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# STUDENTS' MATHEMATICAL LITERACY IN SOLVING ETHNOMATHEMATICS-BASED PROBLEMS VIEWED FROM SELF-EFFICACY

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***ABSTRACT***
The purpose of this study is to describe how students' mathematical literacy is in solving ethnomathematics-based questions in terms of student self-efficacy. Three grade VIII students of SMP Negeri 1 Surakarta were selected as samples based on the results of the self-efficacy questionnaire and assigned according to the self-efficacy category. Data collection techniques were carried out using self-efficacy questionnaires, mathematical literacy tests, and interviews. The results of the research that has been done show that students with high self-efficacy categories can fulfill the six indicators of mathematical literacy. Students in the self-efficacy category are being able to solve the questions given, but have not been able to fulfill the indicators of using arithmetic operations and mathematical symbols. Students in the low self-efficacy category were only able to fulfill the communication and mathematization indicators on the three mathematical literacy questions.
**Keywords:** Mathematical Literacy, Self-Efficacy, Ethnomathematics

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## PRELIMINARY

Education in Indonesia is closely related to mathematics, where mathematics is always placed as a priority at all levels of education. This kind of mathematical position shows the importance of mathematics in everyday life. Aside from being a medium for developing students' thinking skills, mathematics can also act as a means of training in solving problems that arise in everyday life. More than that, mathematics also supports the growth of science and technological development (Ananda & Wandini, 2022).

Technological developments are so massive currently, demanding that students continue to develop their various abilities, one of which is mathematical literacy. Mathematical literacy is closely related to problem-solving abilities in mathematics (Asmara et al., 2017). Pramujiyanti Khotimah & Masduki (2019) explained that solving problems requires learned mathematical concepts and procedures. Mathematical literacy is the ability

to formulate, implement, and modify mathematics in context, which includes individual abilities to reason mathematically and apply mathematical concepts, facts, procedures, and media to predict, describe and explain a phenomenon (Kurniawati & Mahmudi, 2019). Mathematical literacy is also not maximized if you only understand mathematical knowledge but are also able to apply it in everyday life. The importance of mathematical literacy for students is that it can help students understand the role and benefits of mathematics in everyday life (Rayhan & Juandi, 2023). The importance of mathematical literacy for students is that it can help students understand the role and benefits of mathematics in everyday life.

In Indonesia, the mathematical literacy of students is quite low and far below the international average in the PISA study. This fact can be seen from the results of the PISA test obtained by Indonesian students who always rank at the bottom. The PISA test is carried out periodically every three years, in which Indonesia has participated since 2000 (OECD, 2014). The results of data analysis from the last PISA test held in 2018 showed Indonesia's average score in the reading category was 371, the science category was 396 and the score in the mathematics category was 379. In the 2018 PISA test results, Indonesia was ranked 74th out of 79 participating countries and the average score of the PISA test achieved by Indonesia in 2018 decreased when compared to the results of the PISA test carried out in 2015 where Indonesia's average score in the reading category was 397, the science category was 403, and the average score was the average in the math category is 386 (Peña-López, 2019). The study conducted by PISA has a close relationship with mathematical literacy. It can be seen from the results of the PISA tests that were carried out in 2015 and 2018 showing that the low mathematical literacy of students in Indonesia is real (Sutisna et al., 2018).

Mathematical literacy means students' ability to apply knowledge and skills is not only mastered theoretically. Mathematical reasoning is also needed so that students can build knowledge and skill structures (Masduki et al., 2020). Mathematical literacy has a close relationship with mathematical models, namely using skills and abilities in working on mathematical models, as well as interpreting and evaluating results (Kurniawati & Mahmudi, 2019). The processes in mathematical literacy are explained by David K. Pugalee (2010) regarding how one correlates the context of a problem with mathematics and complete the problem. The four processes are representation, manipulation, reasoning, and argumentation, and problem-solving.

The context aspect is one of the characteristics of the mathematical literacy questions developed by PISA involving various situations, one of which is personal context. Personal context relates to students' daily lives, where students will be faced with various contextual

problems that require solving. Culture is one of the personal contexts that can be seen from various aspects of life, especially in the arts, for example, such as the construction of temples, handicrafts, and the making of batik with patterns that are related to mathematics. Mathematical material taught to students in a cultural context will have a better understanding of mathematics. Apart from context, the characteristics of the mathematical literacy questions explained by PISA are content. PISA content is also divided into several aspects, one of which is quantity content. Quantity content relates to skills in understanding scale, design, numeration, and everything related to numbers in everyday life. One of the contents that can be raised for the problem of mathematical literacy is ethnomathematics.

Ethnomathematics is an implication of a cultural approach to learning mathematics (Faiziyah et al., 2021). Ethnomathematics can also be said to play a role as a bridge connecting cultural preservation with technological developments that can develop students' abilities in learning mathematics (Nur et al., 2020). Ethnomathematics is access to learning that has the potential to spur the development of students' metacognition in solving mathematical problems, which can improve reasoning abilities. In addition, the ethnomathematics approach helps students in the development of intellectual, social, and emotional learning of students by applying their own culture by cultivating knowledge, skills, and behavior in students (Fouze & Amit, 2018). Ethnomathematics focuses on competencies that are developed in diverse cultural areas in everyday life, while mathematical literacy focuses on mathematical competencies and the social needs of society. Therefore, ethnomathematics aspects and mathematical literacy aspects are two essential aspects for students in learning mathematics.

Many factors influence the low mathematical literacy of students, one of which is self-efficacy. Self-efficacy is a factor in the psychological aspects of learning mathematics that must be optimized. The definition of self-efficacy according to Bandura is individual belief or confidence in their ability to produce performance that influences events that affect their lives (Calaguas & Consunji, 2022).

