ANALYSIS OF STUDENTS' UNDERSTANDING OF MATHEMATICAL CONCEPTS ON FRACTIONS IN GRADE VIII AT SMP NEGERI 2 MAZINO

Aldin Luaha
Teachers of SMP Negeri 2 Mazino
(aldinluaha@gmail.com)

Abstract

This study aims to describe and identify the factors contributing to the low understanding of mathematical concepts related to fractions among students. This research is qualitative in nature with a descriptive approach. The informants in this study are 18 eighth-grade students from SMP Negeri 2 Mazino. Data were analyzed through the steps of data reduction, data presentation, and conclusion drawing. The data collection techniques used are tests and interviews. The results show that, overall, students exhibit low understanding of concepts when distinguishing between two fractions, with 18% categorized as very poor. In classifying fractions by type, the percentage is 19% in the very poor category. For ordering fractions from smallest to largest, the percentage is 37%, categorized as poor. In simplifying addition and subtraction operations involving fractions, 22% fall into the poor category. Additionally, in relating everyday life to fraction concepts, the percentage is 60%, categorized as sufficient, while 20% fall into the very poor category. Factors influencing this include a lack of understanding of the statements in the tests, not comprehending the questions posed, being less meticulous in understanding simple fractions, and difficulty in interpreting word problems related to fraction operations. In conclusion, eighth-grade students at SMP Negeri 2 Mazino demonstrate low understanding in completing tests on fractions. It is recommended that teachers create a question-and-answer space in their lesson plans to enhance students' conceptual understanding when working with fractions.

Keywords: *Concept Understanding Analysis; Students' Mathematical Concept Understanding; Fractions.*

Abstrak

Penelitian ini bertujuan untuk menggambarkan dan mengidentifikasi faktor-faktor yang menyebabkan rendahnya pemahaman konsep matematika terkait pecahan di kalangan siswa. Penelitian ini bersifat kualitatif dengan pendekatan deskriptif. Informan dalam penelitian ini adalah 18 siswa kelas delapan dari SMP Negeri 2 Mazino. Data dianalisis melalui langkah-langkah reduksi data, penyajian data, dan penarikan kesimpulan. Teknik pengumpulan data yang digunakan adalah tes dan wawancara. Hasil penelitian menunjukkan bahwa secara keseluruhan, siswa menunjukkan pemahaman konsep yang rendah saat membedakan antara dua pecahan, dengan 18% tergolong sangat buruk.

Dalam mengklasifikasikan pecahan berdasarkan jenisnya, persentasenya adalah 19% dalam kategori sangat buruk. Untuk mengurutkan pecahan dari yang terkecil hingga terbesar, persentasenya adalah 37%, yang dikategorikan sebagai buruk. Dalam menyederhanakan operasi penjumlahan dan pengurangan yang melibatkan pecahan, 22% tergolong dalam kategori buruk. Selain itu, dalam mengaitkan kehidupan sehari-hari dengan konsep pecahan, persentasenya adalah 60%, yang dikategorikan sebagai cukup, sementara 20% tergolong dalam kategori sangat buruk. Faktor-faktor yang mempengaruhi ini termasuk kurangnya pemahaman terhadap pernyataan dalam tes, tidak memahami pertanyaan yang diajukan, kurang teliti dalam memahami pecahan sederhana, dan kesulitan dalam menginterpretasikan soal cerita yang terkait dengan operasi pecahan. Kesimpulannya, siswa kelas delapan di SMP Negeri 2 Mazino menunjukkan pemahaman yang rendah dalam menyelesaikan tes tentang pecahan. Disarankan agar guru menciptakan ruang tanya jawab dalam rencana pembelajaran mereka untuk meningkatkan pemahaman konseptual siswa saat bekerja dengan pecahan.

Kata Kunci*: *Analisis Pemahaman Konsep; Pemahaman Konsep Matematika Siswa; Pecahan.

