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EXPLORING STUDENTS' THINKING PROCESSES IN MATHEMATICAL PROBLEM SOLVINGBASED ON THE DEWEY MODEL AT MINHAJUT THULLAB QUR'AN SCIENCE JUNIOR HIGH SCHOOL

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Abstract

ResearchThis research was motivated by the low ability of students in solvingmathematical problems that require reflective thinking. This study aims toexplore the stages and strategies of students' thinking in solvingmathematical problems at SMP Sains Qur'an Minhajut Thullab, East Lampung. The researchused an exploratory descriptive qualitative approach with sixeighth-grade students as subjects selected purposively. Data were collectedthrough tests, interviews, and observations, then analysed using theMiles and Huberman model and validated by triangulation of sources and methods. The resultsof the study show that the students' thinking processes reflect the stages ofproblem solving according to Dewey's model, with variations in the consistency ofits application. Students with high abilities are able to follow almost allstages of reflective thinking systematically, while students with moderate abilitiesonly reach the stages of reasoning and verification of results, and studentswith low abilities tend to stop at the stage of drawing conclusions withoutdeep reflection. This variation shows that the level of reflective thinking ability affects the completeness of the stages of mathematical problem solving,so that strengthening metacognitive aspects and reflective thinking exercises are necessaryto improve the effectiveness of mathematics learning.

Keywords: reflective thinking, mathematical problem solving, John Dewey model

Abstrak

Penelitian ini dilatarbelakangi oleh rendahnya kemampuan siswa dalam pemecahan masalah matematis yang menuntut berpikir reflektif. Penelitian ini bertujuan mengeksplorasi tahapan dan strategi berpikir siswa dalam menyelesaikan masalah matematika di SMP Sains Qur’an Minhajut Thullab, Lampung Timur. Penelitian menggunakan pendekatan kualitatif deskriptif eksploratif dengan enam siswa kelas VIII sebagai subjek yang dipilih secara purposive. Data dikumpulkan melalui tes, wawancara, dan observasi, kemudian dianalisis menggunakan model Miles dan Huberman serta divalidasi dengan triangulasi sumber dan metode. Hasil penelitian menunjukkan bahwa proses berpikir siswa telah mencerminkan tahapan pemecahan masalah menurut model Dewey dengan variasi dalam konsistensi penerapannya. Siswa dengan kemampuan tinggi mampu mengikuti hampir seluruh tahap berpikir reflektif secara sistematis, sementara siswa dengan kemampuan sedang hanya mencapai tahap penalaran dan verifikasi hasil, dan siswa berkemampuan rendah cenderung berhenti pada tahap penarikan kesimpulan tanpa refleksi mendalam. Variasi ini menunjukkan bahwa tingkat kemampuan berpikir reflektif berpengaruh terhadap kelengkapan tahapan pemecahan masalah matematis, sehingga penguatan aspek metakognitif dan latihan berpikir reflektif diperlukan untuk meningkatkan efektivitas pembelajaran matematika.

Kata kunci: berpikir reflektif, pemecahan masalah matematis, model John Dewey

INTRODUCTION

Mathematics plays a crucial role in developing students’ logical, critical, and systematic thinking skills, which are fundamental for understanding and responding to various real-life situations (Komariyah & Laili, 2018). In mathematics learning, students are expected not only to master concepts and procedures, but also to apply these concepts

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flexibly, creatively, and reflectively when solving problems. Mathematical problem-solving skills therefore occupy a central position in the Merdeka Curriculum, as they contribute directly to the development of critical and independent thinking that characterises the Pancasila learner profile (Setiowati et al., 2024). Through problem-solving activities, students are trained to reason logically, make decisions based on evidence, and take responsibility for the solutions they produce.

However, in practice, many junior secondary school (SMP) students still experience significant difficulties in solving non-routine mathematical problems. Students often rely heavily on memorising formulas and applying procedures mechanically, without fully understanding the meaning and structure of the problems presented (Aisyah et al., 2023). This condition indicates that students' thinking processes have not developed optimally, as they tend to focus on obtaining answers rather than understanding and reflecting on the problem-solving process itself. As a result, reflective activities such as analysing information, interpreting relationships, and evaluating the suitability of solution strategies are rarely carried out (Trisnani, 2020). Consequently, higher-order thinking skills, which constitute the core objective of mathematics learning, have not been achieved effectively.

