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Kemampuan Berpikir Reflektif Matematis Siswa dalam Menyelesaikan Permasalahan Sistem Persamaan Linear Dua Variabel (SPLDV)

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Abstrak

Kemampuan berpikir reflektif matematis merupakan salah satu kemampuan tingkat tinggi yang mampu menunjang kemampuan berpikir matematis lainnya. Oleh karena itu, penting untuk memastikan siswa memiliki kemampuan berpikir reflektif matematis yang baik. Tujuan penelitian ini yaitu untuk menganalisis kemampuan berpikir reflektif matematis siswa (KBRMS) pada materi sistem persamaan linear dua variabel (SPLDV). Pendekatan penelitian ini yaitu kualitatif dengan jenis fenomenologi. Teknik pengumpulan data yang dilakukan berupa tes kemampuan berpikir reflektif dan wawancara. Subjek penelitian yaitu siswa kelas VIII SMP yang telah mempelajari materi SPLDV dengan teknik penentuan sampelnya menggunakan teknik *purposive sampling*. Teknik analisis data pada penelitian ini yaitu reduksi data, display data, penarikan kesimpulan, dan verfikikasi. Analisis kemampuan berpikir reflektif matematis ini berdasarkan indikator-indikator kemampuan berpikir reflektif matematis yaitu *reacting, elaborating* dan *contemplating*. Hasil penelitian ini menunjukkan bahwa siswa mampu menguasai indikator *reacting* dan *elaborating* ketika dihadapkan pada soal yang biasa ditemuinya, sedangkan untuk indikator *contemplating* siswa masih mengalami beberapa kesulitan ketika dihadapkan pada soal yang memiliki bentuk berbeda dari yang biasa dicontohkan, kesulitan dalam memahami permasalahan serta menentukan konsep materi yang digunakan. Berdasarkan hal tersebut, ditunjukkan bahwa kemampuan berpikir reflektif matematis siswa belum terpenuhi secara optimal.

Kata Kunci: kemampuan berpikir reflektif, pembelajaran matematika, sistem persamaan linear dua variabel (SPLDV)

Students' Mathematical Reflective Thinking Ability in Solving System of Linear Equations in Two Variables Problems

Abstract

Mathematical reflective thinking ability is one of the higher-level abilities that can support other mathematical thinking skills. Therefore, ensuring students have good mathematical reflective thinking skills is essential. This study aimed to analyze students' mathematical reflective thinking skills (KBRMS) on the material of a two-variable linear equation system (SPLDV). This research approach is qualitative with a phenomenological type. Data collection techniques were carried out through reflective thinking skills tests and interviews. The study subjects were grade VIII junior high school students who had studied SPLDV material using purposive sampling techniques. Data analysis techniques in this study are data reduction, data display, conclusions, and verification. This mathematical reflective thinking ability analysis is based on indicators of mathematical reflective thinking ability, namely reacting, elaborating, and contemplating. The results of this study show that students can master reacting and elaborating indicators when faced with problems they usually encounter. In contrast, for contemplating indicators, students still experience difficulties when faced with problems different from those traditionally exemplified, such as difficulties in understanding problems and determining the concept of the material used. Based on this, it is shown that students' mathematical reflective thinking skills have not been fulfilled optimally.

Keywords: *mathematics learning; reflective thinking ability; system of the linear equation of two variables (SPLDV)*

INTRODUCTION

Mathematics has a vital role in the development of science and technology. Along with the development of science and technology, the abilities that must be mastered in understanding and solving mathematical problems are increasingly comprehensive. To deal with mathematical problems, students should master the five basic skills proposed by NCTM: problem-solving, reasoning and proof, representation, connection, and communication skills (National Council of Teachers of Mathematics, 2020). In addition to mastering these five basic abilities, other abilities are essential in learning mathematics: thinking skills/ability.

Thinking ability is an activity that involves the process of remembering, gathering information, and drawing a conclusion. As stated by Presseisen & Barbara (1984), thinking is a cognitive process that involves mental activities to obtain knowledge, which in the process requires active involvement on the part of the thinker, who will get the results of memory, learning, reasoning, and higher processes, such as assessing and reciprocal relationships developed through thinking such as the use of evidence over time. For this reason, we need to have the ability to think.

