, and interpret mathematically to solve problems (Kusuma et al, 2022). Good literacy skills will make it easier for them to face various issues in the 21st century.

In the 21st century, there are many literacies that students must master, some of which are science literacy, digital or technology literacy, information literacy, mathematical literacy, and others. Several of these literacies are used as educational benchmarks or evaluations, including in Indonesia (Stacey, 2011). These literacies are mathematical literacy, scientific literacy, and reading literacy (OECD, 2017). Mathematical literacy is one of the skills that must be mastered by students (Slyamkhan et al, 2022). Mathematical literacy is an individual's numeracy skills and in-depth readiness to act appropriately and respond to all mathematical challenges associated with a particular real-life situation (Niss & Højgaard, 2019., & Umbara & Suryadi, 2019), it is used to analyze mathematics in a variety of contexts (Pujiastuti & Haryadi, 2020), and this becomes an important part of solving students' real-life problems (Susanta et al, 2023). Individuals who have good mathematical literacy are citizens who have intelligent knowledge. They have the ability to interpret and analyze the various information they have (Martin, 2007). The term numeracy is used in some English-speaking countries (Australia, New Zealand, and the United Kingdom). In the United States, it uses quantitative literacy and mathematical iteration (Geiger et al, 2015).

In mathematics education, mathematical literacy is an important component that requires various integrated skills, such as problem understanding and mathematical calculations (Lei & Xin, 2023). Mathematical literacy relates to mathematical reasoning because it involves using mathematical concepts, techniques, facts, and tools to describe, explain, and predict an event (Dewi & Maulida, 2023). Mathematical literacy is an important part that can positively impact thinking skills, especially in decision-making (critical thinking and problem-solving). Mathematical literacy is the knowledge to understand and apply basic mathematical concepts in daily life (Ojose, 2011). Mathematical literacy functions not only to understand mathematical ideas but through a gradual process from basic to complex, such as involving basic literacy and the ability of individuals to use mathematical thinking, build understanding, and solve problems in daily life (Yore et al, 2007). The benefits of mathematical literacy are not only felt by individuals but also benefit the broader community because they can create and strengthen democracy and culture (Genc & Erbas, 2019). In several periods, Indonesian students' mathematics literacy results were still low, their scores were below the OECD average and tended to rank in the bottom 10 participating countries. Some summaries of Indonesian students' mathematical literacy results from 2000-2018 are explained in Table 1 below.

Table 1. Indonesian Students' Mathematical Literacy Results (2000-2018)

Years	Rank	Participating Countries	Score
2000	39	41	367
2003	38	40	360
2006	50	57	391
2009	61	65	371
2012	64	65	375
2015	63	70	386
2018	73	79	379

The test results above are sourced from the OECD. This score also puts Indonesia below Brunei, Malaysia, and Singapore (OECD, 2019). Then, based on the latest Indonesian mathematics literacy results report in 2022, the score is 366 (Wijaya et al, 2024). Below is a graph of Indonesian students' mathematics literacy scores from 2000-2022.

