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Analysis of Student Errors in Completing Mathematics Understanding Questions in Mathematics Capita Selecta Course

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A B S T RAK

Tujuan dari penelitian ini untuk mengetahui kemampuan pemahaman matematis mahasiswa dalam memahami materi aritmatika sosial ditinjau dari tingkat tinggi, sedang dan rendah, untuk mengetahui kesalahan apa yang dialami mahasiswa dalam menyelesaikan soal kemampuan pemahaman matematis dan apa yang menjadi faktor penyebab mahasiswa sering melakukan kesalahan pada soal kemampuan Pemahaman matematis pada mata kuliah Kapita Selekta Matematika. Jenis penelitian yang digunakan adalah penelitian deskriptif kuantitatif. Subjek dalam penelitian ini adalah mahasiswa tingkat I program studi pendidikan matematika di Kabupaten Cianjur tahun ajaran 2019/2020. Teknik pengumpulan data yang digunakan adalah tes, dan wawancara. Instrumen yang digunakan berupa tes kemampuan pemahaman matematis, dan wawancara secara tidak langsung. Hasil tes kemampuan pemahaman matematis mahasiswa dalam memahami materi aritmatika sosial ditinjau dari kemampuan tingkat tinggi, sedang dan rendah mahasiswa masih melakukan kekeliruan dalam menyelesaikan soal pemahaman matematis pada soal aritmatika sosial baik mahasiswa dengan kriteria tinggi, sedang maupun rendah. Sedangkan kesalahan yang sering dialami mahasiswa dominan melakukan kesalahan menggunakan data, selain itu beberapa mahasiswa masih terdapat kekeliruan pada kesalahan konsep dan kesalahan teknis dan faktor utama penyebab mahasiswa melakukan kesalahan yaitu kurangnya ketelitian dan kesulitan dalam memahami yang termuat dalam soal.

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A B S T R A C T

The purpose of this study was to determine the students' mathematical understanding ability in understanding social arithmetic material in terms of high, medium, and low levels, to find out what errors were experienced by students in solving problems of mathematical understanding ability, and to determine the factors that caused students to often make mistakes on ability questions. Mathematical understanding in Capita Selecta Mathematics courses. The type of research used is descriptive quantitative research. The subjects in this study were level I students of the mathematics education study program in Cianjur Regency for the 2019/2020 academic year. Tests and interviews are used as data collection techniques. The instruments used are a test of mathematical understanding ability and indirect interviews. The results of the students' mathematical understanding ability test in understanding social arithmetic material in terms of high, medium, and low-level abilities show that students still make mistakes in solving mathematical understanding problems on social arithmetic problems, both students with high, medium, and low criteria. While the mistakes that are often experienced by dominant students make errors using data, besides that, some students still have conceptual and technical errors, and the main factors causing students to make mistakes are lack of accuracy and difficulty in understanding what is contained in the questions.

Keywords:
Analysis
Error
Mathematical Understanding
Social Arithmetic

1. INTRODUCTION

Mathematics is a process of reasoning, the formation of character and thinking patterns, the formation of an objective, honest, systematic, critical, and creative attitude as well as a supporting science in making a conclusion (Wanti, 2017). From the above opinion, it can be interpreted that mathematics has a very important role in our lives, with mathematics being able to shape character and patterns of thinking objectively. In learning mathematics, mathematical understanding is a very important ability and must be possessed by students. The ability to understand mathematics is one of the important goals in learning, providing an understanding that the materials taught to

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students are not only memorized, but more than that, with an understanding that students can better understand the concept of the lecture material itself. Mathematical understanding is also one of the goals of each material presented by the lecturer because the lecturer is a student mentor to achieve the expected concept (Karim & Nurrahmah, 2018).