A. **Introduction**

In the realm of formal education or schools, there are various subjects, one of which is mathematics. Mathematics is a vast field of knowledge that encompasses all aspects of life. It is not an isolated discipline that can be perfected on its own; rather, mathematics exists primarily to help humans understand and tackle social, economic, and natural problems (Kline in Noer, 2017). The importance of studying mathematics is also highlighted by Sari (2020:23), stating that "Mathematics lessons involve concepts or principles that are used in everyday life and are also essential for the advancement of science and technology." This underscores why mathematics education plays a crucial role in human life, as it equips students with various abilities and skills.

One recognizable characteristic of mathematics is that it deals with abstract subjects, such as facts, concepts, principles, and operations or procedures. Many students perceive mathematics as a difficult subject due to its abstract nature. Despite this perception, they must continue to study it, as noted by Marti in Sundayana (2018:2), "Even though mathematics is regarded as highly challenging, everyone must learn it as it is a means to solve everyday problems."

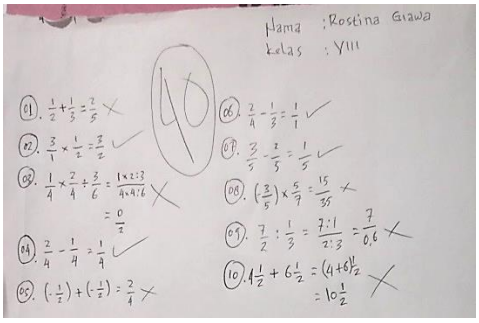
To foster students' ability and willingness to learn, motivation is essential to encourage active learning and comprehension. Understanding concepts can be defined as the level of ability expected of students to grasp concepts, situations, and known facts, and to explain them in their own words without altering

their meanings. Every mathematics lesson should focus more on instilling concepts based on understanding; if an educator only teaches skills without ensuring comprehension of the material, students will struggle when encountering subsequent topics. According to Sudaryono (2009:50), understanding is the ability of an individual to respond to or grasp the meaning and significance of the material studied. Therefore, learning concepts is a process that arises from an individual's understanding obtained through in-depth knowledge. Ihsana (2007:4) states that learning is an activity where there is a process from not knowing to knowing, from not understanding to understanding.

Based on preliminary studies conducted by the researcher on November 9, 2023, through tests and interviews at SMP Negeri 2 Mazino, it was found that many students have low comprehension skills regarding fractions. The challenges faced by students stem from linguistic aspects, content knowledge, and understanding fundamental concepts, largely because they are not given enough practice by their teachers. Students tend to focus on writing down and listening to the material presented by the teacher, leading to passive classroom participation, which contributes to their low comprehension abilities.

Furthermore, during the test administration, the researcher discovered issues related to low conceptual understanding, such as rephrasing concepts, logically applying concepts, and identifying operational properties in solving fraction-related problems. Based on these issues, the researcher concluded that students have not achieved the expected results. Despite the teacher's efforts to provide repeated practice, the students' scores on the tests remain below the minimum competency standard (KKM) of 65, with 30% of the 18 students showing low conceptual understanding. This is partly due to students' perceptions of mathematics as a very difficult subject, given the numerous formulas required to solve problems. As seen in the image below, the test results indicate challenges faced by students in understanding fractions.

Figure 1. Student Answer Sheet for Grade VIII on Fraction Material



Source: Observation Data

From the image above, it can be seen that students' basic mathematical conceptual understanding regarding fractions is quite low. In completing the test, students tended to answer questions without truly understanding the concepts, relying on formulas for their work on fractions. They also struggled with the arithmetic

operations involving integers, including multiplication, division, subtraction, and addition of fractions. For instance, in question number 3, it was noted that students had difficulty understanding the concept of dividing fractions, resulting in answers that did not meet expectations. In questions 4 and 8, students displayed low understanding in performing multiplication with fractions, leading to unsatisfactory test results. Additionally, in questions 9 and 10, it was evident that students lacked understanding of how to apply integer operation signs in fraction problems, resulting in incorrect answers. This situation is exacerbated by students' passive engagement in expressing their ideas.