The thinking skills that must be mastered in learning mathematics consist of various kinds, including the ability to think reflectively. Reflective thinking is a high-level ability that can support the development of other high-level abilities, such as critical thinking, creativity, problem-solving, and communication skills (Deringöl, 2019). This opinion is reinforced by Sabandar (2009) opinion, which states that critical and creative thinking skills are part of critical thinking skills, and these abilities will later be used to solve mathematical problems. Therefore, reflective thinking skills should be instilled in the mathematics learning process.

Reflective thinking ability is an ability needed in learning mathematics to reach conclusions from a problem based on the knowledge possessed. Dewey (1933) suggested that reflective thinking is carried out actively, persistently, and thoughtfully in deciding a belief with a clear knowledge base to conclude a solution to the problem given. In the process, critical thinking requires significant effort in its mastery because it departs from the knowledge possessed to be able to conclude the problem encountered.

In addition, reflective thinking can also help someone solve problems based on the appropriate stages. This is in line with Kholid, Sa'dijah, Hidayanto, & Permadi (2020), which states that reflective thinking is a thought process characterized by efforts to overcome the confusion experienced by students in solving problems through planned stages based on knowledge, experience, and problem-solving skills. The ability to think reflectively encourages students to focus on solving the problems they face and still pay attention to the process that involves their experiences until they can determine the solution to the problems they encounter.

Students' mathematical reflective thinking ability involves connecting mathematical ideas from the knowledge and experiences passed. In line with the opinion of Muntazhimah, Turmudi, & Prabawanto (2021), mathematical reflective thinking ability will go through stages of reflection where students will reflect on themselves to solve the mathematical problem, they are facing by involving their initial abilities or prior knowledge as a provision for students to learn to think quickly in making the right strategy for problem-solving and learning further mathematical material. In mathematics, the reflective thinking process leads to applying mathematical concepts related or relevant to a problem, including the ability to master deep concepts to solve the problem. In addition, by mastering reflective thinking skills, students can master their adaptive reasoning skills.

Adaptive reasoning is the capacity to think logically about relationships between concepts and situations (logical thought), the ability to think reflectively (reflection), the ability to explain (explanation), and the ability to justify (justification) (Kilpatrick, 2010). Adaptive reasoning is a person's ability to think flexibly and adjust their approach to different situations or problems. Flexibility thinking is a person's ability to generate multiple approaches and conclusions by connecting several procedural knowledge (Basuki & Farhan, 2023) to solve the problems encountered.

Adaptive reasoning cannot be separated from a flexible thinking process in determining solutions to problems. When students can think adaptively, they may not focus on one approach to solving problems; they can change how they look at the problem, evaluate the strategies used, and look for solutions that best suit the situation. In addition, students with adaptive reasoning can adjust their

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knowledge, skills, and experience to solve problems they have never encountered before. Thus, adaptive reasoning and flexible thinking are critical for mastering reflective thinking skills. The development of adaptive reasoning and flexible thinking is closely related to students' learning experiences.

Through their learning experiences, students will explore the knowledge they want to master and be better prepared for other problems they will encounter. Thus, learning experiences must be fostered so that students become more familiar with the problems they face. They also understand what they need to do to solve more complex tasks when they know their learning experiences (Karaoglan-Yilmaz, Ustun, Zhang, & Yilmaz, 2023). Students' experience and knowledge of KBRMS play a significant role in solving mathematical problems, in line with Sümen (2023), who stated that mathematical reflective thinking ability is an essential skill that directly influences mathematical problem-solving and determines success in obtaining results. Therefore, the ability to use mathematical reflective thinking is essential to mastering and obtaining good processes and results in mathematics learning. Reaching this stage requires an indicator.

Students' mathematical reflective thinking ability (KBRMS) has indicators that can be used as a benchmark for students' ability to think mathematically reflectively. According to Kamalia & Nuriadin (2021), there are three phases of KBRMS indicators, including Reacting; in this phase, students can understand the problem correctly and understand the adequacy of what is known to solve the problem being asked. Elaborating; in this phase, students can describe problems they have faced before and correlate problems they have previously faced with current conditions. Contemplating; in this phase, students can explain what they are doing, find truths and errors in the answers, correct and explain again if there are errors in the answers, and students can draw the correct conclusions.