Reflective thinking is therefore essential in addressing these challenges. John Dewey conceptualises reflective thinking as an active, systematic, and continuous process of examining problems based on logical reasoning and supporting evidence. According to Dewey, problem solving involves five interrelated stages: perceiving the difficulty, defining the problem, proposing hypotheses, reasoning the possible consequences, and testing solutions through action (Zubaidah & UM, 2017). This framework highlights that effective problem solving is not a spontaneous or intuitive activity, but a structured process that requires careful consideration and reflection at each stage, making it highly relevant to mathematics learning.

Dewey's model enables teachers to examine students' thinking processes comprehensively, rather than focusing solely on the correctness of final answers (Tanjung, 2018). Through this approach, students are encouraged to think critically, explore alternative strategies, justify their reasoning, and reflect on the validity of the solutions they obtain (Siswanto et al., 2024). Therefore, Dewey's reflective problem-solving model provides a strong theoretical foundation for analysing how students construct understanding and make decisions when solving mathematical problems.

Minhajut Thullab Qur'an Science Junior High School integrates scientific learning with Qur'anic values, aiming to foster students' critical, scientific, and ethical thinking simultaneously. An educational approach that combines scientific reasoning with Islamic values is expected to shape rational and reflective thinking that remains grounded in moral principles and spiritual awareness (Sugiman et al., 2025). Nevertheless, initial observations indicate that some students still struggle to understand word problems, identify relevant information, and reflect on the solutions they produce, particularly at the early stages of problem solving.

Based on this background, this study aims to explore students' thinking processes in solving mathematical problems using Dewey's reflective thinking model. The study focuses on identifying the stages of students' problem solving, analysing the strategies they employ, and examining the alignment of their thinking processes with Dewey's theoretical framework ((Rahaju, 2024). The findings are expected to contribute to the improvement of reflective-based mathematics learning, particularly in science-oriented schools that integrate Islamic values, by providing insights into how students think and how instruction can better support the development of reflective problem-solving skills.

METHODS

This study uses an exploratory descriptive qualitative approach that aims to deeply understand the thinking process of students in solving mathematical problems based on Dewey's model (Sulistiyo & others, 2023). This approach was chosen because the study does not focus on testing hypotheses but rather on describing and deeply understanding the stages of reflective thinking that students go through. Through a qualitative approach, researchers can obtain natural, contextual, and holistic data through direct interaction with the research subjects. The main data in this study were observations, interviews, and documents that reflected how students thought, acted, and reflected on the process of solving mathematical problems.

The research was conducted at SMP Sains Qur'an Minhajut Thullab, a science and Qur'an-based educational institution located in East Lampung Regency, Lampung Province.

This location was chosen based on the school's characteristic of emphasising a balance between logical, scientific, and spiritual thinking, in line with the principles of reflective thinking proposed by John Dewey. The research activities were carried out during the even semester of the 2024/2025 academic year, covering the initial observation stage, field data collection, and analysis of research results.

The research subjects consisted of six Year 8 students selected through purposive sampling based on the recommendations of the mathematics teacher and the results of preliminary observations of problem-solving abilities. The six students represented three ability categories, namely high, medium, and low, in order to obtain a comprehensive picture of the variety of thinking processes. In addition to the students, the mathematics teacher was also involved as a supporting informant to provide additional data on student characteristics and the context of mathematics learning at school.

