JURNAL
Pendidikan, Sains, Sosial dan Agama
SEKOLAH TINGGI AGAMA BUDDHA NEGERI RADEN WIJAYA WONOGIRI

Analysis Of Students' Mathematical Communication Ability And Problem-Solving Ability On The System Of Linear Equations With Two Variables (SPLDV) In Grade VIII

Christin Geovani Purba[1], Samuel Juliardi Sinaga[2], Tutiarny Naibaho[3]
Pendidikan Matematika, Fakultas Keguruan Dan Ilmu Pendidikan, Universitas HKBP Nommensen Medan, Indonesia
Email: christingeovani.purba@student.uhn.ac.id

Article History:
Accepted: 17 March 2025 ***Revised: 12 June 2025*** ***Diterbitkan: 11 February 2026***

Abstrak

This study aims to analyze students' mathematical communication skills and problem-solving abilities on the topic of Systems of Linear Equations in Two Variables (SPLDV) in Grade VIII of SMP Swasta HKBP Sidorame in the Academic Year 2025/2026. The background of this research is the low level of students' skills in communicating mathematical ideas and in solving problems related to real-life situations.This research is a descriptive qualitative study with 14 eighth-grade students as the subjects. The instruments used consisted of an essay test on mathematical communication skills, a problem-solving test, and interviews. The data were analyzed through validity testing, reliability testing, difficulty level, and discriminating power, and then presented descriptively based on the established indicators.The results of the study indicate that students' mathematical communication skills fall into the medium category, with 14.29% of students in the high category, 57.14% in the medium category, and 28.57% in the low category. In terms of problem-solving skills, 21.43% of students were in the high category, 64.29% in the medium category, and 14.28% in the low category. Students were relatively able to express mathematical ideas in both visual and written forms and to develop a solution plan, but they still experienced difficulties in interpreting ideas and reviewing their answers. The study concludes that students' mathematical communication and problem-solving skills are in the medium category, thus more varied learning strategies are needed to improve these two abilities.

Kata kunci: *Mathematical Communication, Problem-Solving, Spldv, Junior Highschool, Mathematics Learning*

INTRODUCTION

According to Sinaga (Retnowati & Ekayanti, 2020) , mathematics serves as a tool to improve thinking and is crucial for everyday life and the development of science and technology. According to Marliani (Nugraha & Pujiastuti, 2019), mathematics is a symbolic language system that has meaning that is understandable and easily comprehended by every individual. Mathematics is a crucial element in educational institutions. Mathematics can be viewed as a language system. Mathematics learning is a process of interaction between learning elements to improve students' communication skills and problem-solving

abilities. Mathematics learning can support students in building mathematical concepts through their own abilities.

Based on the Regulation of the Minister of National Education No. 22 of 2006, one of the objectives of mathematics learning in the fourth point is for students to be able to communicate ideas with symbols, tables, diagrams, or other tools to explain situations or problems. From the fourth point, it appears that one of the skills that students need to have is the ability to communicate mathematically. Through mathematics learning, students are expected to be able to express ideas with symbols, tables, diagrams, or other media to explain situations or problems, because in mathematics learning, for example, such as compiling a problem into a mathematical model in the form of diagrams, mathematical equations, graphs, or tables.

In mathematics learning, various materials are presented to students, one of which is systems of linear equations in two variables (SLS). Systems of Linear Equations in Two Variables (SLS) is a part of mathematics that presents problems according to existing conditions, namely issues related to everyday activities. In accordance with the topic of systems of linear equations in two variables (SLS) and related to the mathematical communication skills of students with an impulsive cognitive style, it is very appropriate. Because the material on systems of linear equations in two variables (SLS) contains problems relevant to everyday life, mathematical communication skills are essential to transform these problems into simpler ones so they are easier to understand and solve (Ismayanti & Sofyan, 2021) .

However, in reality, students' mathematical communication skills are still lacking. Preliminary pre-research observations conducted by researchers with mathematics teachers at HKBP Sidorame Private Middle School in Medan indicated that several students had low or deficient abilities in mathematics, including their mathematical communication skills. A number of students had low mathematical communication skills, particularly in the topic of systems of linear equations in two variables (SPLDV).