Seeing the urgency of KBRMS above is inversely proportional to the facts on the ground. Facts in the school show that students' mathematical reflective thinking skills are rarely taught to students in solving problems, resulting in inappropriate results. This is in line with research by (Ramadhani & Aini, 2019; Sihaloho & Zulkarnaen, 2019; Syadid & Sutiarso, 2022), stating that students' mathematical reflective thinking abilities are classified as low. One of the factors that influence students' low ability to think mathematically reflectively is students still think that learning mathematics is difficult to understand, students' low interest in learning mathematics, lack of variety in mathematics questions, students are also not yet able to analyze and communicate problems well optimally, this is because students are very fixated on the examples the teacher has given so that when students encounter different questions, they feel unfamiliar and cannot solve the problem. In addition, students have not been accustomed to reflective thinking skills. If the KBRMS is not appropriately fulfilled, it will affect students' mathematical problem-solving.

In addition, research conducted by Mudakir, Suratno, & Angkotasan (2020) showed that 30 students out of 33 obtained KBRMS in the low category with the statement that they had connected previous knowledge with new knowledge and could determine relationships and formulate solutions correctly. However, there were still errors, namely, incomplete, and they have not been able to evaluate the solutions they have worked on. Another research conducted at a high school in Tangerang Regency showed that KBRMS was still low, with almost 60% of students not being able to achieve these indicators of ability (Mentari, Nindiasari, & Pamungkas, 2018). Furthermore, Mentari et al. (2018) stated that students' abilities that are still low in achieving KBRMS indicators include the ability to interpret, correlate knowledge, and provide evaluations of the completion process.

Some of the research above trends show that students' reflective thinking skills are still low and accompanied by factors that influence a student's point of view. However, no one has discussed more deeply the extent to which the fulfillment of reflective thinking skills is based on each indicator. In this study, an in-depth analysis will be carried out on how to fulfill each indicator of mathematical reflective thinking ability and in which parts students have difficulty thinking reflective dominant. Then, the researcher will also analyze the factors that affect the ability to think reflectively mathematically from the point of view of the teacher who teaches, such as whether the learning presented is adequate in the development of mathematical reflective thinking skills and what the obstacles in developing students' mathematical reflective thinking skills from the teacher's point of view.

In this study, material that has never been used as material in the KBRMS analysis was also selected, namely the system of the linear equations of two variables (SPLDV). Learning a linear equation of two variables is very important because it has many applications in various areas of life. Systems of the linear equations of two variables are essential tools in problem-solving in social sciences, economics, science, engineering, and others. Understanding how to solve this system of equations allows us to find accurate solutions in situations where more than one variable affects the outcome. Many phenomena and situations of everyday life can be modeled using a two-variable system of linear equations. Examples include the market's relationship between price and quantity, population distribution, etc. Systems of the linear equations of two variables are also often used in more complex problems such as designing and optimizing the design of machines and building structures, analyzing market behavior, and even developing artificial intelligence algorithms.

Based on the previous explanation regarding the urgency and problems at KBRMS, researchers are interested in conducting research aimed at finding out students' mathematical reflective thinking abilities to solve systems of linear equations in two-variable problems in the 8^{th} grade of junior high school.

METHOD

Researchers in this study used a qualitative approach, using a type of phenomenology related to junior high school students' mathematical reflective thinking abilities. Phenomenology is a qualitative approach that focuses on the nature of experience from the perspective of the person experiencing the phenomenon, which is more clearly known as "lived experience" (Connelly, 2010). The subjects of this research were all 19 students in 8^{th} grade of A. The sampling technique used is purposive sampling. Things that are considered are student learning outcomes and student activity in classroom learning. This consideration is made to meet the criteria for students' mathematical reflective thinking abilities. The criteria in question are the ability of students who have mastered basic mathematical skills so that later students' ability to reflect on their abilities on newly encountered problems will be seen.

The main instrument in this research is the researcher, who uses data collection techniques through tests and interviews with students and teachers. The test comprises three questions based on indicators of reflective thinking abilities. The test was carried out to determine students' mathematical reflective thinking abilities, while interviews with students aimed to clarify the answers they gave. Student interviews were conducted with students who communicated well based on KBRM test results and teacher assessments. This is done to make it easier for researchers to analyze students' mathematical reflective thinking skills. Interviews with teachers were conducted to see the factors that affect the ability to think reflectively mathematically from the teacher's point of view on learning. Interviews were conducted semi-structured to make it easier for researchers to obtain complete information.

