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The Mathematical Literacy Process Based on The Students' Mathematical Resilience

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Abstract

Mathematical literacy is very important in daily life, however, the mathematical literacy of Indonesian students is still low. Improving mathematical literacy requires a resilient and unyielding attitude known as mathematical resilience. This study aims to find out the process of mathematical literacy reviewed from the mathematical resilience of students. This research uses a qualitative method. The subject of this study is a grade VIII student at one of the junior high schools in Semarang City. Data collection uses questionnaires, written tests, interviews and documentation. Data analysis uses triangulation techniques. The results of the study show that the students' mathematical literacy process has not been optimally achieved against the existing stages of the mathematical literacy process.

Keywords: *Literacy, Mathematics, Mathematical, Resilience.*

Introduction

One of the goals of the Indonesian nation is to educate the life of the nation which can be realized by one of them is quality education (Kustini, 2016). The government has made various efforts to improve the quality of education by participating in the Programme for International Student Assessment (PISA) assessment organized by the Organization for Economic Cooperation and Development (OECD) (Devi et al., 2024)(Kamila et al., 2024)(Sistyawati & Apriani, 2024). The results of this PISA study are used as a reference in measuring the quality of education in a country (Fauzi & Masrupah, 2024)(Rafsanjani et al., 2024). Another effort made by the Government of Indonesia to improve the quality of education is to present Freedom of Learning both at the school and tertiary levels. One of these programs is to abolish the National Examination (UN=indonesian). The abolition of this national exam by the Government was replaced by the National Assessment (Hasanah & Hakim, 2021)(Abnis, 2024). The national assessment consists of three parts, namely the Minimum Competency Assessment (AKM=indonesian), character survey, and learning environment survey (Hafizha et al., 2024)(Zahra & Mukhlis, 2024)(Sunanti et al., 2024)(Rachmawati et al., 2024)(Taufik et al., 2024)

The learning environment survey will capture the quality of the educational unit as a whole, starting from the input and teaching and learning process in the classroom and at the school level. The learning environment survey measures the following aspects: 1) the quality of learning; 2) learning improvement practices by teachers; 3) instructional leadership; 4) school security climate; 5) the climate of diversity in schools; 6) support for gender equality; 7) climate inclusivity; 8) support for parent and student participation; and 9) students' socio-economic background. The character survey is intended to measure the development of students' character as one of the learning outcomes. The characteristics measured in students in Indonesia are based on the Pancasila Student Profile which includes: 1) faith, fear of God Almighty and noble character, especially morality in humans, morality in nature, and morality in the state; 2) mutual cooperation; 3) creativity; 4) critical reasoning; 5) global diversity; and 6) independence. AKM consists of reading literacy and numeracy literacy (mathematics). This is in accordance with the focus of the

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PISA test organized by the OECD which consists of reading literacy, mathematics literacy, and science literacy (Kusuma et al., 2021; Stoica & Wardat, 2021; Alneyadi et al., 2022b)

The efforts that have been made by the Government of Indonesia in improving mathematical literacy are very significant, but Indonesia's mathematical literacy is still low. This is evidenced by the results of PISA 2022 which shows that Indonesia's mathematical literacy ranks 70th out of 81 countries that follow with a score of 366 compared to the OECD country score of 472. Indonesian students in mathematics literacy are at level 2 with a proportion of 18% of students and students have not been able to reach level 5 or 6 in PISA mathematical literacy. Based on preliminary research conducted in one of the junior high schools in Semarang City, it shows that 23% of the proportion of students can achieve minimum competence. Based on the education report card at the junior high school obtained from the results of the National Assessment in 2023, it shows that 9.52% of students with mathematical literacy are far below the minimum competency and 21.43% of the proportion of students are below the minimum competency(Wardat et al., 2022 ; Jarrah et al., 2020; Gningue et al., 2022 ; Tashtoush et al., 2022).

Based on the explanation above, researchers suspect that low mathematical literacy is not only caused by a lack of mastery of knowledge, but there are factors that cause students to not achieve optimally. One of the factors is that students still think that mathematical literacy is synonymous with mathematics so that it has an impact on mathematics is difficult. This is in line with (Lestari et al., 2018)(Yuniawatika et al., 2021)(Subaidah & Nuryanti, 2022) which states that students find math lessons difficult. This assumption can trigger anxiety, fear of failure, lack of confidence, easily give up on mathematical literacy problems, feel unable to do it so that the knowledge and abilities possessed by students will actually have an effect. Students' efforts to improve or optimize Indonesian mathematical literacy require a tough, diligent, and enterprising attitude in dealing with mathematical literacy problems. This attitude is known as mathematical resilience(Hidayat & Wardat, 2023; Tashtoush et al., 2023a; Alneyadi et al, 2022a; Jarrah et al., 2022a; Wardat et al., 2021).

Mathematical resilience is an important concept in education (Ghifari et al., 2022). The importance of this mathematical resilience can be seen in mathematics learning where students experience obstacles, difficulties, and anxiety in learning mathematics which results in students' dislike of mathematics (Zanthy, 2018). Mathematical resilience in some studies has a positive impact on problem solving (Attami et al., 2020)(Maharani & Bernard, 2018)(Rohmah et al., 2020), Creative thinking (Habibah et al., 2021), and critical thinking (Rifdah & Cahya, 2020). Problem-solving, creative thinking, and critical thinking are interrelated with mathematical literacy. Therefore, mathematical resilience has an impact on mathematical literacy (Setiawan et al., 2022)(Setiawan et al., 2023).

