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Analysis of Students' Critical Thinking Ability in Solving Mathematical Problems Assisted by Ethnomathematics Based on *Adversity Quotient*

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ABSTRACT

This study aims to examine critical thinking ability in mathematical problem-solving using ethnomathematics, based on the Adversity Quotient of class IX A MTsN 6 Kerinci Regency. Subjects were selected purposively, comprising 6 students. Data collection techniques included ARP questionnaires, ethnomathematics-assisted critical thinking ability tests, and interviews. The results showed that students' critical thinking ability in solving mathematical problems assisted by ethnomathematics varied across AQ categories. Students with high AQ (Climbers) met most critical thinking ability indicators. They demonstrated high critical thinking ability, while students with moderate AQ (Campers) showed varied fulfillment of indicators at a moderate level, and students with low AQ (Quitters) showed limitations in fulfilling these indicators. Thus, students with high and moderate AQ have superior critical thinking abilities compared to students with low AQ.

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1. INTRODUCTION

Critical thinking, in theory, is the ability to analyze information logically, evaluate arguments, and make rational decisions. One of the four main pillars of the 21st century is *critical thinking*. Mardatillah emphasizes that critical thinking is a structured skill essential for students' independence in creative problem-solving and data-based decision-making for career development [1]. UNESCO includes it among the four pillars (learning to know, learning to do, learning to be, and learning to live together), indicating that critical thinking is a fundamental component of global education [2]. The integration of critical thinking into the Merdeka Curriculum through a deep learning approach and Graduate Profile is a strategic

national step to shift the orientation of education from memorization to the construction of applicable knowledge [3].

Therefore, it is necessary to conduct a study on students' critical thinking ability, particularly in learning that emphasizes the development of ability, namely, learning mathematics. Mathematics is a subject that develops critical thinking skills, which are helpful during the learning process and for solving various mathematical problems. However, the student's ability to finish, especially routine questions, is still classified as low, as some students can only finish questions at a low difficulty level.

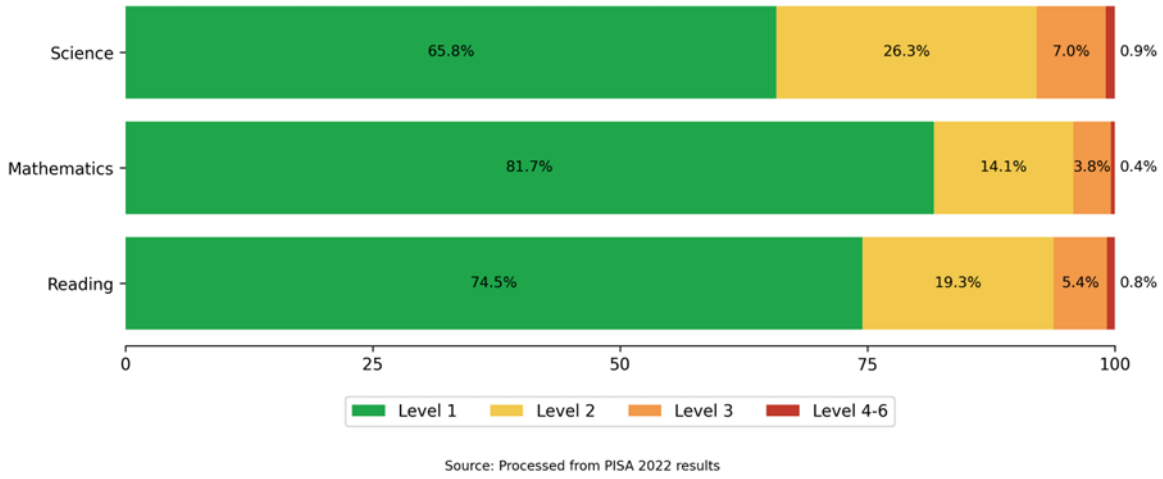

Figure 1. PISA Results 2022

The 2022 PISA results diagram shows that students are only capable of finishing questions at a low level that require memorization and calculation rather than analysis or reflection [4]. The 2022 PISA results also show that only around 14% of Indonesian students reach at least Level 2 in mathematics, 3.8% reach Level 3, and 0.4% reach Levels 4-6. This shows that students are only capable of understanding simple situations, so that lots of students do not have the critical thinking ability needed to handle complex questions that require modeling mathematics, election strategy, or solving the right problem. In learning mathematics, critical thinking helps students not only understand concepts but also apply them in relevant and testing contexts [5].

To train students' critical thinking skills in problem-solving, it is best to use context, as it is hoped that an appropriate context will provide students with new and diverse experiences [6]. Several studies on the use of context that integrates culture and region are interesting topics [7]. Supriyatno demonstrated that digital innovation effectively improves critical thinking skills, which served as the basis for this study to develop these competencies through other approaches, such as ethnomathematics [8].

Learning mathematics that utilizes the context culture known as ethnomathematics. This approach links mathematical concepts with local culture and daily life for students. Implementation of ethnomathematics make learning more contextual and meaningful, as well as capable of increasing cognitive involvement in the critical thinking process. The

presence of cultural elements in learning mathematics makes a significant contribution to understanding mathematics students [9].

Besides, ethnomathematics helps students understand draft mathematics more easily because the material is presented in familiar, everyday contexts [10]. This approach also provides students with an opportunity to connect draft mathematical concepts of an abstract nature with real-life situations, so that mathematics is not only understood as gathering formulas and theories, but also as a tool for solving practical problems in daily life [11]. Thus, implementing ethnomathematics is expected to enhance students' critical thinking in solving mathematical problems and increase active student involvement in learning.