Capita Selecta is a compulsory subject for students of the Mathematics Education Study Program. The study of capita selecta is very broad. Therefore, in the mathematics education manual, capita selecta I, capita selecta II, and selecta III. The materials studied in the Selecta I Capita include sets, relations and functions, sequences and series, algebra, absolute values, comparisons, social arithmetic, and probability. Based on data from the results of the final semester exams in 2018/2019, it was found that the scores of some students in the Capita Selecta Mathematics I course were less than satisfactory. Based on the observation results of the UAS (Semester Final Exam) for the Capita Selecta I course from 31 students of the mathematics education study program at Suryakancana University, Cianjur for the 2018/2019 academic year, it showed that 35% of students who scored below 50, 45% of students who scored below 80 and only 20% of students scored above 80. From the data, it can be seen that most of the students had difficulty spelling out the questions of capita selection, especially in social arithmetic. This is because some students make mistakes in working on questions related to the Capita Selecta I course, one of which is on social arithmetic material.

Social arithmetic material has actually been studied by students at the junior high school level, but in reality, there are still many students who make mistakes in solving social arithmetic problems. Anggraeni (2019) stated that one of the causes of weak students in mathematics is the lack of understanding of these students to recognize basic mathematical concepts related to the subject being discussed. Understanding ability is the most basic ability that must be possessed by students because this ability can support students to achieve other mathematical thinking skills. Sumarmo (2003) states that it is important for students to have mathematical understanding because it is needed to solve mathematical problems, problems in other disciplines, and problems

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in everyday life, which is the vision of developing mathematics learning to meet today's life. The ability to understand mathematics is able to help students always think systematically, allowing them to solve mathematical problems in everyday life. Mathematical understanding is one of the keys to the success of learning mathematics. Understanding basically comes from the word "understand," which means "really understand". Understanding Bloom's taxonomy is one aspect of the cognitive domain.

Bloom (Ramdhani et al., 2017) divides aspects of understanding into three kinds of understanding, namely: translation, interpretation, and extrapolation. Translation (change), is the ability to understand an idea expressed in a different way from the original statement. For example, being able to change (translate) story questions into mathematical sentences, give meaning (interpretation), for example, being able to interpret a similarity, and estimate (extrapolation). Thus, it can be said that understanding is shown by the ability to explain or define information verbally, in addition to being able to see the relationship between one concept and another.

According to the Big Indonesian Dictionary, an error is a matter of wrong, mistake, or omission. Errors in general can be viewed as the result of inappropriate actions, which deviate from the rules, norms, or systems that have been determined.. Therefore, to understand mathematical concepts, it is necessary to pay attention to the concepts that were previously studied.

An error is a form of deviation from the actual answer, which is systematic (Ardiawan, 2015). An attempt to observe, find, and classify errors with certain rules (Astuty & Wijayanti, 2013). According to (Astuty & Wijayanti, 2013). The mistakes of students need to be analyzed to find out the various mistakes made by students. Through this analysis, the type and location of errors will be obtained, so that educators can provide the right solution so that it can be corrected and not repeated. Error information in solving math problems can be used to increase the effectiveness of learning mathematics.

Research on error analysis has also been carried out, including error analysis in solving math problems (Istiqomah, 2016), solving mathematical induction problems (Ardiawan, 2015),

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solving the divergence type proving problem (Widodo, 2013), and analyzing student errors in courses The previous prerequisite for calculus 1 has also been carried out by Abdin (2012) on trigonometry problems. Student errors in working on the problem can also be one of the clues to determining the extent to which students understand the material. Therefore, the existence of these errors needs to be found to what extent students understand the material and find solutions to solve them. Thus, errors in solving math problems can be used to improve the quality of teaching and learning activities and, ultimately, improve mathematics learning achievement.

Therefore, it is necessary to analyze the errors made by students in solving math problems, especially in social arithmetic, to find out what mistakes students make in working on social arithmetic problems. Furthermore, the results of the analysis can be used to find out where the student made a mistake so that the factors that caused it can be known. If the factors that cause student errors are known, errors can be minimized so as to help overcome these problems.