This study aims to analyze the process of mathematical literacy reviewed from students' mathematical resilience and explain the stages in the process of mathematical literacy in students. This is intended to produce a description or characteristic of the mathematical literacy process that is reviewed from the students' mathematical resilience(Tashtoush et al., 2023b; Wardat et al., 2024).

Literature Review

Mathematical literacy is the ability of students to formulate, apply, and interpret mathematics in a variety of contexts, including mathematical reasoning and also using mathematical concepts, procedures, and facts (OECD, 2018)(Maulana et al., 2019)(Sayekti et al., 2022)(Wesna et al., 2021)(Kusuma et al., 2021). Mathematical literacy as knowledge to know and apply basic mathematical concepts in daily life (Maulana et al., 2019)(Nurutami et al., 2019)(Asmara et al., 2024). Mathematical literacy is also the most important ability to support students' mathematical abilities (Pradana et al., 2020)(Abylkassymova et al., 2020). Mathematical literacy is also a person's proficiency in using mathematical concepts to solve problems in a real-life context (Kemendikbudristek, 2023). Mathematical literacy is also defined as the ability to use the capacity of knowledge and understanding of mathematics to solve problems in daily life. In mathematical

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literacy, it must also achieve the main goal of learning mathematics, because mathematical literacy is the ability to implement mathematical concepts in daily life so that it is not only understood and used as a tool for calculation but can also be used to make it easier for a person to complete various affairs(Wardono & Mariani, 2023). The process of mathematical literacy can be seen through 1) formulating problems mathematically (formulate); 2) using concepts, procedures, facts, and reasoning in mathematics (employ); 3) interpreting, applying, and evaluating the results of a mathematical process (interpret).

Mathematical resilience is part of a student's ability to overcome his or her mathematical anxiety or the ability to maintain a positive attitude when dealing with mathematical problems, as well as developing new skills if needed. According to (Asih et al., 2019)(Hutauruk & Priatna, 2017) Mathematical resilience as a positive attitude in overcoming anxiety, fear, and difficulties in learning mathematics to face difficulties before finding solutions. According to (Marlina & Harahap, 2018)(Ishak et al., 2020) Resilience is a positive attitude when someone finds math challenging, and they will find new strategies to overcome it. Mathematical resilience is an attitude with good quality in mathematics learning which includes confidence through hard work towards an achievement, showing perseverance in facing difficult situations, having a willingness to exchange opinions, reflect, and conduct research (Azizah & Abadi, 2022). According to (Zanthy, 2018) Mathematical resilience is the ability to cope and adapt to severe events or problems that occur in life. The aspects of mathematical resilience are 1) emotional control; 2) impulse control; 3) optimistic; 4) analyze the cause of the problem; 5) the ability to empathize; 6) self-efficacy; and 7) reach out to what is used(Zakariya & Wardat, 2023; Jarrah et al., 2022b).

Research Methodology

Research Design

The design of this study is a descriptive qualitative research. The purpose of this study is to analyze the process of mathematical literacy reviewed from the mathematical resilience of students and explain the stages in the mathematical literacy process in students.

Subject, Data Collection, and Research Instruments

The research data was taken from grade VIII students at one of the junior high schools in Semarang City. The research subjects include 24 subjects. The research subjects totaling 24 were then selected or selected 3 subjects as research samples using the purposive sampling technique. It aims to select subjects with high, medium, and low mathematical resilience categories. Subjects with high mathematical resilience were named S1, subjects with medium mathematical resilience were named S2, and subjects with low mathematical resilience were named S3.

The data collection in this study is a mathematical resilience questionnaire, a mathematical literacy test, an interview, and documentation. The research instrument is designed to obtain an objective instrument. The mathematical resilience questionnaire was validated by experts consisting of 44 statements of both positive and negative statements. The validation results show that the mathematical resilience questionnaire is valid. The mathematical literacy test was validated by experts with the validation results showing that the 5 mathematical literacy test questions were valid and reliable so that they could be used.

Data of Analysis

The data analysis in this study is data reduction, data presentation, conclusion drawing and verification. Data reduction is used to summarize, select the essentials, focus on the essentials, and discard the unnecessary. The presentation of data is carried out in the form of a brief description. Drawing conclusions and verification are used to provide conclusions on the description of the mathematical literacy process reviewed from mathematical resilience. Triangulation was carried out to validate the data, namely the results

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of the mathematical resilience questionnaire, the results of the mathematical literacy test, in-depth interviews, and documentation.

Results & Discussion

Based on the results of the student mathematical resilience questionnaire, the research subjects were categorized into the categories of high mathematical resilience, medium mathematical resilience, and low mathematical resilience. The results of the students' mathematical resilience questionnaire can be seen in Table 1.