Based on previous results, the study found that using traditional games like Gobak Sodor can help increase students' critical thinking indicators when solving mathematical problems [12]. Research also found that implementing ethnomathematics significantly increases students' understanding of mathematics contextually, as well as positively impacting their interests, communication skills, mathematical thinking, and critical thinking [13]. The study by Atmaja states that human logic is based on critical thinking, which plays an important role in the development and implementation of mathematics across various cultures [14].

The third study shows a strong correlation between critical thinking ability and the application of ethnomathematics in learning mathematics. Ethnomathematics can create an environment that can push students' mental activities in a more in-depth way. However, this method is highly dependent on students' conditions, including their cognitive abilities and personal characteristics.

Several previous studies have examined ethnomathematics as an approach to learning mathematics [11], [12], [13], [14], but few have specifically examined the relationship between ethnomathematics and Adversity Quotient in improving students' critical thinking skills.

Every student has a different way of thinking, especially when solving mathematical problems. *Adversity Quotient* (AQ), which measures an individual's resilience in the face of difficulties, is one of the factors that determines a student's ability to solve problems [15]. AQ divides individuals into three main types: *quitters, campers*, and *climbers.*

Previous studies show that the AQ category significantly influences students' problem-solving approaches in mathematics. Studies show that students with high AQ are more critical thinkers, able to identify problems, develop plans, and find the right solutions [16].

One potential addition to this research is the implementation of learning ethnomathematics, as this approach can increase the relevance of the material in mathematics for students. By linking mathematical concepts to well-known cultural and contextual contexts, students can more easily understand and apply their learning in everyday life. Ethnomathematics also encourages students to think critically, because they are invited to review and analyze problems in the contexts in which they experience them.

Thus, this study attempts to fill this gap by analyzing students' critical thinking skills in solving mathematical problems assisted by ethnomathematics, based on the adversity quotient of social arithmetic material for class IX.

2. METHOD

This type of research uses qualitative research. The data produced are from a qualitative study; this type is written or oral, describing the people observed and the behavior observed. Qualitative research was chosen because this research aims to gain a deeper understanding of how students with different AQ levels exhibit patterns of critical thinking when solving mathematical problems. This research uses a descriptive approach, which means examining the phenomenon as a whole and comparing it with other phenomena [17].

The data in this study were obtained from the results of written tests assisted by ethnomathematics, questionnaires, and interviews, which produced descriptive data in the form of words, phrases, and collections of sentences containing important information concerning identification, as well as Analysis of Students' Critical Thinking Abilities in Solving Mathematical Problems Assisted by Ethnomathematics Based on *Adversity Quotient* [18].

The subject selection technique used was the purposive sampling technique [18]. The subjects of this study were 14 students in grade IX A at MTsN 6, Kerinci Regency. This class was chosen based on the considerations of MTsN 6 teachers and because they have different levels of intelligence. Furthermore, class IX A has varying abilities and has studied social arithmetic.

The selected students for this research are 6 students from class IX A MTsN 6 Kerinci Regency, who are categorized into three adversity quotient categories: Camper, Quitter, and Climber. They were chosen based on Adversity Response Profile (ARP) results, and two students who shared became a group each to make it easier for researchers to investigate the subject further. Next, administer a test of critical thinking ability to classify them as having high, medium, or low ability. Then, interviews were conducted with the subjects for further analysis. In qualitative studies, there are several techniques for data analysis: data reduction, data display (data presentation), and drawing conclusions/verification (concluding). conclusion and verification) [18]. For the count results test, the following was used:

$$Score = \frac{the\ total\ point\ obtained\ across\ all\ indicators}{the\ maximum\ possible\ point\ across\ all\ indicators} \times 100\%$$

After accepting the exam results, the researcher assigned students to the high, medium, and low categories using subjective sampling. This was done using Table 1, which classifies critical thinking ability, and Table 2, which classifies the level of Adversity Quotient score [15].

Table 1. Calculation Category Ability Critical thinking

Criteria	Mark
Tall	$Score \geq \bar{x} + SD$
Currently	$\bar{x} - SD \leq Score < \bar{x} + SD$
Low	$Score < \bar{x} - SD$

Table 2. Categorization Student Adversity Quotient Type

No	Score	Category Student
1.	59 and under	*Quitter*
2.	60 - 94	Transition *Quitter* to *Camper*
3.	95 – 134	*Camper*
4.	135 – 165	Transition *Camper* to *Climber*
5.	166 - 200	*Climber*

3. RESULTS AND DISCUSSION

Among 14 students in class IX A that the researcher tested, 2 students had low AQ (Climber), 2 students had medium AQ (Camper - Climber), 7 students had medium AQ (Camper), 0 students had low AQ (Quitter-Camper), and 2 students had low AQ (Climber).

Table 3. Results Frequency Student Adversity Response Profile Levels Based on Category

No	Score	Category Student	Frequency
1.	59 and under	*Quitter*	3
2.	60 - 94	Transition *Quitter* to *Camper*	0
3.	95 – 134	*Camper*	7
4.	135 – 165	Transition *Camper* to *Climber*	2
5.	166 - 200	*Climber*	2

Results from Table 3 show that researchers investigate three types, each with two representatives: high AQ (Climber), medium AQ (Camper), and low AQ (Quitter). As a result, the total number of students to be studied in this research is 6.

