

ANALYSIS OF STUDENTS' MATHEMATICAL CRITICAL THINKING SKILLS WITH A REALISTIC MATHEMATICS EDUCATION (RME) APPROACH TO TWO-VARIABLE LINEAR EQUATION SYSTEM MATERIAL

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Abstract:

Students must have the ability or potential as well as a good mathematical attitude, such as the ability to solve problem in solving problems in this Systems of Linear Equations in Two Variables material. These abilities include mathematical problems, including the abilities that exist within each student so that they can solve problems in the Systems of Linear Equations in Two Variables material. This research was conducted to find out how students solve and apply two-variable linear equation systems at the 10th-grade high school level in real-world problems. This research also examines real-world problems and students' systematic thinking on how students solve or apply mathematics problems in Systems of Linear Equations in Two Variables material. This data collection was carried out by examining class x level students at MAN 1 JEMBER with research themes that had been implemented. The application criteria used in this research use journal articles on Sinta 2 or Google Scholar which must be published within the last 5 years maximum. After all the data has been collected, the next step is the data processing process which is carried out by analyzing the data on the class x high school level learning model in real life. The purpose of this research is to determine the abilities of students with visual, auditory, and kinesthetic learning styles and to be able to conclude the application of how students solve mathematics problems in Systems of Linear Equations in Two Variables material.

Keywords: Problem-Based Learning, Student Abilities, Learning Style, Systems of Linear Equations in Two Variables

ANALISIS KEMAMPUAN BERPIKIR KRITIS MATEMATIKA SISWA DENGAN PENDEKATAN REALISTIC MATHEMATICS EDUCATION (RME) PADA MATERI SISTEM PERSAMAAN LINEAR DUA VARIABEL

Abstrak:

Siswa harus memiliki kemampuan atau potensi serta sikap matematika yang baik seperti kemampuan untuk memecahkan masalah dalam menyelesaikan soal materi

Sistem Persamaan Linear Dua Variabel ini. Kemampuan tersebut terdapat masalah matematisnya antara lain kemampuan yang ada dalam diri setiap siswa sehingga dapat menyelesaikan soal dalam materi Sistem Persamaan Linear Dua Variabel. Penelitian ini dilakukan untuk mengetahui bagaimana siswa menyelesaikan dan menerapkan sistem persamaan linear dua variabel di tingkat SMA kelas X dalam permasalahan dunia nyata. Penelitian ini juga menelaah terkait permasalahan dunia nyata dan sistematis pemikiran pada siswa bagaimana siswa untuk memecahkan atau menerapkan soal matematika dalam materi Sistem Persamaan Linear Dua Variabel. Pengumpulan data ini dilakukan dengan meneliti siswa jenjang kelas X di MAN 1 Jember dengan tema penelitian yang sudah diterapkan. Kriteria penerapan yang digunakan pada penelitian ini menggunakan artikel jurnal pada Sinta 2 atau google scholar yang harus dipublikasikan maksimal 5 tahun terakhir. Setelah semua data terkumpul, selanjutnya yaitu proses pengolahan data yang dilakukan dengan menganalisis data pada model pembelajaran tingkat SMA kelas X di kehidupan nyata. Tujuan penelitian ini adalah untuk mengetahui kemampuan siswa dengan gaya belajar visual, auditori, dan kinestetik serta dapat membuat kesimpulan dari penerapan terkait bagaimana siswa menyelesaikan soal matematika dalam materi Sistem Persamaan Linear Dua Variabel.

Kata Kunci: Penyelesaian Masalah, Kemampuan Siswa, Gaya Belajar, Sistem Persamaan Linear Dua Variabel

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INTRODUCTION

Education can improve a person's quality of life development. Therefore, a person can obtain education both in the school environment and in the family environment. There are several levels of education in Indonesia, namely early, primary, secondary, and student. Mathematics is also included in education. Mathematics is a very important form of education, thus someone must study and know mathematics so that they can improve their thinking processes (Anggraeni & Haerudin, 2022). Learning mathematics can increase student activity and students' thinking abilities. Improving students' thinking abilities can be done by interpreting, analyzing, inferring, and explaining. Mathematics can develop human potential and creativity in studying it. Creativity is the highest competency

that students should have. Student creativity can make it easier for students to adapt to a rapidly changing world. Even creative children tend to be able to add color to their lives. Creative thinking is a thinking process to find something that can improve conditions for the better. Creative thinking is also useful for finding insights and solutions in solving problems (Ramadhani & Caswita, 2017). Not only that, mathematics can also improve students' abilities such as critical, detailed, systematic thinking and being able to develop cooperation in groups. This ability can be formed by studying mathematics so that someone can think logically (Usman, Patalo, & Djadir, 2021). Developing this ability can be done through mathematics which substantially facilitates the development of thinking abilities based on the rules of logical, critical, and systematic reasoning (Sapa'at, 2020).