Table 1. Results of the Student Mathematical Resilience Questionnaire

Category	Number of Students	Description
RMT	4	Have emotional control, have impulse control, have an optimistic attitude, are able to analyze the cause of problems, have empathy, have self-efficacy, and are able to achieve what is used Have emotional control, have impulse control, have an optimistic attitude, are able to analyze the cause of problems, have empathy, have self-efficacy, and are able to achieve what is used
RMS	9	Have emotional control, have impulse control, lack of optimism, less able to analyze the causes of problems, have empathy, lack of self-efficacy, and are able to achieve what is used
RMR	11	Lack of emotional control, lack of impulse control, lack of optimism, inability to analyze the causes of problems, lack of empathy, lack of self-efficacy, and lack of ability to achieve what is used

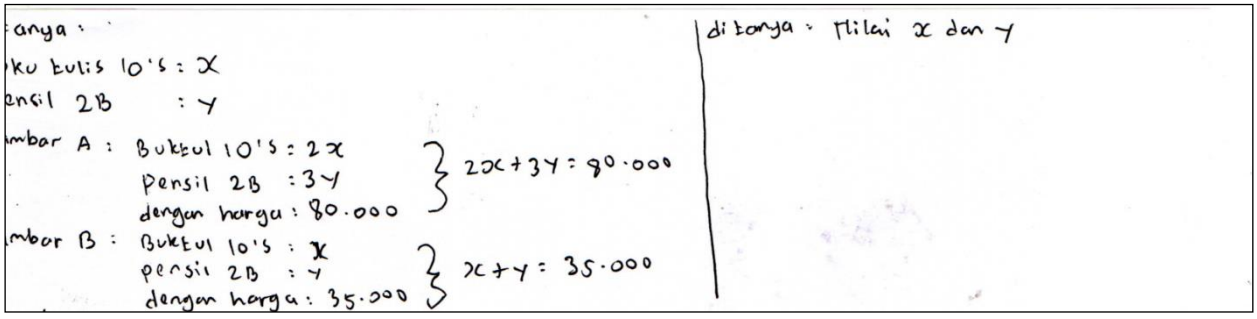
Information:

RMT = High Mathematical Resilience; RMS = Medium Mathematical Resilience; RMR = Low Mathematical Resilience

The sample subjects were selected based on the results of the mathematical resilience questionnaire of students in each category. The next step is for the researcher to provide a mathematical literacy test and conduct an in-depth interview related to the process of completing mathematical literacy carried out by selected sample subjects. The following are the results of the analysis of each subject.

S1 Subject in Formulating Mathematical Problems (Formulates)

The process of formulating mathematical problems on the subject of S1 is shown in Figure 1.



Translation:	asked for value x and y

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Asked:
Notebooks 10's : x
Pencil 2B : y
Figure A : notebooks 10's = 2x
pencil 2B = 3y
with price = 80.000
Figure B : notebooks 10's = x
pencil 2B = y
with price = 35.000

Figure 1. The Process of Formulating the Problem of Subject S1

Based on the results of the work of Subject S1 in the process of formulating mathematical problems, it was found that Subject S1 showed the ability to mathematize, namely being able to convert mathematical literacy problems or problems into the form of mathematical models. Subject S1 also shows the ability to use symbols by reasoning with variables so that it makes it easier for Subject S1 to make his mathematical model. The researcher conducted more in-depth interviews with S1 Subjects to obtain a complete picture of how the mindset of S1 Subjects.

R : "What is the first thing you will do when you will solve the problem?"

S1 : "I take the main point of the question, sir. Then I make an analogy with a variable and then I make a mathematical model"

R : "Why do you do it that way?"

S1 : "Because if the problem is shaped like that, the logic must be in the core way, sir, it is impossible in mathematics the work is the same as the problem, so I have to understand the problem and then find the core of the problem"

The results of in-depth interviews conducted with S1 subjects showed that S1 subjects dared to express their opinions when they were going to solve the problem. This shows that the S1 Subject is able to perform communication skills in the results of his work. Based on the work and in-depth interviews with S1 Subjects, it can be concluded that S1 Subjects can fulfill the process of formulating mathematical problems with the ability to mathematize, use symbols, and communicate in presenting the results of their work.

S1 Subject in Using Concepts, Procedures, Facts, And Reasoning in Mathematics (Employ)

The process of using concepts, procedures, facts, and reasoning in mathematics based on the work of Subject S1 can be seen in Figure 2.

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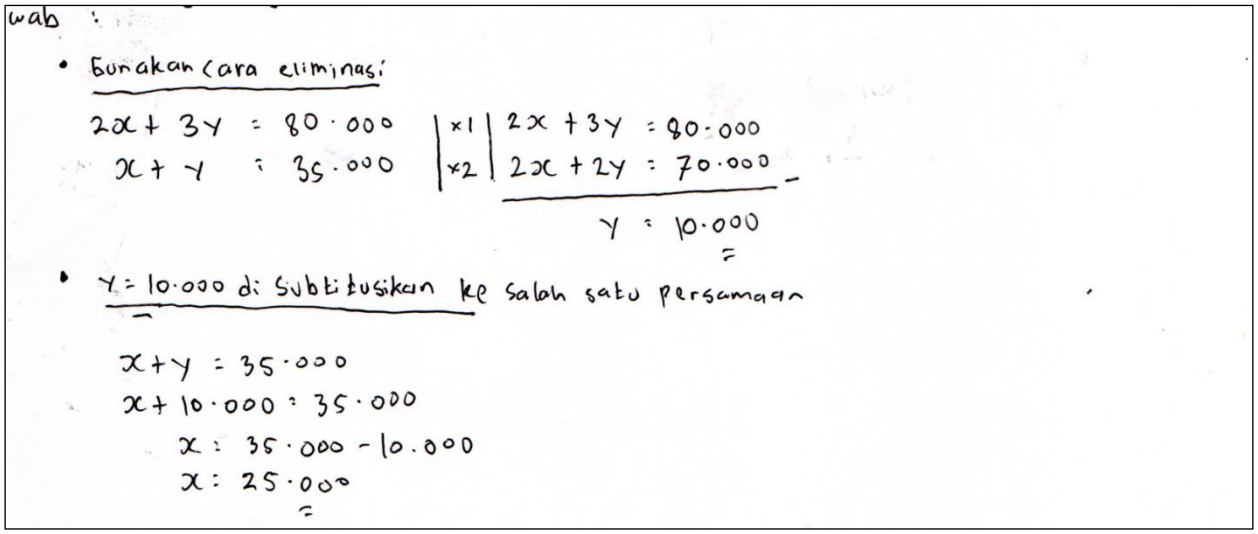