Table 4. Subjects Study Based on Student Adversity Quotient Class IX A MTsN 6

No	Student Name		Score	AQ Category
1	SC Subject	ZRP (SC1)	180	Climbers (High)
		SNS (SC2)	174	
2	Subject SCa	MSJ (SCa1)	106	Campers (Medium)
		NS (SCa2)	112	
3	SQ Subject	H (SQ1)	50	Quitters (Low)
		ZSA(SQ2)	52	

Based on the results of the critical thinking ability test assisted by ethnomathematics for 3 AQ types with a total of 6 students, the following results were obtained.

3.1. Critical thinking skills in solving mathematical problems of *the* *Climbers type*

Focus

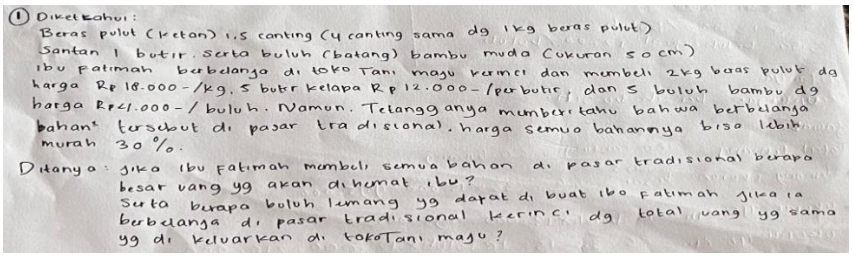

Figure 2. Sheet Answer SC1 Students Focus Indicator

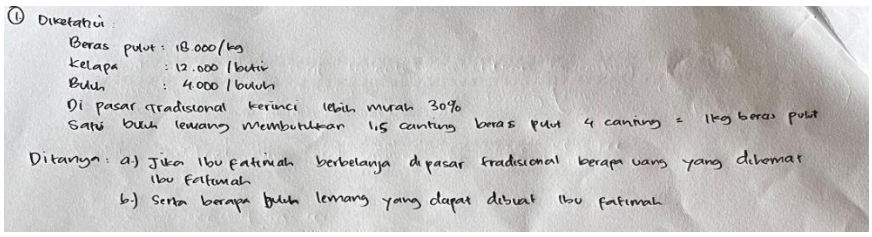

Figure 3. Sheet Answer SC2 Students Focus Indicator

Based on the answer written SC, it is visible that the second SC subject has written information obtained from the question. For example, they know the price of sticky rice at 18,000 rupiah per kilogram, coconut milk at 12,000 rupiah per grain, and bamboo at 4,000 rupiah per stick. From this explanation, it can be concluded that the second SC subject can differentiate the main problem from what is known and what is asked.

Reason

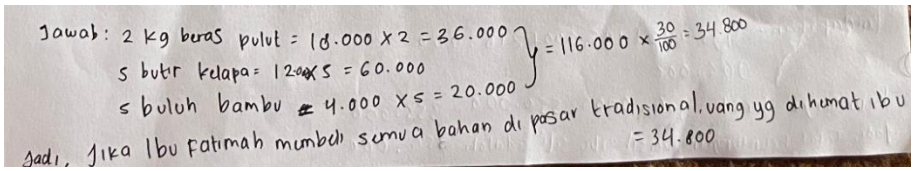

Figure 4. Sheet Answer SC1 Students Reason Indicator

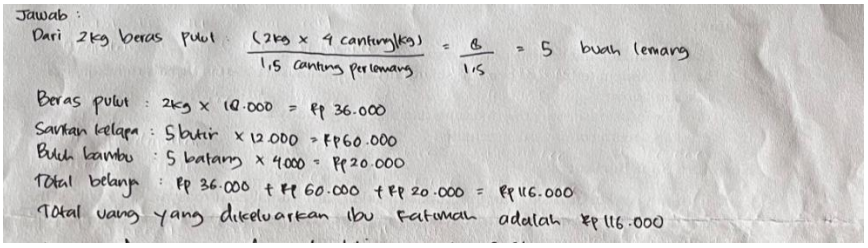

Figure 5. Sheet Answer SC2 Students Reason Indicator

Based on the results, the second SC subject can perform calculations in accordance with the settlement plan, as well as carry out the operation count correctly. SC subject determines total expenditure. Mother Fatima at the Farmer's Shop. Go ahead, then count percentage shopping if done in a traditional market. This finding shows that the second SC

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subject has understood the step-by-step approach to the beginning settlement problem, namely, formulating a settlement plan systematically.