The various roles of mathematics are 1) mathematics as a way of thinking, when working on mathematical problems it can be solved in a way that is acceptable to logic. Therefore, mathematics can build thinking processes, 2) mathematics is an understanding of patterns and relationships, in mathematics problems students often connect a concept with the knowledge they have. Therefore, it can teach students to be holistic in looking at objects with the development of students' brains 3) Mathematics as a tool, mathematical concepts are often used in everyday life so mathematics can also be used as a tool in solving problems 4) mathematics as a language and tool for communicate, in mathematics there are symbols used by various countries, it can be said that mathematics is a universal communication tool (Natalia, 2017).

Mathematics is a science that is applied to solving problems. The problem in question includes story problems or questions that can be said to be difficult or difficult. In studying mathematics, students can use their abilities to solve problems. The ability to solve problems is the most important thing in mathematics because this ability can benefit oneself and one can apply it in everyday life (Rahmawati, 2021). Mathematical critical thinking ability is the ability to think critically using indicators 1) the ability to identify and justify concepts, namely the ability to provide reasons for mastery of concepts; 2) the ability to generalize, namely students can complete supporting data and information; 3) the ability to analyze algorithms, namely the ability to evaluate or examine Realistic Mathematical Critical Thinking Ability Analysis (Anugraheni & Sartono, 2022). In mathematics, there are several materials, one of which is Systems of Linear Equations in Two Variables material. Systems of

Linear Equations in Two Variables is a two-variable linear equation system that has two variables and has a rank of 1. Systems of Linear Equations in Two Variables consist of variables, coefficients, and constants. Variables are substitutes for words, for example, car becomes x . The coefficient is a number that states the number of variables. Meanwhile, constants are numbers that do not have variables and have fixed values (Amalia, 2020). This material is important because it relates to everyday life and in this material there are also steps, procedures, and processes for solving the problem or questions that have been given (Wulandari, Sujadi, & Aryuna, 2016). Unsatisfactory learning outcomes, will also indirectly affect mathematical thinking abilities. The reason for the high level of anxiety toward mathematics is the low interest of students in the field of mathematics (Sari, Nasriadi, & Salmina, 2021).

In the Systems of Linear Equations in Two Variables material, there are story questions and usually, they can also be related to real life so that it is easy to understand when solving these questions (Indahsari & Fitrianna, 2019). However, many people think that mathematics is very difficult or too complicated to solve, even though learning mathematics when it is related to real life is easier to understand. The achievement of material in mathematics is very difficult for students to understand and it has been proven that this achievement is very low when compared to other subjects. The level of difficulty in mathematics depends on how the person assumes it is. The level of students' mathematical critical thinking abilities is certainly inseparable from internal factors. One factor that can influence students' critical thinking abilities is students' initial abilities. Students' initial abilities influence how quickly students understand the learning material (Ningsih, & Sari, 2023) If the person thinks mathematics is difficult without trying then it will be difficult, and if the person thinks mathematics is easy without trying then it will be difficult. So, if someone has the will, they will like and make the effort to find out about mathematics and have the thought that if mathematics is related to real life, it will be easier and will have broad thinking (Anggraini, Testiana, & Wardani, 2020). In the independent curriculum, students are given the freedom to explore their potential interests and thinking process abilities. Mathematics subjects equip students with how to think, reason, and reason through certain mental activities that form a continuous flow of thinking and culminate in the formation of a flow of understanding of mathematics learning material in the form of facts, concepts, principles, operations, relationships,

problems and certain mathematical solutions, which is formal-universal (Nuryanti, 2022).