Based on the tests administered in the eighth grade at SMP Negeri 2 Mazino, it was evident that students faced challenges in completing the assessments, particularly regarding fractions. Their inability to solve the test questions significantly affects the quality of mathematics learning, especially in this area. If left unaddressed, this issue will impact their understanding of subsequent topics and overall mathematical concept comprehension. Therefore, it is essential to analyze the factors contributing to students' low understanding of fractions. This leads the researcher to conduct a study titled "Analysis of Students' Conceptual Understanding of Fractions in Grade VIII at SMP Negeri 2 Mazino."

B. **Research Method**

The approach used in this study is descriptive, which describes existing data, analyzes, and interprets it. Descriptive research determines facts with appropriate interpretations to understand accurate phenomena (Nazir, 2012). This study analyzes data in the form of student answer sheets and interview results from grade VIII at SMP Negeri 2 Mazino.

This research is qualitative in nature (Moleong, 2017), meaning it employs a research method that utilizes descriptive data aimed at understanding the phenomena experienced by the research subjects, such as written or spoken language. The researcher seeks to identify the factors influencing the low understanding of mathematics among students and the efforts to address this issue regarding fractions in grade VIII at SMP Negeri 2 Mazino.

Data collection techniques utilized by the researcher include direct data gathering at the research site. Some examples of data collection techniques are administering tests, conducting interviews, documentation, and triangulation.

Data collection techniques involve searching for and organizing collected data so that conclusions can be drawn and used as information understandable by oneself and others. Qualitative data analysis techniques are inductive, meaning the obtained data are developed through certain relational patterns or become hypotheses.

Data validity checks in this study are conducted using triangulation techniques. According to Sugiyono (2012:270), data validity testing in qualitative research includes credibility, transferability, dependability, and confirmability. Triangulation is a technique for verifying data by comparing existing data with various sources.

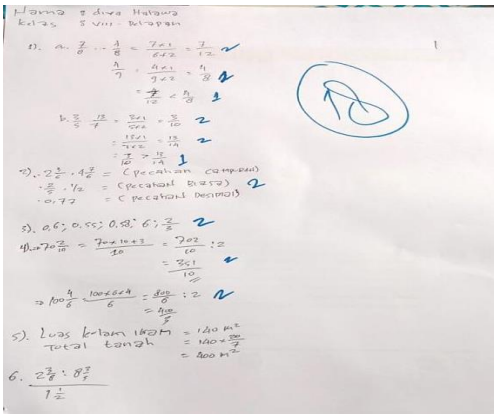
C. **Research Findings and Discussion**

Research Findings

From the analysis of the fraction test given to students, several findings emerged regarding students' low understanding of mathematical concepts, which can be outlined as follows:

1. **Low Understanding in Distinguishing Between Two Fractions**

Students show a lack of understanding and mastery of fraction material, which affects their ability to describe the form and concept of fractions. Based on the analysis of student answer sheets conducted by the researcher, there were several instances where students struggled to differentiate between two fractions. The results from the students' answer sheets, as shown in the image below, illustrate this issue.



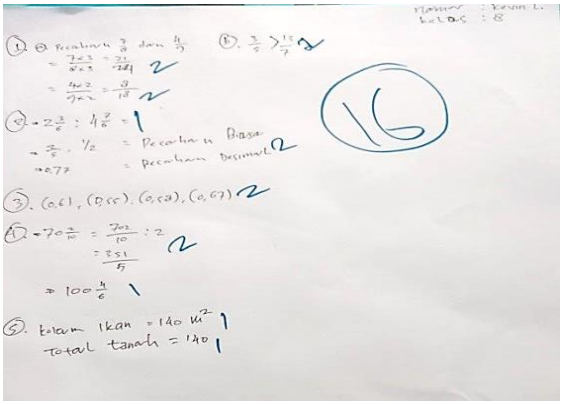
Based on the image above, it is evident that students are unable to differentiate between two fractions. For example, in question number one, students did not complete the fraction test according to the procedures outlined in the question. Many answered the test carelessly, lacking a proper understanding of the concept of fractions. As a result, the outcomes of the test did not meet expectations, highlighting the need for efforts to educate students so they can improve their abilities, particularly regarding fraction material.