2. METHODS

The type of research used in this research is included in qualitative descriptive research. This study intends to describe, explain, or tell students' mistakes in the process of solving math problems. According to (Zellatifanny C.M & Mudjiyanto B., 2018) descriptive research is a research method that seeks to describe and interpret objects as they are. The purpose of this study was to analyze and describe student errors in solving students' mathematical understanding skills in social arithmetic material in the Capita Selecta I course.

The subject of this research involves students of the Mathematics Education Study Program Level 1 (One) Semester 2 (Two) for the 2019/2020 academic year in Cianjur Regency. A research instrument is needed to find out student errors in working on mathematical understanding problems on social arithmetic material. Therefore, to obtain the complete data in this study, a set of research instruments was compiled. The data obtained from the results of the study was then processed to obtain answers to the formulation of the problem examined by the instrument used by the

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researcher, namely the test instrument. However, before the instrument was tested on students, it was first tested for validity, reliability, discriminatory power, and the index of difficulty of each item. The test instrument was tested using Anates Software Version 4.0.5.

Data collection techniques are used by researchers in the form of tests of mathematical understanding abilities and indirect interviews. The test conducted in this study was a test of mathematical understanding. The test was given to research subjects to find out student errors in working on questions related to mathematical understanding abilities in social arithmetic material. This study uses data collection techniques through interviews. in understanding social arithmetic material in terms of high, medium, and low levels and to find out what mistakes students experience in solving problems of mathematical understanding ability on social arithmetic material. An interview is a conversation with a specific purpose. The conversation was carried out by two parties, namely the interviewer (interviewer) who asked the question and the interviewee who gave the answer to the question.

Data analysis techniques are obtained from tests of mathematical understanding abilities and interviews with students. Analysis of mathematical understanding abilities was used to determine how students' mathematical understanding abilities in understanding social arithmetic material were viewed at high, medium, and low levels and to find out what errors were experienced by students in solving the problem of mathematical understanding ability on social arithmetic material. Interviews were conducted so that researchers would know the mistakes made by students. Interviews were conducted with students based on upper, middle, and lower class categories. Interview analysis was carried out by looking back at the errors that had been recorded when checking the answers to test questions and interview results. Then the researcher will verify the students' mistakes by asking questions. In order to obtain further data, the researcher will also use the types of errors made by students to be used as questions in determining the factors that cause student errors when working on questions.

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3. RESULT AND DISCUSSION

The data obtained from this research is qualitative data. Qualitative data was obtained from the results of the test instrument, namely the analysis of the results of student answers, and non-test instruments, namely in the form of no interviews, This student's mathematical understanding ability analysis test was carried out for 90 minutes. This test was followed by first-year students, namely 18 students and 3 students who did not take it, so 15 students took the test. This mathematical understanding ability test is carried out individually before the implementation of the test. The researcher explains to students how to work on the questions that will be done. The following is Table 1 of the results of the mathematical understanding ability test.

Table 1. Results of Students' Mathematical Comprehension Ability Test in Solving Problems

Score	Frekuency	Percent	Criteria
90% – 100%	1	7%	**very high**
75% – 89%	6	40%	**High**
55% – 74%	5	33%	**Medium**
40% – 54%	3	20%	**low**
0% – 39%	0	0%	**Very Low**
Jumlah	**15**	**100%**	

Based on Table 1, information is obtained that the results of the mathematical understanding ability test in the Capita Selecta 1 course, especially on social arithmetic material in solving 5 questions from 15 people who are students of the mathematics education study program, consist of 3 criteria, namely high, medium, and low criteria. The interpretation of test results on the high criteria is presented in Figure 1 below:

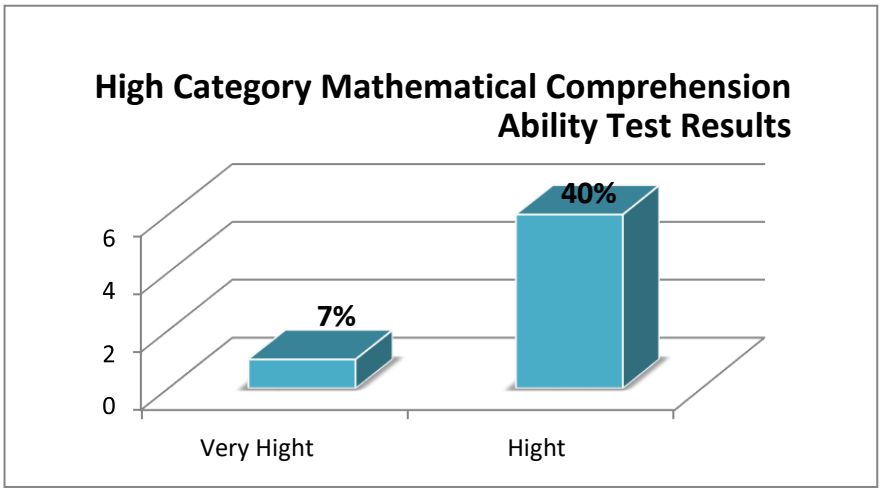

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Figure 1. Results of the High Category Mathematical Comprehension Ability Test

Based on Figure 1, information is obtained that the results of the mathematical understanding ability test in the Capita Selecta course as many as 1 students who successfully answered social arithmetic questions and approached the perfect score, which was included in the range of values of 90-100 but it was unfortunate that there was only 1 student and entered the criteria. very high, while 6 students managed to answer social arithmetic questions with a range of values from 75 to 89 and entered into the high criteria. Furthermore, the interpretation of test results on the criteria is presented in Figure 2.

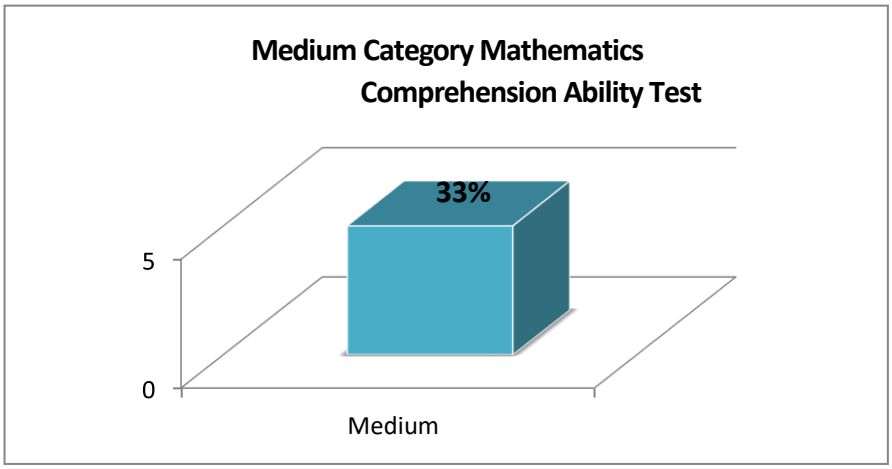

Figure 2. The results of the Mathematical Comprehension Ability Test Medium Criteria

Based on Figure 2, information is obtained that the results of the mathematical understanding ability test in the Capita Selecta course showed that as many as 5 students answered social arithmetic questions with a range of values from 55 to 74, which were included in the medium criteria. Furthermore, the interpretation of the test results on the low criteria is presented in Figure 3.