For the most part, many students do not like mathematics subjects due to a lack of learning experience and boredom when learning takes place in class. Mathematics is a problem where students have to think logically, mathematically, and critically. These various problems arise due to the learning strategies used by teachers, resulting in the class becoming passive and students feeling bored or fed up. This mathematics learning uses an independent curriculum where learning is aimed more at activities so that students become more active mentally, creatively, intellectually, and socially in mastering mathematical material. Therefore, the use of learning models has a big influence on students' activeness in class in studying mathematics subjects. Class X students at MAN 1 Jember use a more monotonous question-and-answer and discussion learning model. In mathematics learning, various learning models can be chosen to carry out learning. This model was chosen to change the class situation from a passive class to an active class. In this way, students can have an interest and better understand the material provided.

When studying mathematics at school, the most important thing to know is students' understanding of mathematical concepts. If students do not understand and master mathematical concepts from the start of learning, then these students will experience difficulties. Lack of understanding and mastery of mathematics will result in low-quality students understanding. The causes of low student understanding in mathematics lessons are that learning is carried out only centered on the teacher, the material is delivered informatively and students are forced to work on a lot of questions without knowing each student's understanding (Agusta, 2020). Not only is it difficult to solve problems, but the mathematics learning process carried out is not significant and students also do not know how to apply mathematical problems in real life. Thus, teachers are encouraged to help students understand mathematical concepts so that they do not have difficulty solving mathematical problems (Safithri & Saputri, 2023).

The results of interviews conducted by researchers with teachers in the field of mathematics study class by students, namely Systems of Linear Equations in Two Variables material. If you look at the Mid-Semester Examination, especially on Systems of Linear Equations in Two Variables material, many students still get scores below the Minimum Completeness Criteria (KKM) determined by the school, namely ≥ 78 with the average test

score obtained by students being 75.45 (Academic Year 2022/2023). From the results of classroom observations on October 27, 2023, it can be seen that the learning strategy carried out by the classroom teacher uses the Realistic Mathematics Education (RME) learning model. When the teacher explains the material, students can only listen without anyone asking about the material. This is because the teacher does not allow students to ask questions. If the teacher gives students contextual questions or problems, students must understand the problem first. Each student can solve contextual problems independently on the Student Worksheet using their understanding. In working on these questions, students can make connections to the real world. Using RME in the real world, can make students more relevant and understand how mathematics can be used in everyday life (Bey, 2013).

In this research, the researcher explains three mathematical relationships with Systems of Linear Equations in Two Variables material as follows: 1) Relationship between Systems of Linear Equations in Two Variables material and previous material. 2) Relationship between concepts in Systems of Linear Equations in Two Variables material. 3) The relationship between Systems of Linear Equations in Two Variables and real life (Aida, Kusaeri, & Hamdani, 2017).

In this research, several findings require improvement in learning to solve the problems faced by students. One strategy that must be carried out is to apply the RME learning model to learning which emphasizes the use of ideas or student participation as a way of encouraging student involvement through optimal relationships between fellow students, between teachers and students, as well as between students and learning resources. Apart from that, learning also emphasizes students thinking creatively and being active in the classroom. This approach is used to involve students to be active in the mathematics learning process. The approach in question is called problem-based learning.

METHODS

The research method used is descriptive qualitative. This research was conducted in the class X MAN 1 Jember to describe mathematics in Systems of Linear Equations in Two Variables material using Realistic Mathematics Education (RME) learning. Next, researchers used observation to collect data using data analysis techniques. The researcher carried out observations in 1 meeting with the assistance of 2 observers. Indicators in observation refer to

the steps contained in the RME learning model. Indicators of problem-based learning based on analysis are 1) understanding contextual problem 2) Explaining contextual problem 3) Summarizing the results of the discussion. The subjects in this research were 10 students of class X MAN 1 Jember for the 2022/2023 academic year. This test was conducted on Friday, October 27, 2023. This research describes students' abilities in solving problems and solving Systems of Linear Equations in Two Variables material questions and alternative solutions. The collection includes observation, tests, and interviews. The observations in this research were observing students' difficulties in understanding story questions in Systems of Linear Equations in Two Variables material through interviews with teachers and school officials. Students are given a test in the form of 1 story question, then interspersed with student interviews regarding difficulties in solving story questions about Systems of Linear Equations in Two Variables.