From interviews conducted with students about question one, it was revealed that the root cause is their lack of understanding of mathematics as a whole. Therefore, a potential solution to address this issue is to provide students with training and practice exercises related to math tests, which will help enhance their understanding.

1. **Low Understanding in Classifying Fractions by Type**

Students demonstrate a limited ability to classify fractions according to their types. Specifically, they struggle to understand the procedures for identifying whether a fraction is a proper fraction, an improper fraction, a decimal fraction, or a mixed number. While students can recognize the general form of fractions, they often cannot determine what type a given fraction is. Most students are only able to recall the forms of decimal fractions and proper fractions; beyond that, they appear confused when analyzing the types

of fractions. Consequently, students do not respond to the test questions as expected. The results from the students' answer sheets, illustrated in the image below, further support this observation.

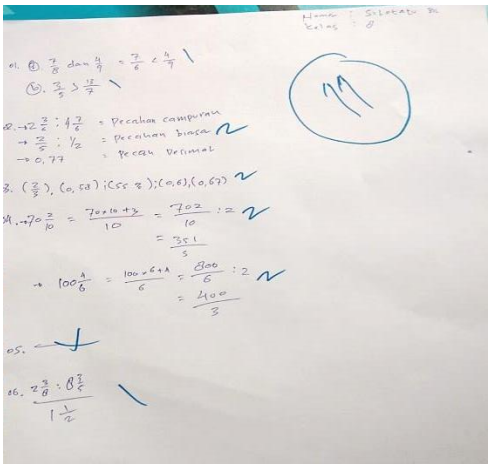


In the image above, it is evident in question number two that students do not understand what a mixed number is. As a result, they did not perform well on this test question, leading to unsatisfactory results that did not meet expectations.

Based on interviews conducted with students regarding question two, it was found that their difficulties in classifying fraction types contributed to this issue, as many students perceive mathematics as complicated. Therefore, a crucial solution to address this problem is for teachers to provide thorough instruction to help students better understand the subject of mathematics.

2. **Low Understanding of Ordering Fractions from Smallest to Largest**

Students demonstrate a limited ability to analyze the simplicity of fractions, which leads to confusion when trying to order them from smallest to largest. The results from the students' answer sheets, as shown in the image below, illustrate this difficulty. Many students struggle to perform this task effectively, indicating a need for targeted instruction to improve their understanding of fraction comparison and ordering.



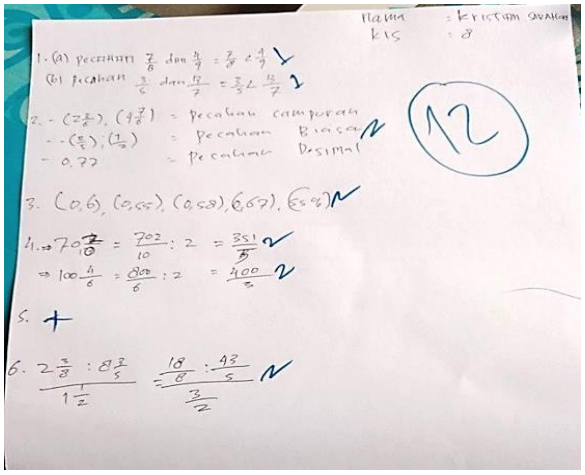
From the image above, it is clear that students struggle to order fractions from smallest to largest. This confusion arises from their difficulty in analyzing the form and procedures of fractions, leading to unsatisfactory results.

Interviews with students revealed that they do not understand how to order fractions and often do not pay attention to the teacher during lessons. To address this issue, it is essential for teachers to actively engage with students during the teaching process in the classroom.

3. **Low Understanding of Simplifying Addition and Subtraction Operations on Fractions**

Students also exhibit a very low understanding of performing addition and subtraction with fractions. They are only able to manage basic arithmetic operations, such as 2 + 3 = 5, but struggle with fraction forms. The results from the students'

answer sheets, as shown in the image below, highlight this challenge. This indicates a pressing need for targeted instruction to help students grasp these operations better.

