M A T H L I N E
JURNAL MATEMATIKA DAN PENDIDIKAN MATEMATIKA

ISSN 2502-5872 (Print)
ISSN 2622-3627 (Elektronik)

Volume 9 Number 4, November 2024, 1235-1251

ANALYSIS OF CONTEXTUAL PROBLEM-SOLVING ABILITY OF THREE-VARIABLE LINEAR EQUATION SYSTEM MATERIAL GIVEN MATHEMATICAL DISPOSITION

Khoirina Ismiranda[1*], Adi Nurcahyo[2], Nida Sri Utami[3]
[1,2,3]Mathematic Education, Muhammadiyah Surakarta University, Central Java, Indonesia
*Correspondence: khoirina13ismiranda@gmail.com

ABSTRACT

This research aims to analyze students' difficulties related to mathematical dispositions and measure students' abilities in solving problems related to three-variable linear equation systems based on mathematical dispositions. Descriptive analysis methods are used in this qualitative research. All X-G students were given a mathematical disposition survey as part of the data collection process for this research. Three students were selected from each mathematical disposition category to take a test of their contextual problem-solving skills. Based on the results of the research, there were three groups of students in class X-G SMAN 1 TOROH, namely 3 students with high mathematics dispositions, 14 students with medium mathematics dispositions, and 16 students with low mathematics dispositions. Based on the analysis of answers and discussions, students with strong mathematical skills have excellent problem-solving skills because they meet three problem-solving indicators, namely making a problem-solving plan, implementing a problem-solving plan, and evaluating problems. Students have difficulty in the indicator of understanding problems because they are not used to writing what they know and what is asked. Students with a moderate mathematical disposition meet two indicators of problem-solving, namely creating and implementing a problem-solving plan, so they are in the moderate category in terms of problem-solving. Students with moderate mathematical dispositions also have difficulty writing the conclusion of the problem. Because students with low mathematical dispositions only fulfill one indicator, namely evaluating the problem, these students have problem-solving skills in the low category. In addition, students with low mathematical dispositions had difficulty in applying the formula.

Keywords: Contextual Problem-Solving Ability, Mathematical Disposition, System of Linear Equations in Three Variables.

How to Cite: Ismiranda, K., Nurcahyo, A., & Utami, N.S. (2024). Analysis of Contextual Problem Solving Ability of Three-Variable Linear Equation System Material Given Mathematical Disposition. *Mathline: Jurnal Matematika dan Pendidikan Matematika*, *9*(4), 1235-1251. http://doi.org/10.31943/mathline.v9i4.720

PRELIMINARY

Education today plays an important role in improving quality, especially in the field of mathematics. Therefore, students need to grow into creative and innovative students, as mathematics is useful in everyday life (Harahap & Hasanah, 2023). Therefore, mathematics must be studied at all levels of formal education, from primary school to senior high school. One of the mathematical concepts studied and used in everyday life is the three-variable linear system of equations (SPLTV). Systems of Linear Equations in

Three Variables (SPLTV) is typically taught in class X since it is a step up from SPLDV material that has been learned in junior high school (Cardo et al., 2020). Zakiyah et al (2019) emphasized that students who have a strong understanding of SPLDV will be more proficient in understanding SPLTV. Students see SPLTV information as challenging because it is presented in the form of intricate, challenging, and time-consuming story problems, even though the material is typically relevant to everyday life. One example is determining the cost price for a product where all costs are known but the unit price is not. Because of this assistance, students must be able to solve problems with the learning they receive, both consciously and unconsciously (Lathifaturrahmah et al., 2024).

Ruseffendi (Kurniawan & Kadarisma, 2020) defines problem-solving ability as the capacity that individuals have to solve new and complicated problems, usually in the form of non-routine problems, with the help of fundamental knowledge and mindsets that facilitate the problem-solving process. It entails the application of deep-thinking ideas, which encourage critical thinking while solving the problem. It also produces expected outcomes during the learning process. Sabandar and Ruseffendi emphasize problem-solving skills in learning (Aisyah et al., 2018). This is done because of the view that problem-solving skills are very significant for students who are learning mathematics and students who want to learn subjects related to everyday life (Pradana & Noer, 2023). This viewpoint defines "problem-solving ability" as the capacity to use critical thinking and in-depth analysis to the solution of novel and challenging challenges. Children must practice problem-solving daily (Maharani et al., 2019). Problem-solving skills are crucial in mathematics education for three reasons, according to Branca, cited in Hadi & Radiyatul (2014): (1) One of the primary objectives of mathematics education is problem-solving; (2) issue-solving serves as the foundation for problem-solving techniques, approaches, and curricula; and (3) problem solving is a critical skill for mathematics education. Problem-solving skills include the following, according to NCTM: determining known and questionable components; creating mathematical problems or making mathematical models; implementing plans to solve other problems (similar or new) in or outside mathematics; providing explanations of results based on the original problem; and using mathematics effectively (Isworo & Rejeki, 2023). According to Polya, students solve problems in four steps: understanding the problem, devising a plan, carrying out the plan, and looking back (Ramadhani et al., 2024). By considering these two perspectives, we can conclude that students can solve problems if they fulfill four conditions: they understand the problem, make a problem-solving strategy, complete the problem, and evaluate it.