Data analysis techniques in tests of students' mathematical reflective thinking abilities are only carried out using descriptive statistics, namely by calculating average values and standard deviations, which aim to classify the test results obtained by students. The classification is outlined in Table 1:

Table 1. Classification Based on Standard Deviation (Kariadinata & Abdurahman, 2015)

Classification	Intervals
High	$X \geq \bar{x} + SD$
Moderate	$\bar{x} - SD \leq X < \bar{x} + SD$
Low	$X < \bar{x} - SD$

Table Information:

x : Student Score.

$\bar{x}$: Average Score.

SD : Standard Deviation.

The formula of standard deviation:

$$SD = \sqrt{\frac{\sum x_i^2 - \frac{(\sum x_i)^2}{n}}{n-1}} \quad \ldots. (1)$$

Average Formula:

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$$\bar{x} = \frac{\sum x_i}{n} \dots (2)$$

Information:
$\sum x_i$: Sum of values
n : Amonth of data

Analysis techniques for non-test data go through several stages, from data reduction and display to drawing conclusions and verification. Data from students' mathematical reflective thinking ability test results were only analyzed for the results obtained and then corroborated with students' interview answers. The results of interviews with students will then be coded. Once the coding and data are deemed accurate, conclusions can be drawn.

RESULTS

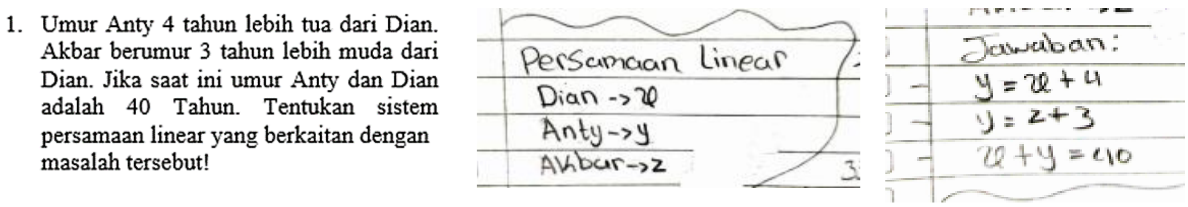
The results of obtaining tests of students' mathematical reflective thinking skills that have been categorized based on classification are presented in Table 2.

Table 2. Classification of Students' Mathematical Reflective Thinking Skill

Classification	Interval	Multiple Student	Percentage
High	$X \geq 29{,}5 + 21{,}3$	Four student	21%
Moderate	$29{,}5 - 21{,}3 \leq X < 29{,}5 + 21{,}3$	11 student	58%
Low	$X < 29{,}5 - 21{,}3$	Four student	21%

Based on the students' mathematical reflective thinking ability test results, it was found that four students were in the high category, 11 students were in the medium category, and the remaining four students were in the low category. Four subjects are from the high category based on the criteria explained in the method. In contrast, the student with the highest score of the four who will be interviewed is selected to be interviewed regarding the reflective thinking ability test that was previously completed. One subject with the highest score is the S3 subject. Interviews were conducted semi-structured to obtain complete information regarding students' mathematical reflective thinking abilities as seen from the results of the tests.

Based on the research results previously described, a high classification of students' mathematical reflective thinking skills was obtained by as many as four people. Then, the students with the most significant scores were selected to be interviewed. Subject S3's answer to question number 1 relates to reaction indicators to obtain results, as in Figure 1.

