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THE RELATIONSHIP BETWEEN MATHEMATICAL PROBLEM SOLVING ABILITY AND STUDENTS' MATHEMATICAL LITERACY ABILITY IN SOCIAL ARITHMETIC

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ABSTRACT
This study aims to explore the relationship between mathematical problem-solving ability and mathematical literacy among junior high school students in the topic of social arithmetic. The research employs a quantitative approach with a correlational method. The population consists of all eighth-grade students at a junior high school in Karawang. The sample was selected using a simple random sampling technique based on Slovin's formula, resulting in 100 students from a total population of 480. The research instrument consists of an open-ended test comprising three questions to measure mathematical problem-solving ability and three questions to assess mathematical literacy. The results indicate a significant relationship between mathematical problem solving ability and students' mathematical literacy in the topic of social arithmetic, with a moderate correlation level. The obtained correlation value of 0.549 suggests a positive relationship, where an increase in problem solving ability directly contributes to students' mathematical literacy. Further analysis reveals that mathematical problem solving ability accounts for 30.92% of the variance in mathematical literacy, particularly in understanding and applying social arithmetic concepts in real-life contexts. These findings are expected to serve as a foundation for developing more effective and relevant teaching strategies to enhance students' mathematical skills.
Keywords*: mathematical literacy ability; mathematical problem solving; social arithmatic*

ABSTRAK
Penelitian ini bertujuan untuk mengeksplorasi hubungan antara kemampuan pemecahan masalah matematis dan literasi matematis siswa SMP pada materi aritmatika sosial. Penelitian ini menggunakan pendekatan kuantitatif dengan metode korelasional. Populasi penelitian meliputi seluruh siswa kelas VIII di salah satu SMP di Karawang. Sampel diambil menggunakan teknik *simple random sampling* dengan rumus Slovin, sehingga diperoleh 100 siswa dari total populasi sebanyak 480 siswa. Instrumen penelitian berupa tes uraian yang terdiri dari tiga soal untuk mengukur kemampuan pemecahan masalah matematis dan tiga soal untuk mengukur kemampuan literasi matematis. Hasil penelitian ini menunjukkan adanya hubungan signifikan antara kemampuan pemecahan masalah matematis dan literasi matematis siswa SMP dalam materi aritmatika sosial, dengan tingkat hubungan sedang. Nilai korelasi yang diperoleh sebesar 0,549 mengindikasikan hubungan positif, di mana peningkatan kemampuan pemecahan masalah matematis berkontribusi langsung terhadap literasi matematis siswa. Analisis lebih lanjut menunjukkan bahwa kemampuan pemecahan masalah matematis memberikan pengaruh sebesar 30,92% terhadap literasi matematis, terutama dalam memahami dan menerapkan konsep aritmatika sosial dalam kehidupan sehari-hari. Temuan ini diharapkan dapat menjadi dasar bagi pengembangan strategi pengajaran yang lebih efektif dan relevan untuk meningkatkan kemampuan matematika siswa.
Kata kunci: aritmatika sosial; kemampuan literasi matematis; pemecahan masalah matematis

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Introduction

Mathematics is one of the fields of study taught at every level of education, from elementary school to college. As a scientific discipline, mathematics plays a role in developing logic, thinking patterns, reasoning skills, and argumentation skills, as well as contributing to solving everyday problems and advancing science and technology (La'ia & Harefa, 2021). In learning, students are not only required to understand the concepts taught, but also must have mathematical abilities that can help them in facing global challenges. Mathematical ability is a student's ability or skill needed in finding solutions or facing, solving or solving mathematical problems (routine or non-routine) consisting of reasoning, communication, problem solving, connections, understanding concepts, critical and creative thinking, and so on which are used in daily activities (Suciati et al., 2021). Especially at the junior high school level, math skills are an important basis to support further education and daily life.

One of the mathematical abilities that students must have is mathematical problem solving ability (Suryani et al., 2020). In line with the opinion of (Tomo et al., 2016) who said that this ability is very useful for students when studying mathematics and in everyday life. Problem solving is considered the heart of mathematics learning, because all mathematical creative activities demand the act of problem solving (Safi'i & Bharata, 2021). One form of problem that is often used in learning mathematics is story problems, which require students to solve problems by applying concepts that have been learned. Ana (2019) explains that the use of story problems aims to introduce students to the benefits of mathematics in real life and train students in solving various relevant problems. Therefore, in the process of learning mathematics, strengthening problem solving skills needs to be prioritized, because by facing and solving problems, students will be encouraged to think more deeply and develop creativity in finding solutions (Sriwahyuni & Maryati, 2022).

Mathematical problem solving ability is the ability of students to solve mathematical problems related to real life with their potential to obtain solutions (Putri & Warmi, 2022). Problem solving ability is very important for students because with this ability, students are able to solve a problem, students gain experience, use the knowledge and skills they already have to be applied in everyday life (Elita et al., 2019). Mathematical problem solving plays an important role in learning mathematics, as expressed by (Polya, 1985) who describes problem solving as a series of steps starting from understanding the problem, planning a solution, implementing the plan, to re-examining the results. This process shows that problem solving is not just about finding answers, but also developing effective strategies and reflecting on the process. The lack of students' problem solving skills causes students to only be able to work on routine problems or problems that are exactly the same as the problems given by the teacher, so that students are not accustomed to working on non-routine problems which results in students experiencing errors in solving mathematical problems (Andayani & Lathifah, 2019). Therefore, problem solving is considered the core of mathematics learning, because almost all creative activities in mathematics require this skill. Problem solving skills allow students to practice the mathematical concepts learned and understand how those concepts are relevant in everyday life.