Students are often given problem-solving tasks in the shape of contextualized stories, suggesting that the tasks are based on their own experiences (Borji et al., 2024). Mathematical problems that utilize contexts, such as real scenarios, phenomena, or events, that are related to the mathematical ideas being studied are referred to as contextual problems, according to Zulkardi and Ilma (Anggraeni et al., 2018). This is because students more easily apply what they learn when they study topics related to the real world than when they study abstract topics (Anggo, 2011). By using contextual problems, students can benefit. This is consistent with Ausubel's view, which contends that learning offers many benefits connected to contextual issues. These include: knowledge retained for a longer time due to meaningful learning; increased ability of students to recall similar events in the past; and learning will become more real and relevant (Zulqarnain & Fatmahanik, 2022). Students' problem-solving skills will be utilized to solve contextual problems.

Solving systems of three-variable linear equations from contextual situations relating to SPLTV material is the basic competency (KD). To answer issues involving the solution of systems of linear equations in three variables, students must possess problem-solving abilities. However, students often fail to solve mathematical problems. Ileh's research indicates that problem-solving abilities are still lacking in Class X IPS 3 SMAN 5 Kota Serang pupils (Azzahra & Pujiastuti, 2020). (1) Students have trouble understanding the three-variable linear equation system during the problem-solving stage; (2) They struggle to write problem-solving plans; (3) They make incorrect calculations and are unable to find the correct solution when using the problem-solving plan; and (4) They only substitute equations during the problem-solving stage. The study's conclusions indicate that pupils still have difficulty understanding mathematical puzzles. Students are not accustomed to applying the phases of problem-solving while they work through challenges. Their failure to solve mathematical problems will have an impact on the progress of their mathematical skills, which is very important for their progress. Problem-solving experience when not experiencing cognitive barriers will help in solving problems (Purnomo et al., 2022).

Students should have perspectives that support their mathematical abilities in problem-solving as part of the development of cognitive abilities (Walkington et al., 2022). One perspective that supports students' mathematical ability is the existence of mathematical dispositions. According to (Hendriana & Kadarisma, 2019), the affective domain affects student learning success. Soft skills, also known as dispositions, are critical elements that are essential to possess when trying to solve an issue. A person's attitude towards mathematics, shown by curiosity, perseverance, confidence, and a strong interest in mathematics, is called a mathematical disposition (Kurniawan & Kadarisma, 2020). Mathematical disposition also refers to students' positive attitude towards learning mathematics (Rivian & Hidayati, 2023). Disposition is defined as a tendency to behave regularly, voluntarily, and consciously to achieve certain goals, according to Katz. How students view and solve problems is related to their mathematical disposition. To scrutinize various problem-solving methods, one must be confident, diligent, passionate, and open (Aprilianti et al., 2022). Therefore, a mathematical disposition is students' positive behavior toward mathematics that shows curiosity, confidence, and responsibility toward mathematical problems. Mathematical dispositions include answering questions, communicating about mathematical concepts, working in groups, and solving problems. Students who are proficient in mathematics should have a positive disposition, which shows that they believe that mathematics has many benefits. Students' ability to solve problems affects the way they view learning maths (Code et al., 2016). Students become less motivated to complete math problems as a result. On the other hand, pupils who approach mathematics with positivity will become industrious, disciplined, and responsible learners and will be able to solve mathematical problems with optimal efficiency. Therefore, students' inclination toward math is related to their ability to solve math problems (Rezita & Rahmat, 2022).

Polking in Syaban (2009) list some indicators of mathematical disposition, such as doing mathematics tasks confidently and diligently, solving problems, utilizing mathematics to explain and communicate, being adaptable in research, looking for different ways of solving problems, and having a desire to use mathematics to improve life. NCTM (1999) states that the purpose of learning mathematics is to improve one's ability to conduct investigations, make hypotheses, make logical reasoning, solve problems, and make connections between mathematical concepts and other intellectual activities. NCTM (Syaban, 2009) describes this ability as a process of mathematical power. The mathematics curriculum does not include the term "mathematical power" specifically. However, the term "mathematical power" indirectly refers to the four main objectives of mathematics education: 1) understand mathematical concepts, explain their relationships, and apply concepts flexibly, accurately, efficiently, and appropriately to solve problems; 2) apply patterns and properties to reasoning, perform mathematical operations to conclude, gather data, or clarify mathematical concepts and statements; and 3) solve problems. Both viewpoints state that if a learner fulfills the following seven requirements, they have a mathematical disposition: 1) self-confidence; 2) mathematical flexibility; 3) tenacity and perseverance in completing tasks; 4) mathematical curiosity; 5) introspection; 6) appreciation of mathematical applications; and 7) recognition of the importance of mathematics and mathematical viewpoints.

There are many previous studies related to the topic of this research, so the following will describe several things that include existing and non-existing findings in previous studies. Among them are 1) research conducted by (Akhyar & Senjayawati, 2023) with the title "Analysis of Mathematics Problem Solving Ability of Vocational Students on SPLTV Material Based on Gender”. The outcomes of problem-solving indicators and problem-solving skills according to gender are covered in this study. The results of this study show that understanding the problem is the indicator with the highest percentage while reexamining the technique and addressing the problem, which is the third indicator, are the indicators with the lowest percentage. Additionally, female students are more adept at solving problems than male pupils. 2) research conducted by (Hajar & Sari, 2018) with the title "Analysis of Problem-Solving Ability of Vocational Students because of Mathematical Disposition". This study shows that the location of student difficulties in each category of disposition is almost in every indicator of problem-solving this is due to several factors that cause it. 3) research conducted by (Aprilianti et al, 2022)with the title "Mathematical Problem Solving Ability Given Mathematical Disposition of Class VIII Students of SMPN 24 Mataram on Straight Line Equation Material for the 2021/2022 Academic Year”. This study shows that students who have a high mathematical disposition can solve problems extremely well, students who have a medium mathematical disposition can solve problems moderately, and students who have a low mathematical disposition can solve problems very poorly or poorly.