RESULTS AND DISCUSSION

Realistic Mathematics Education (RME) is a learning strategy in mathematics that can provide students with direct experience because RME can connect mathematical problems with everyday life. According to Nina, RME can improve students' critical thinking skills in solving questions about Systems of Linear Equations in Two Variables material. Students can explain and understand the information contained in the questions so that students can give their opinions and reasons regarding the questions given and students can solve questions using solutions according to each student's abilities (Suci, 2019). Apart from realistic learning models, learning can also use models that focus on problems that students must solve. Problem-based learning can be used by students to solve mathematical problems. Using the Problem-Based Learning model can produce more positive learning and can develop students' independence and discipline in learning mathematics. (Palinussa & Tamalene, 2021)

The first step in his research was by giving HOTS questions to class X students at MAN 1 Jember. These questions are to determine students' understanding of the Systems of Linear Equations in Two Variables material and errors in working on these questions. Analysis of questions using polya analysis, solution steps according to polya. The types of errors experienced by students include errors in understanding the questions, errors in making a

solution plan, errors in the solution plan, and errors in correcting solutions that have already been worked on.

According to Branca, mathematical solving abilities "broadly speaking, there are three types of interpretation of the term Problem-based learning in mathematics learning, including goal solving, process, and basic skills".

- 1) Problem-based learning as a goal: Mathematics education is defined as the goal of learning mathematics. Often learning mathematics only uses problem-based learning and does not depend on the questions or problems contained in the material provided. However, learning how to solve problems is the initial reason for learning mathematics.
- 2) Problem-based learning a process: When solving a problem, the thing to pay attention to is the process, method, or strategy used. Problem-based learning is the application of knowledge in new and abnormal situations.
- 3) Problem-based learning asks for Basic skills: The teacher's task is to direct students to be able to build students' abilities in solving problems. Students can also understand and solve problems in a narrow or broad sense. (Ryananda, 2017).

Results research obtained students given HOTS questions for knowability And understanding of concept mathematical. The question given is as follows:

"There is an area of 1,350 m² used by four parking spaces. There are 2 types of vehicles parked there, namely vehicle A (car) and vehicle B (motorbike). Vehicle A measures 20 m² and vehicle B measures 10 m². Every vehicle that parks a motorbike pays a ticket of Rp. 5000/hour and car Rp. 10,000/hour. If the maximum number of vehicles is 100 vehicles, then what is the maximum income?"

Following the Haseal test write ability students top completions about HOTS.

a) Analysis of student work results 1

The work results of student 1 who has high mathematical abilities, the data analysis as follows:

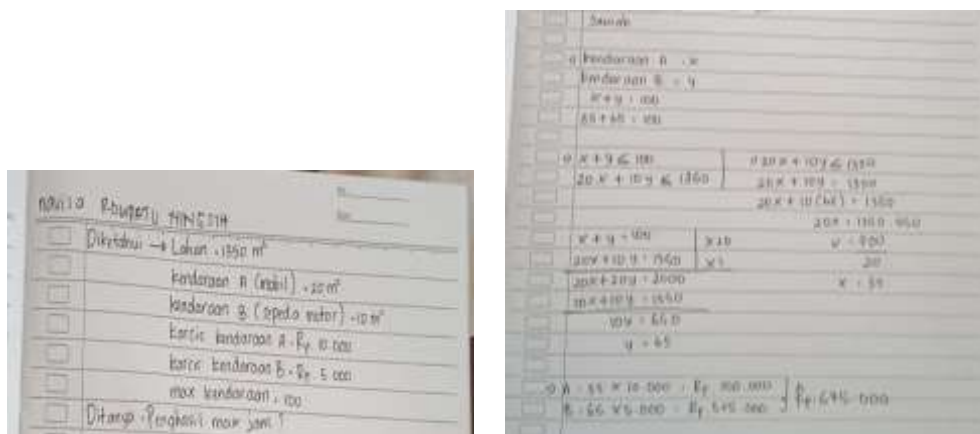


Figure 1. Student Work Results 1

1. Ability to understand mathematical concepts and facts based on simple basic concepts

Student 1 writes what he knows first. After that, student 1 does an example, namely a car is an example of x and a motorbike is an example of y . Student 1 can be said to have understood the mathematical concept of the HOTS questions that have been given.

2. The ability to form logical relationships between dissimilar concepts and facts

Student 1 works on problems by making models that aim to define sentences and change them from story problems to mathematics.