The importance of self-efficacy for students, namely self-efficacy plays an important role as an influence on their behavior in solving problems, persistence in tasks, and responses to failures they face (Kurniawati & Mahmudi, 2019). If students have high self-efficacy, they can target the goals to be achieved, have no fear of facing failure, and will devise new strategies from previous failures. In contrast, students who have low self-efficacy prefer to avoid the assigned task, have a high sense of fear of failure, easily give up on failure, and are reluctant to seek new solutions.

From the description above, research will be carried out related to describing how students' mathematical literacy solves ethnomathematics problems from a self-efficacy perspective. This research is important as an initial identification effort related to students' mathematical literacy at SMPN 1 Surakarta and to train students and teachers in the use of ethnomathematics-based questions. What distinguishes this research from previous research is that the research to be conducted aims to describe students' mathematical literacy in solving ethnomathematics-based questions in terms of the level of self-efficacy possessed by students.

## METHODS

The research carried out is a type of qualitative research with descriptive methods. The research focuses on describing how students' mathematical literacy is in solving ethnomathematics-based questions in terms of students' self-efficacy. The study was carried out at SMP Negeri 1 Surakarta and involved three students from the VIII D grade in the second semester of the 2022/2023 academic year.

Tests, questionnaires, interviews, and documentation were used by researchers in the data collection process. The instrument used is a self-efficacy questionnaire. The self-efficacy questionnaire in the research aims to group students based on their level of self-efficacy. The level of self-efficacy itself is divided into 3 levels, namely high, medium, and low self-efficacy. The scores on scores for each of the students' self-efficacy categories were adjusted according to the interval rating scale by Ebel & Frisbie (1991). The following is a table for self-efficacy category scores.

**Table 1. Self-efficacy Achievement Score Categories**

| Category | Self-efficacy Score Intervals (X) |
|---|---|
| High | $93 < X < 125$ |
| Medium | $59 < X < 92$ |
| Low | $25 < X < 58$ |

The self-efficacy questionnaire was carried out by all VIII D graders. After obtaining the results from the self-efficacy category of grade VIII D students, three students will be taken from the subject of the self-efficacy questionnaire where the sample is taken using a purposive sampling technique. Three students were selected are adjusted to the self-efficacy level group, then carry out a mathematical literacy test with ethnomathematics-based questions which aim to analyze students' mathematical literacy in solving ethnomathematics-

based questions according to the level of self-efficacy based on the results of a self-efficacy questionnaire according to the self-efficacy level group, then carried out a mathematical literacy test with ethnomathematics-based questions which aimed to analyze students' mathematical literacy skills in solving ethnomathematics-based questions according to their level of self-efficacy. The questions tested on students amounted to three questions and were in the form of description questions with problems that had been arranged and adjusted based on students' mathematical literacy indicators, namely: 1) communication, 2) mathematization, 3) representation, 4) problem-solving strategies, 5) use of operations and symbol language, formal language, and technical language, 6) reasoning and reasoning. The final data collection technique is semi-structured interviews with students who have taken a mathematical literacy test. The interviews were conducted to support the process of analyzing mathematical literacy against the results of the previously conducted mathematical literacy tests.

There are three stages in the data analysis technique used in this study, namely data reduction, data presentation, and conclusion. In the data reduction stage, the researcher reduced the data from the results of the self-efficacy questionnaire to determine the level of student self-efficacy which was categorized into three students with high, medium, and low self-efficacy categories respectively. Furthermore, researchers also reduced data from the results of mathematical literacy tests based on ethnomathematics questions based on indicators of mathematical literacy and the results of interview data. At the data presentation stage, the data presented in this study are the results of written tests of mathematical literacy and the results of interviews from samples selected based on students' self-efficacy categories. Furthermore, the data will be presented in the form of image documentation and descriptions. The conclusion of the research is in the form of a description of the results of the analysis of the research conducted, namely describing students' mathematical literacy in solving ethnomathematics-based questions in terms of the level of self-efficacy.

To test the validity of the data, the researcher applied the triangulation method in this study. Method triangulation is a method used to test data by looking for the authenticity of data obtained from similar data sources with various data collection and techniques (Alfansyur & Mariyani, 2020). The triangulation method used was obtained from the results of written tests and interviews with the same data source, namely class VIII D students of SMP Negeri 1 Surakarta as the research sample.

## RESULT AND DISCUSSION

The results obtained from the research conducted at SMPN 1 Surakarta were filling out a self-efficacy questionnaire and the results of an ethnomathematics-based mathematical literacy test on SPLDV material. The results of filling out the self-efficacy questionnaire, the results were obtained from 31 students in grade VIII D with 8 students with high criteria, 15 students with medium criteria, and 8 students with low criteria. Next, the researcher selects subjects accurately according to self-efficacy categories. From the 31 subjects, 3 students of class VIII D with 1 student each in each self-efficacy category are selected as subjects. The four research subjects are listed in the table below:

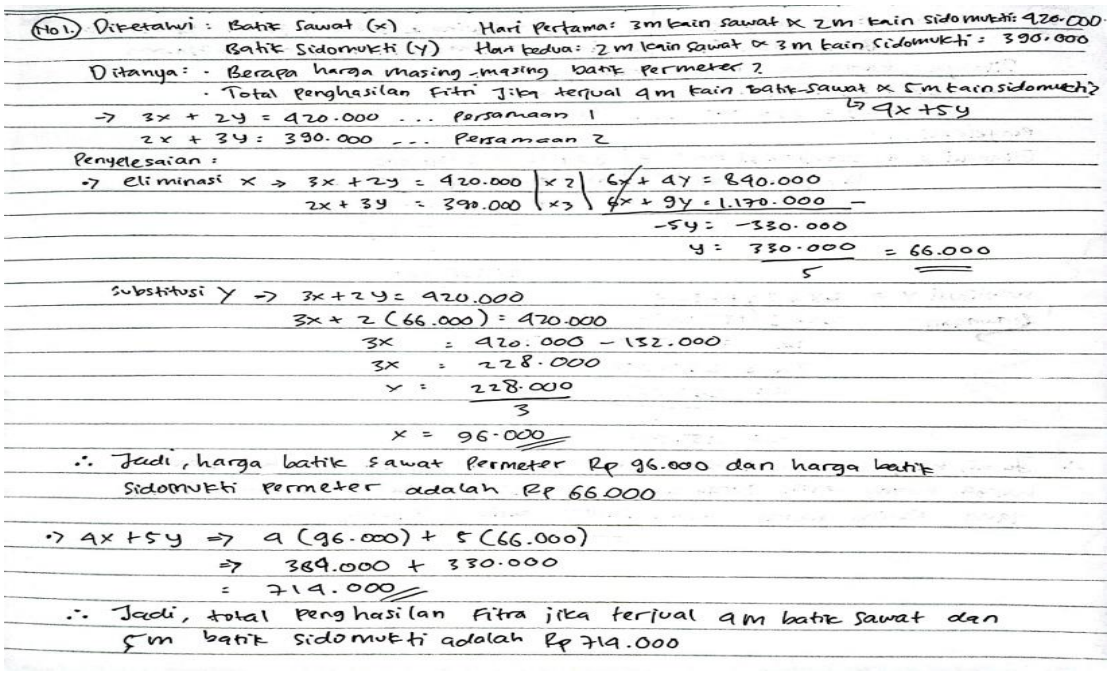
**Table 2. List of Research Subjects' Self-Efficacy Test Scores**

| Subject Code | Self-Efficacy Criteria | Score |
|---|---|---|
| S1 | High | 105 |
| S2 | Medium | 86 |
| S3 | Low | 56 |

The following describes the data of the analysis of students' mathematical literacy with ethnomathematics-based questions in terms of the level of self-efficacy.

### 1. Data Analysis S1 High Self-Efficacy Category

S1 students with the high self-efficacy category can work on mathematical literacy problems well and fulfill all mathematical literacy indicators in all three ethnomathematics-based problems. S1 can describe information related to the problem well, can write mathematical models related to the problem well, can determine and explain the form of representation correctly, can determine strategies and compile problem-solving steps well, can apply arithmetic operations, symbol language, formal language, and technical language correctly, and can conclude the results of solving the problem well. The following are the results of the answers to the three questions that have been done by S1.

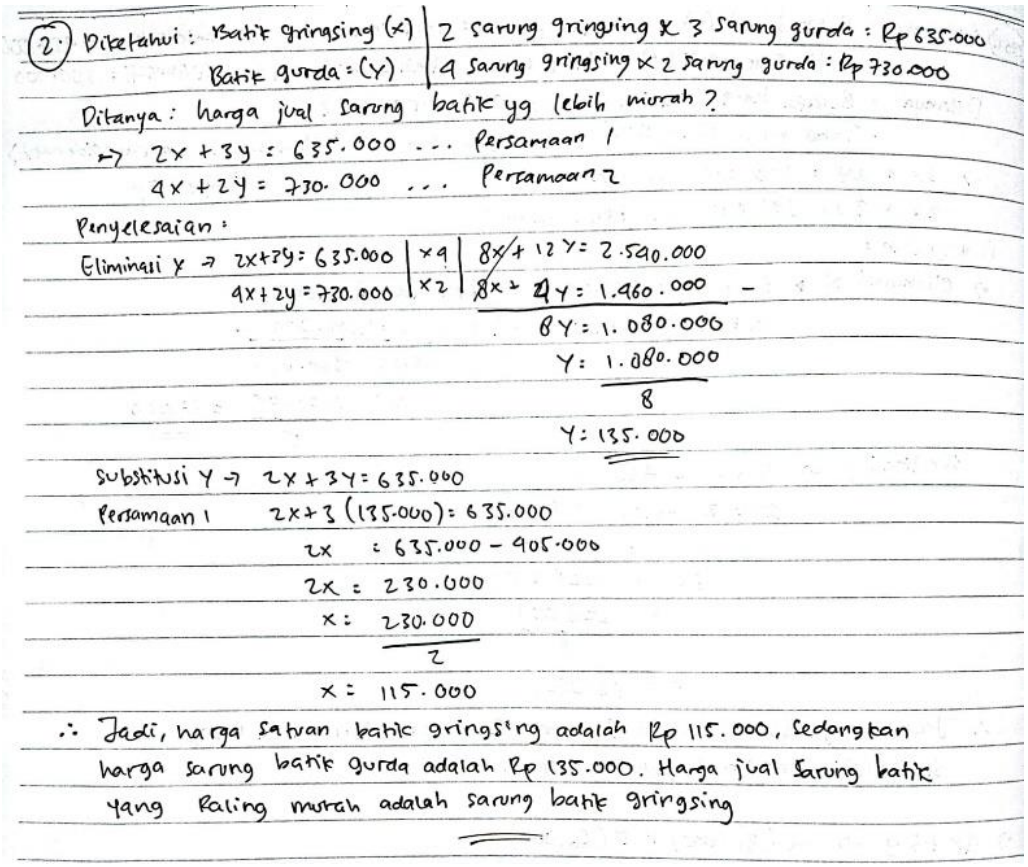



**English Version**

Is Known: Sawat Batik (x)
Sidomukti Batik (y)
First day: 3m of sawat batik cloth & 2m of sidomukti batik cloth : 420.000
Second day: 2m of sawat batik cloth & 3m of sidomukti batik cloth : 390.000
Asked: - how much does one meter of batik cost each?
-Fitra's total income if 4m sawat batik cloth and 5m sidomukti batik cloth are sold?
$3x + 2y = 420.000$…equation 1
$2x + 3y = 390.000$…equation 2
Completion:
x elimination: $3x + 2y = 420.000 \mid \times 2 \mid 6x + 4y = 840.000$
$2x + 3y = 390.000 \mid \times 3 \mid 6x + 9y = 1.170.000$ -
$-5y = -330.000$
$y = 66.000$

y substitution: $3x + 2y = 420.000$
$3x + 2(66.000) = 420.000$
$3x = 420.000 - 132.000$
$3x = 288.000$
$x = 96.000$
$4x + 5y$: 4(96.000) + 5(66.000)
: 384.000 + 330.000
: 714.000
❖ So, the total income of fitra if 4m sawat batik and 5m sidomukti batik are sold is IDR 714,0000.