Similar to this study which analyses and describes problem-solving skills and analyses students' difficulties in solving SPLTV problems. However, the difference between the three studies above and this study is that the process of analyzing problem-solving ability is based on student difficulties in each category of mathematical disposition for each problem. Then students describe the problem-solving ability in each category of mathematical disposition according to the reference, namely "High", "Medium", and "Low" and describe the overall problem-solving ability. In addition, the problems given are based on contextual problems which are more relevant to everyday life situations. With this, it is expected that students are proficient in solving problems. Therefore, the purpose of this study is to analyze students' difficulties based on their mathematical disposition and measure their problem-solving skills.

METHODS

This qualitative study uses descriptive analysis. Descriptive analysis, according to Marlina and Danica (Hajar & Sari, 2018), is used to examine and organize the data collected to improve understanding of the facts and relationships between the events under study. This research was conducted in class X-G of SMA N 1 Toroh. Nine students were selected for the study, with three from each mathematical disposition category (Pathuddin et al., 2024). To gather data for this study, a three-variable linear equation system contextual problem-solving skill exam and a mathematical disposition questionnaire are used. The modifications made to Wahyuni (2015) served as the basis for this mathematical disposition questionnaire. Four description questions on a written exam were also used to assess problem-solving skills. The instrument was initially validated by qualified validators before being put to use.

A mathematical disposition questionnaire with four response options—strongly agree (SS), agree (S), disagree (TS), and strongly disagree (STS)—was distributed to each student in class X-G for this investigation. According to the results of the questionnaire that students receive and complete, it is possible to categorize them as having a medium, high, or low mathematical inclination Herutomo & Masrianingsih (2019). The average mathematical disposition (x) and standard deviation (SD) must be determined before each student's mathematical disposition may be categorized. Then determine the interval using the guidelines in Table 1 as follows:

Table 1. Mathematical Disposition Level Criteria

Interval	Score	Category of Mathematical Disposition
$N \geq (\bar{x} + SD)$	$N \geq 33$	High
$(\bar{x} - SD) < N < (\bar{x} + SD)$	$20 < N < 33$	Medium
$N \leq (\bar{x} - SD)$	$N \leq 20$	Low

Three students from different categories of mathematical dispositions were selected to test their abilities in contextual problem-solving. The contextual problem-solving ability test is conducted offline to explain individual problem-solving skills. The indicators are adapted from the indicators according to NCTM and Polya (Hadi & Radiyatul, 2014). The student's ability to understand problems, create problem-solving plans, solve problems, and evaluate them is the problem-solving indicator used. Table 2 shows how to classify contextual problem-solving abilities based on scores (Azzahra & Pujiastuti, 2020).

Table 2. Category of Problem-Solving Ability

Value interval	Category of Problem-Solving Ability
$Score \leq 25$	Low
$25 < Score < 36$	Medium
$Score \geq 36$	High

Three steps make up the data analysis employed, which is based on the Miles and Huberman Model: data reduction, data presentation, and conclusion drawing (Pangesti & Soro, 2021). Based on their mathematical disposition, pupils were categorized into three groups during the data reduction stage: high, medium, and low. Next, depending on their mathematical disposition, pupils can address difficulties as discussed during the data presentation stage. In the last phase, judgments were drawn from the data analysis findings.

RESULT AND DISCUSSION

As shown by the results of the mathematical disposition questionnaire given to students in class X-G, 33 out of 35 students completed the questionnaire, which is presented in Table 3 below:

Table 3. Mathematical Disposition Data

Mathematical Disposition Category	Number of Students
High	3
Medium	14
Low	16

Three of the thirty-three students who took the test fell into the high math disposition category, fourteen into the moderate math disposition category, and sixteen into the low math disposition category, as can be seen in the above table. In addition, nine kids who scored highly, moderately, and poorly on the math disposition test were chosen to take the problem-solving ability exam; the outcomes are displayed in Table 4:

Table 4. Problem-solving Ability Data based on Mathematical

No.	Student Code	Mathematical Disposition Category	Contextual Problem-solving Ability Score	Category of Problem-solving Ability
1.	HMZ	High	56	High
2.	AS	High	52	High
3.	AFR	High	39	High
4.	DHA	Medium	33	Medium
5.	NHM	Medium	33	Medium
6.	MH	Medium	36	Medium

7.	RA	Low	17	Low
8.	RHV	Low	10	Low
9.	NAA	Low	10	Low

Below we will describe the results of the research and discussion of nine students who were selected based on a mathematical problem-solving ability test with the following question format.

Question 1: A printing house has three machines A, B, and C that are used to print invitations. If all three machines are working, it will produce 222 invitations per day. If machines A and B work, but machine C does not, it produces 159 invitations per day. If machines B and C are working, but machine A is not, it will produce 147 invitations per day. How many invitations will be produced if machine B works twice as much as machines A and C?