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In addition to problem solving, mathematical literacy is also an important aspect that needs to be developed by students. According to Stacey (2010), mathematical literacy is a student's ability to identify and understand the role of mathematics in real life (Novalia & Rochmad, 2017). However, in the practice of mathematics learning in Indonesia, this ability has not been fully developed properly. This is reflected in the results of international assessments such as PISA (Program for International Student Assessment), where the average mathematics score of Indonesian students has decreased, from 379 in 2018 to 366 in 2022, ranking 63rd out of 81 countries (OECD, 2023). One of the causes is the learning approach in schools that still focuses on procedures and formulas without giving enough emphasis on the application of concepts in real life. In fact, this ability is very important to help students process information, analyze data, and make informed decisions. In line with the opinion of (Sopiany et al., 2022), mathematical literacy allows a person to predict and interpret data, reason in various numerical, graphic, and geometric situations, and solve problems in the context of life mathematically and communicate them well.

The link between mathematical literacy and problem-solving skills is also evident in social arithmetic. This material includes concepts such as percentage, profit, loss, discount and interest that are relevant to everyday life. However, many students in Indonesia still have difficulties in understanding and applying these concepts. For example, in the calculation of discounts, many students only finish until determining the amount of the discount, but do not continue to the final step to determine the amount to be paid. This error shows that their understanding is still limited to the calculation procedure without really understanding the concept thoroughly. This is in line with the opinion of (Maulida et al., 2023) which emphasizes that the importance of social arithmetic as material that prepares students to face real situations. For example, to understand discounts on a product, students need to read numerical information, interpret data, and perform calculations to make relevant decisions. This process requires a combination of mathematical literacy and good problem-solving skills. Furthermore, research Oktaviyanthi & Agus (2019) shows that problem solving skills can strengthen students' mathematical literacy. In the problem-solving process, students are required to read data, interpret numbers, and apply mathematical concepts to solve problems. These activities show that mathematical literacy and problem solving support each other, especially in materials related to everyday life such as social arithmetic.

However, various educational evaluation results in Indonesia show that many junior high school students still face obstacles in both aspects. Difficulties in understanding social arithmetic concepts, such as the calculation of discounts, interest and profit, often hinder students in solving problems that require analysis and application in real situations. Many students are only able to complete basic calculations but struggle to connect them to more complex problem solving. Therefore, this study aims to further explore the relationship between mathematical problem solving ability and mathematical literacy of junior high school students in social arithmetic. A good understanding of mathematical literacy can contribute to the improvement of students' problem solving skills, especially in the context of everyday life (OECD, 2019). By understanding the relationship between these two

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abilities, this research is expected to contribute to the development of more effective and relevant teaching strategies to improve students' mathematical abilities.

Research Methods

This research uses a quantitative approach with a correlational method. The purpose of correlational research is to determine whether there is a relationship between the variables under study, how strong the relationship is, and whether the relationship is significant or not (Laia, 2021). Therefore, this study was designed to further explore the relationship between mathematical problem solving ability and mathematical literacy ability without involving any intervention or special treatment beforehand. The research design used in this study is shown in Figure 1, as follows:

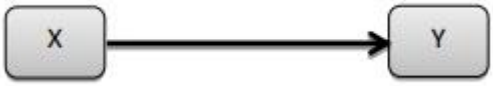

Figure 1. Research design
Reference: (Sahir, 2022)

Description:
X: Mathematical Problem Solving Ability
Y: Mathematical Literacy Ability

This study was conducted in Karawang, West Java, with a population consisting of all grade VIII students in a junior high school in the region. Sampling used a simple random sampling technique with calculations based on the Slovin formula, so that 100 students were obtained from a total population of 480 students.

The research instrument is a description test which includes three questions to measure mathematical problem solving ability adopted from research (Lestari, 2019) and three other questions to assess mathematical literacy Ability adopted from (Oktaviani et al., 2022). Details of the indicators used in this study for both abilities can be seen in table 1. Indicators of Mathematical Literacy Ability and Mathematical Problem Solving Ability.

Table 1. Indicators of Mathematical Problem Solving Ability and Mathematical Literacy Ability

No	Indicators of Mathematical Problem Solving Ability According to (Polya, 1985)	Indicators of Mathematical Literacy Ability According to (OECD, 2017)
1	Understanding the Problem	Formulate the situation mathematically
2	Develop a solution plan	Use mathematical concepts, facts, procedures and reasoning
3	Implementing the solution plan	Interpret, apply, and evaluate math results
4	Rechecking the completion result	

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To determine the level of correlation, refer to the following Table 2 interpretation of the r value:

Table 2. Correlation Interpretation (Guilford Empirical Rules)

Correlation coefficient r	Interpretation
$0{,}00 \leq r < 0{,}20$	Very weak correlation
$0{,}20 \leq r < 0{,}40$	Weak correlation
$0{,}40 \leq r < 0{,}60$	Medium correlation
$0{,}60 \leq r < 0{,}80$	Strong correlation
$0{,}80 \leq r < 1{,}00$	Very strong correlation

Reference: (Lestari dan Yudhanegara, 2017)

The data analysis techniques used can be seen in Figure 2, which illustrates the flow of data analysis techniques systematically, as follows:

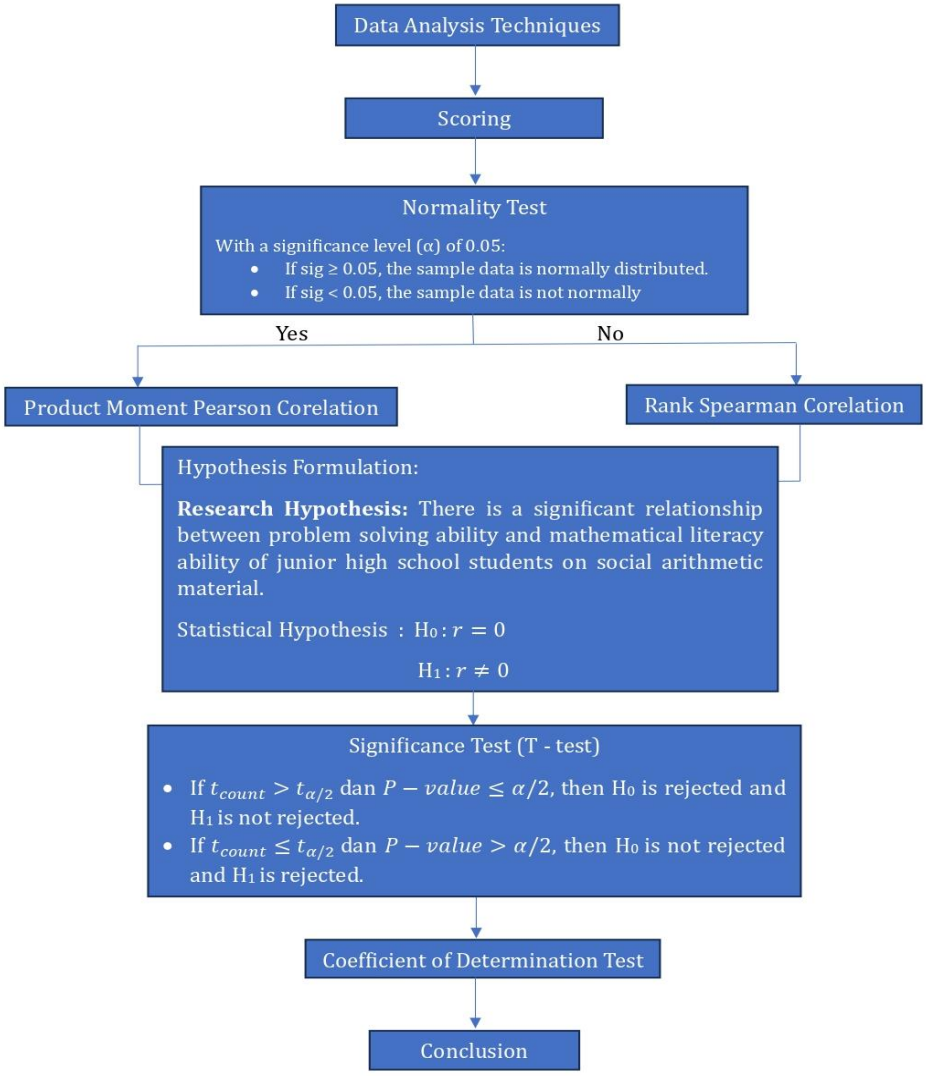

Figure 2. Flow of Data Analysis Techniques

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Results and Discussion

Results

To analyze the data more accurately, this study used Minitab software in data processing. The analysis results obtained provide an overview of the relationship between the variables studied. Details of the data analysis test results can be seen in Table 3, as follows:

Table 3. Data Analysis Test Results

No	Test Name	Test Result	Description
1	Normality test using Kolmogorov-Smirnov: a. Mathematical problem solving ability b. Mathematical literacy ability	 KS: 0.137 P-value: < 0.010 KS: 0.083 P-value: 0.091	a. Mathematical problem solving ability data is not normally distributed b. Mathematical literacy ability data is normally distributed.
2	Spearman rank correlation test	r: 0.549 P-value: 0.000	Positive and moderate correlation
3	Significance test (t test)	T-value: 6.62 P-value: 0.000	H_0 is rejected and H_1 is not rejected
4	Coefficient of determination test	30.92%	Mathematical problem solving ability contributed 30.92% to mathematical literacy ability

Table 3. shows the results of the normality test analysis using Kolmogorov-Smirnov for problem solving ability data of 0.137 with a P-Value < 0.010 (< 0.05) which means that the data is not normally distributed and for mathematical literacy ability data of 0.083 with a P-Value: 0.091 meets the sig> 0.05 requirement which means that the data is normally distributed. Then, the data analysis continued on the Spearman Rank correlation test, obtained an r value of 0.549, meeting the sig> 0.05 requirement, so the two data are positively correlated, meaning that if the mathematical problem solving ability is low, the mathematical literacy ability is low and if the mathematical problem solving ability increases, the mathematical literacy ability will also increase, and if you look at table 2. the correlation of these two data is classified as moderate. Then, the next step is the significance test or t test. Based on the t test conducted, the results obtained are 6.62 with a P-Value <0.05, so H_0 is rejected and H_1 is not rejected, meaning that there is a significant relationship between problem solving ability and mathematical literacy ability of junior high school students on social arithmetic material. The last step is the coefficient of determination test, the results of the coefficient of determination test show 30.92%, which means that the contribution or influence of mathematical problem solving ability on mathematical literacy ability is 30.92%, while the remaining 69.08% is influenced by other factors. The normality test results of the mathematical problem solving ability test are supported by the graph in Figure 3, as follows:

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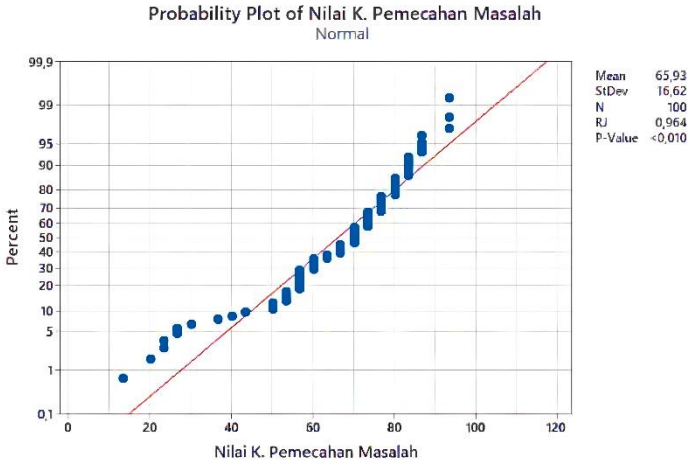

Figure 3. Normality Test Results of the Mathematical Problem Solving Ability Test

Figure 3. shows that the results of Mean: 65.93, Standard Deviation: 16.62, N (Number of Samples): 100, KS (Kolmogorov-Smirnov): 0.137, P-Value: < 0,010. The P-Value < 0.010 (< 0.05) indicates that the mathematical problem solving ability data does not meet the normal distribution assumption. Some points on the graph deviate from the straight line (normal distribution) especially at the end of the distribution which supports the conclusion that the data is not normally distributed. The next test conducted was the normality test of mathematical literacy ability. The results of this normality test can be seen in Figure 4, as follows:

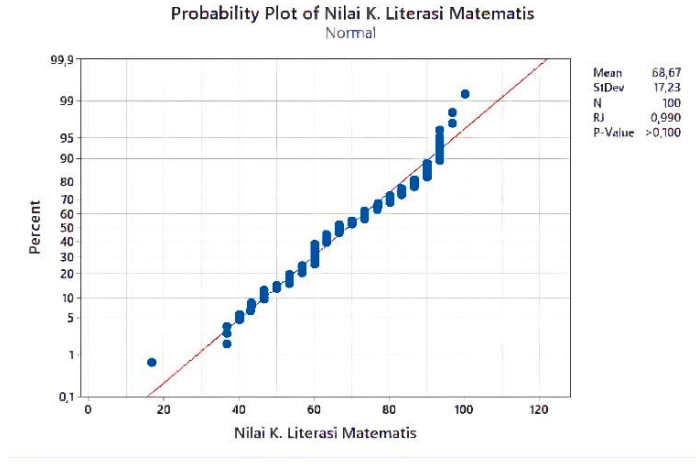

Figure 4. Normality Test Results of the Mathematical Literacy Ability Test

From Figure 4. It can be seen that the Mean (average) value: 68.67, Standard Deviation: 17.23, N (Number of Samples): 100, KS (Kolmogorov-Smirnov): 0.083, P-Value: 0.091. The P-Value of 0.091 (> 0.05) indicates that the data is not significantly different from the normal distribution. Therefore, the distribution of math literacy data is close to normal. The points on the graph tend to follow a straight line (normal distribution reference line), which supports the conclusion that the data is normal.

Since the mathematical problem solving ability data is not normally distributed, the next step is to conduct the Rank Spearman correlation test to analyze the relationship between the two variables. The results of the Rank Spearman correlation test are presented in Figure 5, as follows:

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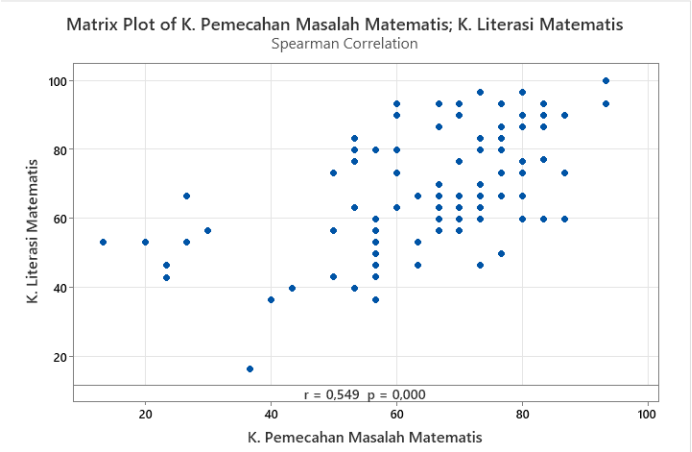

Figure 5. Spearman Rank Correlation

From Figure 5, it can be seen that the value of r = 0.549. A positive correlation coefficient (r > 0) indicates a unidirectional relationship. That is, when mathematical problem solving ability decreases, mathematical literacy ability tends to decrease. The value of r = 0.549 indicates a relationship with moderate strength. The p-value is smaller than 0.05, so the relationship between the two variables is statistically significant. The dots on the scatter plot show the distribution of the data. Most of the dots form an upward diagonal pattern, consistent with a positive correlation. So, the conclusion is that there is a significant positive relationship with moderate strength between mathematical problem solving ability and mathematical literacy. This means that the lower a person's ability to solve mathematical problems, the lower their mathematical literacy tends to be.