**Figure 1. S1 Student Answer Sheet Number 1**




**English Version**

Is Known: Gringsing Batik sheath(x)
Gurda Batik sheath (y)
2m of gringsing sheath & 3m of gurda sheath: 635.000
4m of gringsing sheath & 2m of gurda sheath: 730.000
Asked: cheaper selling price of batik sheath?

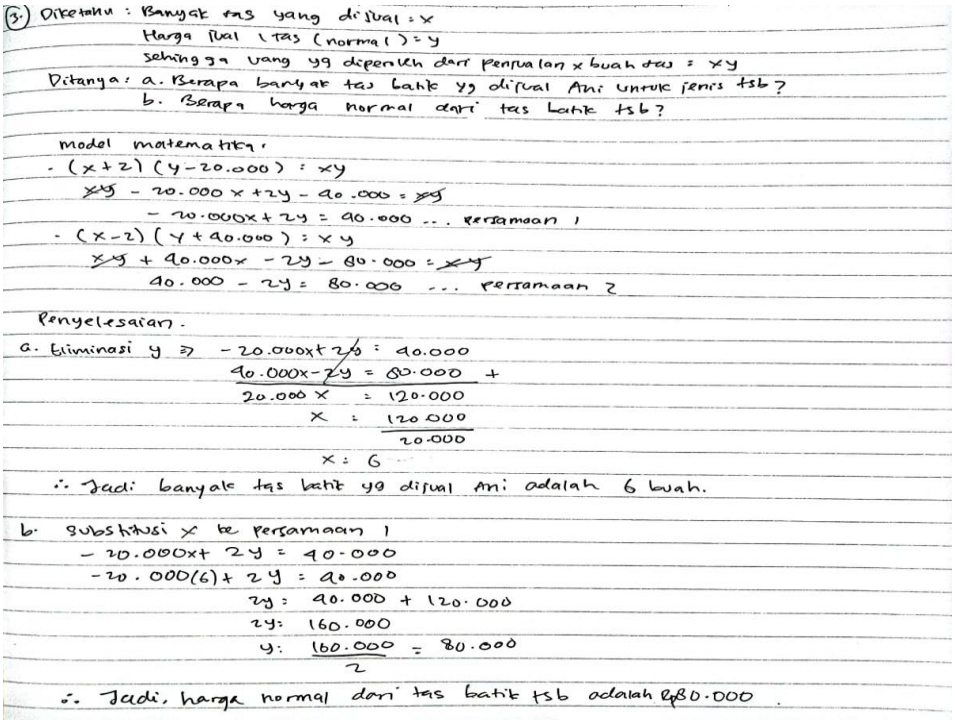
$2x + 3y = 635.000$…equation 1
$4x + 2y = 730.000$…equation 2

Completion:
x elimination: $2x + 3y = 635.000$ | x4 | $8x + 12y = 2.540.000$
$4x + 2y = 730.000$ | x 2 | $8x + 4y = 1.460.000$ -
$8y = 1.080.000$
$y = 135.000$

y substitution: $2x + 3y = 635.000$
$2x + 3(135.000) = 635.000$
$2x = 635.000 – 405.000$
$2x = 230.000$
$x = 115.000$

❖ So, the unit price of a gringsing batik sheath is IDR 115,000, while the price of a gurda batik sheath is IDR 135,000. The cheapest selling price of batik sheath is gringsing batik sheath

**Figure 2. S1 Student Answer Sheet Number 2**




**English Version**

Is Known: Many bags on sale: $x$
Selling price of 1 bag (normal): $y$
So the money earned from selling x bags: $xy$
Asked a. How many batik bags did Ani sell?
b. What is the normal price of the batik bag?
math model: * $(x + 2)(y - 20.000) = xy$
$xy - 20.000x + 2y - 40.000 = xy$
$-20.000x + 2y = 40.000$ ……equation 1
*$(x - 2)(y + 40.000) = xy$
$xy + 40.000x - 2y - 80.000 = xy$
$40.000x - 2y = 80.000$ …equation 2
Completion:
a. y elimination: $-20.000x + 2y = 40.000$
$40.000x - 2y = 80.000$ +
$20.000x = 120.000$
$x = \frac{120.000}{20.000}$
$x = 6$

❖ So, many batik bags sold by Ani are 6 pieces

b. substitute x into equation 1: $-20.000x + 2y = 40.000$
$-20.000(6) + 2y = 40.000$
$-120.000 + 2y = 40.000$
$2y = 40.000 + 120.000$
$2y = 160.000$
$y = 80.000$

❖ So, the normal price of the batik bag is IDR 80,000.

**Figure 3. S1 Student Answer Sheet Number 3**

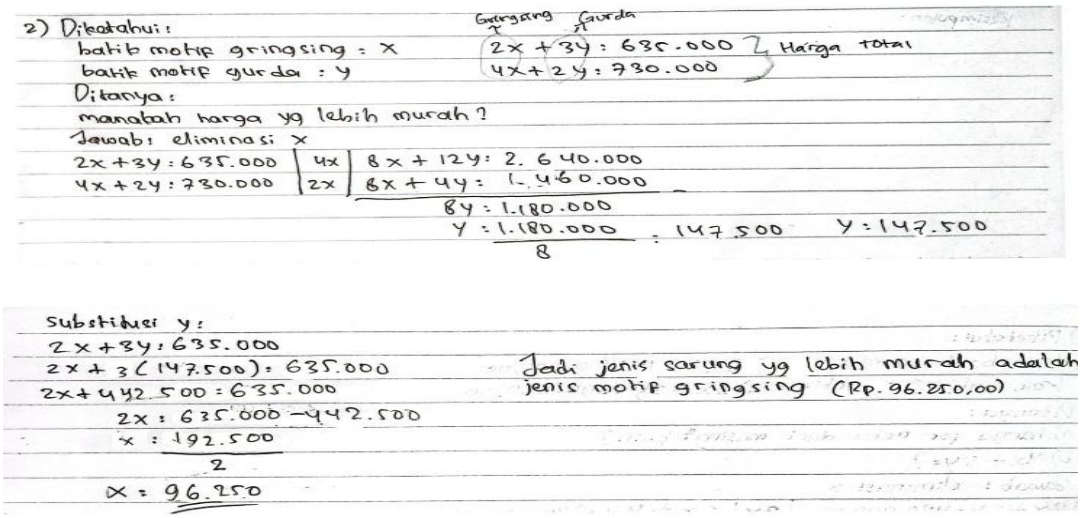
The following is also explained through the results of interviews with S1 related to the results of the answers to the three mathematical literacy questions.