Question 2: Hery, Arif, and Rifki collect capital to build a mini market. The ratio of Hery and Arif's capital is 2:3. The total capital of Hery and Rifki is IDR 270,000,000. If twice the capital from Arif plus the capital from Rifki equals IDR350,000,000. Who gave more capital?

Question 3: A shop owner borrowed IDR 2,250,000,000.00 from three banks to expand his shop. The three banks provide loans with interest rates of 5%, 6%, and 7%. If the annual interest payable by the customer is IDR 130,000,000.00 and the amount of money the customer borrows at 5% interest is equal to twice the amount of money the customer borrows at 7% interest. Which of the three banks has the lesser loan?

Question 4: Mrs Yanti bought 5 kg of eggs, 2 kg of meat, and 1 kg of prawns for IDR 305,000. Mrs Eka bought 3 kg of eggs and 1 kg of meat for Rp 131,000. Mrs Putu bought 3 kg of meat and 2 kg of shrimp for IDR 360,000. If Mrs Aniza buys 3 kg of eggs, 1 kg of meat, and 2 kg of shrimp, how much should she pay?

1. **Results of analysis of contextual problem-solving abilities with high-category mathematical disposition**

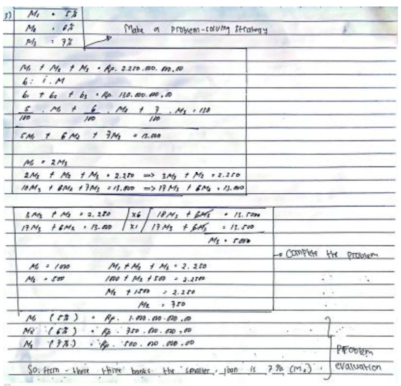

Figure 1. Results of high mathematical disposition students' answers

It can be seen in Figure 1 the results of the work of students who have high category mathematical disposition. Where in these samples, students can work on the problem as a whole and can answer the questions correctly. From the indicators contained in the problem-solving ability, the first indicator is understanding the problem. There are still many students who do not understand the problem well, and it can be seen in Figure 1 that students do not write what is known and what is asked in the problem. Then in the second indicator, namely making a problem-solving plan, the student has made a problem-solving plan well, this is evidenced by the student being able to make mathematical models and equations from the problem correctly. Then the third indicator is implementing the problem-solving plan, the student can solve the problems in the problem in the right way and the results and the student can perform the calculation operation correctly to get the final result. The last indicator is evaluating the problem, the student re-examines the entire process and the results of his work so that the student can get the right answer according to the question asked and can conclude.

Based on the results of the analysis, it can be concluded that students with high mathematical dispositions fulfill 3 out of 4 indicators of problem-solving, namely being able to make plans, implement plans, and evaluate problems. The three students from high mathematical disposition made mistakes in understanding the problem, namely writing what is known and what is asked. This is because students are not used to writing down what is known and asked. This habit is in line with the results of previous research by (Nurussafa'at et al., 2016) which states that language errors made by field-dependent (FD) type students are assuming that writing what is known is not very important because it is clear what is asked in the problem.

Several errors can occur in students with a high-category mathematical disposition that make these students not fulfill all problem-solving indicators, namely, students experience errors in calculation operations when implementing problem-solving plans in problem number 1. This is evidenced in Figure 2 below, it can be seen that when substituting c = 63 and a = 159-b it should be to the equation b + c = 147 not to b = 222-a-c because later the results obtained become b = 222-159 + b-63 or 0 = 222-159-63 or 0 = 0.

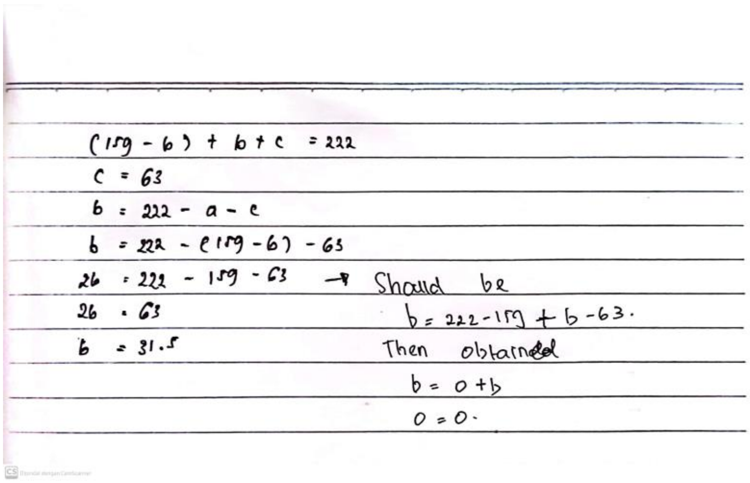

Figure 2. Student error in question number 1

2. **Results of analysis of contextual problem-solving abilities with mathematical disposition in the medium category**