Table 1. Research Participation

Code	Status
R1	Year 8 pupils
R2	Year 8 pupils
R3	Year 8 pupils
R4	Year 8 pupils
R5	Year 8 pupils
R6	Year 8 pupils

Research data was collected through three main techniques, namely mathematical problem-solving tests, in-depth interviews, and direct observation. Problem-solving tests were used to elicit students' thinking processes through non-routine questions designed based on Polya's problem-solving ability indicators and analysed through Dewey's stages of thinking. Semi-structured interviews were conducted with students and teachers to explore in greater depth the stages of thinking that students went through, from recognising the problem to finding a solution. Meanwhile, observation was used to observe students' behaviour, expressions of thought, and strategies during the problem-solving process. Documentation in the form of field notes, photographs, and video recordings was also used to reinforce the research findings (Ahmad et al., 2018).

Data validity was ensured through source and method triangulation techniques. Source triangulation was carried out by comparing information obtained from students, teachers, and observation results, while method triangulation was carried out by combining test results, interviews, and observations. In addition, the researchers conducted member checks by requesting confirmation from the research subjects to ensure the accuracy of the data and interpretation of the findings.

Data analysis was conducted interactively and continuously with reference to the Miles and Huberman model, which consists of three stages, namely data reduction, data presentation, and conclusion drawing (Qomaruddin & Sa'diyah, 2024). In the data reduction stage, information obtained from interviews, observations, and tests was classified and focused on important aspects in accordance with Dewey's stages of thinking: recognising difficulties, formulating problems, proposing hypotheses, reasoning about consequences, and testing solutions. Next, the data is presented in the form of descriptive narratives, tables, and diagrams of students' thinking processes to facilitate the identification of patterns and relationships between stages of reflective thinking. The final stage is drawing conclusions and verification, which is carried out repeatedly to ensure the consistency and validity of the research findings.

RESULTS AND DISCUSSION

1. Presentation of Mathematical Problem Solving Test Results

Mathematical problem-solving tests were given to six eighth-grade students at SMP Sains Qur'an Minhajut Thullab to explore their thinking stages based on John Dewey's model. The questions used were non-routine and required students to demonstrate reflective thinking processes, starting from understanding the problem, formulating hypotheses, collecting data, reasoning about consequences, to drawing conclusions. The results of this test were used as a basis for determining the categories of students' thinking abilities, namely high, medium, and low.

In general, the test results showed variations in the students' reflective thinking abilities in solving mathematical problems. Students with high abilities were able to follow Dewey's stages of thinking completely and systematically, while students with moderate abilities showed a good understanding of the problem but were not consistent in evaluating the results. Students with low abilities still experienced difficulties in the early stages of problem solving, especially in understanding the context of the question and formulating logical hypotheses.

The following table presents the results of mathematical problem-solving tests along with the classification of students' ability levels based on indicators from Dewey's model.

Table 2. Mathematical Problem Solving Test Results

Student Code	Ability Category	Mastered Dewey Stages	Strengths	Main Challenges
R1	High	Understanding the problem, determining strategies, evaluating results	Systematic and reflective problem-solving steps	Inconsistent in formulating hypotheses
R2	High	Understanding the problem, formulating strategies, reasoning consequences	Careful and logical in calculations	Lacks reflection on final results
R3	Moderate	Identifying relevant data, reasoning consequences	Able to select important information	Lacks reflection on mistakes
R4	Moderate	Testing hypotheses, reasoning consequences	Able to verify results	Difficulty determining initial strategy
R5	Low	Drawing conclusions without reflective process	Accurate in evaluating results	Lacks confidence in formulating hypotheses
R6	Low	Incomplete strategy planning	Able to connect basic concepts	Difficulty maintaining consistency in thinking

Based on these results, students in the high ability category (R1 and R2) demonstrated good reflective thinking skills. They were able to understand problems in depth, determine appropriate strategies, and verify the final results. Their thinking patterns were in line with Dewey's five stages of reflection, although they still needed to be strengthened in formulating hypotheses and reflecting on the final results.

Students in the medium ability category (R3 and R4) were able to follow some of the stages of Dewey's model, particularly in understanding problems, identifying data, and reasoning the consequences of the chosen strategy. However, they did not yet fully demonstrate reflective abilities in evaluating the process of completion and the final results.

Meanwhile, students with low ability categories (R5 and R6) still focus on the final result without going through a complete reflective thinking process. They tend to have difficulty in determining initial assumptions and planning systematic strategies, so they often skip the stage of reasoning consequences or testing assumptions.