Q : " Did you face any difficulties while solving the three questions?

S1 : "Based on my understanding, questions 1 and 2 were manageable, but question 3 was challenging as it required a thorough comprehension of the problem to determine the appropriate mathematical model.

**2. Data Analysis S2 Medium Self-Efficacy Category**

S2 subjects in the medium self-efficacy category were able to work on mathematical literacy questions quite well. It can be seen from the results of problem number 1, S2 can do well to fulfill the six indicators of mathematical literacy. In question number 2, S2 can fulfill the five indicators. Here are the results of answer number 2 in the image below.




**English Version**

Is Known: Gringsing Batik motif: $x$ ; Gurda batik motif: $y$ ; $2x + 3y = 635.000$, $4x + 2y = 730.000$ } Harga Total

Asked: cheaper selling price of batik?

Completion:

$x$ elimination: $2x + 3y = 635.000$ | x4 | $8x + 12y = 2.640.000$

$4x + 2y = 730.000$ | x 2 | $8x + 4y = 1.460.000$ -

$8y = 1.180.000$

$y = 147.500$

y substitution: $2x + 3y = 635.000$

$2x + 3(147.500) = 635.000$

$2x = 635.000 – 442.500$

$2x = 192.500$

$x = 96.250$

❖ So, the cheaper type of sarong is the type of gringsing motif (IDR 96,250)

**Figure 4. S2 Student Answer Sheet Number 2**

In answer number 2, S2 has completed the completion process with the six indicators completely. But on the indicators of using arithmetic operations and symbol language, the work process was not quite right, because S2 was not thorough in the results of arithmetic operations which caused the answers from the results of calculation number 2 to be incorrect and the conclusions on number 2 to be incorrect. The statement below is a reinforcement of the master's subject work.

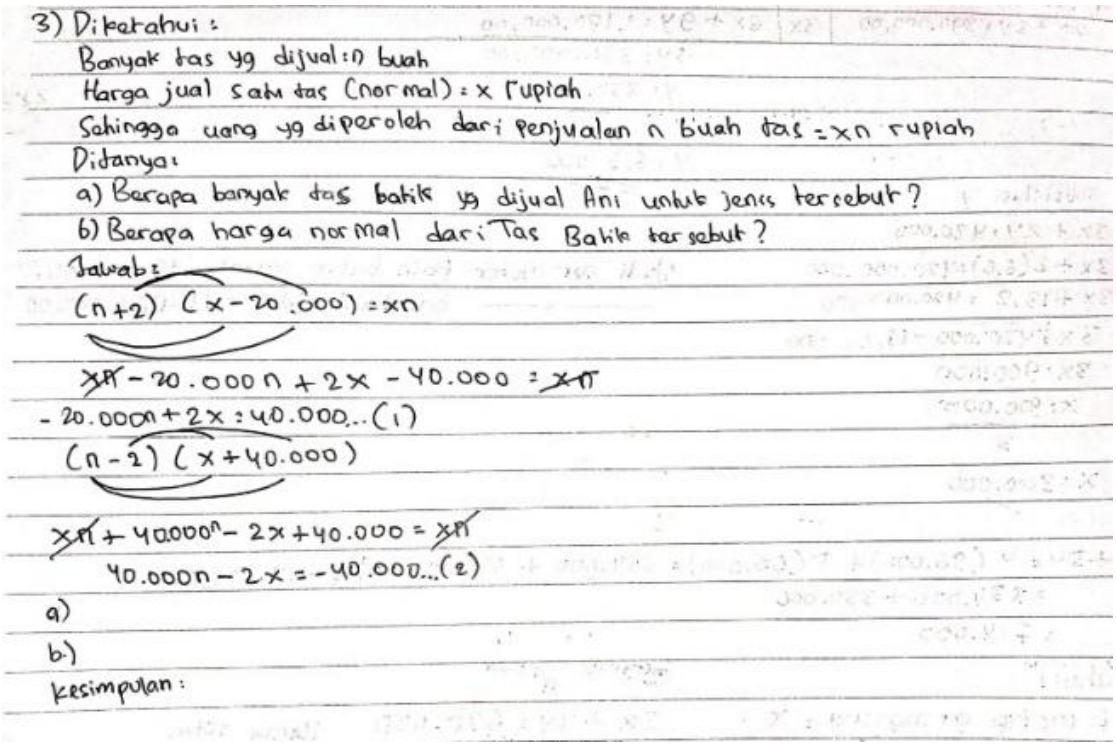
Q : "Are the arithmetic operations and mathematical symbols that you use in the problem-solving process, correct?"

S2 : "Not correct ma'am, because there was an error in the multiplication in the process of eliminating the value of x, so the final answer was not correct ma'am, because I did not correct my work again"

Q : "From the entire process of solving question number 2, were there any difficulties in solving the problem?

S2 : "For question 2, in my opinion, there is no difficulty in working on the answer, it's just me because I wasn't careful in the calculation process, so the answer is wrong ma'am."

Furthermore, on the results of solving problem number 3, S2 was only able to fulfill two indicators, namely communication and mathematization indicators. The following is the result of the S2 answers on number 3.