Situation

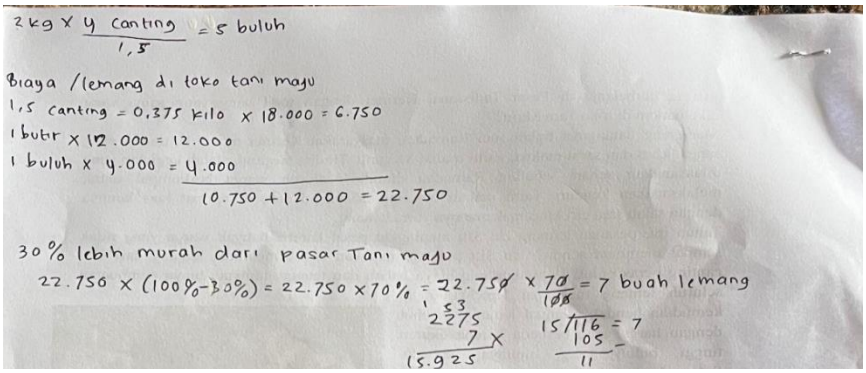

Figure 6. Sheet Answer SC1 Student Situation Indicator

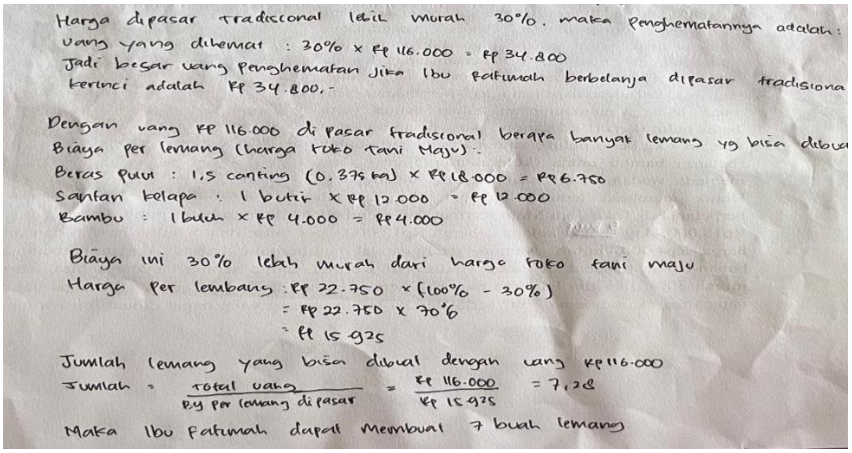

Figure 7. Sheet Answer SC2 Student Situation Indicator

Subject SC's answer, writing down all purchased materials, totaling them, and multiplying by 30% according to the information in the question, proves that SC can recognize the situation described in the question and explain it in the search.

Inference

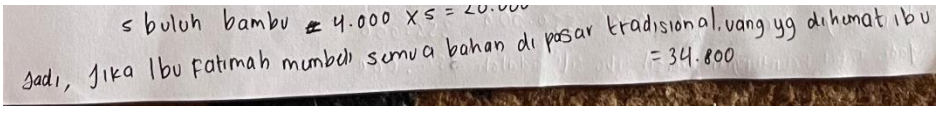

Figure 8. Sheet Answer SC1 Students Inference Indicator

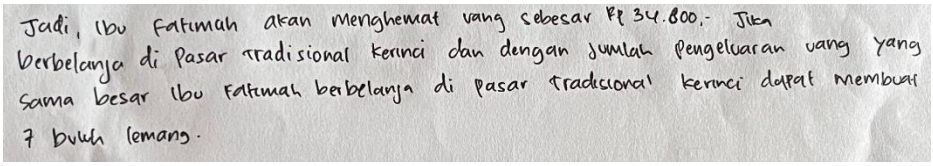

Figure 9. Sheet Answer SC2 Students Inference Indicator

From the answer of subject SC on question no. 1, it can be seen that both subjects can conclude the answers obtained. Two questions require conclusions. Subject SC1 wrote the

first conclusion: "So if Mrs. Fatimah buys all the ingredients at the traditional market, the money saved by the mother = 34,800." However, for the question of how many bamboos the mother can make with the same money, she did not conclude. During the interview, she said that she forgot to conclude.

Meanwhile, subject SC2 wrote the conclusion "so, the money that Mrs. Fatimah saved was Rp. 34,800," then, for the next question, he concluded the following: "so the total lemang that Mrs. Fatimah can make is 7 pieces of lemang." During the interview, subject SC2 confidently stated the conclusion he reached from his search.

Clarity

Based on the written results and interviews with the two SC subjects, both rechecked their search results. The SC subjects explained how they solved the problem. "First, I looked at what was known and asked about the problem, ma'am. From the first question, I looked for it by adding up all of Mrs. Fatimah's purchases multiplied by 30% if shopping at the Traditional Market, then obtained. Next, how many bamboos can be made by calculating the materials needed to make 1 bamboo and by shopping at the Traditional Market? I got the result, ma'am. Both of them more or less had the same idea because they had been taught this social arithmetic material.

Overview

Based on the interview results, both SC subjects demonstrated the ability to review their work before submitting the test. They ensured each step was completed correctly, that the answers obtained were appropriate, and that they could explain the process leading to their conclusions. Thus, both met the *overview indicator, which is ensuring the accuracy of answers and the ability* to conclude from the results.