These findings show that students' reflective thinking abilities are on a diverse spectrum. Students with high abilities have demonstrated systematic thinking processes in accordance with Dewey's model, while students with moderate and low abilities still need guidance in the stages of hypothesis formulation and evaluation of results. Therefore, learning strategies are needed that can stimulate students to more actively reflect on their thinking steps, such as the use of non-routine questions, reflective discussions, and continuous metacognitive guidance.

2. Presentation of Interview Results on Students' Thinking Processes in Mathematical Problem Solving

a. Identification of the Stages of Students' Thinking Processes in Mathematical Problem Solving

The thinking process of students in solving mathematical problems reflects how they understand, interpret, and construct solutions to a problem systematically. According to John Dewey, problem solving is a reflective thinking activity consisting of five stages, namely recognising the problem, formulating hypotheses, collecting data, testing hypotheses, and drawing conclusions. Each stage requires students to use analytical and reflective skills in connecting mathematical concepts with the context of the given problem. Understanding these stages of thinking is important in order to determine the extent to which students are able to think critically and logically in finding mathematical solutions independently.

Research conducted by (Ningrum et al., 2024) shows that students' reflective thinking skills have a significant effect on the effectiveness of mathematical problem-solving processes, especially in the problem recognition and analysis stages. In line with this, a study by (A. R. Siregar et al., 2024) found that students who are able to identify problems well tend to demonstrate accuracy in strategy and consistency in solving them. Based on these findings, this study seeks to identify the stages of thinking of students at SMP Sains Qur'an Minhajut Thullab in solving mathematical problems based on John Dewey's problem-solving model, in order to describe in depth how students construct solutions in accordance with the stages of reflective thinking.

Results of the interview with R1: How do you understand and identify the problems in the maths questions given?

> “…When reading maths questions, I try to understand the meaning of each sentence first. I read them repeatedly so that I know what is actually being asked. I usually mark the important parts, such as numbers, units, or keywords that indicate mathematical operations. After that, I try to imagine the problem in real terms so that it is easier to understand before starting to look for a solution…”

Results of the interview with R2: Once you understand the content of the question, what is the first step that comes to mind to begin solving it?

> “…After understanding the question, the first step I think about is finding the formula or concept that corresponds to the type of question. I try to connect the question with the material that has been studied in class. Usually, I write down what I know and what is being asked first, then I begin to organise the steps to solve it gradually so that I don't go in the wrong direction in calculating or making decisions…”

Interviews with R1 and R2 indicate that both students show systematic thinking in solving mathematical problems. R1 focuses on identifying keywords, numbers, and context, while R2 emphasizes selecting formulas and organizing solution steps logically. These findings align with (Najib et al., 2023), which highlight that students with strong problem-solving skills begin with understanding the problem and planning the solution through activities like rereading questions, marking key information, and linking concepts. Thus, both respondents exhibit thinking patterns consistent with John Dewey’s theory and prior empirical studies.

Interview results with R3: How do you determine which data, information, or figures you consider relevant and important to use in the problem-solving process?

> "…I determine important data or information by reading the question more than once, then marking numbers or keywords that are directly related to the question. After that, I separate the data needed for calculations from the additional data. I usually rewrite important data on a worksheet so that it is easier to use when compiling the steps to solve the problem…"

Results of the interview with R4. What do you do to ensure that the steps or procedures you use are correct and in line with the mathematical concepts you have learned?

> "…I usually double-check every step I have taken and compare it with the examples or formulas explained by the teacher. If the result seems odd, I try again from the beginning or use another method to ensure that the answer is the same. Sometimes I also discuss with my friends to compare our solutions, so that I know whether my steps are correct and in line with the mathematical concepts we have learned…"

Interviews with R3 and R4 show that both students demonstrate critical and reflective thinking in solving mathematical problems. R3 focuses on identifying relevant data, while R4 emphasizes verifying solution steps for conceptual consistency. These findings align with (Suryaningsih, 2019), which states that effective problem solvers select relevant information and evaluate solution procedures through reflection and discussion. Thus, R3 and R4's responses confirm that success in mathematical problem solving relies not only on computation but also on reflective and evaluative thinking throughout the process.