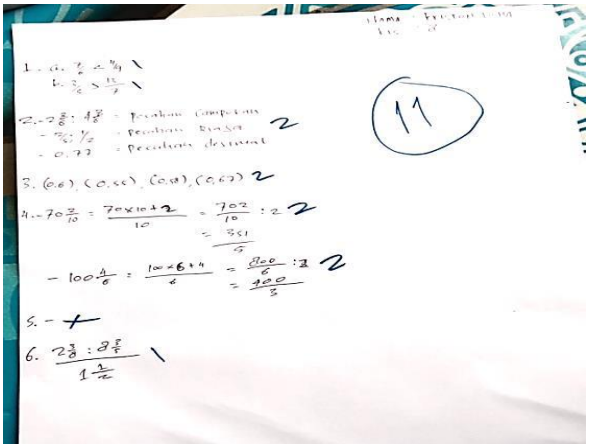


From the image above, it can be seen that in question number four, the data indicates that students are unable to simplify fractions by directly reducing them to their simplest form. Conceptually, their work aligns with the expected outcomes; however, they fail to present their solutions as required by the test.

Interviews conducted by the researcher with students revealed that they do not understand mathematics well and find it challenging to perform mathematical tasks effectively. To address this issue, it is essential for teachers to provide students with ample practice through various test questions.

4. **Low Understanding of Relating Daily Life Situations to Fraction Concepts**

Students frequently struggle to solve mathematical problems related to real-life scenarios involving fractions. The results from the students' answer sheets, as shown in the image below, highlight this difficulty. This indicates a significant need for instruction focused on applying fraction concepts to everyday situations to enhance students' comprehension and problem-solving skills.

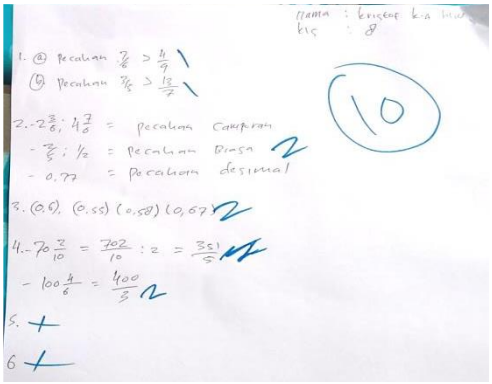


From the image, it is evident that many students struggle to relate everyday situations to the concept of fractions. The data shows that students were unable to answer question number five due to their difficulty in classifying word problems related to fractions. This issue arises from a lack of seriousness among students when attempting to solve word problems based on fraction concepts.

Interviews conducted by the researcher revealed that students find it challenging to classify fractions in everyday life because they perceive mathematics as complicated. To address this issue, teachers should provide students with numerous examples of word problems related to daily life involving fractions. Additionally, teachers should encourage students to express their opinions about fraction material and offer clear descriptions of fraction forms.

5. **Low Understanding of Simplifying Mixed Operations with Fractions**

Students' understanding in this area is quite complex, particularly when it comes to mixed fractions. They experience confusion when performing operations involving mixed fractions. The results from the students' answer sheets, as shown in the image below, illustrate this challenge. This indicates a need for focused instruction on simplifying mixed operations with fractions to enhance students' comprehension and skills.



From the image, it is clear that many students have a low understanding of simplifying mixed fractions. This difficulty arises because students do not grasp the types of fractions, particularly mixed fractions, and struggle to perform addition and subtraction with fractions, as well as the necessary steps to complete these operations. They also lack an understanding of the methods or systems for working with comparisons, especially concerning fractions.

Based on interviews conducted by the researcher, it was found that students struggle to simplify operations involving fractions and perceive mathematics as difficult to understand. To address this issue, teachers should focus on helping students understand the operations of multiplication, division, addition, and subtraction. Additionally, providing assignments related to fraction material will reinforce their learning and understanding.

Discussion

According to Ruseffendi (2001;25), mathematics is generally defined as the field of study that explores patterns and structures. It is a subject often perceived as difficult for students to learn. Many students believe that mathematics is filled with complex solutions, which explains why numerous students struggle to master the procedures and systems required for solving mathematical problems, particularly in the area of fractions.