3.2. Critical thinking skills in solving *Campers-type mathematical problems*

Focus

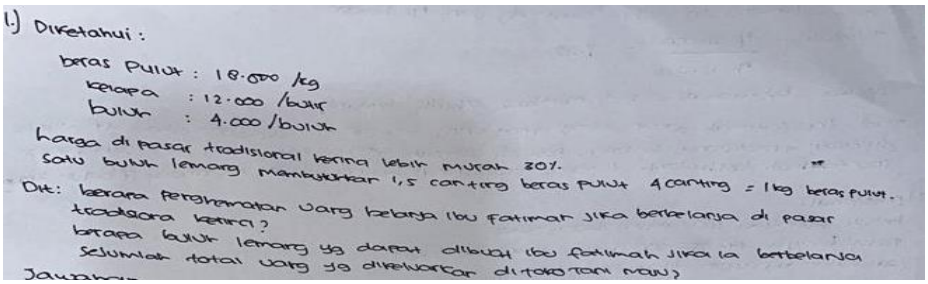

Figure 10Sheet Answer SCA1 Students Focus Indicator

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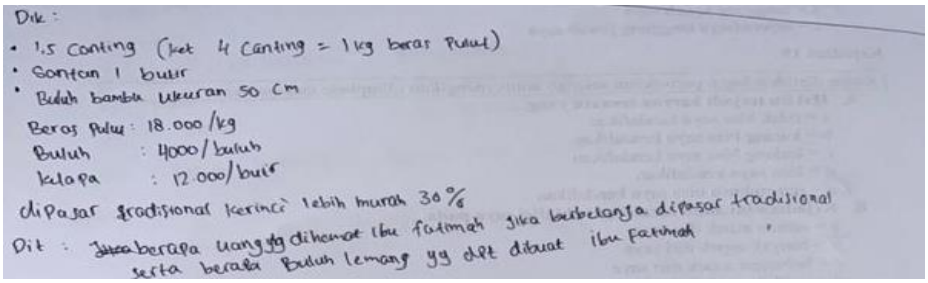

Figure 11. Sheet Answer SCA2 Students Focus Indicator

Both SCA subjects wrote the information known in the questions written using their own language. Both SCA subjects began presenting information with "the price of ingredients at the Tani Maju shop then continued to present information that prices at traditional markets are 30% cheaper, and the last information known is that one lemang bamboo requires 1.5 canting of glutinous rice and 4 canting = 1 kg of glutinous rice". Both SCA subjects have met the benchmark for building understanding by stating what is known and what is asked.

Reason

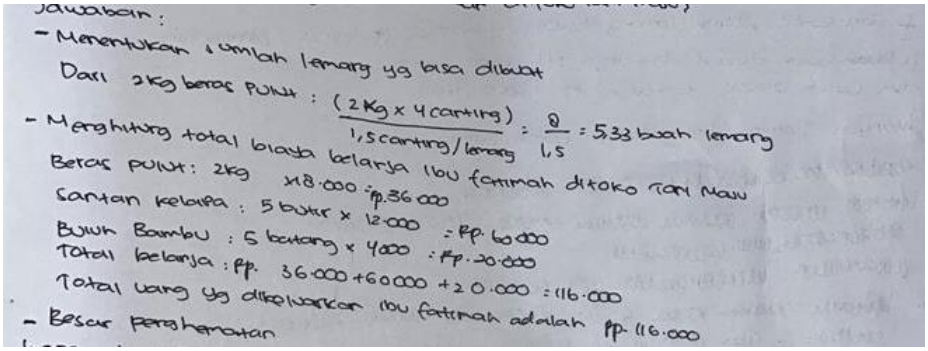

Figure 12Sheet Answer SCA1 Students Reason Indicator

Subject SCA1 wrote the reasons correctly in the look-for-answer section in your own language, as well as a complete start from determining the amount that can be made; next, he calculates the total cost of shopping with Mother Fatima at the Farmer's shop. Proceeding amounting to Rp.116,000. So, from the written answers, it appears that SCA1 has the fulfil indicator 'Reason'.

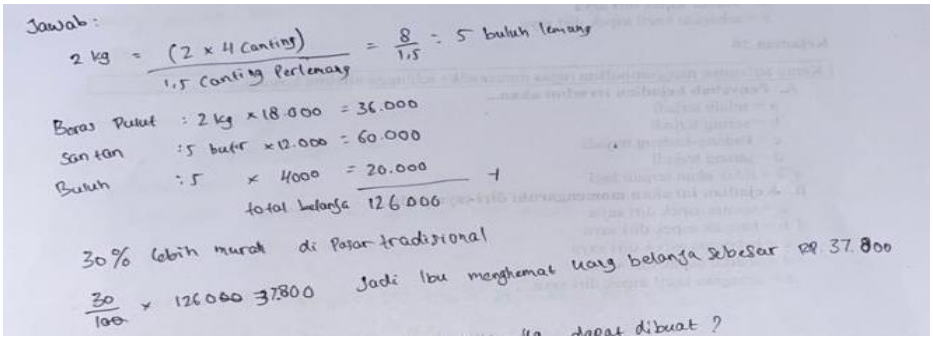

Figure 13. Sheet Answer SCA2 Students Reason Indicator

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Subject SCA2 starts looking for an answer based on strong reasons and evidence during the search, but when researchers correct the answer, it turns out to be wrong in the calculation of the amount spent by Mother Fatima, so SCA subjects write the wrong answer.