Translation:
Answer:
Use the elimination method:

y = 10.000 substituted into one of the equations

Figure 2. The Process of Using Concepts, Procedures, Facts, And Reasoning of S1 Subject

Based on the results of the work of Subject S1 in the process of using concepts, procedures, facts, and reasoning, it was obtained that Subject S1 used various kinds of situations, one of which equalized coefficients in solving problems, for example by multiplying by the numbers 1 and 2 so that one of the coefficients of the two equations would be the same so that Subject S1 could solve the problem. This shows that the S1 Subject is able to reason and argue against the problem. Subject S1 also uses the elimination method first to find one of the variables, then continues with the substitution method to find the other variables. This shows that Subject S1 is also able to design a strategy in solving the problem because the selection of the solution method carried out by Subject S1 will accelerate Subject S1 to find a solution to the problem. The researcher conducted an in-depth interview to find out the mindset of the S1 Subject.

R : "What you understand?"
S1 : "I see that the coefficients of the two equations are not the same"
R : "Then what do you do?"
S1 : "I equalize the coefficient first by multiplying the numbers I want with Sir, so that later I can easily calculate it with elimination"
R : "Why immediately choose elimination?"
S1 : "I prefer elimination first sir"

The results of in-depth interviews conducted with Subject S1 showed that Subject S1 dared to express his opinion when asked about what Subject S1 had understood with his own logic or reasoning so that Subject S1 was faster in finding a solution to the problem. This shows that the S1 Subject is able to communicate, reason, and argue against what he is doing firmly. Based on the work and in-depth interviews of S1 Subjects, it can be concluded that S1 Subjects can fulfill the process of using concepts, procedures, facts, and reasoning in mathematics with the ability to design strategies, reason and argue and communicate. However, the S1 subject does not use mathematical tools to help solve the problem.

S1 subject in interpreting, applying, and evaluating the results of a mathematical process (interpret)

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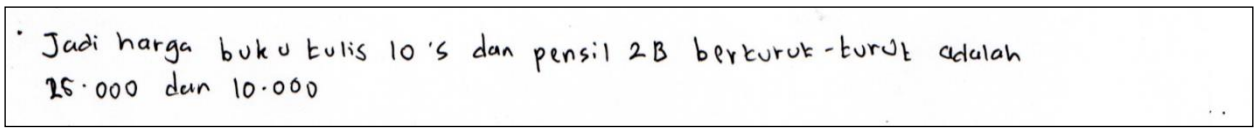
The process of interpreting, applying, and evaluating the results of a mathematical process based on the work of Subject S1 can be seen in Figure 3.



Translation:

So the prices of 10's notebooks and 2B pencils respectively are 25.000 and 10.000

Figure 3. The Process of Interpreting, Applying, and Evaluating S1 Subjects

Based on the results of the work of Subject S1 in the process of interpreting, applying, and evaluating, it was found that Subject S1 rewrote the results of mathematical forms into the real context that existed in the problem. This shows that Subject S1 is able to represent from the form of a mathematical model to a real context again. The researcher conducted an in-depth interview to find out the mindset of the S1 Subject.

R : "Why are you rewriting it like that?"
S1 : "That's right, sir. We have to return it to the form of the problem in question, sir"
R : "Why not in the form of a variable like the one found earlier?"
S1 : "The form of the variable is only reasoning, sir. So we are obliged to write down to the reality even though there is enough reasoning"

The results of in-depth interviews conducted with Subject S1 showed that Subject S1 dared to express his opinion even though it was denied, but Subject S1 remained principled to his opinion. This shows that the S1 Subject is able to communicate well. The explanation of Subject S1 also shows that Subject S1 is able to reason and argue against what he has done. Based on the work and in-depth interviews of S1 Subjects, it can be concluded that S1 Subjects can fulfill the process of interpreting, applying, and evaluating with the ability to represent, communicate, reason, and argue.

A summary of the analysis of the mathematical literacy process of S1 Subject can be seen in Table 2.