One example that shows low mathematical problem solving ability so that mathematical literacy is also low is shown based on the results of student S33's answers. The reason for choosing subject S33 is because based on the results of the scoring that has been done, S33 has the lowest score of mathematical problem solving ability and mathematical literacy ability compared to other subjects. The following are the test questions of mathematical problem solving ability and mathematical literacy ability along with S33's answers.

A. Mathematical problem solving ability test questions

1. Dinda went to an electronics store to buy a television. A week later, Dinda sold the television because of an urgent situation. From the selling price of the television, Dinda suffered a loss of Rp. 800,000. If the purchase price of the television is three times greater than the selling price of the television, then what is the purchase price and selling price of the television? Explain your answer!
2. A sack of rice delivered from Dolog has a gross weight of 100 kg and a tare percentage of 2%. Determine the net weight of the rice in the sack! Include an explanation and the concepts used in solving the problem!
3. Shinta wants to buy a veil at a fashion store. The veil that Shinta wants is sold at a price of Rp. 60,000, - and there is a 20% discount. Determine how much money Shinta must pay to be able to buy the veil to the cashier! Explain how to get the answer!

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a. S33's answer on the mathematical problem solving ability test

The results of student answer number 1 in the mathematical problem solving ability test can be seen in Figure 6, which shows the steps of solving the problem and the strategies used in answering it, which are as follows:

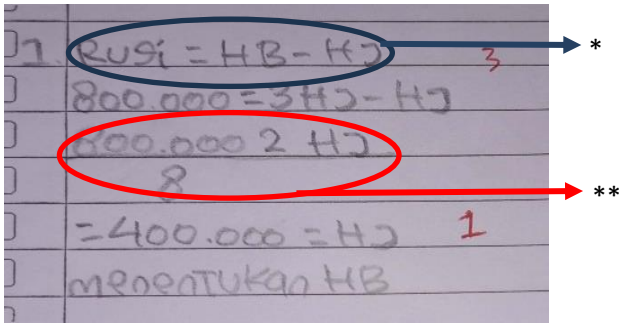

Figure 6. S33 Answer Number 1 Test of Mathematical Problem Solving Ability

Description : * S33 immediately wrote the formula without explaining the previous steps.
** S33 made a calculation error, it should be divided by 2 instead of 8.

In Figure 6, it can be seen that S33's answer to question number 1, the indicator of understanding the problem, S33 did not write the information given and the question to be solved in the problem so that it was given a score of 0. Then, on the indicator of compiling a solution plan, S33 compiled the plan correctly, but the plan was still not fully detailed, it should explain what to look for and use what formula, not immediately write the formula so that it was given a score of 3. On the indicator of carrying out the solution plan, S33 carried out the solution plan correctly but still miscalculated the calculation shown in the red circle, it should be to get the value of the selling price divided by 2 not 8 and the purchase price has not written the formula so that it is given a score of 4. In the indicator of carrying out the solution plan, S33 carried out the correct procedure but the wrong calculation shown in the red circle, it should be to get the value of the selling price divided by 2 not 8 and the purchase price has not been determined, so it was given a score of 1. In the indicator of checking back, S33 did not check back and did not write other information so that it was given a score of 0. So that the total score obtained by S33 in question number 1 is 4 with a maximum score of 10.

Furthermore, the results of student answer number 2 on the mathematical problem solving ability test can be seen in Figure 7, as follows:

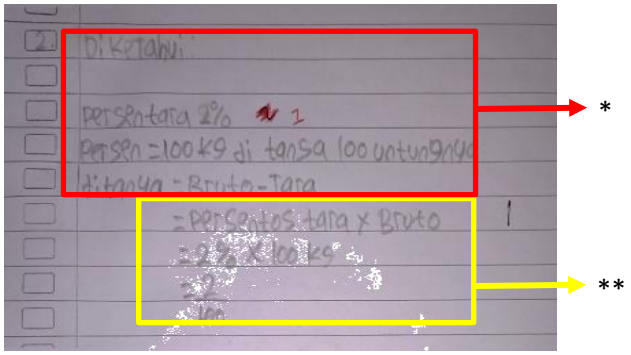

Figure 7. S33 Answer Number 2 Test of Mathematical Problem Solving Ability

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Description : * S33's writing is not clear, what is known should be gross = 100 kg and what is asked is net rice.
** S33 there is a miscalculation if you want to be explained $\frac{2}{100} \times 100 = 2$ and there is a step that is not done should be after this is to determine the net.

In Figure 7, it can be seen that S33's answer to question number 2, the indicator of understanding the problem, S33 misinterpreted part of the problem and ignored the problem requirements as seen in the red box, it should be gross = 100 kg and what was asked was Netto rice, so it was given a score of 1. Then, on the indicator of developing a solution plan, S33 did not make a plan so it was given a score of 0. On the indicator of carrying out the solution plan, S33 carried out the correct procedure but miscalculated and there were steps that were not carried out as seen in the yellow box, after this it should find the net value of rice, so it was given a score 0. In the indicator of carrying out the solution plan, S33 carried out the correct procedure but miscalculated and there were steps that were not carried out as seen in the yellow box, after this it should find the net value with the gross-tare formula, so it was given a score of 1. In the indicator of checking back, S33 did not check back and did not write other information so it was given a score of 0. So that the total score obtained by S33 in question number 2 is 2 with a maximum score of 10.