**English Version**

Is Known: many bags on sale: $n$ pieces
Selling price of 1 bag (normal): $x$
So the money earned from selling x bags: $xn$
Asked a. How many batik bags did Ani sell?
b. What is the normal price of the batik bag?
math model: * $(n + 2)(x - 20.000) = xn$
$xy - 20.000n + 2x - 40.000 = xn$
$-20.000n + 2x = 40.000\ldots$ (1)
*$(n - 2)(x + 40.000) = xn$
$xy + 40.000n - 2x + 40.000 = xn$
$40.000n - 2x = -40.000\ldots$ (2)
a.)
b.)
Conclusion:

**Figure 5. S2 Student Answer Sheet Number 3**

S2 has difficulty understanding and analyzing questions so it takes a long time to convert word problems into mathematical models, and then cannot do other solving processes. Following are the results of the interviews which reinforce the analysis of S2 answers.

Q : "How do you write the information related to problem number 3 into the mathematical model?"

S2 : "For question number 3, I have difficulty understanding the question ma'am, so I spend time just changing the problem into the mathematical model"

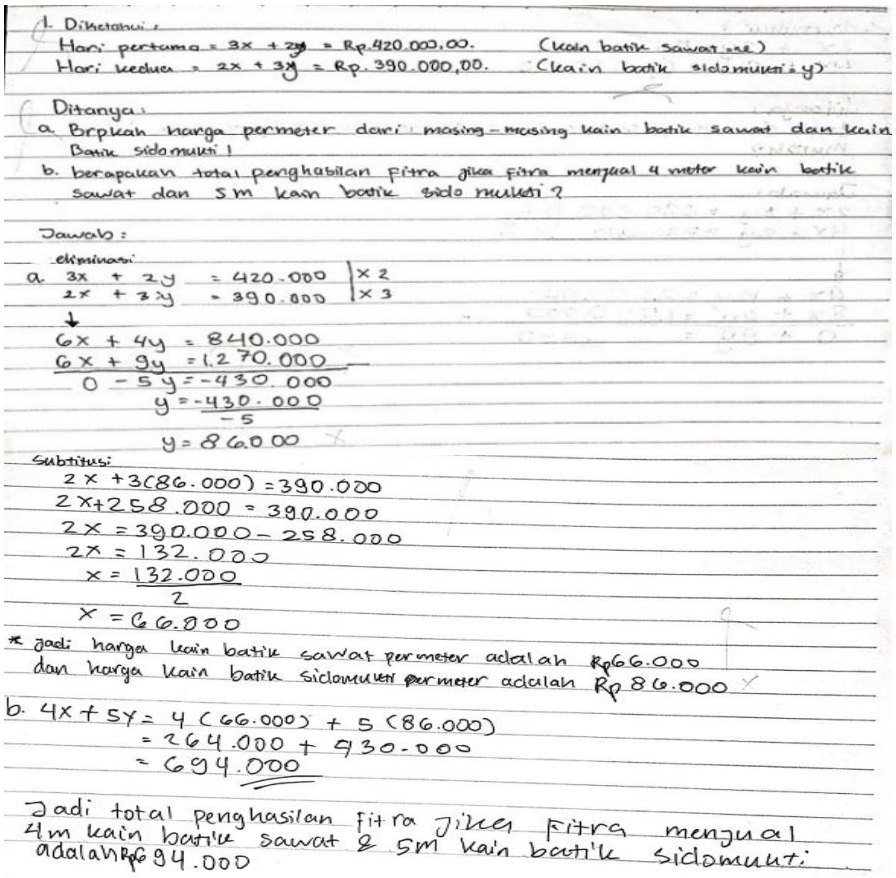
Q : "From the entire process of solving question number 3, were there any difficulties in solving the problem?

S2 : "For question 3, I have problems understanding and analyzing the problem, so I spend a lot of time thinking about changing the problem to the mathematical model, so I don't have time to work on the next answer"

In statement S2 above, it was found that if the difficulty in working on number 3 was found in the mathematization indicator, S2 was less able to convert information from word problems into a mathematical model, so he could not reach other indicators.

**3. S3 Data Analysis Low Self-Efficacy Category**

S3 subjects with low self-efficacy categories in the results of working on mathematical literacy questions seemed to have problems in the process. In answer number 1, S3 can fulfill the five indicators of mathematical literacy.




**English Version**

Is Known: First Day: $3x + 2y = 420.000$ (Sawat Batik cloth: $x$)
Second Day: $2x + 3y = 390.000$ (Sidomukti Batik cloth: $y$)

Asked: a. how much is the price of one meter of each sawat batik cloth and sidomukti batik cloth?

b. Fitra's total income if 4m sawat batik cloth and 5m sidomukti batik cloth are sold?

Completion:

a. x elimination : $3x + 2y = 420.000 \mid \times 2 \mid 6x + 4y = 840.000$
$2x + 3y = 390.000 \mid \times 3 \mid 6x + 9y = 1.270.000$ -
$-5y = -430.000$
$y = 86.000$

y substitution: $2x + 3y = 390.000$
$2x + 3(86.000) = 4390.000$
$2x = 390.000 - 132.000$
$2x = 132.000$
$x = 66.000$

❖ So, the price of one meter of sawat batik is IDR 66,000 and the price of one meter of sidomukti batik is IDR 86,000.

b. $4x + 5y$: $4(66.000) + 5(86.000)$
: $264.000 + 430.000$
: $694.000$

❖ So, the total income of fitra if 4m sawat batik and 5m sidomukti batik are sold is IDR 694,0000.

**Figure 6. S3 Student Answer Sheet Number 1**

It can be observed in the picture above, the completion process carried out by S3 is quite complete for solving problem number 1, but S3 is less able to meet the indicators of using arithmetic operations and symbolic language because in the calculation process, the value of x is eliminated, there is an error in the result of the multiplication of the second equation which should be the product of 390,000 by 3 is 1,170,000, but the result of the S3 calculation is 1,270,000. The calculation error made by S3 resulted in the calculation results in the next answer until the conclusion process was wrong. The following is the result of the interview which strengthens the doctoral answer to question number 1.