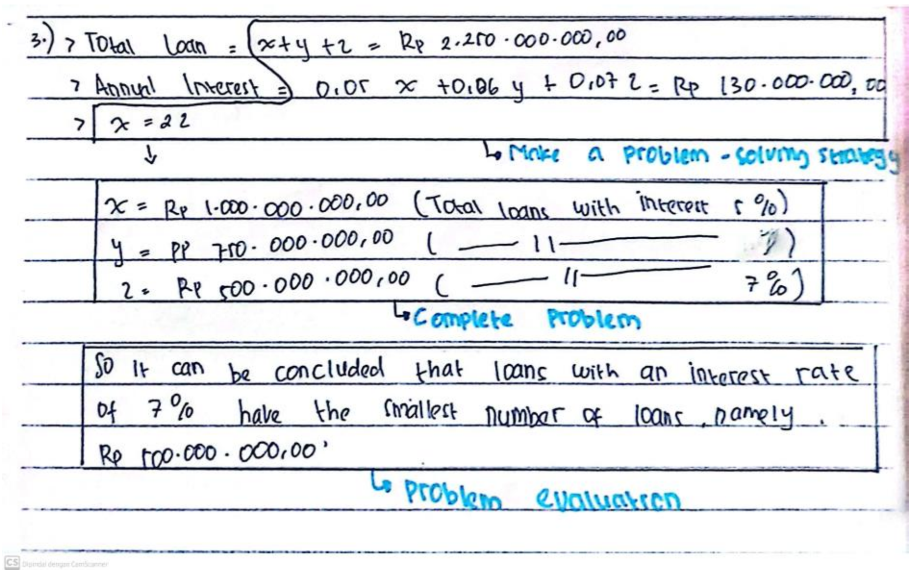

Figure 3. Results of medium mathematical disposition students' answers

Figure 3 shows the answers of students with a moderate mathematical disposition category. The first indicator, understanding the problem, indicates that students have not understood the problem well because they have not written what they know about the problem and the question. The second indicator, creating a problem-solving plan, indicates that students have created a good problem-solving plan, which is evidenced by their ability to create mathematical models and equations for the problem. The third indicator, implementing a problem-solving plan, shows that students can perform calculation operations correctly and solve problems in the right way and with the right results. The last indicator, problem evaluation, shows that students do not double-check the entire process and the results of their work, which causes them not to get the right answers as needed.

Based on the results of the analysis, it can be concluded that students with a moderate mathematical disposition meet two of the four criteria of problem-solving ability: creating strategies and applying them. The most common mistake students make occurs when they evaluate the problem; they do not double-check and do not make conclusions about the problem. This is in line with research (Aprilianti et al., 2022), which found that students with moderate mathematical ability have not been able to recheck answers. This is due to a lack of attention and thoroughness, as well as a lack of understanding of proof or not knowing how to check the answer. Previous studies on problem-solving abilities (Usman et al., 2022) are in line with the problems students face. The indicator of evaluating problems rarely comes up because most students ignore this command and feel enough to get their final result without reconsidering their results.

Some of the errors that can occur in students with moderate mathematical dispositions are that students experience errors in calculation operations when implementing problem-solving plans in problem number 1. Figure 4 below shows that the student modeled the mathematics of the question by saying machine B=2x, which means that the number of machines A became twice the number of machines B. There should have been an additional variable used to model machine B. Therefore, if you mis-model the problem, you will also get the answer wrong.

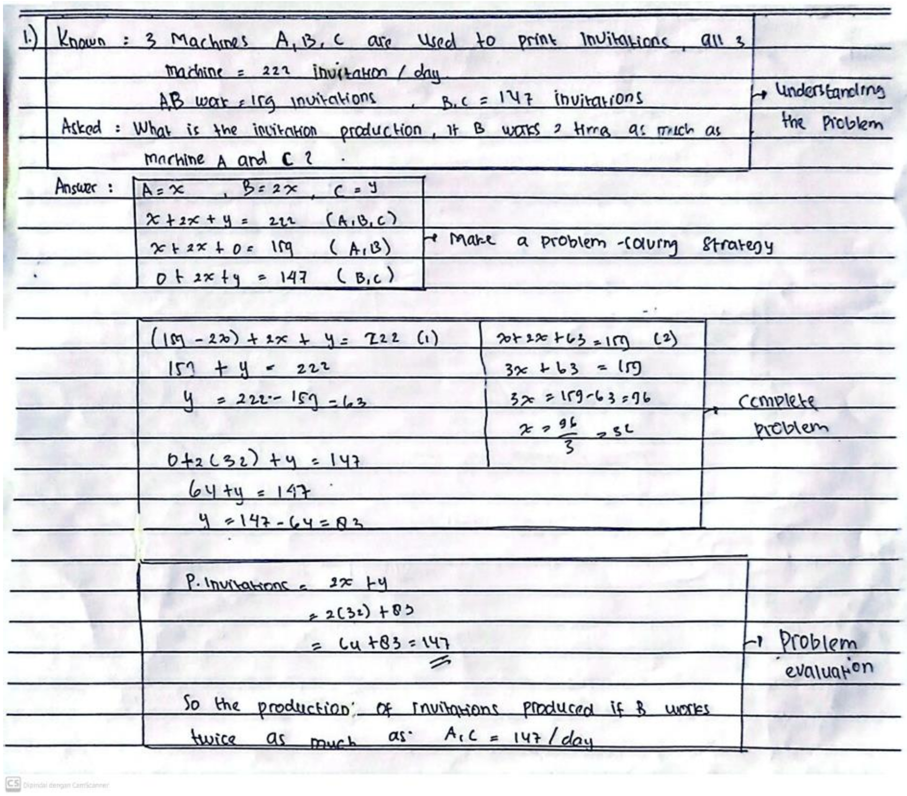
1.) Known : 3 Machines A, B, C are used to print invitations, all 3 machine = 222 invitation / day
AB work = 159 invitations , B, C = 147 invitations
Asked : What is the invitation production, if B works 2 times as much as machine A and C ?
→ Understanding the Problem
Answer : A = x , B = 2x , C = y
x + 2x + y = 222 (A, B, C)
x + 2x + 0 = 159 (A, B)
0 + 2x + y = 147 (B, C)
→ Make a problem-solving strategy
(159 − 2x) + 2x + y = 222 (1)
159 + y = 222
y = 222 − 159 = 63
x + 2x + 63 = 159 (2)
3x + 63 = 159
3x = 159 − 63 = 96
x = 96/3 = 32
0 + 2(32) + y = 147
64 + y = 147
y = 147 − 64 = 83
→ complete problem
P. invitations = 2x + y
= 2(32) + 83
= 64 + 83 = 147
→ Problem evaluation
So the production of invitations produced if B works twice as much as A, C = 147 / day