Then, the results of student answer number 3 on the mathematical problem solving ability test can be seen in Figure 8, as follows:

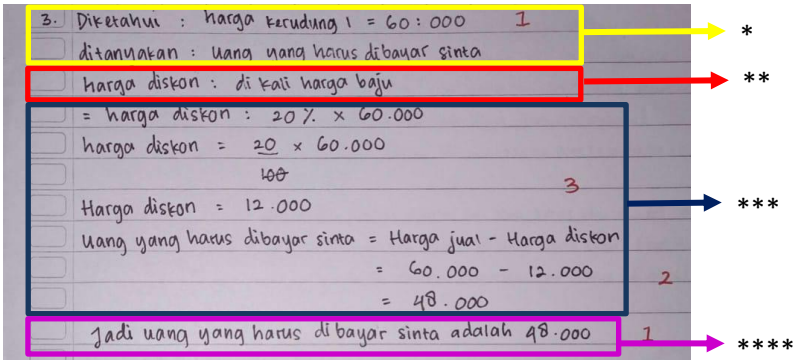

Figure 8. S33 Answer Number 3 Test of Mathematical Problem Solving Ability

Description : * There should be information about the 20% discount but S33 did not write it down.
** The plan should have been written as discount price = discount percentagen x shirt price.
*** S33 has done the correct process and got the correct result.
**** S33 immediately wrote the conclusion without checking again.

In Figure 8, it can be seen that S33's answer to question number 3, the indicator of understanding the problem S33 is incomplete in writing what is known from the problem shown in the yellow box, there should be known information, namely the 20% discount but S33 did not write it down so that it was given a score

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of 1. Then, on the indicator of developing a solution plan, S33 made a correct but incomplete plan shown in the red box so that it was given a score of 3. On the indicator of implementing the solution plan, S33 carried out the correct process and got the correct result shown in the blue box so that it was given a score of 2. On the indicator of checking back, S33 did the correct process and got the correct result shown in the red box so it was given a score of 1. On the indicator of checking back, S33 did the correct process and got the correct result shown in the blue box so it was given a score of 2. On the indicator of implementing the solution plan, S33 did the correct process and got the correct result shown in the blue box so it was given a score of 2. On the indicator of checking back, S33 only wrote the conclusion without checking back shown in the pink box so it was given a score of 1. So, the total score obtained by S33 in question number 3 is 7 with a maximum score of 10.

So, the score obtained by S33 on the mathematical problem solving ability test is 43.

B. Mathematical literacy ability test questions

1. Mr. Badrun bought 100 kg of oranges directly from the owner of the orange farm. Mr. Badrun bought the oranges for Rp. 7,500.00 per kg. then, the oranges were sold for Rp. 10,000 per kg. How much profit did Mr. Badrun get from selling the oranges? Explain how to solve it!
2. Mr. Ahmad sold a car for Rp. 45,000,000 and it turned out that he lost 5%. Determine the purchase price of the car!
3. The purchase price of 1 quintal of rice is Rp. 500,000. If the rice is sold at Rp. 4,900 per kg, will the trader make a profit or loss? Determine the percentage of profit or loss and include your way of solving it!

b. S33's answer on the mathematical literacy ability test

The results of student answer number 1 on the mathematical literacy test can be seen in Figure 9, which shows the steps of solving the problem and the strategies used in answering it, as follows:

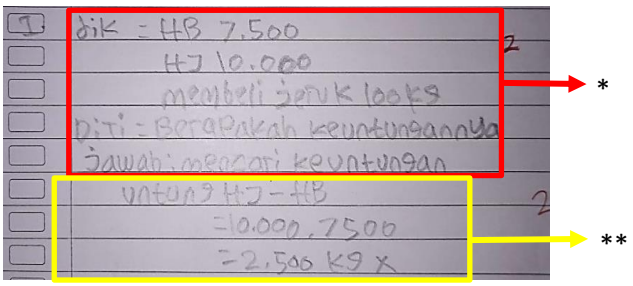

Figure 9. S33 Answer Number 1 Test of Mathematical Literacy Ability

Keterangan : * The selling price and buying price should be every 1 kg not 100 kg.
** The 2,500 that has been obtained should be multiplied by 100 kg because 2,500 is the profit of 1 kg.

In Figure 9, it can be seen that S33's answer to question number 1, the indicator of formulating the situation systematically, S33 was able to write what

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was known and asked but was still not precise as shown in the red box should have used each kilogram in the purchase price and selling price so that it was given a score of 2. Then, on the indicator of using mathematical concepts, facts, procedures and reasoning, S33 was able to design and apply strategies to find mathematical solutions but was not precise and did not match the problem as shown in the yellow box should have been 2. 500 that has been obtained is multiplied by 100 kilograms because 2,500 is the profit of 1 kilogram while Mr. Badrun bought 100 kilograms of oranges, so it is given a score of 2. On the indicator of interpreting, applying, and evaluating mathematical results, S33 was unable to interpret the results of the answer to the initial problem and did not evaluate the suitability of the mathematical solution so that it was given a score of 0. So, the total score obtained by S33 in problem number 1 is 4 with a maximum score of 10.

For questions number 2 and 3, S33 did not answer at all. So, the score obtained by S33 on the mathematical problem literacy ability test is 13.

Discussion

Based on the results of the correlation test analysis and significance test, there is a significant relationship between mathematical problem solving skills and mathematical literacy skills of junior high school students on social arithmetic material. This result is in accordance with previous research by (Rosita et al., 2023) which states that mathematical literacy ability have a positive and significant relationship with problem solving ability in fourth grade students of Al-Fath Cirendeu Elementary School.