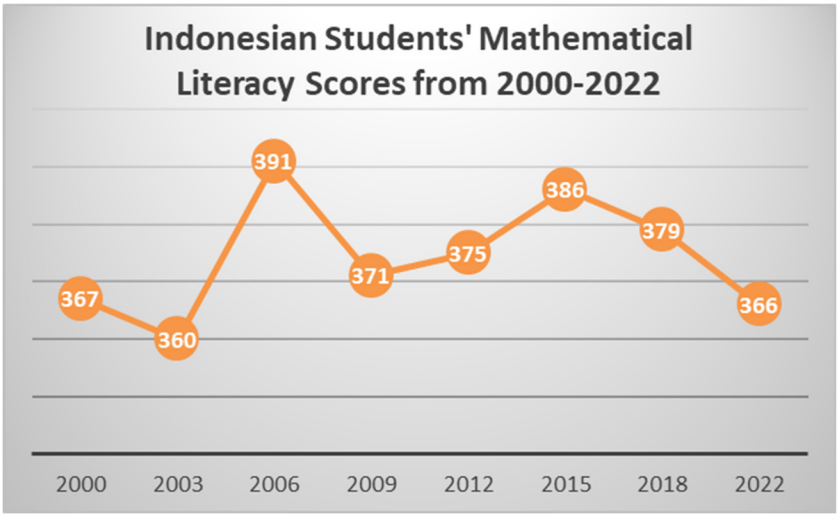

Figure 1. Indonesian Students' Math Literacy Scores from 2000-2022

Based on Figure 1, the mathematics literacy results of Indonesian students have never received a score above 400, and in recent years, the score has decreased, namely 2015-2018 (-7 points) and 2018-2022 (-13 points). According to Firdaus et al (2017 the problem with students' mathematical literacy in elementary schools is that some students can only understand a mathematical concept. Some students are still less able to connect mathematical concepts and apply mathematical procedures to everyday life problems (Firdaus et al, 2017). The low literacy score of Indonesian students, including in mathematics on the PISA test, impacts the national assessment policy organized by the Ministry of Education and Culture (MoEC). In Indonesia, the National Assessment is carried out for students in grade 5, grade 8, and grade 11 (MoEC, 2020). According to Wagner & Hastedt (2022), most national assessments are carried out to identify various aspects of knowledge and skills possessed by students.

The National Assessment uses three instruments: the minimum competency assessment (MCA), character survey, and learning environment survey. MCA aims to measure students' literacy skills (Purnomo et al, 2022). According to Megawati & Sutarto (2021), MCA measures students' thinking skills (reasoning and problem-solving), including abilities requiring mathematical knowledge. The mathematical literacy test in MCA measures students' mathematical knowledge in explaining events, problem-solving, or decision-making in everyday life. Rohmah et al (2022) state that MCA results are the basis for mapping education (inputs, processes, and outcomes). The questions in the MCA refer to the PISA test (Nusantara et al, 2021), with the types of questions being multiple-choice, complex multiple-choice, matchmaking, short fill, and essays. The impact of the national assessment is the transformation of learning that leads to improved literacy and numeracy skills for students, and this occurs at all levels of education, from elementary school to junior high school and high school. According to Herman et al (2022), minimum competency assessment (MCA) can encourage teachers and schools to improve the quality of education and learning in schools, meaning that teachers must strive to strengthen the abilities of various literacy, including student mathematics, through contextual and meaningful learning. The results of the 2022 PISA test show that the mathematical literacy of Indonesian students has increased by 2 levels, Indonesia is ranked 71st out of 81 countries participating in the PISA test, although if you look at the score, Indonesia got a score of 366 (OECD, 2023). There was a decrease in the score from 2015-2022. This decrease in score was due to learning loss from the impact of COVID-19.

Some research related to mathematical literacy in elementary school, such as Fauzi & Chano (2022), which measures the mathematical literacy skills during online learning, Wigati et al (2020), which analyzes the mathematical literacy skills through the PMRI Approach, and Rohmah et al (2022), which examines lesson planning in strengthening the mathematical literacy in the context of MCA. This study aims to see in detail the results of the mathematical literacy skills of elementary school students in Bandung. This is different from previous studies. This study examined how mathematical literacy skills are based on 7 indicators from the OECD (2016a). The questions are based on the MCA from the Ministry of Education and Culture (MoCE), and the test is carried out after COVID-19. In addition, the results of this mathematical literacy test are an important part in identifying mathematical literacy skills and seeing their relevance to MCA results in aspects of mathematical literacy skills. So, this becomes the basis for developing and improving mathematical literacy skills and minimum competency assessments in elementary schools in the