Interview results with R5: How do you draw conclusions from the results of solving problems and assess the accuracy of the answers you obtain?

> "…I draw conclusions by writing down the final results of my calculations, then I check again whether the answers answer the questions in the problem. After that, I double-check the steps to ensure there are no calculation errors or incorrect use of formulas. If the final results are logical and consistent with the data in the problem, I am confident that my answers are accurate…"

Interview results with R6: In your opinion, which part of the mathematical problem-solving process is the most challenging or difficult to do?

"…In my opinion, the most difficult part is determining the right steps or strategy to solve the problem. Sometimes I understand the question, but I am confused about where to start or what formula to use. In addition, maintaining concentration so as not to make mistakes in my calculations is also quite challenging, especially if the question is long and there is a lot of data to analyse…"

Interviews with R5 and R6 show that both students demonstrate reflective abilities in concluding and awareness of cognitive challenges during problem solving. R5 re-examines results for accuracy, while R6 highlights difficulties in selecting strategies and maintaining focus. These findings align with (Agusta, 2020), which notes that challenges in planning strategies and evaluating results require higher-order thinking and reflection. Thus, R5 and R6's responses confirm that metacognitive skills in evaluation and strategy management are key to successful mathematical problem solving.

b. Analysis of Problem-Solving Strategies Used by Students

Problem-solving strategies are planned steps that students use to find solutions to mathematical problems. The choice of strategy reflects the student's way of thinking, learning experiences, and level of conceptual understanding. In the context of mathematics learning, students can use various strategies such as drawing, guessing and checking, making tables, using patterns, or applying relevant formulas. Through strategy analysis, researchers can identify how students interpret problems, select procedures that are considered effective, and adjust their solution steps when encountering difficulties.

The results of research conducted by (Susanto, 2024) confirm that success in solving mathematical problems is not only determined by conceptual knowledge, but also by students' ability to choose appropriate and flexible strategies and use them effectively. Meanwhile, a study by (Liani et al., 2025) shows that students with high metacognitive abilities tend to be better able to adjust their strategies to the complexity of the problems they face. Based on these findings, this study seeks to analyse the various strategies used by students at SMP Sains Qur'an Minhajut Thullab in solving mathematical problems, to understand their thinking patterns and the effectiveness of the approaches they apply at each stage of the solution.

Results of the interview with R1: When you work on this problem, what strategy or method do you use to find the answer?

> "…When working on problems, I usually use a strategy of first writing down the known data and what is being asked. After that, I choose the formula or method that best suits the type of problem. I also try to make the steps to solve the problem in sequence so that I don't get confused halfway through. If the first method doesn't work, I try another approach until the result makes sense…"

Interview results with R2: Do you plan your solution steps before you start calculating, or do you just try to solve it while thinking?

> "…I usually plan the steps first before I start calculating, so that I have a clearer direction. I write down what needs to be done first, such as finding unknown values or determining the formula to use. But sometimes, if I already understand the pattern, I try to calculate while thinking, then correct the steps if I feel something is not quite right…"

Interviews with R1 and R2 show that both students apply strategic and systematic thinking in solving mathematical problems. R1 develops sequential plans and evaluates alternatives, while R2 focuses on planning solution steps before calculating. These findings align with (Rahmawati & Afriansyah, 2023), which state that effective problem solvers plan strategies, identify key information, and predict outcomes before computing. Thus, R1 and R2's responses confirm that planning and selecting appropriate strategies are key indicators of systematic thinking in mathematical problem solving.

Results of the interview with R3: During the process of solving problems, do you use formulas, draw pictures, make tables, or use specific models?

> "…Yes, I often use formulas and sometimes also make simple drawings or tables to make it easier to understand the relationship between data. For example, if the question is about comparison or geometry, I make a sketch to help me see the position and size. That way, I can find the right steps more quickly and avoid calculation errors…"

Interview results with R4: Have you ever changed your strategy midway when you felt your initial approach was not quite right?