Communication can generally be defined as a method for conveying messages from a sender to a recipient, conveying information, opinions, or behavior, either directly or indirectly through media. One type of mathematical communication is the activity of understanding mathematics. Understanding mathematics plays a crucial role in the mathematics learning process because it encourages students to learn in a more meaningful way. Classroom interactions occur between teachers and students, with messages being conveyed either verbally or in writing (Annisa & Siswanto, 2021) .

According to Baroody Bina et al. (Maudi, 2016) , there are two main reasons why it is important to develop communication in mathematics among students. First, mathematics as language, meaning that mathematics not only functions as a tool for thinking, finding patterns, solving problems, or drawing conclusions, but also as a means to express various ideas clearly, precisely, and accurately. Second, mathematics learning as a social activity, meaning that as a social activity in mathematics education, mathematics also functions as a medium for interaction between students and communication between teachers and

students. The communication skills that students need to have in learning mathematics are the ability to communicate mathematics.

According to Lestari et al. (Br et al., 2022), mathematical communication skills are the ability to express mathematical ideas/concepts, both verbally and in writing, as well as the ability to understand and appreciate the mathematical ideas of others carefully, analytically, critically, and evaluatively in order to deepen understanding. Mathematical communication skills are skills that students must master in the learning process. Students can convey their ideas to teachers and to classmates through interaction. Every educator needs to pay attention to students' mathematical communication skills. Students can deepen their mathematical understanding by expressing ideas to others, one of the important basic skills that students must have is fundamental mathematical communication.

According to Nashihah (2020) , students' lack of mathematical communication skills is caused by teachers frequently demonstrating how to solve problems, teachers directly explaining mathematical material during teaching, and students learning by listening and watching teachers solve math problems. To address these issues, learning methods are needed that can increase student engagement.

The results of preliminary pre-research observations by researchers and mathematics teachers at HKBP Sidorame Private Middle School in Medan showed that several students still faced difficulties in solving problems related to the topic of systems of linear equations in two variables (SPLDV). Students showed difficulty in understanding the problems, developing appropriate strategies, and their problem-solving skills were still considered low.

Based on the results of the TIMSS (Trends in International Mathematics and Science Study) study in 2015, it showed that the average score obtained by Indonesia was 397 and was ranked 44th out of 49 participating countries, while the average standard score set by TIMSS was 500. The results of the TIMSS (Trends in International Mathematics and Science Study) research showed that Indonesian students were ranked very low in the ability to: (1) understand complex information, (2) theory, analysis and problem solving, (3) use of tools, procedures and problem solving, and (4) conduct investigations. One of the mathematical abilities that is categorized as low is problem-solving ability, because in general students still do not understand the problems presented, due to students' habit of working on routine questions. This condition is reinforced by Wilujeng (Robiah & Nuraeni, 2023) who stated that students are still low in problem-solving abilities. In addition to mathematical communication, problem-solving abilities are also important as an objective in mathematics learning. According to Yusri et al. (Pasaribu & Karo Karo S, 2019) that "problem solving competence is the ability of students to understand and choose strategies to solve a problem". Mathematical problem solving is a cognitive ability that can support students in solving mathematical problems well AAmam (Sidabutar, 2016) Problem solving ability is important for students because if students have good problem solving ability, then student learning achievement will also be good Hodiyanto, nd (Ariawan & Nufus, 2017) However,

until now, students' mathematical problem solving ability is still hampered by the low ability of students' mathematical problem solving.

According to Joefanny et al. (Safira & Amry, 2024) "In solving problems, students have difficulty in understanding, analyzing, and interpreting problems", in the process of learning mathematics, teachers often do not direct students to everyday situations and pay less attention to students' problem-solving abilities Yulianto et al., nd

Based on the background description above, the researcher will conduct a study with the title "Analysis of Mathematical Communication Skills and Problem Solving Skills of Students on the Material of Two-Variable Linear Equation Systems (SPLDV) in Class VIII of HKBP Sidorame Private Middle School in the 2025/2026 Academic Year"

METHOD

The type of research used in this study is descriptive research employing a qualitative research design. The purpose of descriptive research is to systematically, accurately, and factually produce statements and descriptions relating to the facts, characteristics, and relationships between the phenomena being analyzed.