future. The question in this study is how students' mathematical literacy skills are viewed from OECD indicators and MCA results. This mathematical literacy test is given to students in grade 5 of elementary school for several reasons: 1) students in grade 5 are considered representative at the elementary school level because they have learned various basic mathematical concepts and skills, 2) students in grade 5 are considered not to have as heavy a learning load as grade 6 who will face the final exam, 3) students in grade 5 are part of the sampling of the national assessment carried out by the government, and 4) this makes it possible to compare the results of the literacy test with the results national assessment carried out in grade 5. Then, several reasons for choosing schools in Bandung are as follows: 1) schools in Bandung have the same system for accepting new students (zoning) so that students in each school have the same basic abilities, 2) the curriculum system also has similarities, namely using a Merdeka Curriculum, and 3) has adequate facilities for providing education and learning.

2. Method

The method in this study is quantitative descriptive. This method aims to describe in detail using statistics about the state or description of a condition based on existing data and facts. The form of data described in this study is about mathematical literacy with data types based on MCA. This study was conducted on 132 students in grade 5 elementary school in Bandung, Indonesia. The types of distribution of participant data in this study are described in Table 2 below.

Table 2. The Distribution of Participants

Gender	Total
Male	58
Female	74
	132

This sample selection is carried out considering that students at the school go through an admission system determined by the local government through the regional system (zoning), so the environmental characteristics are the same. In addition, this sample also has diverse social backgrounds according to Bandung's characteristics. Another consideration is the similarity of facilities, learning systems, and educational curriculum systems used in Bandung schools. Thus, the sample is representative of the population in Bandung.

The instrument in this study used a mathematical literacy test. The test was conducted to assess mathematical literacy skills in number and geometry material. The test has 35 questions, with the type of questions referring to the MCA questions and OECD Indicators (OECD, 2016a). The distribution of the questions is explained in Table 3 below.

Table 3. The Type of Question

Type of Questions	Total	Points	Scores
Multiple choice	25	1	25
Complex multiple choice	2	5	10
Matchmaking	2	5	10
Short fill	3	1	3
Essays	2	4	8
Open-Ended Question	1	4	4
	35		**60**

The scores of the mathematical literacy test are as follows.

$$\text{Scores} = \frac{Points\ earned}{Maximum\ points} \text{ x } 100$$

The MCA test divides students into 3 levels of competence: knowing, applying, and reasoning. Its relationship with mathematical literacy from the OECD is described in Figure 2 below.