Mathematical problem solving ability is defined as the ability to apply mathematical knowledge in new or complex situations. According to (Polya, 1985), Problem solving involves systematic steps: understanding the problem, planning, executing the plan, and checking back. Meanwhile, mathematical literacy is the ability to understand, use, and communicate mathematical concepts and information in the context of everyday life. According NCTM, Mathematical literacy refers to one's ability to explore, connect and reason logically, as well as apply various mathematical methods efficiently in solving problems. The two are interrelated, with mathematical literacy supporting one's ability to approach and solve mathematical problems effectively. Mathematical literacy provides the foundation for problem-solving skills, as individuals need to understand and apply mathematical concepts to be able to analyze and solve problems. Without good mathematical literacy, the problem-solving process can be hindered.

Based on the results obtained, the normality test for mathematical problem solving ability is 0.137 with a P-Value <0.010 (<0.05), indicating that the data for mathematical problem solving ability does not meet the assumption of normal distribution or the data is not normally distributed. Meanwhile, the normality test results for mathematical literacy ability showed a value of 0.083 with a P-Value of 0.091 (>0.05), which indicated that the data followed a normal distribution. However, because the data for mathematical problem solving ability was not normally distributed, further analysis was carried out using the Spearman Rank correlation test. This correlation test aims to determine the strength of the relationship between variables on a certain scale, which is then interpreted using the interpretation table. The results of the analysis show a correlation value of 0.549

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which is included in the moderate relationship category. These results indicate a positive relationship between mathematical problem solving ability and mathematical literacy ability.

After conducting the correlation test, the next step is the significance test (t-test) to determine whether mathematical problem solving ability has a significant influence on mathematical literacy ability. With a significance level of 0.05 and a P-value <0.05 calculated using Minitab software, the results showed that the mathematical problem solving ability variable contributed to the mathematical literacy ability variable. This also indicates a unidirectional relationship and significant influence between the two variables.

The final step is to check the coefficient of determination. In general, this coefficient is used to assess the extent to which the mathematical problem solving ability variable affects the mathematical literacy ability variable. The results showed that mathematical problem solving ability contributed 30.92% to junior high school students' mathematical literacy ability in social arithmetic, while the remaining 69.08% was influenced by other factors. This shows that mathematical problem solving ability has a significant role in supporting mathematical literacy ability.

This study shows the relationship between mathematical problem solving ability and mathematical literacy ability of junior high school students on social arithmetic material. The main benefit of this research is to provide insights for educators in developing more effective learning strategies with a problem-based approach. However, this study still has limitations especially in the scope of material that only focuses on social arithmetic and does not consider external factors such as learning methods and student background. The results of this study emphasize the importance of contextual learning that is not only oriented to mathematical procedures, but also trains students in analyzing and applying concepts in everyday life.

Conclusion and Suggestion

Based on the results obtained, it can be concluded that there is a significant relationship between mathematical problem solving skills and mathematical literacy skills of junior high school students, with a moderate level of relationship. In addition, mathematical problem solving ability provides an influence of 30.92% on mathematical literacy skills.

The suggestions in this study are aimed at supporting the improvement of the quality of mathematics learning. Teachers are advised to develop learning methods that strengthen problem solving skills and mathematical literacy skills, such as contextual or project-based approaches, as well as learning strategies such as group discussions. Further research can explore other factors, such as learning style or motivation, and be conducted at different levels or materials to gain greater insight.

Reference

Ana, A. R. (2019). *Analysis of Difficulties in Solving Mathematical Problems in the Form of Measurement Stories in Class V Students of Hasanudin Sub-district Margadana Tegal City*. (Thesis, Faculty of Education, Semarang State University: Semarang).

e-ISSN 2746-5594
p-ISSN 2746-5608

https://r.search.yahoo.com/_ylt=Awr1QgM.Z9xnBgIAOKDLQwx.;_ylu=Y29sbwNzZzMEcG9zAzEEdnRpZAMEc2VjA3Ny/RV=2/RE=1743707199/RO=10/RU=https%3a%2f%2flib.unnes.ac.id%2f33852%2f1%2f1401414104_Optimized.pdf/RK=2/RS=XYVeYgYa9SJ88OXLyT3SDEXVUvQ-.

Andayani, F., & Lathifah, A. N. (2019). Analysis of Problem Solving Ability of Junior High School Students in Solving Problems on Social Arithmetic Material. *Cendekia Journal: Journal of Mathematics Education*, 3(1), 1-10. http://dx.doi.org/10.31004/cendekia.v3i1.78.

Elita, G., Habibi, M., Putra, A., & Ulandari, N. (2019). The Effect of Problem Based Learning with Metacognition Approach on Mathematical Problem Solving Ability. *Mosharafa: Journal of Mathematics Education*, 8(3), 447 458. http://dx.doi.org/10.31980/mosharafa.v8i3.517.

Laia, H. T., & Harefa, D. & (2021). The Relationship between Mathematical Problem Solving Ability and Students' Mathematical Communication Ability. *Journal of Non Formal Education Science*, 07(02), 463-473. http://dx.doi.org/10.37905/aksara.7.2.463-474.2021.

Laia, B. (2021). The Relationship between Emotional Intelligence and Integrated Social Studies Learning Motivation of SMP Negeri 2 Amandraya Students. *Journal of Education and Development*, 9(2), 511-516. https://doi.org/10.37081/ed.v9i2.