Situation

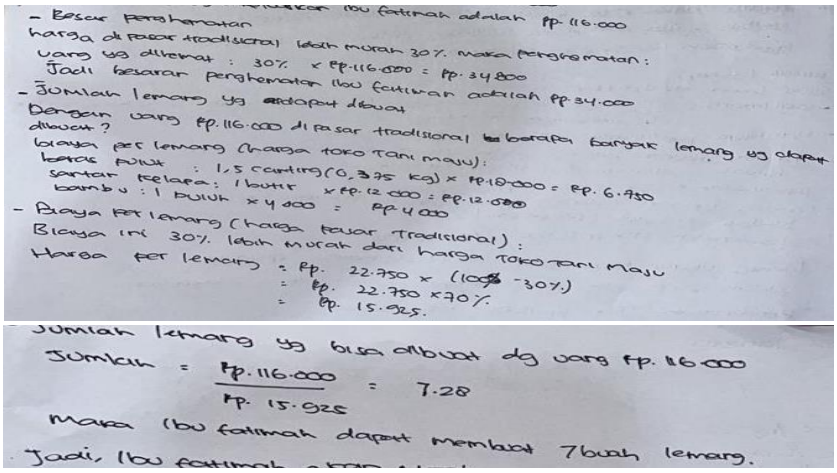

Figure 14. Sheet Answer SCA1 Student Situation Indicator

SCA1 wrote the answer in the problem's context to the end, and correctly answered that "*Mrs. Fatimah's savings if she shops at the Traditional Market is 34,000, and if she shops with the same money at the Advanced Farmers Market, she can make 7 lemang buluh*". From this answer, it can be seen that the SCA1 subject can wholly and correctly create a solution model.

SCA2 subjects do not answer the solution model, then he writes" *with" how much is 126,000 many canting that can be made?"*. Then he did not continue answer the based on results interview in a way, in short, the SCA2 subject admitted that "*I Confused ma'am, how do I find it? For can with the same money, how many lots of bamboo can be made, Mother Fatimah? "* From the results of the interview, it can be seen that SCA2 subjects cannot recognize the situation that occurs, so that when answering questions, they cannot answer questions according to the context of the existing problem.

Inference

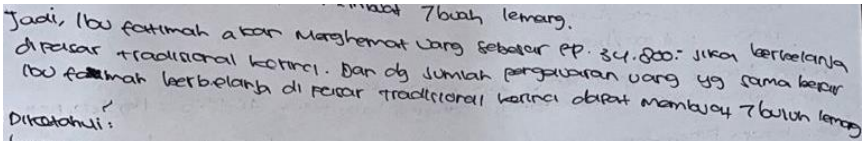

Figure 15. Sheet Answer SCA1 Students Inference Indicators

Subject SCA1 wrote a conclusion after completing the answer to the problem in the question as follows: " *So Mrs. Fatimah will save Rp. 34,800.- if shopping at Kerinci Traditional Market. And with the same amount of money spent, Mrs. Fatimah shopping at Kerinci Traditional Market can make 7 lemang buluh"* so that the Inference indicator of subject SCA1 has been fulfilled well.

Whereas on SCA2 subject he does not write conclusion from the search he did because he does not remember how to search process For determine amount bamboo lemang that can made Mother Fatima If shop with a number of the same money so that based on results interview Herewith I *do not know how to find it For number 1 is this ma'am so on moment determine bamboo I I am stuck, ma'am, so I No Can conclude question the "*

Clarity

Results of SCA1 interview: he was able to explain that they have ensured the search method is already correct. Steps include: writing known and asked information, determining the amount of lemang that can be made, calculating the total cost of shopping with Mother Fatimah at the Farmer's shop, going ahead, counting size savings if shop in Market Traditional, until finally comparing the amount of lemang that can be made with the same money if shop at the advanced farmer shop.

Whereas for the SCA2 subject in the interview process, he was only capable of explaining what is known, asked and searched for an answer for total purchases Mother Fatimah and how much savings Mother Fatimah has if shop in Market Traditional, but for the settlement problem, he did not write the answer because he did not know how to solve problems that exist in question.

Overview

Based on the interview results, SCA1 subjects were able to account for their answers. Through repeated checks, SCA1 subjects ensured that each step was correct and that the answers obtained were accurate. Therefore, the subjects met the *overview indicator* because they were able to re-examine the solution process to reach an appropriate conclusion.

Subject SCA2 did not recheck during the interview because he did not have time and did not know how to complete it, so he only collected what he could.

3.3.Critical thinking skills in solving mathematical problems of the Quitters type

Focus

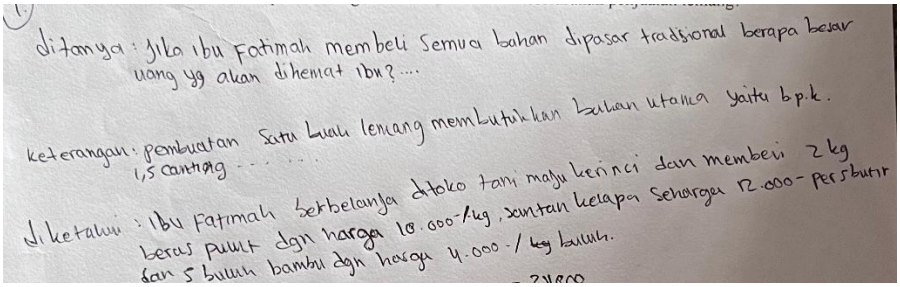

Figure 16. Sheet Answer Student SQ1 Focus Indicator

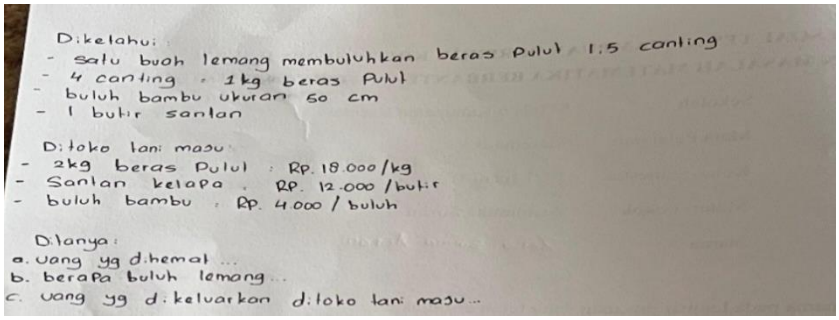

Figure 17. Sheet Answer SQ2 Student Focus Indicator

Both SQ subjects were able to express what they knew in response to the questions and what was asked in their own words. Both subjects wrote down the information they found in the questions and then planned how to solve the problems, along with the students' written answers.