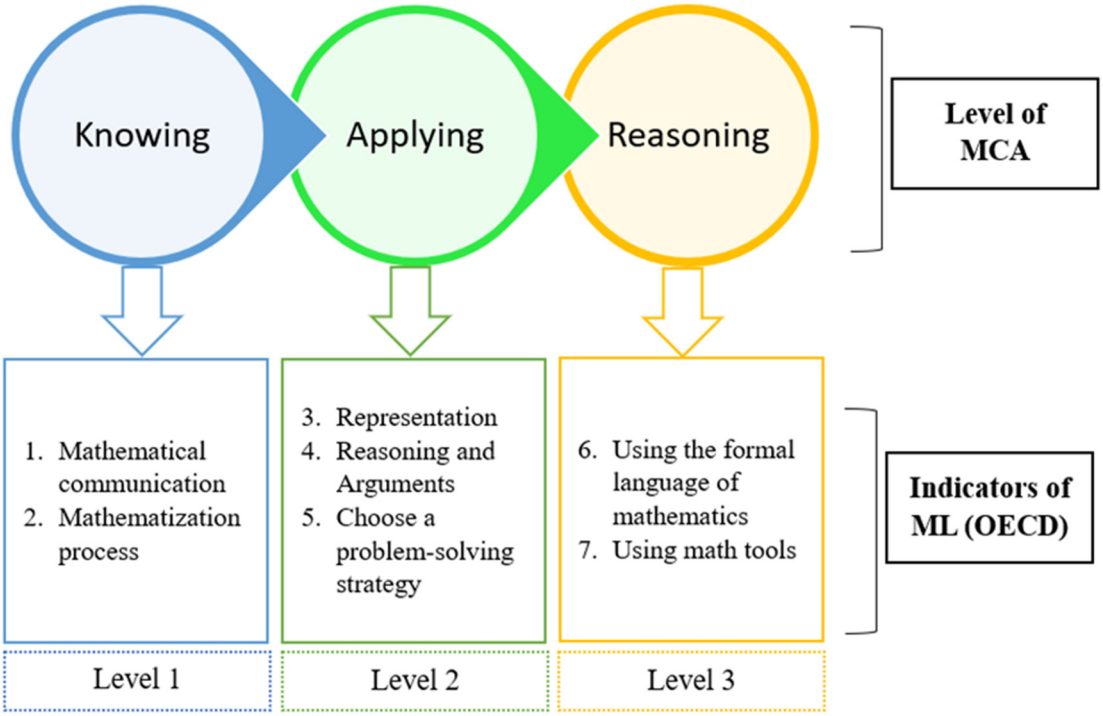

Figure 2. Relationship between Level of MCA and Indicators of Mathematical Literacy Based on OECD

The test was given to 29 students who had received material about numbers and geometry to see the validity and reliability of the instrument. Validity can be sought by linking students' overall scores in one item with the overall scores obtained by all students through Pearson's Product moment correlation technique with the SPSS application. If $r_{xy} > r_{Table}$ is at a significant level of 5%, then it can be concluded that the question item is valid and if $r_{xy} < r_{Table}$, it can be concluded that the question item is both invalid and does not meet the requirements. From the validity test results on 35 question items, a score was obtained in the range of 0.45-0.80. This indicates that the test instrument is valid with enough and high categories. Meanwhile, the reliability score for the mathematics literacy test was 0.934, a very high-reliability category. This indicates that the test instrument has gone through the appropriate stages (valid and reliable). So, this test can be used to measure the mathematical literacy of students in grade 5 of elementary school.

The data analysis conducted in this study involves calculating descriptive statistics (mean, median, mode, minimum value, maximum value, and standard deviation). In addition, the results of the mathematical literacy test will be seen based on the distribution of values (very high, high, medium, low, and very low). The interpretation of value scores is explained in Table 4 below.

Table 4. Interpretation of Mathematical Literacy Scores

Category	Score
Very High	$x \geq 90$
High	$75 \leq x < 90$
Medium	$60 \leq x < 75$
Low	$40 \leq x < 60$
Very Low	$x < 40$

(Ratumanan & Laurens, 2015)

In addition to looking at the distribution of mathematical literacy scores, the difference in average values based on gender (male and female) is also seen, the test of average differences seen from inferential statistics. Before the inferential statistical test, prerequisite tests are carried out, namely normality and homogeneity tests. Data analysis is

the basis for interpreting in detail the findings that arise by relating the results of the analysis to various relevant theories or research.

3. Results

Mathematical literacy tests were given to 132 students in grade 5 elementary schools in Bandung. The type of question is the MCA question. Mathematical literacy problems are based on contextual stories close to students' lives. The descriptive statistical results of students' mathematical literacy skills are described in Table 5 below.

Table 5. Descriptive Statistics of Students' Mathematical Literacy Skills

N	Valid	132
	Missing	0
Mean		56.8409
Median		53.0000
Mode		38.00[a]
Std. Deviation		18.43778
Skewness		.191
Std. Error of Skewness		.211
Minimum		19.00
Maximum		93.00

Based on Table 5 above, the average score is 56.84, the median score is 53, and the mode score is 38. The minimum score is 19, and the maximum score is 93. The distribution of mathematics literacy scores can be explained in Table 6 below.