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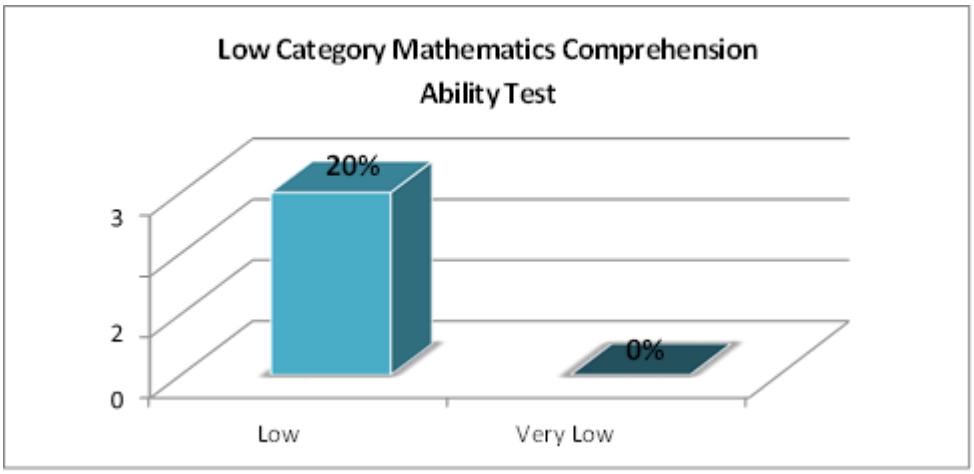

Figure 3. Results of the Low Category Mathematical Comprehension Ability Test

Based on Figure 3, information is obtained that the results of the mathematical understanding ability test in the Capita Selecta course as many as 3 students answered social arithmetic questions with a range of values from 40 to 54. This shows that students do not understand the mathematical understanding ability in social arithmetic material. It can be seen from the results of student answers that there are still errors in the high, medium, and low categories in solving social arithmetic problems. Based on the number of students from each category obtained, as many as 6 students are in the high category (40%) and 1 student is in the very high category (7%) of the total when viewed from students in the high and very high category, students still make mistakes in the questions mathematical understanding ability.

While the criteria were seen from the results of the answers, students still made mistakes in solving mathematical understanding problems. Based on the number of students, there were 5 students who were in the moderate category (33%) of the total. If it is seen from the students' answers in the medium category, students still make mistakes on the indicators of mathematical understanding. And on the low criteria, it can be seen from the results of students' answers that many students make mistakes in solving mathematical understanding problems. Based on the number of students obtained, as many as 3 students (20%) of the total students tested the ability of mathematical understanding. Some indicators that are still lacking include the ability to restate the

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definition of a concept, develop the necessary or sufficient conditions for a concept, apply the concept or problem-solving algorithm, and the ability to relate various concepts. using, utilizing, and selecting certain procedures or operations.

Analysis of mathematical understanding abilities in this section will present research data, namely student errors in working on mathematical understanding problems on social arithmetic material in indicators of the ability to restate the definition of a concept, develop necessary or sufficient conditions for a concept, apply concepts or problem solving algorithms, and ability to link various concepts. and use, utilize, and choose certain procedures or operations.

The following are the results of the analysis of student answers about the types of errors made by students of the Mathematics Education Study Program level I regarding student errors in working on problems of mathematical understanding ability on social arithmetic material, which are presented in Table 2.

Table 2. Recapitulation of Error Analysis of Student Answers Based on Mathematical Understanding Problems

Question	Indicator	Sum %
1	Mistakes Using Concept	**7%**
	Error Using Data	**7%**
	Technical problem	**13%**
	Average	**9%**
2	Mistakes Using Concept	**0%**
	Error Using Data	**0%**
	Technical problem	**0%**
	Average	**0%**
3	Mistakes Using Concept	**73%**
	Error Using Data	**100%**
	Technical problem	**40%**
	Average	**71%**
4	Mistakes Using Concept	**80%**
	Error Using Data	**100%**
	Technical problem	**67%**
	Average	**82%**
5	Mistakes Using Concept	**20%**
	Error Using Data	**20%**
	Technical problem	**27%**
	Average	**22%**

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From table 2, it is obtained that student errors in working on questions 1 to 5 are divided into 3 types of errors, namely: errors using concepts, errors using data and technical errors. The average error made by students in question 1 is 9%, consisting of 7% of the total number of students who make mistakes using concepts, 7% of all students make mistakes in using data; and 13% of all students make technical errors.