Figure 4. Student errors on the indicator of making a problem-solving plan

3. **Results of analysis of contextual problem-solving abilities with low category mathematical disposition**

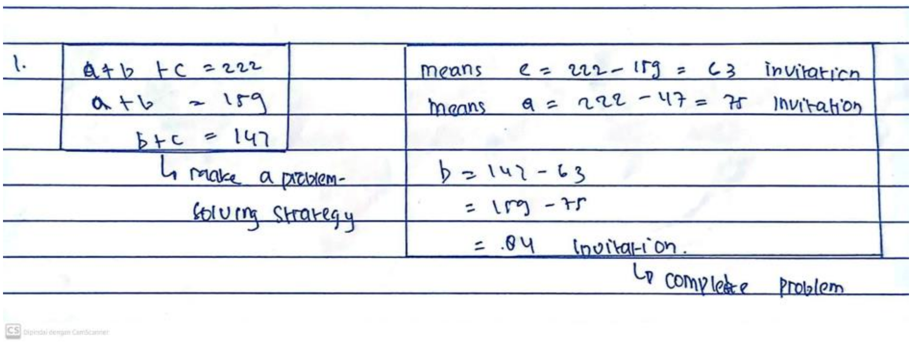
1. a + b + c = 222
a + b = 159
b + c = 147
↳ make a problem-solving strategy
means c = 222 − 159 = 63 invitation
means a = 222 − 147 = 75 invitation
b = 147 − 63
= 159 − 75
= 84 invitation.
↳ complete problem

Figure 5. Results of low mathematical disposition students' answers

The work of pupils with low-category mathematical tendencies is displayed in Figure 5. Students are limited to writing the problem's final result and drawing conclusions from it; they are unable to write down what they already know or are asked to write; they correctly write the equation but fail to identify the variables; and they fail to provide a detailed explanation of the sources of their results.

Based on the results of the above analysis, it can be concluded that students with low mathematical disposition meet one of four criteria of problem-solving ability: ability to evaluate problems. The three additional criteria are understanding the problem, creating a problem-solving plan, and implementing the plan. A study

(Pratama, 2021) found that students failed to solve maths problems correctly; they failed to write down the information in the problem; they faced difficulties inputting data into the formula; and they could not write down the right steps to solve the problem. This could be caused by a lack of attention during the learning process, dislike of mathematics, calculation difficulties, and difficulty applying the formula. According to research (Kudsiyah et al., 2017), fifteen factors influence a person's ability to solve mathematical problems: learning difficulty, mastery of the material, context of the problem, understanding, thinking long, previous experience, formulas, and attitude (like or dislike).

There are four indicators of problem-solving carried out in solving contextual problems by the subject. Of the four indicators, there is only one indicator that can be achieved by students with low mathematical dispositions. Students with high mathematical disposition fulfilled three indicators which include making a problem-solving plan, carrying out problem-solving, and evaluating the problem. This study shows that the mathematical disposition possessed by students greatly affects the problem-solving ability of the subject, so in teaching and learning activities teachers should apply fun learning methods to make students active and interested in learning mathematics. In addition, teachers must also be able to change the paradigm of students who view mathematics as a difficult and scary lesson. Based on this description, this research can be used as a reference for teachers to create a good learning atmosphere to improve students' mathematical disposition and problem-solving skills. The limitation in this study lies in the implementation time. The limited implementation time is due to the time available for data collection being quite long because it adjusts the students' schedule.

CONCLUSION

Based on the analysis of answers and discussions, this study found that students with strong mathematical skills have excellent problem-solving skills because they meet three problem-solving indicators, namely making a problem-solving plan, implementing a problem-solving plan, and evaluating problems. Students have difficulty in the indicator of understanding problems because they are not used to writing what they know and what is asked. Students with a moderate mathematical disposition meet two indicators of problem-solving, namely creating and implementing a problem-solving plan, so they are in the moderate category in terms of problem-solving. Students with moderate mathematical dispositions also have difficulty writing the conclusion of the problem. Because students with low mathematical dispositions only fulfill one indicator, namely evaluating the problem, these students have problem-solving skills in the low category. In addition, students with low mathematical dispositions had difficulty in applying the formula.