3. Ability to relate one step to other known steps

Student 1 does this by operating on the mathematical model that has been created. Student 1 starts eliminating the equation $x + y \leq 100$ with the equation $20x + 10y \leq 1,350$ and produces $y \leq 65$. Then, student 1 determines the value of x by using $y = 65$ which is substituted into the equation $20x + 10y = 1,350$ and produces $x = 35$.

4. Ability to solve mathematical problem

Student 1 can solve the problem by determining the maximum cash income per hour.

b) Analysis of student work results 2

The work results of student 2 who has moderate mathematical abilities, the data analysis as follows:

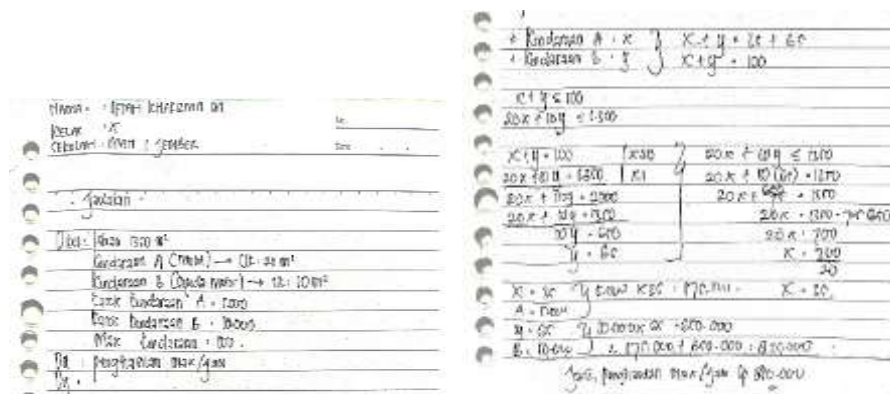


Figure 2. Student Work Results 2

1. Ability to understand mathematical concepts and facts based on simple basic concepts

Student 2 writes what he knows first. After that, student 2 gives an example, namely a car is an example of x and a motorbike is an example of y . Student 2 can be said to have understood the mathematical concept of the HOTS questions that have been given.

2. The ability to form logical relationships between dissimilar concepts and facts

Student 2 works on problems by making models that aim to define sentences and change them from story problems to mathematics.

3. Ability to relate one step to other known steps

Student 2 does this by operating on the mathematical model that has been created. Student 2 starts eliminating the equation $x + y \leq 100$ with the equation $20x + 10y \leq 1,350$ and produces $y \leq 65$. Then, student 2 determines the value of x by using $y = 65$ which is substituted into the equation $20x + 10y = 1,350$ and produces $x = 35$.

4. Ability to solve mathematical problem

Student 2 was less able to solve the problem by determining the maximum cash income per hour because student 2 was less careful in solving the final result of the problem that had been given.

c) Analysis of student work results 3

The work results of student 3 who has low mathematical abilities, the data analysis as follows:



Figure 3. Student Work Results

1. Ability to understand mathematical concepts and facts based on simple basic concepts

Student 3 writes what he knows first. Student 3 also gave an example of the process of solving the problem. Student 3 can be said to understand the mathematical concepts of the HOTS questions that have been given.

2. The ability to form logical relationships between dissimilar concepts and facts

Student 3 works on problems by making models that aim to define sentences and change them from story problems to mathematics.

3. Ability to relate one step to other known steps

Student 3 does this by operating on the mathematical model that has been created. Student 3 starts by eliminating the equation $20x + 10y = 5,000$ with the equation $x + y = 10,000$. and produces $y = 287$. Then, student 3 determines the value of x using $y = 287$ which is substituted into the equation $20x + 10y = 10,000$ and produces $x = 20$.

4. Ability to solve mathematical problem

Student 3 has not been able to understand the concept of the problem and has not been able to solve the problem by determining the maximum cash income per hour, because substituting the equation above is wrong (Rosida, & Pujiastuti, 2020).

From the data on the work of 10 students in class X MAN 1 Jember, it can be seen that the abilities of each student are different. After students complete the HOTS questions that have been given, data analysis is obtained that following each other's abilities as follows:

Table 1. Data on Student Ability Results in Solving HOTS Questions

No	Ability Category	The number of students
1	Hight	3
2	Middle	4
3	Low	3

Based on table 1, it can be concluded that more students have moderate mathematical abilities than students who have high and low mathematical abilities. The ability to solve problems can be said to be low because the learning carried out by teachers in the classroom is still passive or boring, students also lack understanding of the concept of the questions given and thoroughness also results in low students' ability to solve problems (Nisa, Viani, Rahmawati, Nurunnisa, & Salikah, 2020).