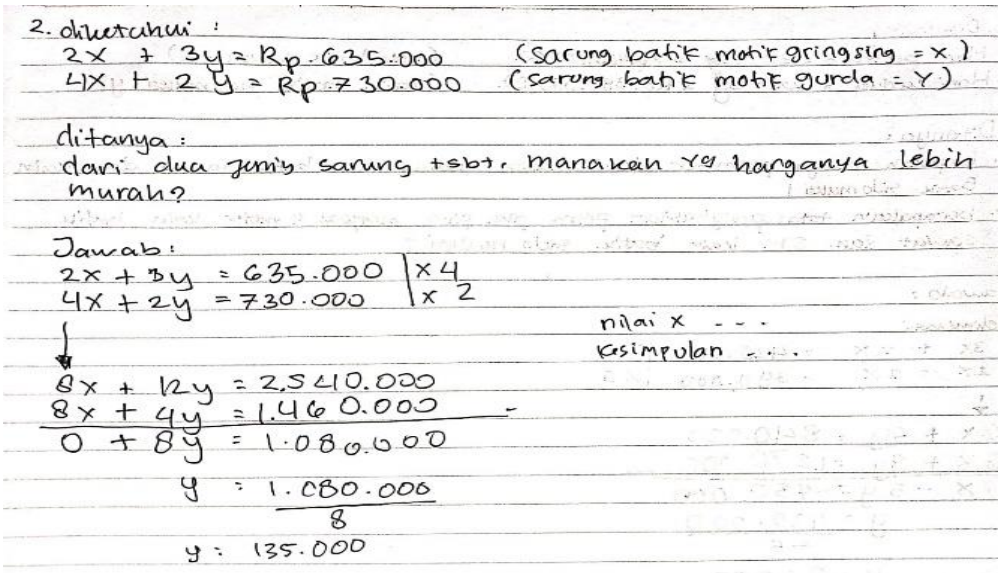
Q : "From the entire process of solving problem number 1, were there any difficulties in solving the problem?

S3 : "For question number 1, I think I'm a little confused about counting, ma'am because the numbers are big. So, there might be an erroneous calculation, ma'am."

Q : "Are the arithmetic operations and mathematical symbols that you use in the problem-solving process, correct?"

S3 : "Not right ma'am, the calculation in the elimination method section for my x value was wrong ma'am, the multiplication result of 390,000 if 3 should be the result is 1,170,000 not 1,270,000. So, the answers in the substitution method until the conclusion is all wrong ma'am"

In answer number 2, S3 only met two indicators of mathematical literacy, namely communication, and mathematization. S3 cannot fulfill the other four indicators.



**English Version**

Is Known: $2x + 3y = 635.000$ (Gringsing motif batik sheath: $x$)
$4x + 2y = 730.000$ (Gurda motif batik sheath: $y$)
Asked: Of the two types of sheaths, which one is cheaper?
Completion:
x elimination: $2x + 3y = 635.000 \mid \times 4 \mid 8x + 12y = 2.540.000$
$4x + 2y = 730.000 \mid \times 2 \mid 8x + 4y = 1.460.000$ -
$8y = 1.080.000$
$y = 135.000$
x…?
Conclusion…?

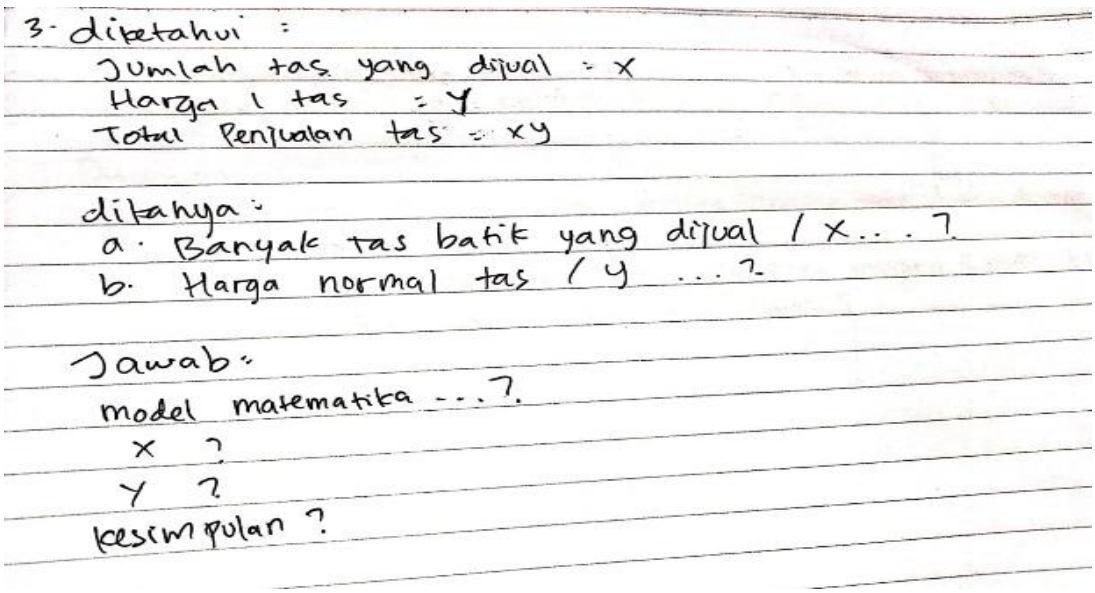
**Figure 7. S3 Student Answer Sheet Number 2**

It can be observed from the S3 answer sheet that only writes information about questions and mathematical models. In the next completion process, S3 only wrote down half of the answers. The strategy in answer number 2 should use the elimination and substitution method, but S3 only includes the elimination method, so the answer to S3 on question number 2 is incomplete. The following is the result of the interview which strengthens the doctoral answer on question number 2.