Table 2. Summary of Analysis of The Mathematical Literacy Process for S1 Subject

	P 1	P2	P3
Description of Mathematical Literacy	Mathematical skills, using symbols, and communication are fulfilled	The ability to design strategies, reason and argue and communicate is fulfilled	Representation, communication, reasoning and argumentation skills are fulfilled
Description of Mathematical Resilience	Emotional control	Stay calm even under pressure	
	Impulse control	Able to think clearly and accurately	
	Optimism	Have a diligent attitude, do not give up easily, and are confident in their own abilities	
	Analysis of the cause of the problem	Able to identify the cause of the problem	
	Ability to empathize	Able to socialize or discuss	
	Self-efficacy	Have the confidence to rise from failure	

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	Reach for what is used	Demonstrate a willingness to seek out self-learning resources

Information: P1 = Process 1; P2 = Process 2; dan P3 = Process 3

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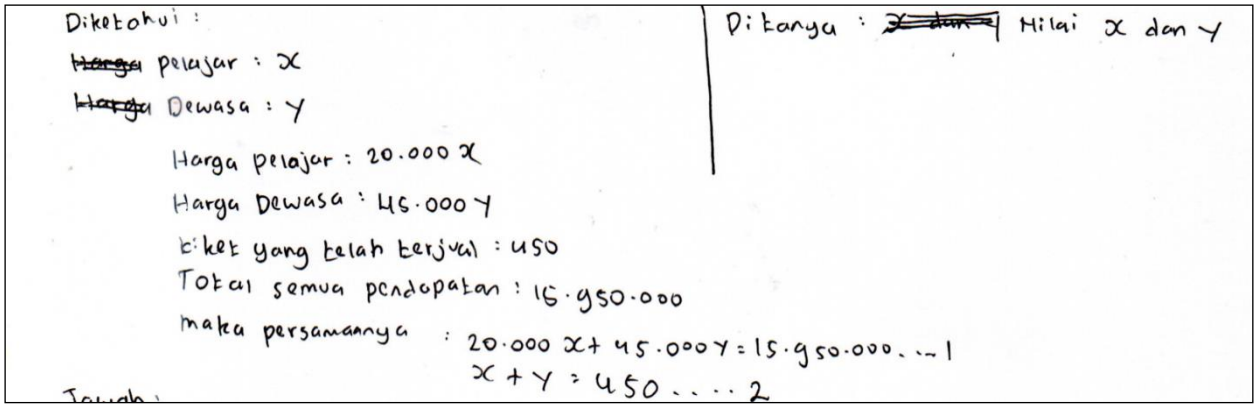
S2 subject in formulating mathematical problems (formulates)

The process of formulating mathematical problems on the subject of S2 is shown in Figure 4.



Translation:

Known: Asked the value x and y

Student = x

Mature = y

Student price = 20.000x

Mature price = 45.000y

Tickets that have been sold = 450

Total of all income = 15.950.000

So the equation is .....

Figure 4. The Process of Formulating the Problem of S2 Subject

Based on the results of the work of S2 Subject in the process of formulating mathematical problems, it was found that S2 Subject showed the ability in mathematization, namely being able to convert mathematical literacy problems or problems into the form of mathematical models. Subject S2 also shows the ability to use symbols by reasoning with variables so that it makes it easier for Subject S2 to make his mathematical model. The researcher conducted more in-depth interviews with S2 Subjects to obtain a complete picture of how the mindset of S2 Subjects.

R : "What do you understand from the question?"
S1 : "At first, it was difficult for him to understand it, but he had to be forced. The question is in the form of a story, what I do is what the story contains"

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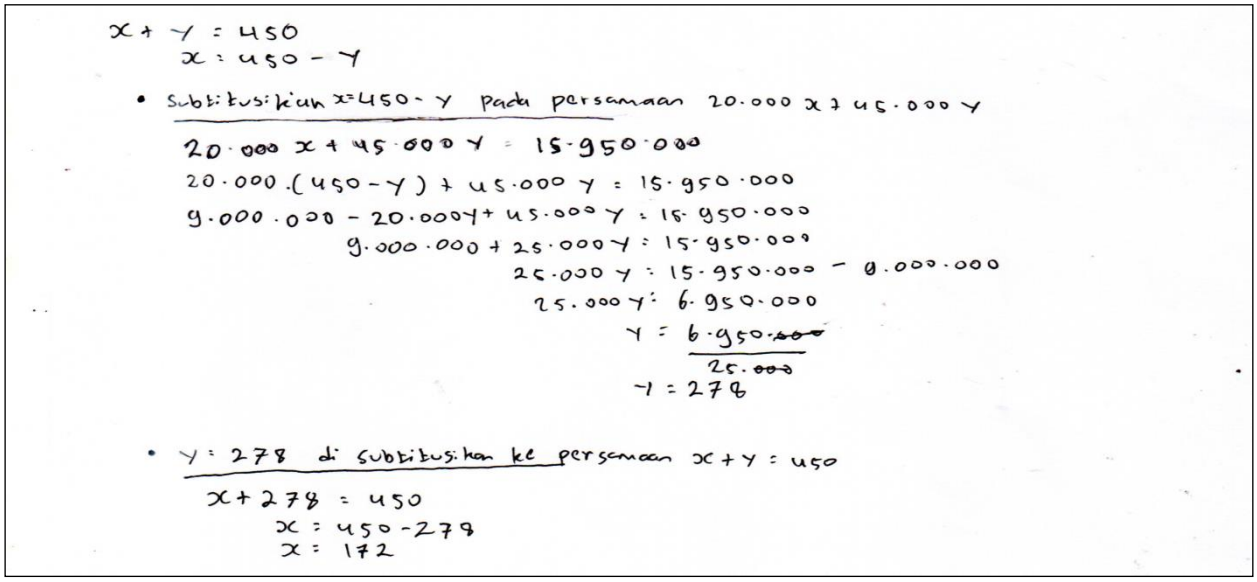
R : "What's next?"
S1 : "I made it in math sir"