The creative thinking ability of grade X students in solving problems or HOTS problems given there are various ways to solve these problems according to the ability of each student. Therefore, we can find out what methods are used in solving problems.

In problem-based learning, students have high abilities in reading and analyzing existing problems. So that there is information or solutions that are known and needed to solve the problem. Furthermore, students have a high ability to research and identify the information needed to solve the given problem. Students choose various problem solutions and try to solve them to get the right conclusion from solving the problem they are working on. Likewise, students can also explain the reasons used in solving problems logically which are based on mathematical concepts, but many students still lack confidence in explaining the results of problem-based learning carried out to solve the given problem.

Students with medium and low abilities seem to lack understanding of the problem given. Students with a low ability to explain results or solve problems in a convoluted and incomplete manner. Students have not been able to explain any solutions given in the problem, if students are asked to explain the solution procedure, students give explanations that are difficult to

understand in solving the problem created. However, the researcher asked questions that led to the correct answer, but the students were still unable to understand the errors in the answers that had been made.

This research shows that students' mathematical critical thinking abilities in mathematics learning are not yet optimal, especially for students who have low abilities, therefore learning habits are needed to train thinking skills through various learning models such as RME (Farib, Ikhsan, & Subianto, 2019).

CONCLUSION

The learning method that has been used in this research in class X MAN 1 Jember is the RME. This RME method focuses more on the real world or everyday life. In this RME method, researchers give questions to students and then students answer them by relating them to the real world. In the next stage, the researcher explains the meaning of the questions and provides reviews or grids on how to solve the given HOTS questions.

From the results of this research, it is known that the number of students in the class is 10 students, In solving the HOTS questions given, there were 3 students with correct answers, 4 students with incorrect answers, and 3 students with incorrect answers.

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REFERENCES

- Agusta, E. S. (2020). Peningkatan kemampuan matematis siswa melalui pendekatan pendidikan matematika realistik. *ALGORITMA: Journal of Mathematics Education*, 2(2), 145–165. <https://doi.org/10.15408/ajme.v2i2.17819>.
- Aida, N., Kusaeri, K., & Hamdani, S. (2017). Karakteristik instrumen penilaian hasil belajar matematika ranah kognitif yang dikembangkan mengacu pada model PISA. *Suska Journal of Mathematics Education*, 3(2), 130. <https://doi.org/10.24014/sjme.v3i2.3897>.
- Amalia, N. (2020). *Sistem Persamaan Dua Variabel*.

- Anggraini, D., Testiana, G., & Wardani, A. K. (2020). Pembelajaran matematika materi SPLDV menggunakan model pembelajaran creative problem solving (CPS). *Suska Journal of Mathematics Education*, 6(2), 119-128. <http://dx.doi.org/10.24014/sjme.v6i2.9124>.
- Anggraeni, S., & Haerudin, H. (2022). Analisis kesulitan siswa pada materi spldv berdasarkan kemampuan pemecahan masalah matematis. *PHI: Jurnal Pendidikan Matematika*, 6(1), 148-153. <https://doi.org/10.33087/phi.v6i1.199>.
- Anugraheni, I., & Sartono, E. K. E. (2022). Analisis kemampuan berpikir kritis matematis berbasis realistik. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, 12(3), 244-249. <https://doi.org/10.24246/j.js.2022.v12.i3.p244-249>.
- Bey, A. (2017). Penerapan pembelajaran problem solving untuk meningkatkan aktivitas dan hasil belajar matematika pada materi SPLDV. *Jurnal Pendidikan Matematika*, 4(2), 224-239. <https://dx.doi.org/10.36709/jpm.v4i2.2035>.
- Farib, P. M., Ikhsan, M., & Subianto, M. (2019). Proses berpikir kritis matematis siswa sekolah menengah pertama melalui discovery learning. *Jurnal Riset Pendidikan Matematika*, 6(1), 99-117. <https://doi.org/10.21831/jrpm.v6i1.21396>.
- Indahsari, A. T., & Fitrianna, A. Y. (2019). Analisis kemampuan pemecahan masalah siswa kelas X dalam menyelesaikan SPLDV. *JPMI (Jurnal Pembelajaran Matematika Inovatif)*, 2(2), 77. <https://doi.org/10.22460/jpmi.v2i2.p77-86>.
- Nisa, A. K., Viani, A. O., Rahmawati, F., Nurunnisa, N., & Salikah, S. (2020). Analisis kemampuan pemecahan masalah siswa dalam soal spldv ditinjau dari motivasi belajar. *Edumaspul: Jurnal Pendidikan*, 4(2), 231-240. <https://doi.org/10.33487/edumaspul.v4i2.836>.
- Natalia, S. (2017). Realistic mathematics education: suatu langkah mendidik berpikir matematis. *Jurnal Dinamika Pendidikan*, 10(1), 81-96.
- Rosida, N., & Pujiastuti, H. (2020). Analisis pemahaman konsep sistem persamaan linear dua variabel. *Jurnal Analisa*, 6(2), 163-172.
- Nuryanti, F. E. (2022). Analisis proses berpikir matematis siswa pada sistem persamaan linear dua variabel. *SUBSET - Jurnal Pendidikan Matematika Dan Terapan*, 1(1), 30-39. Retrieved from <https://jurnal.updkediri.ac.id/index.php/subset/article/view/14>.