According to Sugiyono (2016), qualitative research relies on data in the form of words, sentences, and images, comprising a collection of non-numerical, descriptive data. This descriptive qualitative research aims to analyze students' mathematical communication skills in problem-solving on the topic of systems of linear equations in two variables (SPLDV). This research will be conducted at HKBP Sidorame Private Junior High School located at Jl. Dorowati No. 40, Sidorame Barat II, Medan Perjuangan District, Medan City, North Sumatra, 20236. The time of implementation of this research is in the odd semester of the 2025/2026 Academic Year. The data sources used in this research are teachers (educational staff) and eighth grade students. In this research, the research subjects are eighth grade students of HKBP Sidorame Private Junior High School. (Sutiawan, Suyono, & Wiraningsih, 2020) .

In this study, the data used was qualitative. According to Sugiyono (Putri, Juandi, & Jupri, 2022), Qualitative data is data in the form of words, diagrams, and images. The qualitative data in this study are test results. With this descriptive qualitative approach, all verbal and written facts from observed research sources are then described or explained truthfully, based on the facts obtained from the sources. These data will then be reviewed and presented as the research findings.

Data validity testing is the level of trustworthiness or truthfulness of research results. According to Lincoln and Guba (in Ananda Setiyawan & Sri Wijayanti, n.d. 2020), data validity in qualitative research is realistic and dynamic, so nothing is the same or consistent as before. Data validity is achieved through data collection using data triangulation techniques.

According to Sugiyono (Rufaidah, 2019) Data triangulation is a data collection method that integrates various existing data and sources. According to Ananda Setiyawan & Sri Wijayanti, n.d. (Arsyad, Asdar, & Muthmainnah, 2018) Data triangulation is a method of

verifying information from multiple sources, using different methods and at different times. Therefore, there is source triangulation, data collection triangulation, and time triangulation.

RESULTS AND DISCUSSION

Time and Place of Implementation

This research was conducted at HKBP Sidorame Private Junior High School located at Jl. Dorowati No. 40, Sidorame Barat II, Medan Perjuangan District, Medan City, North Sumatra, 20236. The students studied in this study were 14 eighth grade students. The time of this research was carried out on July 26, 2025 to August 1, 2025, for one week in the Odd Semester of the 2025/2026 Academic Year (Wahyu, Sutiarso, & Bharata, 2020) .

Instrument Test Results

Before being implemented in the research class, the mathematical communication ability test questions were first tested in grade IX. The trial was carried out to test the validity, reliability, level of difficulty, and discriminatory power of each test with a total of 22 students. The results of the validity calculation using the product moment correlation formula showed that of the 5 questions tested, all 5 questions had a calculated r value > r table at a significance level of α = 5% so that the questions were declared valid because they met the validity criteria. The following are the results of the validity of the trial of the mathematical communication ability test questions (Ningsih, 2019) .

Analysis of Research Subject Test Results

Mathematical Communication Skills

Expressing mathematical ideas by writing and describing into visuals.

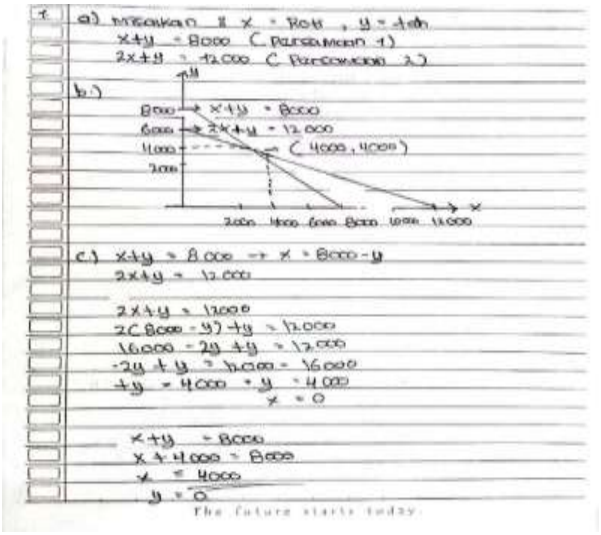

Figure 1. Student completion sheet with indicators stating mathematical ideas

Based on the image above, it can be seen that the student in the first question is good in communicating. This is evident in his ability to determine variables relevant to the

problem, write an appropriate mathematical model, and develop a visual representation through graphs. In addition, the student is also able to carry out the solution procedures in the form of substitution and elimination in writing. This ability shows that the student not only understands the problem conceptually, but is also able to express it into interrelated symbolic and visual forms. Thus, the student can convey mathematical ideas clearly through writing and drawings, and successfully connects between verbal, symbolic, and visual representations. Based on the first indicator in mathematical communication skills, the student can be categorized as having met the criteria because he is able to express his mathematical ideas in a coherent, logical, and understandable manner.