The average error made by students in question 2 is 0%, consisting of 0% of all students who make mistakes using concepts, 0% of all students who make mistakes using data, and 0% of all students making technical errors. The average error made by students in question 3 is 71%, consisting of 73% of all students who make mistakes using concepts, 100% of all students make mistakes using data, and 40% of all students make technical errors. The average error made by students in question 4 is 82%, consisting of 80% of all students who make mistakes using concepts, 100% of all students make mistakes using data, and 67% of all students make technical errors.

While the average error made by students in question 5 is 22%, consisting of 20% of all students who make mistakes using concepts, 20% of all students make mistakes in using data, and 27% of all students make technical errors. So students make mistakes based on questions 1 to 5, namely errors in using concepts, errors in using data, and technical errors, because students do not understand each item and students are not accustomed to working on problems with mathematical understanding completion. Furthermore, it will be discussed that students' answers errors on the five questions based on error indicators. The error indicator used is based on Kastolan. The following is a Table 3 recapitulation of student answers based on indicators.

Table 3. Recapitulation of Error Analysis of Student Answers Based on Error Indicators

No	Indicator	Question	Sum
1	Mistakes Using Concept	1	**7%**
		2	**0%**
		3	**73%**

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		4	**80%**
		5	**20%**
	Average	**36%**	
2	Error Using Data	1	**7%**
		2	**0%**
		3	**100%**
		4	**100%**
		5	**20%**
	Average	**45%**	
3	Technical problem	1	**13%**
		2	**0%**
		3	**40%**
		4	**67%**
		5	**27%**
	Average	**29%**	

Based on table 3, information is obtained that the student's errors in working on questions no. 1 to 5 are divided into 3 errors, namely: errors using concepts, errors using data, and technical errors. The average error made by students in the first indicator is the error using the concept of 36% of the total number of students who make mistakes using the concept with a presentation of 7% on question number 1, 0% on question number 2, 73% on question number 3, 80% on question number 4 and 20% on question number 5. The average error made by students in the second indicator is the error using data by 45% of the total number of students who make mistakes using concepts, with a presentation of 7% on question number 1, 0% on question number 2, 100% on question number 3, 100% on question number 4 and 20% on question number 5.

While the average error made by students on the third indicator, namely technical errors, was 29% of the total number of students who made mistakes using concepts, with a percentage of 13% on question number 1, 0% on question number 2, 40% on question number 3, 67% on question number 4 and 27% on question number 5. So, based on the analyzed data, it was found that students made errors in using data by 45% because they failed to understand the questions, so they

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incorrectly entered data into variables and some students even added data that was not required to do these questions. The following are the results of student answers who made mistakes based on the concept error indicator on the problem of mathematical understanding ability shown in Figure 4.

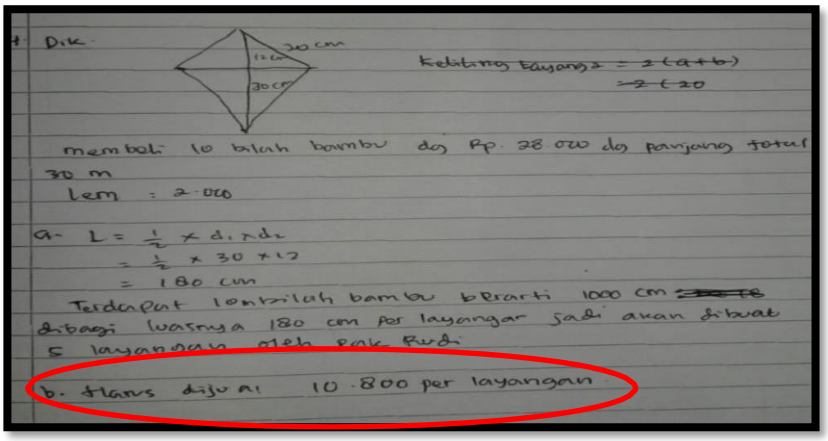

Figure 4. Results of Student Answers Who Make Errors on Concept Error Indicators

Based on Figure 4, students make mistakes in the first indicator, namely conceptual errors. It can be seen in the answers that students only write their answers without classifying the data and using formulas to fulfill the questions given, so that students are wrong in solving this problem. Furthermore, examples of errors based on the second indicator, namely errors using data made by students in solving problems of mathematical understanding ability, are shown in Figure 5.