> "…Yes, sometimes when I am calculating, I realise that the steps I have taken are actually making the problem more complicated or the result doesn't make sense. When that happens, I stop and go back to reading the question to

find an easier way. I usually change the formula or the order of the steps so that I can find the answer more quickly and get the right result…"

Interviews with R3 and R4 show that both students demonstrate flexible and representational thinking in solving mathematical problems. R3 uses visual representations like diagrams or tables to clarify data relationships, while R4 shows flexibility by adjusting strategies when results seem inconsistent. These findings align with (Sholehah et al., 2023), which note that using multiple representations and adapting strategies indicate high reflective and flexible thinking. Thus, R3 and R4's responses confirm that visual representation and strategic flexibility enhance effectiveness and accuracy in mathematical problem solving.

Interview results with R5: How did you know that the strategy you used was effective in solving the problem?

> "…I know that the strategy I use is effective if the steps lead me to the correct answer and do not confuse me along the way. I usually check whether the final result is consistent with the logic and data in the question. If the process feels easier and the result is correct, it means that the strategy I have chosen is correct and efficient…"

Results of the interview with R6. In your opinion, what strategies are the easiest and most difficult to apply when solving maths problems?

> "...In my opinion, the easiest strategy is to use a direct formula if the type of question is clear, because you just need to plug in the numbers according to the data provided. But the most difficult ones are questions in the form of stories or those that require several steps of thinking before finding the right formula. Sometimes you have to try several methods first until you find the strategy that can really produce the correct answer..."

Interviews with R5 and R6 show that both students demonstrate metacognitive awareness in evaluating the effectiveness of their problem-solving strategies. R5 judges strategy effectiveness by process smoothness and result accuracy, while R6 distinguishes strategy difficulty based on problem complexity. These findings align with (Pasaribu et al., 2025), which state that students with strong metacognitive skills can assess and adapt strategies according to problem type and difficulty. Thus, R5 and R6's responses confirm that mathematical problem-solving success depends not only on formula mastery but also on metacognitive evaluation and strategic adaptation.

c. The Compatibility of Students' Thinking Processes with the Stages of Problem Solving According to John Dewey

The alignment of students' thinking processes with John Dewey's stages of problem solving is an important indicator in understanding the quality of their reflective thinking while solving mathematical problems. Dewey emphasises that reflective thinking is a systematic and logical process that occurs in five stages: recognising the problem, formulating a hypothesis, collecting data, testing the hypothesis, and drawing conclusions. In practice, not all students are able to follow these stages sequentially. Differences in ability levels, conceptual understanding, and learning habits can cause variations in the sequence and depth of students' thinking. Therefore, it is important to analyse the extent to which students' thinking processes in the field are in line with Dewey's stages of reflective thisnking.

Research by (I. Siregar et als., 2024) shows that most students only reach the stage of identifying problems and determining strategies, but are not yet fully capable of reflecting on and evaluating the solutions they have obtained. Meanwhile, research by (Ningrum et al., 2024) reveals that students' reflective thinking skills can develop if teachers provide guidance that encourages students to relate their work back to the initial concepts and problems. Based on these findings, this study focuses on analysing the suitability of the thinking process of students at SMP Sains Qur'an Minhajut Thullab with John Dewey's problem-solving stages, in order to identify the extent to which students are able to think reflectively and systematically in solving mathematical problems.

Interview results with R1: In your opinion, are the steps you take when solving problems systematic, from understanding the problem to finding the answer?

> “...In my opinion, the steps I take are quite systematic. I usually start by understanding the question, writing down the known data, then determining the appropriate formula before calculating. After getting the result, I check again whether the answer answers the question. But sometimes, when I'm in a hurry, I like to calculate immediately without writing down the steps first...”

Results of the interview with R2: When working on the questions, did you guess or estimate the possible answers before doing the calculations?