Reason

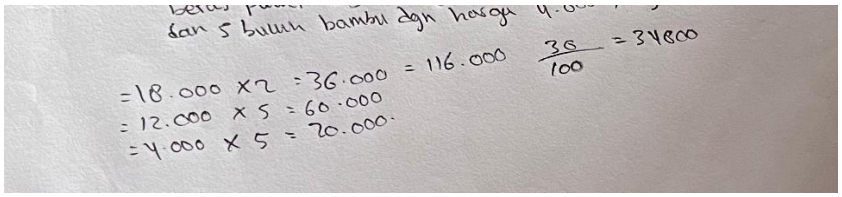

Figure 18. Sheet Answer Student SQ1 Reason Indicator

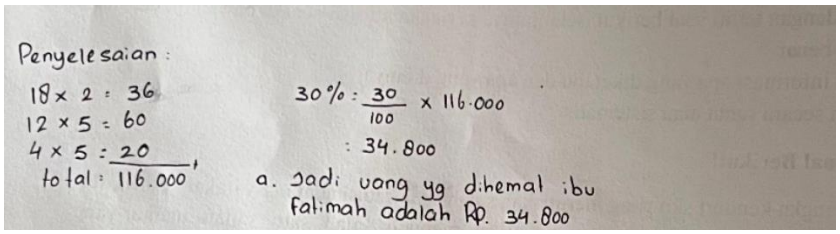

Figure 19. Sheet Answer Student SQ2 Reason Indicator

Subject SQ1 can be seen to have started a step search for multiple amounts of purchased materials by Mother Fatima to make lemang. Then add them up to obtain the total expenditure. Mother at the Farmer's shop proceeds. However, in the answer written by subject SQ1, no dozens of thousands are included. However, as explained, SQ1 and SQ2 are different, and what was done and the reasons given are already clear, with steps and settlement that trace the reasons presented at the time the interview was conducted. This has also been done appropriately, so that the second subject has fulfilled the indicator *reason.*

Situation

The written results from subject SQ1 did not indicate that they understood the process used to solve the following problem, so they only reported the amount of savings Mrs. Fatimah made when shopping at the traditional market. From the explanation, it was clear that subject SQ1 did not fulfill the *Situation indicator.*

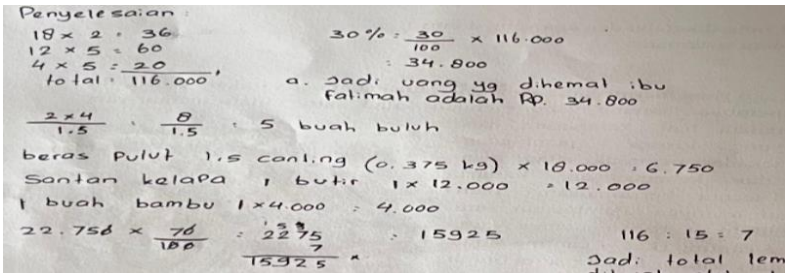

Figure 20. Sheet Answer Student SQ2 Situation Indicator

Based on the answer of SQ2, it is in accordance with the context of the problem in question, namely by stating how much it costs to make 1 lemang bamboo, then from the results of the cost of making 1 lemang bamboo, how many lemang bamboos can be made from the same total money spent by Mrs. Fatimah at the Tani Maju shop of Rp. 116,000 so that both subjects get the answer, namely as many as 7 lemang bamboos that Mrs. Fatimah can make if she shops at the Traditional Market. So that the subject of SQ2 fulfills the *situation indicator.*

Inference

Based on the answer written by SQ1 in the sheet, the answers he collected for subject No continue the search process. This indicates that SQ1 was unable to identify the key factors to be considered in solving the problem. This inability stemmed from a lack of understanding of the problem's purpose, so the subject did not know what the next steps were.

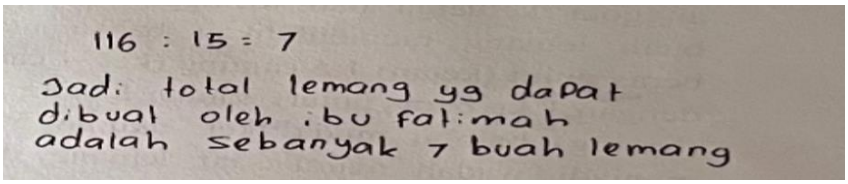

Figure 21. Sheet Answer Student SQ2 Inference Indicator

The second answer of subject SQ2 shows that SQ2 can conclude the answer that has been obtained. Subject SQ2 wrote the conclusion that is *"So, the total lemang that Mrs. Fatimah can make is 7 pieces of lemang"*. Subject SQ2 only wrote the number of lemang the mother can make; she did not include at the end how much money the mother would save by shopping at the Traditional Market. When interviewed, subject SQ2 said, " *I have written the conclusion first so that the question asking the amount of savings Mrs. Fatimah stated as question number a, so she made 2 conclusions for 2 sub-questions."*

Clarity

The interview results show that subject SQ1 does not understand the meaning of 'matter'. As a result, he cannot explain the content question or the plan-step settlement using the information he has. As a result, SQ1 cannot finish problems and does not know the conclusion that must be achieved. Consequently, subject SQ1 does not fulfil the clarity indicator.