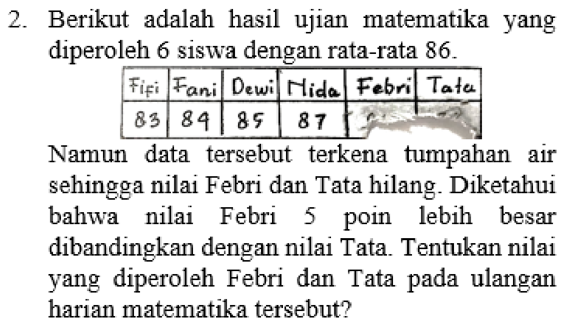


Translation:	Linear Equations	Answer:
Anty is 4 years older than Dian. Akbar is 3 years younger than Dian. Currently, Anty and Dian are 40 years old. Determine the system of linear equations related to the problem.	Dian = *x* Anty = *y* Akbar = *z*	*y = x + 4* *y = z + 3* *x + y = 40*

Figure 1. Question number 1 and Answers from Subject S3 in reaction indicators

In answering question number 1, the subject was asked to make a mathematical model of the problem presented. S1, S2, S3, and S4 subjects showed similar interview results. In answering the question, the subject did not express what was known and asked, even though these two things became very important in the reacting indicator because they could see how students understood their problems.

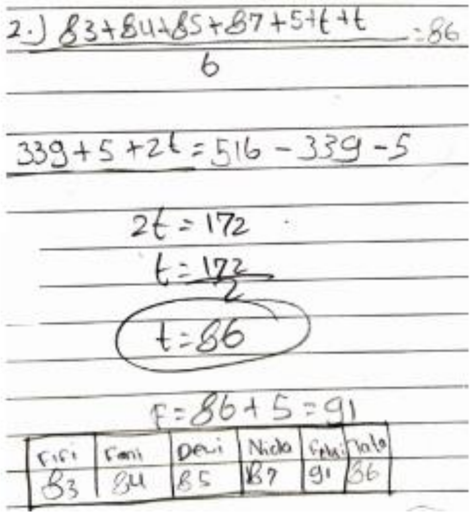
A particular case was experienced by the subject of S3, in which he directly put forward examples of each variable. Then, the S3 subject poured it into a mathematical model. When students do not express what they know and ask, it is difficult to detect whether they understand the problem satisfactorily or follow the usual pattern taught in class. When validated through the interview, S3 subjects did understand the problem well but often experienced doubts about whether the example was done as it should have been. Next, students' answers to question number 2 are shown in Figure 2.



2. Berikut adalah hasil ujian matematika yang diperoleh 6 siswa dengan rata-rata 86.

Fifi	Fani	Dewi	Nida	Febri	Tata
83	84	85	87	[illegible]	[illegible]

Namun data tersebut terkena tumpahan air sehingga nilai Febri dan Tata hilang. Diketahui bahwa nilai Febri 5 poin lebih besar dibandingkan dengan nilai Tata. Tentukan nilai yang diperoleh Febri dan Tata pada ulangan harian matematika tersebut?



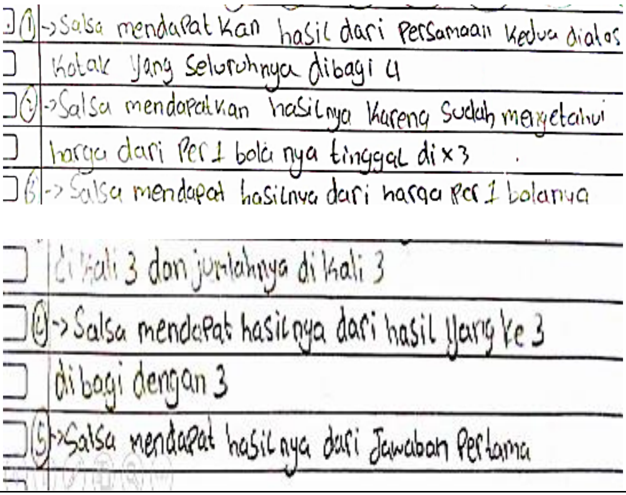
Translation:
The following are the results of the mathematics exam obtained by 6 students with an average of 86. However, the data was affected by a water spill so Febri and Tata's values were lost. It is known that Febri's score is 5 points greater than Tata's score. Determine the marks obtained by Febri and Tata on the daily mathematics test.

Figure 2. Question number 2 and answer from subject S3 in elaborating indicator

In question number 2, relating to the elaborating indicator, students are asked to determine the value of two unknown children. Solving this problem involves previous knowledge related to finding the value of the combined average. S3 subjects work according to the method of finding the combined average by taking, for example, the things asked in the question. However, in writing the Answer, subject three did not first write down the examples of the two things being asked; even though after entering the formula, the examples were visible, it still became less systematic, and the student's understanding of this question was doubtful. Apart from that, there was an error in the S3 subject when writing in the third step; it should have been $339 + 5 + 2t = 516$, but it could have been continued directly at $2t = 516 - 339 - 5$. However, when writing the answer to subject S3, he wrote $339 + 5 + 2t = 516 - 339 - 5$.. Seeing this, students do not understand the steps they should take to solve the problem.