Fractions are common in mathematics education. The term "fraction" comes from the Latin word "fractus," meaning "broken." A fraction represents a part of a whole quantity and is mathematically expressed as "a/b," where "a" is the numerator and "b" is the denominator (as per the Mathematics textbook for grade VIII).

Based on the analysis of student answer sheets, it is evident that many students at SMP Negeri 2 Mazino in grade VIII have a low understanding of mathematical concepts, particularly in solving fraction-related tests. The data collected from testing 18 students showed that:

a. students (18%) had a low understanding of differentiating between two fractions, categorized as very poor.
b. 3 students (19%) had a low understanding of classifying fractions by type, also categorized as very poor.
c. 4 students (37%) struggled with simplifying addition and subtraction operations involving fractions, categorized as adequate.
d. 3 students (22%) had a low understanding of applying fractions in everyday situations, categorized as very poor.
e. 3 students (60%) had difficulty simplifying mixed operations with fractions, categorized as adequate.

From this data, it can be concluded that the lowest-performing indicator was ordering fractions from smallest to largest, with only 20% correct, categorized as very poor.

a. Further analysis of interview results with students reveals specific insights regarding the test indicators:
b. For the indicator of differentiating between two fractions, students did not understand the test's statements, leading to confusion about the forms of fractions.
c. In classifying fractions by type, students lacked comprehension of what was being asked, often reading the statements without recognizing the fraction types.

When it came to ordering fractions from smallest to largest, students were not meticulous enough in identifying the simplest form, making it difficult for them to arrange fractions correctly. In simplifying addition and subtraction operations, students showed a lack of mastery over basic arithmetic, complicating their ability to apply fraction concepts.

Regarding applying fractions to everyday situations, students struggled to interpret word problems according to the basic rules of fraction operations.

Finally, in simplifying mixed operations with fractions, students demonstrated a lack of attention and understanding of how to simplify fractions due to insufficient knowledge of arithmetic operations. Overall, these findings indicate a critical need for targeted instructional strategies to improve students' understanding and application of fractions in various contexts.

D. Conclusion

Summary

Based on the data analysis and discussion regarding students' understanding of mathematical concepts, the following conclusions can be drawn:

a. The understanding of mathematical concepts related to fractions among students at SMP Negeri 2 Mazino is classified as inadequate. Students have not yet mastered mathematical concepts effectively. Test results indicate that two students scored in the very poor category with a percentage of 18%, suggesting a lack of comprehension of the test statements. Additionally, three

students scored 19%, also categorized as very poor, indicating confusion about the questions being asked. Four students scored 37%, categorized as adequate; however, they showed a lack of attention regarding the simplest fractions that could still be divided. Three students scored 22%, categorized as poor, demonstrating an inability to master basic arithmetic operations. Furthermore, three students scored 60%, categorized as adequate, but struggled to interpret word problems according to the basic rules of fraction operations. Finally, three students scored 20%, categorized as very poor, indicating a lack of attention in comparing and simplifying fractions.

b. The understanding of mathematical concepts regarding fractions is influenced by internal factors that affect students' learning processes. Students face various challenges, such as misunderstanding the statements on tests, lacking clarity on the questions, insufficient attention to the simplest fractions, and difficulties in interpreting word problems based on basic fraction operations.

Recommendations

Based on the conclusions drawn, the following recommendations are offered:

a. Students are encouraged to enhance their understanding of concepts when working on fraction-related problems.
b. Teachers should pay closer attention to students during mathematics lessons, as students exhibit different ways of absorbing information throughout the learning process.
c. For other researchers interested in studying similar topics, it is hoped that this research can serve as a reference and guide for future investigations.

E. References

Arikunto, S. (2018). *Dasar-dasar Evaluasi Pendidikan* (3rd ed.). Bumi Aksara.