Table 6. Distribution of Mathematical Literacy Scores

Very Low	Low	Medium	High	Very High
28 Students	55 Students	24 Students	22 Students	3 Students

Based on Table 6, there are 28 students in the very low category, 55 students in the low category, 24 in the medium category, 22 in the high category, and 3 in the very high category. The percentage distribution of students' mathematical literacy data is explained below.

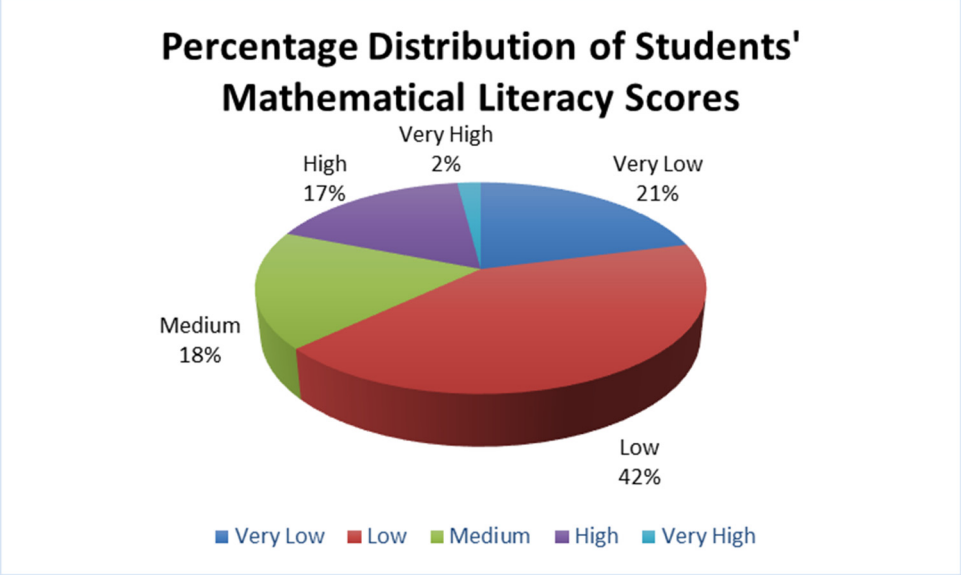

Figure 3. Percentage Distribution of Students' Mathematical Literacy Scores

Figure 3 above shows that 42% of students are in the low category, 21% of students are in the very low category, 18% of students are in the medium category, 17% of students are in the high category, and only 2% of students are in the very high category. The distribution of scores by gender can be seen in detail in Table 7 below.

Table 7. Descriptive Statistics of Mathematical Literacy Skills by Gender

Statistics	Male	Female
Mean	56.42	58.39
Median	54.00	54.00
Std. Deviation	18.93	18.08
Minimum	19	25
Maximum	92	93
Skewness	0.94	0.206

Based on Table 7, the average score between males and females is different; males have an average score of 56.42, and females get an average score of 58.39, this means that the average score of females' mathematical literacy skills is slightly higher than males by a margin of 1.97. The median has the same score of 54.00. The minimum male score is 19, and female is 25. The maximum male score is 92, and the female score is 93. Based on the normality test results, male and female students' mathematical literacy scores are as follows: 1) male students' mathematical literacy skills scores have sig. = 0.230 > α (0.05), meaning that the data is usually distributed, and 2) female students' mathematical literacy skills scores have sig. = 0.042 < α (0.05), meaning the data is not normally distributed. From these data, parametric tests cannot be done because there is data that is not normally distributed, so the test of the difference in average mathematical literacy scores between male and female students is carried out using a non-parametric test (Mann-Whitney Test). The results of the Mann-Whitney test of mathematical literacy skills between males and females are described in Table 8 below.

Based on Table 8, the sig. is 0.919 > α, it can be concluded that there is no difference in the average score of mathematical literacy between males and females, or if you look at the average score, the difference is only slightly different at 1.97. Males scored an average of 56.42, and Females scored an average of 58.39.