Understand, interpret and evaluate mathematical ideas presented in written or visual form.

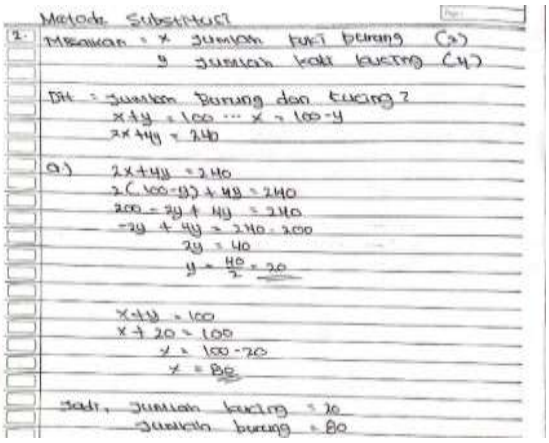

Figure 2. Student completion sheet with indicators of understanding, interpreting and assessing mathematical ideas.

Based on Figure 4.6 above , it can be seen that the student in the second question communicated well. This is demonstrated by his ability to understand the information contained in the story problem, then interpret that information into the appropriate algebraic form. (M.Pd, Rini, & Parida, 2021) . In addition, students can also use the appropriate solution strategy, namely the substitution method, resulting in a coherent and logical solution process. In the final stage, students are able to draw conclusions from the mathematical solutions obtained. Thus, it can be concluded that students have demonstrated a good understanding in connecting written information into mathematical representations, as well as presenting and evaluating solutions correctly, so that the indicators of mathematical communication skills in this aspect can be said to be fulfilled (WATI, 2019) .

Using vocabulary or language, notation and structure to express ideas, describe relationships, and create models.

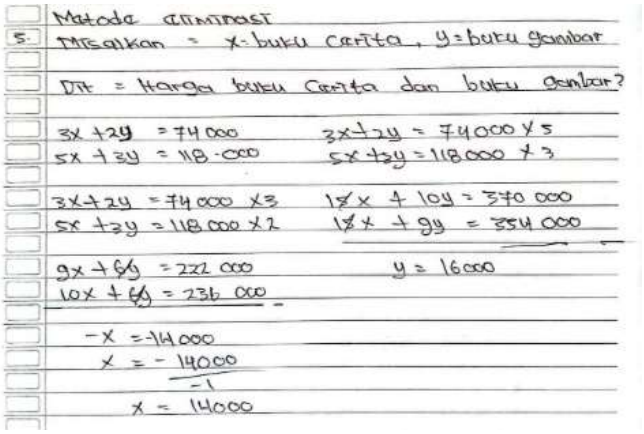

Figure 3. Student completion sheet with vocabulary or language indicators, notation and structure

Based on the figure above, it can be seen that the student in the fifth question is good at communicating. The student is able to use mathematical vocabulary and language appropriately, utilize mathematical notation and symbols correctly, and compile and build relevant mathematical models from the given contextual situation. In addition, the student can also draw clear conclusions based on the results of the solution. This ability shows that the student has used mathematical language, symbols, and structures effectively to convey ideas, construct models, and illustrate the relationships between concepts in the problem. Therefore, it can be said that the student has fulfilled the third indicator in mathematical communication skills. (Asmara & Sari, 2021) .