When validated with interviews, Subject S3 did not remember the combined average material or the materials involved in reaching the solution. Subject S3 only tried out what method could obtain the two things asked. Subject S3 explained that it was enough to add up all the existing scores, including the value of what was sought, and then divide by six according to the number of students to obtain an average score of 86. Then, the sum result without variables was subtracted by the same number in both sections. So that only $2t$ remains on the left side, and then continue operating until the value t is obtained, the value of t is obtained, it is then substituted for the example of $5 + t$ to become the value of f.

Based on this, by looking at the results of the interview and the calculation results written on the answer sheet, students understood the problem. They can solve it, but students still have difficulty expressing their thoughts in mathematical language or writing. Students still need to be trained in understanding problems to express these things in mathematical writing. Apart from that, students need to remember and improve their understanding of the concepts of previous material they have studied and problems they have solved so that they do not have difficulty developing elaborating indicators in KBRMS.



Translation:
Note the strategy used by Salsa to determine the respective prices of field tennis balls and table tennis ping pong balls.

What do you think is the answer to the salsa above?

1. Salsa gets the results from the second equation above the box which is completely divided by 4.
2. Salsa gets results because he already knows the price of 1 ball. Just multiply by 3
3. Salsa gets the results from the price per 1 ball multiplied by 3 and the number multiplied by 3
4. Salsa gets the result from the third result divided by 3
5. Salsa gets the result from the first answer.

Figure 3. Question number 3 and Answer from subject S3 in contemplating indicator

In question number 3, subject S3 was asked to describe the strategy carried out to obtain the results stated in the question. Subject S3 answered correctly for the first statement, where the price of one tennis ball plus one ping pong ball was obtained from the second equation by dividing the whole by 4. For the second statement, subject S3 gave the correct Answer, too, because he only needed to multiply the whole by the number 3. Then, in the fourth subject, S3, the correct Answer was also obtained; namely, the fourth statement was obtained from the third statement divided by 3. However, subject S3's third statement was wrong in determining the argument; he argued that three tennis balls were obtained by multiplying the price of each ball by 3. Even though we know that to reach statement stage 3, the price of one tennis ball and one ping pong ball has not yet been determined. Subject S3 eliminates equation 1 and the second statement. In the fifth statement, the subject gave an argument that was not linked to the SPLDV solution, only saying that the price of the ping pong ball was obtained from the results of the first statement. The same thing was done by subjects S1 and S2 also, where the brand did not explain the first statement given how to get the price of ping pong balls; the student should explain that the price of ping pong balls obtained from the first statement was eliminated or substituted by the fourth statement.

When validated by interviews on question number 3, subjects S1, S2, and S3 did feel confused about understanding the problems in the questions. When subjects S1, S2, and S3 know what to do, they do not understand that these statements are related. Thus, the answers that subjects S1, S2, and S3 give to the third statement seem only to guess where the statement was obtained from, not to understand that this question is still related to the completion of SPLDV related to substitution and elimination. Seeing this, the subjects still have difficulty providing arguments and conclusions from what they are doing on this contemplating indicator and do not even understand the meaning of the problem being worked on.