Table 8. Mann-Whitney Test of Mathematical Literacy Skills by Gender

	Scores
Mann-Whitney U	2115.500
Wilcoxon W	3768.500
Z	-.101
Asymp. Sig. (2-tailed)	.919

4. Discussion

4.1 Students' Mathematical Literacy Based on OECD Indicators

Mathematical literacy is the key for students in understanding mathematical content. Mathematical literacy focuses on the mathematical processes experienced by individuals in solving problems and classifying questions in sub-dimensions of mathematical content and frameworks (Saka, 2023). The findings show that 63% of students are in the low and very low categories. Students who have low mathematical literacy skills have low critical thinking skills (Maslihah et al, 2020), even though critical thinking and mathematics learning are an inseparable part of the learning process (Sadikin et al, 2019), and have become an essential part of teaching higher order thinking skills (HOTS) (FitzPatrick & Schulz, 2015), inevitably that mathematical literacy skills will train HOTS. The results showed that students directly answered mathematical literacy questions without investigating and interpreting the thinking stage for decision-making, even though these three things are part of the critical thinking stage that students must do (Ridwan et al, 2022). Good critical thinking skills, including mathematical literacy, can lead a person to have cognitive competence to achieve the desired goals (Umam & Susandi, 2021).

Another aspect that encourages students to have difficulty answering mathematical literacy problems is that they do not have good problem-solving skills. Mathematical literacy skills are closely related to problem-solving skills, even people with good mathematical literacy will be sensitive to mathematical concepts relevant to the problem (Suciati et

al, 2020). Problem-solving includes using cognitive, affective, and motor skills, determining the most effective strategies for solving the problem and gathering information from the problem (Tüysüz, 2013). According to Prahmana (2022), one of the factors for low PISA scores in mathematics is students' difficulty in understanding and designing existing problems. The problem presented is a context close to student life, but students find it challenging to translate from informal contexts into mathematical models. According to Kolar & Hodnik (2021), the key to mathematical literacy skills is how one can understand, analyze, interpret, evaluate, and synthesize the problem at hand, then turn it into a mathematical model and determine solutions with the effective use of mathematical concepts, or according to Elke et al (2021) that the transition from informal situations to formal mathematics is an important part of the developmental phase of children's mathematics.

In addition, students also find it difficult to understand story problems. The context of stories in everyday life can be one of the tools that teachers can use in learning mathematics effectively. According to Mulia (2018), In fact, in various countries, the problem faced in learning mathematics is that it does not involve aspects of students' daily lives (informal mathematics) in teaching mathematics in schools (formal mathematics), meaning that mathematics learning is given directly using formal language consisting of symbols and numbers. In contrast, if you look at the stages of development of thinking according to Piaget, students in elementary school are still at a concrete operational stage (Franzoi, 2011), at this stage, the student can think logically and rationally but is limited to objects close to his life so that the form of stories that are close to the lives of students will help them understand the given math problem. This reason causes students to have difficulty answering story questions. When linked to 7 indicators of mathematical literacy skills from the OECD, students in the low category are in stages 1-2 and have problems with mathematical communication and mathematical processes.

Another aspect that results in low students' mathematical literacy scores is that they are not used to doing non-routine questions, and this is also shown by other studies that explain that students have low scores in solving non-routine problems (Wessels, 2009), non-routine contexts can allow students to analyze problems, engage in reasoning, and come up with alternative solutions to solve problems (Işık & Kar, 2011). The provision of non-routine problems will result in cognitive conflict, in Piaget's theory that students must be accustomed to experiencing cognitive conflict because it is a process of learning and to improve student's learning experience (Ngicho et al, 2020). In addition, the presentation of non-routine problems makes students experience a process of disequilibrium, meaning that students must understand the context of the problem using new information and experiences (Lovatt & Hedges, 2014). So, it is the teacher's task to determine how this disequilibrium process can be converted into equilibrium. According to Nizaruddin & Kismaryono (2023), teachers can engage the actual thought process through the process of reflection and giving scaffolding to students.. According to Lu (2023), this scaffolding strategy was introduced by Vygotsky in his theory, Zone of Proximal Development (ZPD). Scaffolding is an important strategy in the learning environment to cope with the challenges associated with problem-solving (Haesol et al, 2021). This scaffolding assists students in solving the problems they face. However, when students have begun to understand the problem, the assistance begins to be reduced so that students can take responsibility independently for solving the problem (Baxter & Williams, 2010). If scaffolding can be done well, students will experience equilibrium, where students begin to understand the given problem.