Discussion

In this study, an analysis was conducted to determine the level of students' mathematical communication skills and problem-solving skills in the Two-Variable Linear Equation System (SPLDV) material. Based on the results of the study, it was found that 14% of students had mathematical communication skills in the high category, 57% of students were in the medium category, and 29% of students were in the low category. These findings indicate that most students are still at a medium level in communicating their mathematical ideas. Meanwhile, in problem-solving abilities, the results showed that 22% of students were in the high category, 64% of students were in the medium category, and 14% of students were in the low category. Thus, this distribution indicates that the majority of students are still in the medium category, both in terms of mathematical communication skills and problem-solving abilities.

1. Mathematical Communication Skills

a. Expressing mathematical ideas by writing and describing them visually.

In the first indicator, namely the ability to express mathematical ideas in visual form, it was found that 93% of students or 13 students were able to present mathematical ideas through graphs, tables, sentences, or mathematical symbols and 1 student was less able to present mathematical ideas through graphs, tables, sentences, or mathematical symbols. Ten students in the high category were able to draw linear equation graphs correctly, determine the intersection points correctly, and provide information on the x and y axes. In addition, they were also able to arrange the solution steps coherently in written form. Three students in the medium category were able to create graphs, but there were still inaccuracies in placing the coordinate points so that the results were less accurate. Meanwhile, one student in the low category tended to only write numbers in the form of equations without linking them to visual representations or complete written explanations (Asdlori & Slamet Yahya, 2023) .

b. Understand, interpret and evaluate mathematical ideas presented in written or visual form.

In the second indicator, namely the ability to interpret graphs and information from questions, it was found that 71% of students or as many as 10 students were able to understand and interpret information well and as many as 4 students were less able to understand and interpret information well. Students in the high category as many as 3 people were able to demonstrate a strong understanding in converting problem information into mathematical models and were able to evaluate the suitability of the results obtained. Students in the medium category as many as 7 people were able to understand some of the information, but often made mistakes in connecting data into variables so that the mathematical model formed was less precise (Permana, 2015) . Meanwhile, students in the low category as many as 4 people tended to only copy information from the questions without processing it in depth, so that the mathematical model they compiled did not match the given problem.

c. Using vocabulary or language, notation and structure to express ideas, describe relationships, and create models.

In the third indicator, namely the ability to use mathematical symbols and notation, it was found that 50% of students or as many as 7 students were able to use symbols and notation correctly, especially in compiling equations from story problems and as many as 7 students were less able to use symbols and notation correctly. One student in the high category was able to write notation correctly and explain the relationship between variables clearly. Six students in the medium category were able to compile equations, but were still less precise in carrying out the final solution. Meanwhile, seven students in the low category showed weaknesses both in writing notation and in obtaining correct final results (Rusdyi & Isman M. Nur, 2021) .

Based on the analysis of the three indicators of mathematical communication skills, it is clear that the first indicator, namely expressing mathematical ideas through writing and visualization in the form of graphs or tables, is the indicator that can be implemented most

by 13 students. Meanwhile, in the third indicator, namely the use of mathematical vocabulary or language, notation, and the arrangement of the structure of ideas to describe relationships and build mathematical models, only a few students were able to implement it well. Most students still forgot to write conclusions or describe the relationships between variables in the problem, so that these aspects did not appear on the answer sheet as many as 7 students.

2. Problem Solving Skills

1. Understand the Problem

In the first indicator, 93% of students, or 13 students, were able to demonstrate skills in identifying known information and determining what was asked in the problem, while 1 student was less able to demonstrate skills in identifying known information and determining what was asked in the problem. Eleven students in the high category were able to write down the known information completely and formulate the question from the problem in the problem correctly. Two students in the medium category only wrote down some of the known information but were unable to formulate what was asked precisely. Meanwhile, one student in the low category tended to solve the problem directly without writing down the known and asked parts, resulting in a less systematic solution (Untari, Hasanah, Wardana, & Jazuli, 2022) .

2. Prepare a problem plan

In the second indicator, 93% of students or 13 students demonstrated the ability to develop an appropriate solution plan, for example by using the elimination or substitution method and 1 student was less able to demonstrate the ability to develop an appropriate solution plan, for example by using the elimination or substitution method. 11 students in the high category were able to design solution steps systematically and consistently using the appropriate method. 2 students in the medium category knew the method to be used, but most were less precise in continuing the solution steps until the end. Meanwhile, 1 student in the low category was less able to design a clear solution strategy and often made mistakes in determining the solution steps.