- Palinussa, A. L., & Tamalene, H. (2021). Perbedaan hasil belajar matematika materi spldv pada siswa SMP Di Kota Ambon. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, 10(2), 951. <https://doi.org/10.24127/ajpm.v10i2.3558>.
- Rahmawati, S. (2021). Analisis kemampuan pemecahan masalah spldv menggunakan indikator soemarmo. *Lentera Sriwijaya: Jurnal Ilmiah Pendidikan Matematika*, 3(2), 58-68. <https://doi.org/10.36706/jls.v3i2.13924>.
- Ramadhani, M. H., & Caswita. (2017). Pembelajaran realistic mathematic education terhadap kemampuan berpikir kreatif. *Seminar Nasional Matematika Dan Pendidikan Matematika2017UIN Raden Intan Lampung*, 265-272.
- Ryananda, S. (2017). *Pengembangan modul matematika realistik pada materi sistem persamaan linear dua variabel berbasis masalah pada siswa SMP* (Doctoral dissertation, Pendidikan Matematika-FKIP).
- Safithri, R., & Saputri, R. (2023). Pengembangan bahan ajar matematika berbasis problem based learning materi SPLDV kelas X SMA. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 7(1), 784-795. <https://doi.org/10.31004/cendekia.v7i1.1827>.
- Sapa'at, A. (2020). Pengembangan keterampilan berpikir matematis melalui pembelajaran matematika. *Jurnal Pendidikan Dompot Dhuafa*, 10(1), 15-19. Retrieved from <https://jurnal.pendidikandd.org/index.php/JPD/article/view/192>.
- Sari, W., Nasriadi, A., & Salmina, M. (2021). Analisis kemampuan berpikir matematis siswa menyelesaikan soal ujian akhir semester (Uas) pada tahun ajaran 2020 di SMAN 1 Teluk dalam Kabupaten Simeulue. *Jurnal Ilmiah Mahasiswa*, 2(1).
- Ramadani, P. S. (2019). Kemampuan berfikir kritis siswa menggunakan pendekatan pembelajaran realistic mathematic education (RME) pada materi SPLDV. *Jurnal PEKA (Pendidikan Matematika)*, 3(1), 18-22. <https://doi.org/10.37150/jp.v3i1.1130>.
- Simanullang, A. S., Ningsih, Y. L., & Sari, E. F. P. (2023). Analisis kemampuan berpikir kritis siswa pada materi sistem persamaan linear tiga variabel kelas X. *Laplace: Jurnal Pendidikan Matematika*, 6(1), 22-31. <https://doi.org/10.31537/laplace.v6i1.1131>.

Usman, M. R., Patalo, A. R. G., & Djadir, D. (2021). Analisis kemampuan komunikasi matematis siswa pada materi program linear. *Jurnal Edukasi dan Sains Matematika (JES-MAT)*, 7(2), 127-142. <https://doi.org/10.25134/jes-mat.v7i2.4331>.

Wulandari, S. P., Sujadi, I., & Aryuna, D. R. (2016). Profil pemecahan masalah SPLDV dengan langkah polya ditinjau dari kecerdasan logis matematis siswa. *PRISMA, Prosiding Seminar Nasional Matematika*, 1(1), 724-732.