Q : "From the entire process of solving question number 2, were there any difficulties in solving the problem?

S3 : "For question number 2, it's the same as number 1, I have difficulty calculating with large numbers so I don't continue because it takes a long time to work on it."

In answer number 3, S3 can only meet the communication indicators. S3 is unable to fulfill the other indicators, from mathematization to reasoning and giving reasons.



**English Version**

Is Known: many bags on sale: *x*
Selling price of 1 bag (normal): *y*
So the money earned from selling x bags: *xy*
Asked a. How many batik bags did Ani sell / x?
b. What is the normal price of the batik bag / y?
Completion:
Math model…?
x…?
y…?
Conclusion…?

**Figure 8. S3 Student Answer Sheet Number 3**

As can be seen from the picture above, the answers written by S3 are only information that is known and asked. S3 had difficulty converting word problems into mathematical models in problem number 3, so S3 could not work on the completion process to its conclusion. The following is the result of the interview as a reinforcement of the results of the S3 answer in number 3.

Q : "From the whole process of solving problem number 3, were there any difficulties in solving the problem?"

S3 : "For question number 3, I had difficulty changing the problem to the mathematical model because I had to understand the problem correctly, while I was confused about understanding the problem."

**Discussion**

The following description is based on the results obtained from answers and interviews conducted with research subjects regarding students' mathematical literacy in solving ethnomathematics-based problems in terms of self-efficacy. Based on the analysis above, it can be concluded that students' self-efficacy levels have an impact on their mathematical literacy skills when working on ethnomathematics-based problems. It was determined that higher levels of self-efficacy are correlated with better mathematical literacy skills.

Students with a high level of self-efficacy tend to have high academic aspirations and always try to associate learning activities optimally compared to students with low self-efficacy (Santrock, 2014, p. 180). The results of the study show that S1 can fulfill the six indicators of mathematical literacy, indicating that these students have a high self-efficacy category for learning processes and outcomes. Students with high self-efficacy are also able to think critically and develop broader insights so that these students can do tasks well

(Cheung, 2015). This is in line with research conducted by Martalyna et al. (2018), students who have high self-efficacy in solving HOTS-oriented problems have a strong desire to master mathematics which leads to excellent mathematical literacy. Likewise, Purwanti & Mujiasih's research (2021) shows that students who have high self-efficacy in solving HOTS-oriented problems can create mathematical models, find the right solution, and draw conclusions. This is also in line with the results of Geraldine & Wijayanti's research (2022) showing that the mathematical literacy of students with high self-efficacy in solving problems can formulate problems by identifying mathematical aspects of the problem and converting problems into appropriate mathematical language, then applying facts, rules, and algorithms during the process of determining mathematical results and finally being able to interpret and evaluate their suitability in the context of the original problem.

Students with a moderate level of self-efficacy are able to identify mathematical values and important variables in ethnomathematics-based mathematical problems. This is evidenced by students who are able to provide the information stated in the problem and are able to channel mathematical ideas and visualize them into mathematical models. Students are also able to determine representations and strategies in the solution process with a fairly good category but do not interpret the value of calculations and mathematical symbols, this is based on a student's statement who said that the student was not careful about the calculation results. In the dimension of planning strategies for solving problems, students can design strategies quite well, but not all strategies can be implemented properly. The results of this study are in line with research conducted by Atho'illah et al., (2022) Students who fall under the category of moderate self-efficacy are capable of solving problems to some extent, but they may not be able to fully optimize their work outcomes. This is in line with the research of Martalyna et al., (2018); Ulya & Hidayah (2016); and Purwanti & Mujiasih (2021) students who have moderate self-efficacy have the ability to understand problems but may have incomplete solutions or errors in the problem-solving process.

Students with a low level of self-efficacy in working on all the problems given were only able to fulfill the communication and mathematization indicators in two problems. The student has not been able to fulfill several indicators of mathematical literacy, including representing formulas appropriately in solving problems, having difficulty determining the right strategies and steps in solving problems, making mistakes in arithmetic operations and using mathematical symbols, and not being able to evaluate the solution process and provide appropriate reasons. This is in line with research conducted by Geraldine & Wijayanti (2022) students with low self-efficacy are only able to complete the formulation process and identify

the mathematical aspects of a problem. As research conducted by Ulya & Hidayah (2016) that such students can understand a problem, make an appropriate problem-solving plan but incompletely, struggle to carry out the plan, and are less precise in calculations. This is also supported by research from Martalyna et al., (2018) and Ghofur et al., (2022) which state that students with low self-efficacy cannot master all aspects optimally. Research from Rahayu (2019) explains that students with low self-efficacy tend to give up before trying, leading to careless work and incomplete and incoherent results.

## CONCLUSION

The elaboration of the results of the analysis of ethnomathematics-based mathematical literacy questions from the three research subjects showed that S1 students with high self-efficacy categories were capable to fulfill the six indicators of mathematical literacy in working on ethnomathematics-based questions. S2 students with moderate self-efficacy categories cannot fulfill several indicators in the three questions given, one of which is the use of operations and symbolic language, formal language, and technical language. S3 students with low self-efficacy categories have not been capable to fulfill some of the indicators of mathematical literacy such as indicators of representation and problem-solving strategies, use of operations and symbolic language, formal language, and technical language, as well as reasoning and giving reasons.

Reviewing the results of the analysis of student answers and the results of interviews with the three students S1, S2, and S3, it was concluded that the indicators of mathematical literacy that can be fulfilled by the three students in the three questions of mathematical literacy are indicators of communication and mathematization.

As for suggestions that can be given to students to increase self-efficacy, namely the need for students' efforts to familiarize themselves with continuing to practice solving problems through mathematical literacy questions, self-efficacy will naturally appear in students which can later help students to achieve the goals set. wanted. Teachers and schools are also responsible for providing facilities that can support students in increasing mathematical literacy and student self-efficacy.

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