Apart from students with low and very low mathematical literacy skills, some students are in the medium category. Overall, students in the medium category already understand the given problem. Students at that stage have passed the indicators of mathematical literacy, namely mathematical communication and mathematical processes. Still, students begin to be confused about several things, such as making representations, reasoning, and arguments, and choosing strategies to solve problems because students tend to have mathematical skills based on rote memorization, so when finding different issues will make students have difficulty (Fauzi et al, 2023). In addition, some students with high mathematical literacy skills show that they understand the context of a given problem through their problem-solving skills. According to Business Council of Australia and Australian Chamber of Commerce and Industry (2022), students with good problem-solving skills will show initiative and independence and produce innovative, creative, and practical solutions. Students with high mathematical literacy skills have good cognitive knowledge in mathematics, which is not just rote memorization but can also be applied in different situations.

The results of the Mann-Whitney test related to mathematical literacy skills based on gender show that males and females have the same abilities in terms of mathematical literacy. According to (Rahe & Quaiser-Pohl, 2023), there is no difference in mathematical skills between genders, meaning that data on students' mathematical literacy skills has the same distribution in the low, medium, and high categories. The data on the distribution of mathematical literacy skills by gender can be seen in Table 9 below

Table 9. Distribution of Data on Students' Mathematical Literacy Skills by Gender

	Very Low	Low	Medium	High	Very High
Male	13 Students (10%)	22 Students (17%)	12 Students (9%)	10 Students (8%)	1 Student (1%)
Female	15 Students (11%)	33 Students (25%)	12 Students (9%)	12 Students (9%)	2 Students (1%)
Total	**28 Students**	**55 Students**	**24 Students**	**22 Students**	**3 Students**

The subjects in this study consisted of 58 male students and 74 female students. Based on Table 9, male students with very high categories are 1 student, and females are 2 students. Male students with high categories are 10 students, and females are 12 students. Male students with medium category are 12 students, and females are 12 students. Male students with low category are 22 students, and females are 33 students. Male students with very low category are 13 students, and female students are 15 students.

4.2 Students' Mathematical Literacy Based on Minimum Competency Assessment (MCA)

MCA is held to see student competencies (MoEC, 2020). The competencies measured in MCA are literacy and numeracy, with the assessment covering 3 things: the ability to think logically systematically, the ability to reason using ideas and knowledge, and the ability to process information. In 2022, the Ministry of Education and Culture (MoEC) explained that 2 out of 3 students have not reached the minimum competence on the mathematical literacy test (MoEC, 2022), this shows that there are still many students who do not have good basic skills in mathematics. There are 4 things in mathematical literacy in MCA: above the minimum competence, achieving minimum competence, below the minimum competency, and far below the minimum competency. The distribution of MCA results on mathematical literacy skills is as follows.

Figure 4. Student Numeracy (Mathematical Literacy) Results on the MCA Test (MoEC, 2022)

In detail, the yellow and red graph shows that students have not reached the minimum competence on the mathematical literacy test, and the green and blue colors mean that students have reached the minimum competence on the mathematical literacy test. When viewed from the elementary school category, more than 60% of students are still in the basic category and need special intervention (have not reached the minimum competence) on the mathematical literacy test. This study also shows that 63% of students are in the low and very low categories (Figure 3).