Darmawan Harefa, Murnihati Sarumaha, Kaminudin Telaumbanua, Tatema Telaumbanua, Baziduhu Laia, F. H. (2023). Relationship Student Learning Interest To The Learning Outcomes Of Natural Sciences. *International Journal of Educational Research and Social Sciences (IJERSC)*, 4(2), 240–246. https://doi.org/10.51601/ijersc.v4i2.614

Dimyati, & Mudjiono. (2013). *Belajar dan Pembelajaran*. Rineka Cipta.

Emzir. (2012). *Metodologi penelitian kualitatif*. Jakarta: PT. Raja Grafindo Persada.

Fau, A. D. (2022a). *Budidaya Bibit Tanaman Rosela (Hibiscus Sabdariffa) dengan Menggunakan Pupuk Organik Gebagro 77*. *Tunas: Jurnal Pendidikan Biologi*, 3(2), 10–18. https://jurnal.uniraya.ac.id/index.php/Tunas/article/view/545

Fau, A. D. (2022b). *Kumpulan Berbagai Karya Ilmiah & Metode Penelitian Terbaik Dosen di Perguruan Tinggi*. CV. Mitra Cendekia Media.

Fau, Amaano, D. (2022). *Teori Belajar dan Pembelajaran*. CV. Mitra Cendekia Media.

Gaurifa, M., & Harefa, D. (2023). Development Of A Cartesian Coordinate Module To The Influence Of Implementing The Round Club Learning Model On Mathematics Student Learning Outcomes. *Afore: Jurnal Pendidikan Matematika*, 2(2), 45–55.

Halawa, S., & Darmawan Harefa. (2024). The Influence of Contextual Teaching and Learning Based Discovery Learning Models on Students' Mathematical Problem Solving Abilities. *Afore: Jurnal Pendidikan Matematika*, 3(1), 11-25. https://doi.org/10.57094/afore.v3i1.1711

Harefa, A., D. (2022). *Kumpulan Strategi & Metode Penulisan Ilmiah Terbaik Dosen Ilmu Hukum di Perguruan Tinggi*.

Harefa, D. (2022). *Edukasi Pembuatan Bookchapter Pengalaman Observasi di SMP Negeri 2 Toma*. *Haga Jurnal Pengabdian Kepada Masyarakat*, 1(2).

Harefa, D. (2023). *Efektivitas Model Pembelajaran Talking Chips untuk*. *Tunas: Jurnal Pendidikan Biologi*, 4(1).

Harefa, D. (2023). The Relationship Between Students' Interest In Learning And Mathematics Learning Outcomes. *Afore: Jurnal Pendidikan Matematika*, 2(2), 1–11.

Harefa, D., D. (2020). *Teori Model Pembelajaran Bahasa Inggris dalam Sains*. CV. Insan Cendekia Mandiri.

Harefa, D., D. (2022). *Kewirausahaan*. CV. Mitra Cendekia Media.

Harefa, Darmawan, D. (2023b). *Teori Fisika*. CV Jejak. https://tokobukujejak.com/detail/teori-fisika-A1UFL.html

Harefa, Darmawan, D. (2023c). *Teori Perencanaan Pembelajaran*. CV Jejak. https://tokobukujejak.com/detail/teori-perencanaan-pembelajaran-GO5ZY.html

Iyam Maryati, Yenny Suzana, Darmawan Harefa, I. T. M. (2022). Analisis Kemampuan Komunikasi Matematis dalam Materi Aljabar Linier. *PRISMA*, 11(1), 210–220.

Kilpatrick, Swafford, & Findell. (2001). *Adding It Up: Helping Children Learn Mathematics*. National Academy Press.

Laia, M. F. (2023). Development Of A Cartesian Coordinate Module To Improve The Ability To Understand Mathematical Concepts. *Afore: Jurnal Pendidikan Matematika*, 2(2), 27–44.

Martiman Suaizisiwa Sarumaha, D. (2023). *Pendidikan Karakter di Era Digital*. CV. Jejak. https://tokobukujejak.com/detail/pendidikan-karakter-di-era-digital-X4HB2.html

Moleong, L. J. (2012). *Metodologi Penelitian Kualitatif*. PT Remaja.