3. Complete the plan

In the third indicator, 78% of students, or 11 students, were able to implement the solution plan according to the strategy they had developed, while 3 students were less able to implement the solution plan according to the strategy they had developed. Six students in the high category were able to complete the steps sequentially, correctly, and precisely to obtain the final answer. Five students in the medium category were able to partially implement the plan, but the solution was incomplete and they often made calculation errors. Meanwhile, three students in the low category tended to be less precise in implementing the solution steps and often fell into algebraic manipulation errors (Said, 2021) .

4. Look back at all the answers

In the fourth indicator, 42% of students, or 6 students, were able to double-check their solution results and summarize their answers in mathematical sentences, while 8 students were less able to double-check their solution results and summarize their answers in

mathematical sentences. One high-skill student was able to carefully check their results and write down their conclusions accurately. Five medium-skill students checked their results but did not write down their final conclusions. Meanwhile, 8 low-skill students did not double-check or write down their conclusions because they did not complete the problem solving until the final stage (M.Pd et al., 2021) .

Based on the analysis of the four problem-solving ability indicators, the most commonly mastered indicator was the first, understanding the problem, with 13 students. Meanwhile, the fourth indicator, double-checking all answers, was performed only slightly. This indicates that most students lacked confidence in their answers, so they did not double-check and did not write a final conclusion (8 students).

CONCLUSION

Based on the data results obtained from the analysis of the research instrument, the following conclusions were obtained:

1. Based on the percentage results of the mathematical communication ability test that has been done by the eighth grade students of HKBP Sidorame Private Middle School in Figure 4.1 above, it can be concluded that the mathematical communication ability of the eighth grade students of HKBP Sidorame Private Middle School in solving five questions on the material of the system of linear equations in two variables (SPLDV) is classified as moderate mathematical communication ability. Based on the results of the analysis of the students' answer sheets, students are able to solve questions based on the steps of the mathematical communication ability indicators in the first to second indicators, but there are still students who tend not to write the steps of the fourth indicator, namely the students' ability to use vocabulary or language, notation and structure to express ideas, describe relationships, and make models.
2. Based on the percentage results of the problem-solving ability test of students that have been completed by the eighth grade students of HKBP Sidorame Private Middle School in Figure 4.2 above, it can be concluded that the problem-solving ability of eighth grade students of HKBP Sidorame Private Middle School in solving five questions on the material of the system of linear equations in two variables (SPLDV) is classified as moderate mathematical communication ability. Based on the results of the analysis of the students' answer sheets, students are able to solve questions based on the steps of the problem-solving ability indicators in the first to third indicators, but there are still students who tend not to write the fourth indicator step, namely looking back at all the answers and providing conclusions.

Suggestion

Based on the conclusions above, the following suggestions are put forward:

1. For students, it is hoped that they can be more active in the learning process and discuss with friends and teachers to be able to explore various steps in solving problems.

2. For teachers, it is hoped that mathematics teachers need to provide guidance and support to students so that they are more motivated in solving problems.
3. For schools, it is hoped that they can provide support by maximizing mathematics lessons so that students can understand them more easily

REFERENSI

Annisa, S., & Siswanto, R. D. (2021). Analisis Kemampuan Komunikasi Matematis Ditinjau Dari Gaya Kognitif Dan Gender. *Jurnal Penelitian Pembelajaran Matematika*, *14*(2), 146–167.

Ariawan, R., & Nufus, H. (2017). Hubungan Kemampuan Pemecahan Masalah Matematis Dengan Kemampuan Komunikasi Matematis Siswa. *Jurnal Theorems (The Original Research Of Mathematics)*, *1*(2), 82–91.