The low mathematical literacy skills of students in Indonesia are shown from several PISA test results (OECD, 2014., OECD, 2016b., & OECD, 2019), and this has also been explained by Dewanto & Sumarno (2013) that the low quality of Indonesian students' ability to compete in the era of Globalization, especially in the fields of mathematics and science. Low mathematical literacy is caused by students' ignorance of understanding concepts and methods in basic mathematics (Kaiser & Willander, 2005). The results of other studies also show that the low mathematical literacy of Indonesian students is caused by the learning process that has not involved students and is still teacher-centered. The lack of students' practice solving problems so that they have difficulty making mathematical

models of real-world problems (Nurwahid & Ashar, 2022) or the OECD indicators still have issues with mathematical communication and mathematical processes. Other factors affecting the low literacy of students include the use of curriculum and the use of learning strategies (methods and models), including inadequate facilities that support the learning process. (Kurnia et al., 2014).

Students with low and very low mathematical literacy are still at the knowing stage or the OECD indicator level. They are still at the stage of mathematical communication and the mathematical process, meaning that 83 students (63%) still experience problems at level 1. Students with mathematical literacy in the medium category are at the applying stage or the OECD indicator level, namely doing mathematical representation, reasoning, and argumentation, and choosing problem-solving strategies, meaning that 24 students (18%) are at level 2. Students with high and very high mathematical literacy are at the reasoning stage or at the OECD indicator level, namely using formal mathematical language and mathematical tools, meaning that 25 students (19%) are at level 3. The data distribution is shown in Table 10 below.

Table 10. Students' Mathematical Literacy Proficiency Levels Based on MCA and OECD

	Knowing (Indicator 1-2 OECD)	**Applying (Indicator 3-5 OECD)**	**Reasoning (Indicator 6-7 OECD)**
	Level 1	**Level 2**	**Level 3**
Total	83 Students	24 Students	25 Students
Percentage	63%	18%	19%

The importance of mathematical literacy in achieving MCA requires teachers to be able to transform learning mathematics. Teachers must realize that the thinking stages of elementary school-age children are in concrete operations. At the same time, mathematics is a deductive and abstract science, so what teachers must do is teach it concretely abstractly (Huan et al, 2022), or in mathematical language, it is from informal, using real situations towards formal mathematics, using symbols and numbers.

5. Conclusion

Based on the results, the average score of students on the mathematical literacy test is 56.84. 63% of students (N=83) have low mathematical literacy skills. It is also shown from the results of the MCA that more than 60% of students, or 2 out of 3 Indonesian students, have not reached the minimum competency on the mathematical literacy test. Students with low mathematical literacy skills are still at the knowing level in MCA and in OECD indicators and still have problems with mathematical communication and the mathematical process. Students' low mathematical literacy is influenced by various factors, such as the use of the curriculum and the learning strategies, including the facilities used in learning. This research provides facts regarding the mathematical literacy skills of elementary school students in Indonesia with a sample in Bandung. This low level of mathematical literacy needs special attention in efforts to encourage various parties to carry out interventions that support increasing mathematical literacy skills for students in elementary schools. Strengthening mathematical literacy through providing interactive mathematics learning media, non-routine problems, open-ended questions, and real-life contexts in mathematics will impact students' understanding, especially in mathematical communication and the mathematization process, and this will also impact mathematical literacy. In addition, the need for a curriculum that supports the strengthening of mathematical literacy, the use of methods and models relevant to the context of mathematics learning, and the importance of completeness of learning facilities will be very helpful in improving students' literacy skills.

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The authors have collaborated to conduct this research. The division of tasks in this study is Irfan Fauzi: responsible for the research design (instruments, data collection, and data analysis) and making draft articles, Assoc. Prof. Jiraporn Chano: Checking and analyzing data and revising draft articles, and Dr. Chi Cheng: revision and completion of the article.

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