DISCUSSION

Based on the results of the answers given by students regarding all indicators from KBRMS, a conclusion can be drawn, namely that students still experience difficulties when faced with questions that are different from what they usually study, tend to follow the answer pattern exemplified previously so that when they are given problems with the same pattern. Different, they have difficulty understanding the problem being faced and cannot relate the concepts of the material needed as a solution, have difficulty relating previous knowledge, and are not used to giving arguments and drawing conclusions from a given problem. This is in line with the opinion of (Dinata, Rusyid, Fatimah, & Herman, 2023), who stated that it is essential to instill strengthening mathematical concepts in students to make students aware that one mathematical topic is related to other mathematical topics, even if it is outside the mathematical topic. Likewise, Febrianti (2019) stated that students experience difficulties when given problems that are not similar to the examples previously given, especially contextual problems. They experience difficulties when understanding the existing problems. Apart from that, it is also supported by research by (Salido, Suryadi, Dasari, & Muhafidin, 2020), which obtained research results, namely that students who have not thought reflectively in dealing with problems, use inefficient strategies, do not complete answers and quickly give up when facing complex tasks. Other research suggests that students with low abilities still experience difficulties in evaluating what they do (Mudakir et al., 2020). Based on the results of the answers given by students, seems like students have not yet optimally fulfilled the indicators of reaction, elaborating, and contemplating for questions that are different in form from the questions in the example. This is consistent with the fact that in solving questions, students think the most important thing is to answer the question correctly, and they do not understand the meaning of the problem (Kholid et al., 2020; Kholid, Telasih, Pradana, & Maharani, 2021; Syamsuddin, 2020).

Based on the results of interviews with teachers who teach in that class. It was found that students' mathematical reflective thinking abilities are rarely introduced, especially when answering questions about non-routine higher-level thinking. This is based on students' problem-solving abilities and their low understanding of concepts in algebra material and calculating positive and negative integers. This reason can be strengthened by looking at the results of students' mathematical reflective thinking ability tests on students who got the highest scores. This shows that even students with the highest test results experience significant difficulties in solving KBRMS problems, especially students with lower abilities.

In addition to the fact that KBRMS questions are rarely given to students, students also do not like to explore the knowledge they have. Students only want to accept what the teacher says without wanting to learn further outside of classroom learning. Students' lack of learning experience causes this, so they cannot master KBRMS well. When students' learning experiences are good, they will have no difficulty facing mathematical problems related to KBRM because they can think deeply with a broad mind, calling on their knowledge to determine solutions to their problems. They were supported by research by Karaoglan-Yilmaz et al. (2023), which states that students also understand what they need to do to complete more complex tasks when they know their learning experience.

In addition, Umbara & Herman (2023) suggested that teachers pay more attention to students' reflective mathematical thinking to improve students' ability to solve problems. When students are too comfortable being faced with easy questions and are only given information without exploring the knowledge independently in more depth, they will experience difficulties in learning mathematics. There is a relationship between teachers' reflective thinking abilities and students' abilities (Erdoğan, 2020; Kholid et al., 2021; Syamsuddin, 2020).

This is reinforced by the opinion of (Nuriadin, Kusumah, Sabandar, & Dahlan, 2015), who states that when students do not get used to conveying their ideas and only receive information from the teacher, students will be weak in understanding the mathematical concepts being studied so that later they will have difficulty in facing problems. Mathematics encountered and difficulty learning other materials in the future. Teachers can also utilize context in mathematics learning to provide an in-depth understanding and active involvement of students in learning. This is supported by Pauji, Febrianty, &

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Herman (2023), who state that using context in mathematics learning is essential to building meaningful learning and engaging students in learning activities.

CONCLUSION

Based on the results and discussion above, the mathematical reflective thinking skill test results showed that 21% of students were classified as low, 58% as medium, and 21% as high. This shows that students' mathematical reflective thinking skills have not been fulfilled optimally. Students have mastered the reacting and elaborating indicators when faced with familiar questions but still experience some difficulties with the contemplating indicators. This is because learning is not yet oriented towards mathematical reflective thinking processes that support mathematical problem-solving abilities and is not used to dealing with non-routine problems. Students tend to be still fixated on the form of questions exemplified by the teacher; students experience difficulties when given questions that are different from the pattern exemplified, so they have difficulty understanding the problem being faced and cannot relate the concepts of the material needed as a solution, have difficulty relating previous knowledge due to lack of learning experience students have, and are not used to giving arguments and drawing conclusions from a given problem. Therefore, it is recommended that teachers accustom students to think reflectively through non-routine questions and strengthen mathematical concepts to make it easier for students to solve the mathematical problems they encounter. In addition, due to the limitations of this research, it is hoped that further research will be able to develop more research related to students' mathematical reflective thinking abilities, such as by looking at the effectiveness of learning that supports 21st-century skills such as cooperative, PBL, PJBL and other innovative learning to be able to make students more explore their knowledge independently and mastery of the concepts they understand can be more robust.

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