Arsyad, N., Asdar, A., & Muthmainnah, M. (2018). Pengaruh Penerapan Model Pembelajaran Kooperatif Dengan Strategi Think Talk Write Terhadap Kemampuan Penalaran, Dan Komunikasi Matematis, Serta Motivasi Belajar Siswa Dalam Pembelajaran Matematika Di Smpn 1 Sinjai Utara. *Issues In Mathematics Education (Imed)*, *2*(1), 55–70. Https://Doi.Org/Https://Doi.Org/10.35580/Imed9482

Asdlori, A., & Slamet Yahya, M. (2023). Konsep Pembelajaran Pai Berbasis Media Digital Melalui Pendekatan Humanistik. *Jurnal Ilmiah Profesi Pendidikan*, *8*(3), 1877–1886. Https://Doi.Org/10.29303/Jipp.V8i3.1646

Asmara, A., & Sari, D. J. (2021). Pengembangan Soal Aritmetika Sosial Berbasis Literasi Matematis Siswa Smp. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *5*(3), 2950–2961. Https://Doi.Org/10.31004/Cendekia.V5i3.982

Br, J., Sekali, K., Lumbantoruan, S. M., Rebecca, C., Siahaan, F. B., & Sihombing, D. I. (2022). Pengaruh Model Pembelajaran Two Stay Two Stray Terhadap Kemampuan Komunikasi Matematis Peserta Didik Pada Materi Sistem Persamaan Linear Dua Variabel Kelas Viii Smp Gajah Mada Medan T . A 2021 / 2022. *Sepren: Journal Of Mathematics Education And Applied*, *4*(0), 208–214.

Ismayanti, S., & Sofyan, D. (2021). Kemampuan Komunikasi Matematis Siswa Smp Kelas Viii Di Kampung Cigulawing. *Plusminus: Jurnal Pendidikan Matematika*, *1*(1), 183–196. Https://Doi.Org/10.31980/Plusminus.V1i1.1036

M.Pd, A., Rini, N., & Parida, L. (2021). Analisis Faktor-Faktor Yang Mempengaruhi Rendahnya Hasil Belajar Siswa Pada Pelajaran Matematika. *J-Pimat : Jurnal Pendidikan Matematika*, *3*(1), 295–306. Https://Doi.Org/10.31932/J-Pimat.V3i1.1129

Maudi, N. (2016). Implementasi Model Project Based Learning Untuk Meningkatkan Kemampuan Komunikasi Matematis Siswa. *Jpmi (Jurnal Pendidikan Matematika*

Indonesia), *1*(1), 39. Https://Doi.Org/10.26737/Jpmi.V1i1.81

Nashihah, U. H. (2020). Membangun Kemampuan Komunikasi Matematis Siswa Dengan Pendekatan Saintifik: Sebuah Perspektif. *Jurnal Pendidikan Matematika (Kudus)*, *3*(2), 201. Https://Doi.Org/10.21043/Jmtk.V3i2.7193

Ningsih, F. (2019). Pengaruh Model Pembelajaran Group Investigation Terhadap Kemampuan Pemecahan Masalah Siswa Kelas Viii Mtsn Kabupaten Kerinci. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *3*(2), 351–362. Https://Doi.Org/10.31004/Cendekia.V3i2.118

Nugraha, T. H., & Pujiastuti, H. (2019). Analisis Kemampuan Komunikasi Matematis Siswa Berdasarkan Perbedaan Gender. *Edumatica : Jurnal Pendidikan Matematika*, *9*(1), 1–7. Https://Doi.Org/10.22437/Edumatica.V9i1.5880

Pasaribu, G. F., & Karo Karo S, I. R. (2019). Pengaruh Model Pembelajaran Bamboo Dancing Terhadap Kemampuan Komunikasi Matematis Siswa Pada Materi Sistem Persamaan Linier Dua Variabel Di Kelas Viii Mts Al-Ittihadiyah Medan. *Axiom : Jurnal Pendidikan Dan Matematika*, *8*(1). Https://Doi.Org/10.30821/Axiom.V8i1.5453

Permana, E. P. (2015). Penerapan Metode Problem Solving Dengan Media Gambar Seri Untuk Meningkatkan Hasil Belajar Ips Kelas Iv Sekolah Dasar. *Jurnal Pendidikan Dasar Nusantara*, *1*(1). Https://Doi.Org/10.29407/Jpdn.V1i1.152

Putri, N. S., Juandi, D., & Jupri, A. (2022). Pengaruh Model Pembelajaran Kooperatif Tipe Think-Talk-Write Terhadap Kemampuan Komunikasi Matematis Siswa: Studi Meta-Analisis. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *6*(1), 771–785. Https://Doi.Org/10.31004/Cendekia.V6i1.1264