The results of in-depth interviews conducted with S2 subjects showed that S2 subjects dared to express their opinions when they were going to solve the problem. This shows that S2 subjects are able to communicate in their work. Based on the work and in-depth interviews of S2 Subjects, it can be concluded that S2 Subjects can fulfill the process of formulating mathematical problems with the ability to mathematize, use symbols, and communicate in presenting the results of their work.

S2 subject in using concepts, procedures, facts, and reasoning in mathematics (employ)

The process of using concepts, procedures, facts, and reasoning in mathematics based on the work of the S2 Subject can be seen in Figure 5.



Translation:

Substitute x = 450 – y in the equation 20.000x + 45.000 y

Y = 278 substituted in the equation x + y = 450

Figure 5. The Process of Using Concepts, Procedures, Facts, And Reasoning of S2 Subjects

Based on the results of the work of the S2 Subject in the process of using concepts, procedures, facts, and reasoning, it is obtained that the S2 Subject directly uses the substitution method to find one of the variables. This shows that the S2 Subject is able to design a strategy in solving the problem because the selection of the solution method carried out by the S2 Subject is directly to the core of the problem so that the solution can be solved. This also shows that Subject S2 is able to reason and argue on the problem because Subject S2 immediately uses his reasoning after understanding the problem. also The researcher conducted an in-depth interview to find out the mindset of the S2 Subject.

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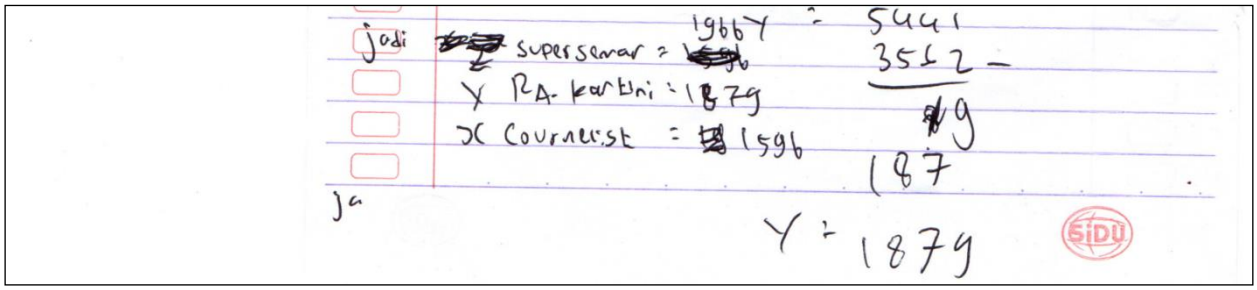
R : "What do you do?"
S1 : "I immediately chose the substitution method, sir"
R : "Why?"
S1 : "Because from what has been formulated, it turns out that one of the variables is already known to have an equation"

The results of in-depth interviews conducted with S2 Subjects showed that S2 Subjects dared to express their opinions when asked about what S2 Subjects had understood with their own logic or reasoning so that S2 Subjects were faster in finding solutions to the problem. This shows that the S2 Subject is able to communicate the skills, reason, and argue against what he is doing firmly. Based on the work and in-depth interviews of S2 Subjects, it can be concluded that S2 Subjects can fulfill the process of using concepts, procedures, facts, and reasoning in mathematics with the ability to design strategies, reason and argue and communicate.

S2 subjects in interpreting, applying, and evaluating the results of a mathematical process (interpret)

The process of interpreting, applying, and evaluating the results of a mathematical process based on the work of the S2 Subject can be seen in Figure 6.



Translation:

So Supersemar = 1996 y

Y RA Kartini = 1879

X Cornelist = 1596

Figure 6. The Process Of Interpreting, Applying, and Evaluating S2 Subjects

Based on the results of the work of Subject S2 in the process of interpreting, applying, and evaluating, it was found that Subject S2 rewrote the results of mathematical forms into the real context that existed in the problem, but Subject S2 misplaced between the variables. This shows that the S2 subject has not been able to represent from the form of a mathematical model to a real context again. The researcher conducted an in-depth interview to find out the mindset of the S2 Subject.

R : "Should it be rewritten like that?"
S1 : "That's right, sir. We have to write like that"
R : "Why?"
S1 : "Because what is being asked is not a variable, sir"

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The results of in-depth interviews conducted with S2 Subjects showed that S2 Subjects dared to express their opinions even though they were not scientific. This shows that S2 subjects are quite capable of communication. The explanation of the S2 Subject shows that the S2 Subject is not able to reason and argue against what he has done. Based on the work and in-depth interviews with S2 Subjects, it can be concluded that S2 Subjects can fulfill the process of interpreting, applying, and evaluating with communication skills for the ability to represent, reason and argue has not been able to do so.

A summary of the analysis of the mathematical literacy process of S2 Subject can be seen in Table 3.