REFERENCES

Aisyah, P. N., Nurani, N., Akbar, P., & Yuliani, A. (2018). Analisis Hubungan Kemampuan Pemecahan Masalah Matematis Dan Self Confidence Siswa Smp. *Journal on Education*, *1*(1), 58–65. https://www.jonedu.org/index.php/joe/article/view/11

Akhyar, I. W., & Senjayawati, E. (2023). Analisis Kemampuan Pemecahan Masalah Matematis Siswa Madrasah Aliyah pada Materi SPLTV. *JPMI : Jurnal Pembelajaran Matematika Inovatif*, *6*(4), 1483–1492. https://doi.org/DOI 10.22460/jpmi.v6i4.18068

Anggo, M. (2011). Pemecahan Masalah Matematika Kontekstual untuk Meningkatkan Kemampuan Metakognisi Siswa. *Edumatika*, *1*(2), 35–42. https://online-journal.unja.ac.id/index.php/edumatica/article/view/182

Anggraeni, R., Herdiman, I., Ikip,), & Bandung, S. (2018). Kemampuan Pemecahan Masalah Matematik Siswa Smp Pada Materi Lingkaran Berbentuk Soal Kontekstual Ditinjau Dari Gender. *Numeracy*, *5*(1), 19–28. https://ejournal.bbg.ac.id/numeracy/article/view/293

Aprilianti, A., Sripatmi, S., Salsabila, N. H., & Kurniati, N. (2022). Kemampuan Pemecahan Masalah Matematika Ditinjau dari Disposisi Matematis Siswa Kelas VIII SMPN 24 Mataram Pada Materi Persamaan Garis Lurus Tahun Ajaran 2021/2022. *Jurnal Ilmiah Profesi Pendidikan*, *7*(3b), 1593–1599. https://doi.org/10.29303/jipp.v7i3b.820

Azzahra, R. H., & Pujiastuti, H. (2020). Analisis Kemampuan Pemecahan Masalah Siswa Pada Materi Sistem Persamaan Linear Tiga Variabel. *Transformasi : Jurnal Pendidikan Matematika Dan Matematika*, *4*(1), 153–162. https://doi.org/10.36526/tr.v4i1.876

Borji, V., Surynková, P., Kuper, E., & Robová, J. (2024). Using contextual problems to develop preservice mathematics teachers' understanding of exponential and logarithmic concepts. *International Journal of Mathematical Education in Science and Technology*, 1–31. https://doi.org/10.1080/0020739X.2024.2309284

Cardo, D., Napisah, D., Wungo, D. D., Utama, G. D., & Ambarawati, M. (2020). Analisis Kesulitan Siswa dalam Mempelajari Sistem Persamaan Linear Tiga Variabel. *Laplace : Jurnal Pendidikan Matematika*, *3*(1), 27–42. https://doi.org/10.31537/laplace.v3i1.311

Code, W., Merchant, S., Maciejewski, W., Thomas, M., & Lo, J. (2016). The Mathematics Attitudes and Perceptions Survey: an instrument to assess expert-like views and dispositions among undergraduate mathematics students. *International Journal of Mathematical Education in Science and Technology*, *47*(6), 917–937. https://doi.org/10.1080/0020739X.2015.1133854

Hadi, S., & Radiyatul, R. (2014). Metode Pemecahan Masalah Menurut Polya untuk Mengembangkan Kemampuan Siswa dalam Pemecahan Masalah Matematis di Sekolah Menengah Pertama. *EDU-MAT: Jurnal Pendidikan Matematika*, *2*(1), 53–61. https://doi.org/10.20527/edumat.v2i1.603

Hajar, Y., & Sari, V. T. A. S. (2018). Analisis Kemampuan Pemecahan Masalah Siswa Ditinjau Dari Disposisi Matematis. *Inspiramatika: Jurnal Inovasi Pendidikan Dan Pembelajaran Matematika*, *4*(2), 120–131. https://doi.org/10.46918/equals.v5i2.1388

Harahap, A., & Hasanah, R. U. (2023). The Analysis of The Problem-Solving Ability of The Ethnomathematics Nuanced Plane Figure In The Sipirok Woven Fabrics Pattern To MTs Students. *Mathline : Jurnal Matematika Dan Pendidikan Matematika*, *8*(3), 1133–1148. https://doi.org/10.31943/mathline.v8i3.495

Hendriana, H., & Kadarisma, G. (2019). Self-Efficacy dan Kemampuan Komunikasi Matematis Siswa SMP. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *3*(1), 153. https://doi.org/10.33603/jnpm.v3i1.2033

Herutomo, R. A., & Masrianingsih, M. (2019). Creative problem-solving model learning to support higher-order thinking skills based on the level of mathematical disposition. *Jurnal Riset Pendidikan Matematika*, *6*(2), 188–199. https://doi.org/10.21831/jrpm.v6i2.26352

Isworo, D., & Rejeki, S. (2023). Analysis of the problem-solving ability of grade X vocational high school students with pharmacy majors in solving matrix problems. *AIP Conference Proceedings*, *2727*(1), 20001. https://doi.org/10.1063/5.0141689

Kudsiyah, S. M., Novarina, E., & Lukman, H. S. (2017). Faktor - Faktor Yang Mempengaruhi Kemampuan Pemecahan Masalah Matematika Kelas X Di SMA Negeri 2 Kota Sukabumi. *Seminar Nasional Pendidikan 2017*, 110–117.