Retnowati, P., & Ekayanti, A. (2020). Think Talk Write Sebagai Upaya Meningkatkan Komunikasi Matematis Siswa. *Sigma*, *6*(1), 17. Https://Doi.Org/10.36513/Sigma.V6i2.863

Robiah, S., & Nuraeni, R. (2023). Pengaruh Kepercayaan Diri Terhadap Kemampuan Komunikasi Matematis Siswa Mts Pada Materi Himpunan. *Jurnal Inovasi Pembelajaran Matematika: Powermathedu*, *2*(2), 215–228. Https://Doi.Org/10.31980/Powermathedu.V2i2.3095

Rufaidah, R. (2019). Peningkatan Kemampuan Komunikasi Matematis Melalui Model Pembelajaran Kooperatif Tipe Think Talk Write (Ttw) Dengan Media Lkpd Pada Materi Relasi Dan Fungsi Siswa Kelas Viii-B Mts Al-Ma'arif Bocek Karangploso Tahun Pelajaran 2017/2018. *Jpm : Jurnal Pendidikan Matematika*, *4*(2), 95. Https://Doi.Org/10.33474/Jpm.V4i2.2621

Rusdyi, & Isman M. Nur. (2021). Perbandingan Hasil Belajar Matematika Siswa Sma Melalui Model Pembelajaran Problem Solving Dengan Jigsaw. *Jurnal Pendidikan Mipa*, *11*(2), 47–53. Https://Doi.Org/10.37630/Jpm.V11i2.475

Safira, N., & Amry, Z. (2024). Pengaruh Kemampuan Awal Matematis Dan Model Pembelajaran (Kooperatif Tipe Student Team Achievement Division Dan Problem Based Learning) Terhadap Kemampuan Komunikasi Matematis Dan Self Afficacy Siswa Di Mtsn 1 Singkil. *Histogram: Jurnal Pendidikan Matematika*, *8*(1), 231–253. Https://Doi.Org/Https://Doi.Org/10.31100/Histogram.V8i1.3505

Said, M. S. (2021). Kurangnya Motivasi Belajar Matematika Selama Pembelajaran Daring Di Man 2 Kebumen. *Jurnal Ilmiah Matematika Realistik*, *2*(2), 7–11. Https://Doi.Org/10.33365/Ji-Mr.V2i2.1047

Sidabutar, R. (2016). *Pengaruh Pembelajaran Berbasis Masalah Terhadap Kemampuan Pemecahan Masalah Dan Komunikasi Matematis Siswa Di Smp Negeri 8 Tanjungbalai*. Unimed.

Sutiawan, H., Suyono, S., & Wiraningsih, E. D. (2020). Pengaruh Model Pembelajaran Kooperatif Tipe Think Talk Write (Ttw) Terhadap Kemampuan Komunikasi Dan Disposisi Matematis Ditinjau Dari Kemampuan Awal Matematika Siswa Di Smp Negeri Kecamatan Kragilan. *Jppm (Jurnal Penelitian Dan Pembelajaran Matematika)*, *13*(1), 33–46. Https://Doi.Org/Http://Dx.Doi.Org/10.30870/Jppm.V13i1.2790

Untari, R. S., Hasanah, F. N., Wardana, M. D. K., & Jazuli, M. I. (2022). Pengembangan Augmented Reality (Ar) Berbasis Android Pada Pembelajaran Pemodelan Bangun Ruang 3d. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, *7*(5), 190. Https://Doi.Org/10.17977/Jptpp.V7i5.15238

Wahyu, M. N., Sutiarso, S., & Bharata, H. (2020). Pembelajaran Soft Skill Komunikasi Untuk Meningkatkan Kemampuan Komunikasi Matematis Siswa. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *4*(1), 406–413. Opgehaal Van Https://J-Cup.Org/Index.Php/Cendekia/Article/View/228

Wati, R. S. (2019). Pengaruh Model Pembelajaran Think Pair Share Terhadap Motivasi Dan Hasil Belajar Pelajaran Ekonomi. *Tajdidukasi: Jurnal Penelitian Dan Kajian Pendidikan Islam*, *8*(2). Https://Doi.Org/10.47736/Tajdidukasi.V8i2.249