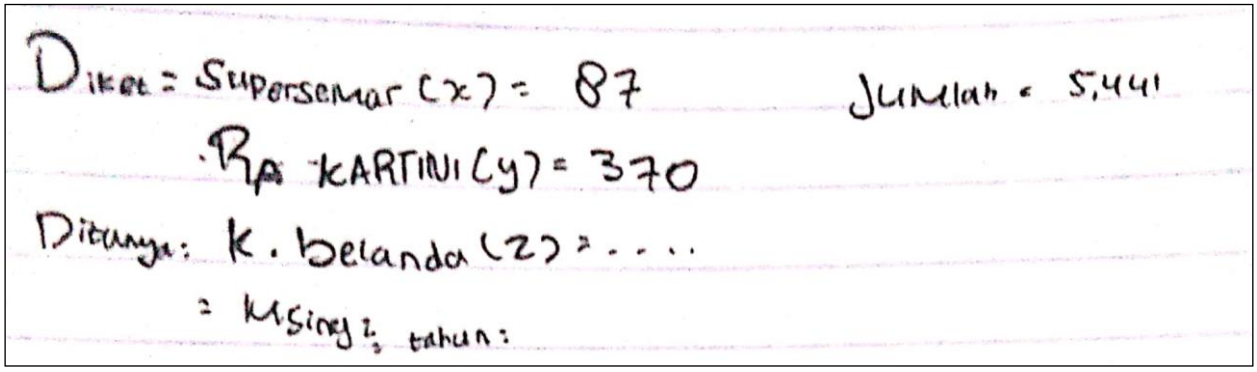
Table 3. Summary of Analysis of The Mathematical Literacy Process For S2 Subject

	P 1	P2	P3
Description of Mathematical Literacy	Mathematical skills, using symbols, and communication are fulfilled	The ability to design strategies, reason and argue and communicate is fulfilled	Communication skills are fulfilled
Description of Mathematical Resilience	Emotional control	Stay calm even under pressure	
	Impulse control	Able to think clearly and accurately	
	Optimism	Have a diligent attitude, give up easily, and are not sure of their abilities	
	Analysis of the cause of the problem	Not able to identify the cause of the problem	
	Ability to empathize	Able to socialize or discuss	
	Self-efficacy	Not having the confidence to rise from failure	
	Reach for what is used	Demonstrate a willingness to seek out self-learning resources	

Information: P1 = Process 1; P2 = Process 2; dan P3 = Process 3

S3 Subject in Formulating Mathematical Problems (Formulates)

The process of formulating mathematical problems on the subject of S3 is shown in Figure 7.



Translation:

Known = supersemar (x) amount = 5.441

RA Kartini (y)

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Asked = K. Belanda (z)

Each year

Figure 7. The Process of Formulating the S3 Subject Problem

Based on the results of the work of S3 Subjects in the process of formulating mathematical problems, it was found that S3 Subjects were not able to mathematize, namely changing mathematical literacy problems or problems into the form of mathematical models. S3 subjects are also not able to use symbols to make it easier for S3 subjects to make their mathematical models. The researcher conducted more in-depth interviews with S3 Subjects to obtain a complete picture of how the mindset of S3 Subjects.

R : "Are you having difficulties in this matter?"
S1 : "I don't understand sir"
R : "Why is this?"
S1 : "Because I can't"

The results of in-depth interviews conducted with S3 Subjects showed that S3 Subjects did not dare to express their opinions when asked about difficulties in the matter. This shows that S3 subjects are not able to perform communication skills in their work results. Based on the work and in-depth interviews of S3 Subjects, it can be concluded that S3 Subjects have not fulfilled the process of formulating mathematical problems with those who have not fulfilled the ability to mathematize, use symbols, and communicate in presenting the results of their work.

S3 Subject in Using Concepts, Procedures, Facts, And Reasoning in Mathematics (Employ)

The process of using concepts, procedures, facts, and reasoning in mathematics based on the work of the S3 Subject can be seen in Figure 8.

Figure 8. The Process of Using Concepts, Procedures, Facts, And Reasoning of S3 Subjects

Based on the results of the work of the S3 Subject in the process of using concepts, procedures, facts, and reasoning, it was found that the S3 Subject has not been able to solve the problem. This shows that the S3 Subject has not been able to design a strategy in solving the problem. S3 subjects immediately reduce the known numbers in the questions easily. This shows that S3 has not been able to reason and argue on the issue. The researcher conducted an in-depth interview to find out the mindset of the S3 Subject.

R : "What you understand?"
S1 : "I don't understand anything sir"
R : "Try to read the question carefully!"
S1 : "I still don't understand sir"

The results of in-depth interviews conducted with S3 Subjects showed that S3 Subjects were not able to express their opinions and easily gave up before trying. This shows that S3 subjects are not able to communicate, reason, and argue against what they are doing. Based on the work and in-depth interviews

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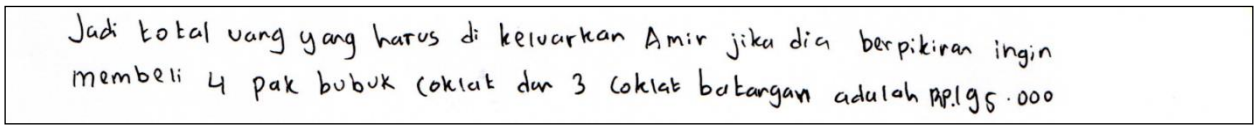
of S3 Subjects, it can be concluded that S3 Subjects have not fulfilled the process of using concepts, procedures, facts, and reasoning in mathematics with the ability to design strategies, reason and argue as well as communicate.