Mubayidh, Makmun. (2006). *Kecerdasan dan Kesehatan Emosional Anak*. Jakarta: Pustaka Kautsar.

Nazir, M. (2012). *Metode Penelitian*. Bogor: Ghalia.

Prashig, B. (2007). *The Power of Learning Styles: Memacu Anak Melejitkan Prestasi dengan Mengenali Gaya Belajarnya*. Mizan.

Rose, C., & Nicholl, M. J. (1997). *Accelerated Learning for the 21st Century*.

Ruseffendi, E. T. (2001). *Pengantar kepada Pembantu Guru Mengembangkan Kompetensinya dalam Pengajaran Matematika untuk Meningkatkan CBSA*. Bandung: Tarsito.

Sarumaha, M. D. (2022). Catatan Berbagai Metode & Pengalaman Mengajar Dosen di Perguruan Tinggi. Lutfi Gilang. https://scholar.google.com/citations?view_op=view_citation&hl=en&user=8WkwxCwAAAAJ&authuser=1&citation_for_view=8WkwxCwAAAAJ:-f6ydRqryjwC

Sarumaha, M., & Harefa, D. (2022). Model Pembelajaran Inquiry Terbimbing Terhadap Hasil Belajar IPA Terpadu Siswa. *NDRUMI: Jurnal Pendidikan Dan Humaniora*, 5(1), 27–36. https://jurnal.uniraya.ac.id/index.php/NDRUMI

Sarumaha, M., Harefa, D., Piter, Y., Ziraluo, B., Fau, A., Telaumbanua, K., Permata, I., Lase, S., & Laia, B. (2022). Penggunaan Model Pembelajaran Artikulasi Terhadap Hasil Belajar. *Aksara: Jurnal Ilmu Pendidikan Nonformal*, 8(20), 2045–2052.

Sarumaha, Martiman S., D. (2023). *Model-Model Pembelajaran*. CV Jejak. https://tokobukujejak.com/detail/modelmodel-pembelajaran-0BM3W.html

Sarumaha, W, F. (2023). Analisis Kemampuan Pemecahan Masalah Matematis Pada Materi Perpangkatan dan Bentuk Akar Ditinjau Dari Minat Belajar Siswa Kelas IX di SMPS Kristen BNKP Telukdalam TA. 2022/2023. *Afore: Jurnal Pendidikan Matematika*, 2(2), 12–26.

Situmorang, S., & Helmi. (2010). *Analisis Data: Untuk Riset Manajemen dan Bisnis*. USU Press.

Slameto. (2010). *Belajar dan Faktor-faktor yang Mempengaruhinya*. Jakarta: PT Rineka Cipta.

Sudjono. (2008). *Pengantar Evaluasi Pendidikan*. Jakarta: Raja Grafindo.

Sugiyono. (2012). *Memahami Penelitian Kualitatif*. Bandung: Alfabeta.

Telaumbanua, M., & Harefa, D. (2020). *Teori Etika Bisnis dan Profesi Kajian bagi Mahasiswa & Guru*. Yayasan Pendidikan dan Sosial Indonesia Maju (YPSIM) Banten.

Tonius Gulo, D. H. (2023). Identifikasi Serangga (Insekta) yang Merugikan Pada Tanaman Cabai Rawit di Desa Sisarahili Ekholo Kecamatan

Lolowau Kabupaten Nias Selatan. *Jurnal Sapta Agrica*, 2(1), 50–61.

Triwiyanto, T. (2015). *Pengantar Pendidikan* (Y. S. Hayati (ed.)). Bumi Aksara.

Umbara, U. (2017). *Psikologis Pembelajaran Matematika*. CV Budi Utama.

Umi Narsih, D. (2023). Bunga Rampai "Kimia Analisis Farmasi." Nuha Medika. https://www.numed.id/produk/bunga-rampai-kimia-analisis-farmasi-penulis-umi-narsih-faidliyah-nilna-minah-dwi-ana-anggorowati-rini-kartika-dewi-darmawan-harefa-jelita-wetri-febrina-a-tenriugi