Lestari, F. D. A. (2019). *Analysis of Mathematical Problem Solving Ability of Junior High School Students on Social Arithmetic Material Based on Polya Stages*. (Thesis, Faculty of Teacher Training and Education, Singaperbangsa University of Karawang: Karawang). Not published.

Lestari, K. E., & Yudhanegara, M. R. (2017). *Mathematics Education Research*. Bandung: Refika Aditama.

Maulida, Putra, R. W. Y., & Fadila, A. (2023). *Social Arithmetic Book for Smp Class VII*. Majalengka: Edupedia Publisher.

Novalia, E., & Rochmad. (2017). Analysis of Mathematical Literacy Ability and Creative Character in Synectics Learning of Class Viii Space Building Material. *UJMER: Unnes Journal of Mathematics Education Research*, 6(2), 225-232. http://journal.unnes.ac.id/sju/index.php/ujmer.

OECD. (2017). *PISA 2015 Assessment and Analytical Framework: Science, Reading, Mathematics, Financial Literacy and Collaborative Problem Solving, revised edition*. Paris: OECD. http://dx.doi.org/10.1787/9789264281820-en.

OECD. (2019). *PISA 2018 Results: What Students Know and Can Do*. Paris: OECD Publishing. https://doi.org/10.1787/5f07c754-en.

OECD. (2023). *PISA 2022 Results (Volume II): Learning During - and From - Disruption*. Paris: OECD Publishing. https://doi.org/10.1787/a97db61c-en.

Oktaviani, R., Fatimah, A. T., & Nuraida, I. (2022). Analysis of Mathematical Literacy Skills of Junior High School Students in Solving Story-Based Mathematics Problems. *J-KIP: Journal of Teacher Training and Education*, 3 (2), 433-444. https://r.search.yahoo.com/_ylt=Awrx.xR97.BnSgMOKPbLQwx.;_ylu=Y29sbwNzZzMEcG9zAzEEdnRpZAMEc2VjA3Ny/RV=2/RE=1744004222/RO=10/RU=https%3a%2f%2fjurnal.unigal.ac.id%2fJ-KIP%2farticle%2fdownload%2f6698%2f5018/RK=2/RS=U7KJi8CMCRNKaqYk0MG1x09GJMc-.

e-ISSN 2746-5594
p-ISSN 2746-5608

Oktaviyanthi, R., & Agus, R. N. (2019). Exploration of Problem Solving Ability based on Mathematical Literacy Process Categories. *Journal of Mathematics Education*, 13(2), 163-184. https://doi.org/10.22342/jpm.13.2.7066.163-184.

Polya, G. (1985). How to Solve It. Princeton University Press: Princeton and Oxford.

Putri, D., & Warmi, A. (2022). Mathematical Problem Solving Ability of Students in Solving Pisa Mathematics Problems on Number Content. *JPPM: Journal of Mathematics Learning Research*, 15(1), 138-152. https://dx.doi.org/10.30870/jppm.v15i1.14102.

Rosita. (2023). *The Relationship between Mathematical Literacy and Problem Solving Ability in Class IV Students of Al-Fath Cirendeu Elementary School*. (Thesis, Faculty of Tarbiyah and Keguruan Sciences, UIN Syarif Hidayatullah: Jakarta). https://repository.uinjkt.ac.id/dspace/handle/123456789/72543.

Rosita, Arif, K. M., & Suryaningsih, T. (2023). The Relationship between Mathematical Literacy and Problem Solving Ability in Elementary School Students. *Elementary: Journal of Basic Education*, 3(2), 86-93. http://dx.doi.org/10.21137/jpp.2020.12.1.7.

Sahir, S. H. (2021). *Research Methodology*. Jogjakarta: KBM Indonesia.

Safi'i, A., & Bharata, H. (2021). The Relationship of Problem Solving Ability and Understanding of Mathematical Concepts to Computer Self-Efficacy. *JKPM: Journal of Mathematics Education Studies*, 6(2), 215-226. http://dx.doi.org/10.30998/jkpm.v6i2.9826.

Sopiany, H. N., Turmudi, Juandi, D., & Sari, R. M. M. (2022). Implementation of the School Literacy Movement Development Stage in Fostering Secondary School Students' Mathematical Literacy Skills. *Journal of Physics: Conference Series*, 2279(1). https://doi.org/10.1088/1742-6596/2279/1/012001.

Sriwahyuni, K., & Maryati, I. (2022). Students' Mathematical Problem Solving Ability on Statistics Material. *Plusminus: Journal of Mathematics Education*, 2(2), 335 344. https://doi.org/10.31980/plusminus.v2i2.1109.

Suciati, I., Pasandaran, R. F., & Hajerina. (2021). The Relationship of Learners' Mathematical Ability to Mathematical Problem Solving Ability: A Systematic Literature Review. *Pedagogy: Journal of Mathematics Education*, 6(2), 56-70. https://doi.org/10.30605/pedagogy.v6i2.1596.

Suryani, M., Jufri, L. H., & Putri, T. A. (2020). Analysis of Students' Problem Solving Ability Based on Mathematics Initial Ability. *Mosharafa: Journal of Mathematics Education*, 9(1), 119-130. http://dx.doi.org/10.31980/mosharafa.v9i1.597.

Tomo, Yusmin, E., & Riyanti, S. (2016). Students' Problem Solving Ability on Flat Building Materials in Junior High School. *Untan Journal of Education and Learning*, 5(5), 1-11. https://www.neliti.com/publications/194348/kemampuan-pemecahan-masalah-siswa-pada-materi-bangun-datar-di-smp#cite.