S3 Subjects in Interpreting, Applying, and Evaluating the Results of a Mathematical Process (Interpret)

The process of interpreting, applying, and evaluating the results of a mathematical process based on the work of the S3 Subject can be seen in Figure 9.



Translation:

So the total money that Amir has to spend if he think about buying 4 packs of chocolate powder and 3 chocolate bars is Rp195.000

Figure 9. The Process of Interpreting, Applying, and Evaluating S3 Subjects

Based on the results of the work of the S3 Subject in the process of interpreting, applying, and evaluating, it is found that the S3 Subject rewrites the results of mathematical forms into the existing real context. This shows that the S3 subject is able to represent from the form of a mathematical model to a real context again. The researcher conducted an in-depth interview to find out the mindset of the S3 Subject.

R : "What do you do?"
S1 : "I made the word so sir"
R : "Why the word is so?"
S1 : "I don't know sir"

The results of in-depth interviews conducted with S3 Subjects showed that S3 Subjects dared to express their opinions even though they were not in accordance with expectations. This shows that the S3 Subject is able to communicate even with unreasonable reasons. The explanation of the S3 Subject also shows that the S3 Subject is not able to reason and argue against what he has done. Based on the work and in-depth interviews of S3 Subjects, it can be concluded that S3 Subjects can fulfill the process of interpreting, applying, and evaluating with representation, and communication skills. However, the S3 subject has not fulfilled the reasoning and argument.

A summary of the analysis of the mathematical literacy process of S3 Subject can be seen in Table 4.

Table 4. Summary of Analysis of The Mathematical Literacy Process for S3 Subject

	P 1	P2	P3
Description of Mathematical Literacy	-	-	Representation and communication skills fulfilled
	Emotional control	Restless under pressure	
	Impulse control	Not able to think clearly and accurately	

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Description of Mathematical Resilience	Optimism	Not having a diligent attitude, giving up easily, and not being confident in their own abilities
	Analysis of the cause of the problem	Not able to identify the cause of the problem
	Ability to empathize	Not able to socialize or discuss
	Self-efficacy	Have the confidence to rise from failure Have the confidence to rise from failure
	Reach for what is used	Demonstrate a willingness to seek out self-learning resources

Information: P1 = Process 1; P2 = Process 2; dan P3 = Process 3

The very important mathematical literacy process begins with formulating mathematical problems. Based on the results of the research, it was obtained that the research subjects were still not able to formulate problems mathematically. This will affect the continuation of the research subject in solving the problem. This inability is characterized by the research subject who has not been able to identify what information is contained in the problem so that the problem can be solved above. This is in accordance with (Sulistiowati, 2022) which states that one of the things that can identify whether students understand the problem is to ask students to determine the information needed to solve the problem given.

Another thing is due to the subject's error in writing down what is known in the problem caused by the subject's lack of thoroughness in reading the questions. When the subject is asked to understand the problem by reading the question again, the subject realizes that the subject has been wrong in identifying the things that are known and asked. This is done because the subject is in a hurry to solve the problem. This is also in accordance with the results of the research (Pratiwi & Anita, 2021) which states that the subject's inaccuracy in reading the questions can be the cause of the subject's mistake in determining what is asked.

The difficulty in modeling mathematics is also felt by the research subjects, this is because the subjects are not used to problems that contain an unknown number of elements. The subject has difficulty interpreting and operating symbols to represent the unknown. It is also acknowledged by the subject that they are more often and happy if the problem is given directly to the point using a number or numbers.

Subjects find it difficult to formulate into a mathematical model because they are unable to connect one mathematical concept with another. This is in accordance with the results of the study (Jupri & Drijvers, 2016) which states that the difficulty of the subject in formulating a mathematical model can occur due to the subject's lack of understanding and ability to connect one mathematical concept to another. The subject also does not understand the meaning of the variable so the solution is to do the calculation of choosing a certain number.

Conclusion

Based on the results of the research, it shows that mathematical resilience has a role in the mathematical literacy process of students. Students with high mathematical resilience have three good mathematical literacy processes with mathematical skills, using symbols, communication, designing strategies, representation, reasoning and arguing. Students with moderate mathematical resilience have three processes of mathematical literacy but with different abilities including mathematical skills, using symbols, communication, designing strategies, reasoning and arguing. Students with low mathematical resilience have one mathematical literacy process with representation and communication skills, while two mathematical literacy processes are not optimal because students' abilities have not been metBased on the results of the research, it shows that mathematical resilience has a role in the mathematical literacy process of students. Students with high mathematical resilience have three good mathematical literacy processes with

mathematical skills, using symbols, communication, designing strategies, representation, reasoning and arguing. Students with moderate mathematical resilience have three processes of mathematical literacy but with different abilities including mathematical skills, using symbols, communication, designing strategies, reasoning and arguing. Students with low mathematical resilience have one mathematical literacy process with representation and communication skills, while two mathematical literacy processes are not optimal because students' abilities have not been met.

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