Overview

Based on research and interviews conducted by the researchers, the two SQ subjects did not recheck the answers they had written. During the implementation test, both tend to direct stop workmanship without review, repeat the step, settle, and the results end.

Condition the show that the second SQ subject does not evaluate the process and results of the settlement that has been done. Thus, neither of them fulfils the indicator overview, namely the ability to review the return answer until getting the right conclusion.

Table 5 shows the results of the data analysis conducted for six subjects in the study on the indicator of critical thinking ability.

Table 4Results Capability Data Analysis Think Critical Student Reviewed from Adversity Quotient (AQ)

Student Name	Number question	Focus	Reason	Inference	Situation	Clarity	Overview
SC1	1	4	4	3	4	4	4
	2	4	4	4	4	4	4
SC2	1	3	4	4	4	4	4
	2	4	4	4	4	4	4
SCA1	1	4	4	4	4	4	4
	2	4	4	0	0	0	0
SCA2	1	4	0	0	0	0	0
	2	4	4	4	4	4	4
SQ1	1	3	3	0	0	0	0
	2	0	0	0	0	0	0
SQ2	1	4	2	2	2	0	0
	2	2	0	0	0	0	0

Results show that each of the six subjects produced different outcomes, both in the written test and the interview. Next, we calculated the types of AQ according to the categories defined by Arikunto [19], as shown in Table 6.

Table 5. Results Category *critical thinking ability* Based on Adversity Quotient

Category	Value criteria	Range of values	Types of students who fall into this category
Tall	$score \geq 92{,}39$	$92{,}39 - 100$	SC1(Climbers), SC2(Climbers)
Currently	$27{,}05 \leq score < 92{,}39$	$27{,}05 - 92{,}39$	SCA1(Campers), SCA2(Campers)
Low	$score < 27{,}05$	$< 27{,}05$	SQ1(Quitters), SQ2(Quitters)

Based on the written answers of the subjects with the Climbers type (hereinafter, subjects SC1 and SC2), both fulfill the 6 indicators of problem-solving ability and are included in the category of students with high-level critical thinking skills. This is in accordance with research by Usman [20], which found that students in the climbers category have very good problem-solving abilities, as indicated by the adversity quotient. In line with research by Astiantari [21], it states that the Climbers type can make plans appropriately,

carry them out in sequence, and solve problems on time. Moreover, the subjects also recheck the answers they have worked on.

Critical thinking ability of campers: type students. The two subjects with moderate AQ had different answers. Subject SCA1 on question number 1 fulfilled all indicators of critical thinking ability, and subject SCA1 solved the problems in the question correctly and sequentially. So, students with the Campers type in solving critical thinking questions are included in the moderate critical thinking category [22]. Subject SCA2 explained what information was known from the question, then gave an answer for the *Reason indicator* but from the results of the answer he was wrong, the results of the interview said that he did not know that the results he did were wrong, for the next stage he was confused when looking for answers so he only answered what he remembered from what had been learned. This explanation is supported by previous research conducted by Labiodonta [23], which found that camper-type students did not carry out their plans effectively; the subject only wrote down the method used, without including the steps for solving the problem.

The critical thinking ability of quitter-type students. The Quitter type is considered to be in the low AQ category. Based on the presentation of the written test results that have been carried out, Subject SQ1 only fulfills the indicators of critical thinking skills, Focus *and* Reason, but in *the situation, inference, clarity, and overview* indicators, the subject does not carry out the following 4 stages, so he only does what is there. This is also based on previous research showing that quitter-type subjects rewrite what is known and what is asked in the correct questions, even though some "quitters" are wrong, they write what is known and what is asked in the questions [24]. Furthermore, subject SQ2 completed all stages correctly, but in the overview indicator from the interview results, it was found that he did not recheck the answers he had provided; he said what I had done was correct, so he did not recheck the steps he had taken. As explained above, this is consistent with research by Juwita [25]. In answering test questions, students with high and medium AQ have superior critical thinking skills compared to students with low AQ. Students' critical thinking skills in solving HOTS questions, as indicated by low logical-mathematical intelligence, suggest that they can fulfill one indicator of critical thinking [26].

4. CONCLUSION

The study shows that students demonstrate critical thinking skills in solving problem-related mathematics using ethnomathematics. Ability to recognize the main information (focus), using Language Alone to disclose the meaning of the question (clarification), convey a logical solution for every step (reason), draw an interesting conclusion in the right way (inference), understand the context of the problem (situation), and review and accept returned answers. Because the problem concerns students' experience and environment, these indicators suggest that an ethnomathematics approach can help students understand more effectively.

Students who show high adversity quotient (AQ) levels tend to have a consistent ability to demonstrate most critical thinking metrics. Students with moderate AQ can show a number of indicators of critical thinking, but look doubtful and inconsistent in linking information contained in about; they are also more systematic in plan completion, trust

themselves in making decisions, and can explain the reasons and steps taken. Students with low AQ experience difficulty in understanding meaning problems and do not compile proper steps for assessment. However, all students in the group can show a level of understanding beginning when the question is associated with a familiar cultural context.

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