Kurniawan, A., & Kadarisma, G. (2020). Pengaruh Disposisi Matematis Terhadap Kemampuan Pemecahan Masalah Matematis Siswa. *JPMI: Jurnal Pembelajaran Matematika Inovatif*, *3*(2), 99–108. https://doi.org/10.30822/asimtot.v1i1.97

Lathifaturrahmah, L., Nusantara, T., Subanji, S., & Muksar, M. (2024). Analysis of mathematics students' problem-solving skills in making prediction mathematical representations. *AIP Conference Proceedings*, *3049*(1), 30010. https://doi.org/10.1063/5.0195480

Maharani, S., Kholid, M. N., Pradana, L. N., & Nusantara, T. (2019). Problem Solving in the Context of. *Infinity: Journal of Mathematics Education*, *8*(2), 109–116. https://doi.org/https://doi.org/10.22460/infinity.v8i2.p109-116

Nurussafa'at, F. A., Sujadi, I., & Riyadi. (2016). Analisis Kesalahan Siswa Dalam Menyelesaikan Soal Cerita Pada Materi Volume Prisma Dengan Fong'S Shcematic Model for Error Analysis Ditinjau Dari Gaya Kognitif Siswa (Studi Kasus Siswa Kelas Viii Semester Ii Smp It Ibnu Abbas Klaten Tahun Ajaran 2013/2014. *Jurnal Elektronik Pembelajaran Matematika*, *4*(2), 174–187. http://jurnal.fkip.uns.ac.id

Pathuddin, Hamidah, D., Panggalo, S., Hakim, Z. A., Suwardin, M., Bakri, & Awuy, E. (2024). Students' Polya problem-solving skills on a system of linear equations with two variables based on mathematical ability. *AIP Conference Proceedings*, *3046*(1), 20018. https://doi.org/10.1063/5.0194577

Pradana, K. C., & Noer, S. H. (2023). Critical Thinking and Mathematical Problem Solving Skills of Students Through Schoology-Assisted Blended Learning Models. *Mathline : Jurnal Matematika Dan Pendidikan Matematika*, *8*(3), 827–844. https://doi.org/10.31943/mathline.v8i3.455

Pratama, D. O. (2021). *Analisis Kemampuan Pemecahan Masalah Dan Disposisi Matematis Kelas VIII SMP Negeri 01 Seluma* (Vol. 21, Issue 1) [Institut Agama Islam Negeri Bengkulu]. https://doi.org/10.1016/j.solener.2019.02.027%0Ahttps://www.golder.com/insights/block-caving-a-viable-alternative/%0A???

Purnomo, E. A., Sukestiyarno, Y. L., Junaedi, I., & Agoestanto, A. (2022). Analysis of Problem Solving Process on HOTS Test for Integral Calculus. *Mathematics Teaching-Research Journal*, *14*(1), 199–214.

Ramadhani, S., Nurcahyo, A., Kasman, N., Hardianti, & Ahmad, J. (2024). Analysis of problem-solving skills with Polya's steps in solving numeracy problems in class VIII junior high school in terms of gender differences. *AIP Conference Proceedings*, *2926*(1), 20045. https://doi.org/10.1063/5.0183389

Rezita, R., & Rahmat, T. (2022). Hubungan Disposisi Matematis dengan Kemampuan Pemecahan Masalah pada Mata Pelajaran Matematika. *Lattice Journal : Journal of Mathematics Education and Applied*, *2*(1), 79. https://doi.org/10.30983/lattice.v2i1.5062

Rivian, D. E., & Hidayati, N. (2023). *Analisis Disposisi Matematis Siswa Pada Pembelajaran Matematika Materi Persamaan Linear Tiga Variabel RADIAN Journal : Research and Review*. *2*(2), 66–75. https://doi.org/10.35706/rjrrme.v2i2.8836

Syaban, M. (2009). Menumbuhkembangkan Daya dan Disposisi Matematis Siswa Sekolah Menengah Atas Melalui Pembelajaran Investigasi. *Jurnal Pendidikan*, *3*(2), 129–136.

Usman, P. M., Tintis, I., & Nihayah, E. F. K. (2022). Analisis Kemampuan Pemecahan Masalah Matematika Siswa dalam Menyelesaikan Sistem Persamaan Linear Tiga Variabel. *Jurnal Basicedu*, *6*(1), 664–674. https://doi.org/10.31004/basicedu.v6i1.1990

Walkington, C., Bernacki, M., Wang, M., Istas, B., & Greene, M. (2022). Posing mathematics problems about STEM careers: problem quality, scaffolds, and problem-solving. *International Journal of Mathematical Education in Science and Technology*, *14*(4), 265–287. https://doi.org/10.1080/0020739X.2022.2128458

Zakiyah, S., Hidayat, W., & Setiawan, W. (2019). Analisis Kemampuan Pemecahan Masalah dan Respon Peralihan Matematik dari SMP ke SMA pada Materi SPLTV. *Mosharafa: Jurnal Pendidikan Matematika*, *8*(2), 227–238. https://doi.org/10.31980/mosharafa.v8i2.437

Zulqarnain, M., & Fatmahanik, U. (2022). Identifikasi Kemampuan Pemecahan Masalah Kontekstual Ditinjau dari Gaya Belajar Siswa. *Jurnal Tadris IPA Indonesia*, *2*(3), 293–304. https://doi.org/10.21154/jtii.v2i3.1172