> "…Yes, sometimes I estimate the possible answer before calculating. I usually look at the size of the numbers in the question to guess whether the final result makes sense or not. That way, if the calculation result is too far from my estimate, I can tell that there is a mistake and immediately check the steps again…"

Interviews with R1 and R2 show that both students demonstrate systematic and reflective thinking in solving mathematical problems. R1 follows a logical sequence from understanding the problem to checking results, though sometimes inconsistently in writing steps, while R2 shows predictive and evaluative skills by estimating outcomes to ensure accuracy. These findings align with (Hutagaol et al., 2024), which state that effective problem solvers use structured thinking and logical prediction to verify results. Thus, R1 and R2's responses confirm that systematic reasoning and prediction are key indicators of effective mathematical problem-solving skills.

Interview results with R3: Have you ever changed your way of thinking or strategy in the middle of the completion process because you found mistakes or unsatisfactory results?

> "…Yes. When I realised that the calculation results were incorrect or too far from the estimate, I immediately stopped and reviewed the previous steps. I usually try to find out where the mistake lies, whether it is in the formula, the data used, or the calculation method. After that, I change my strategy by trying another simpler method so that the results are more accurate…"

Interview results with R4, How do you ensure that the final result accurately answers the questions in the problem?

> "…I ensure that the final result is correct by rereading the question and matching it with the answer I have obtained. I check whether the units are correct and whether the result makes sense in the context of the question. If everything matches, then my answer is correct. But if it feels strange, I repeat the calculation steps to make sure there are no mistakes…"

Interviews with R3 and R4 show that both students demonstrate strong reflective and evaluative thinking in solving mathematical problems. R3 monitors and corrects errors by reviewing steps and adjusting strategies, while R4 verifies final results by matching answers to the problem's context. These findings align with (Adha & Rahaju, 2020), which state that reflective students actively evaluate their processes and modify strategies when inconsistencies arise. Thus, R3 and R4's responses confirm that reflection and self-evaluation are essential for developing accurate and effective mathematical problem-solving skills.

Results of the interview with R5: If you compare your way of thinking with the steps taught by teachers (understanding the problem, formulating hypotheses, collecting data, testing, and concluding), which part do you think you do best, and which part do you still find difficult?

> "…In my opinion, the part I do best is understanding the problem and gathering data, because I am used to reading questions carefully and marking important information. But the part that is still difficult is formulating assumptions or hypotheses, because sometimes I am not sure which steps are the most appropriate to use. Testing the results is also quite difficult if the question is complex and involves a lot of calculations…"

Results of the interview with R6: In your opinion, is the way you think when solving maths problems systematic, like the steps taught in the problem-solving process?

> "…In my opinion, my way of thinking is quite systematic, but it does not fully follow the steps that were taught. I usually follow the sequence from understanding the question to finding the answer, but sometimes I jump straight to the calculation without making a plan first. If the result is not correct, then I go back to the first step to improve my way of thinking and find the mistake that occurred…"

Interviews with R5 and R6 show that both students attempt to apply problem-solving stages systematically, though they still face difficulties in formulating hypotheses and maintaining consistency. R5 understands problems and identifies key data but struggles with hypothesis testing, while R6 follows a sequential pattern yet tends to skip the planning stage. These findings align with (Nasriadi, 2016), which notes that students often master initial problem-solving stages but face challenges in hypothesis formulation and evaluation due to limited reflective and strategic thinking. Thus, R5 and R6's responses confirm that mastering all stages of problem solving requires ongoing practice in reflective and systematic thinking.

CONCLUSION

The thinking process of students in solving mathematical problems at SMP Sains Qur'an Minhajut Thullab has shown systematic and reflective tendencies in accordance with John Dewey's stages of problem solving, although there are still variations in the consistency of its application. Students are generally able to understand problems, identify important data, and select relevant strategies for solving problems. However, some students still experience difficulties in the stages of formulating hypotheses, planning strategies, and evaluating final results, indicating the need to strengthen metacognitive abilities and continuous reflective thinking exercises. Overall, these results indicate that the effectiveness of mathematical problem solving is not only determined by mastery of concepts, but also by students' ability to organise, review, and evaluate their thinking processes systematically and logically.

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