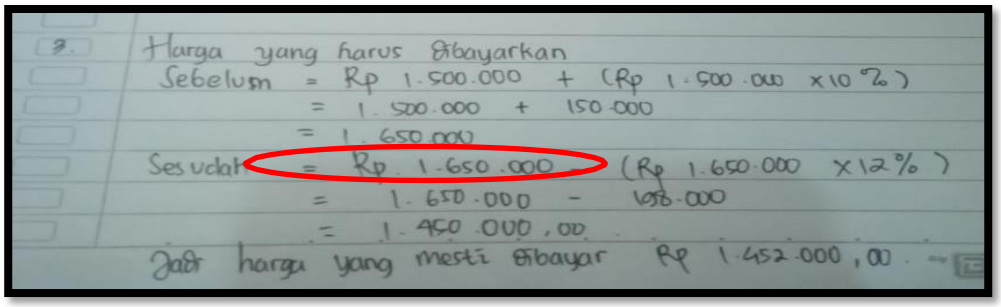

Figure 5. Results of Student Answers Who Make Errors on Error Indicators Using Data

Based on Figure 5 students make mistakes in the second indicator, namely errors in using data. It can be seen that in this answer, students enter incorrect data into variables or students

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incorrectly enter data into formulas, so that students are wrong in solving social arithmetic problems. Furthermore, examples of errors based on the second indicator, namely errors using data made by students in solving problems of mathematical understanding ability, are shown in Figure 6.

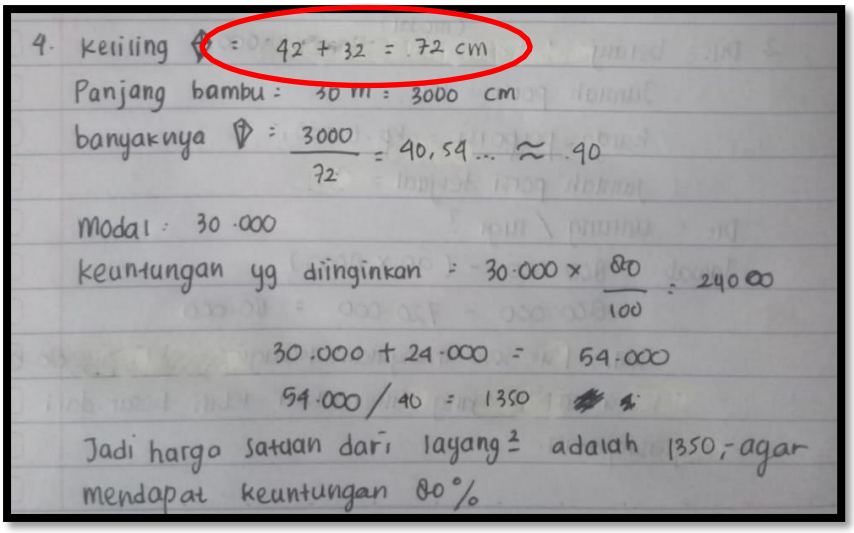

Figure 6. Results of Student Answers who Made Mistakes on Technical Error Indicators

Based on Figure 6 students make mistakes on the third indicator, namely technical errors. This can be seen from the results of students' answers that students are wrong and make mistakes in performing arithmetic operations.

Analysis of data from interviews indirectly or open questions given to students who were carried out after working on the mathematical understanding test showed from several samples with high, medium, and low criteria in the results of interviews analyzed that students had difficulties and made mistakes in solving comprehension problems. mathematical. The results of indirect interviews or open-ended questions are shown in Figure 7

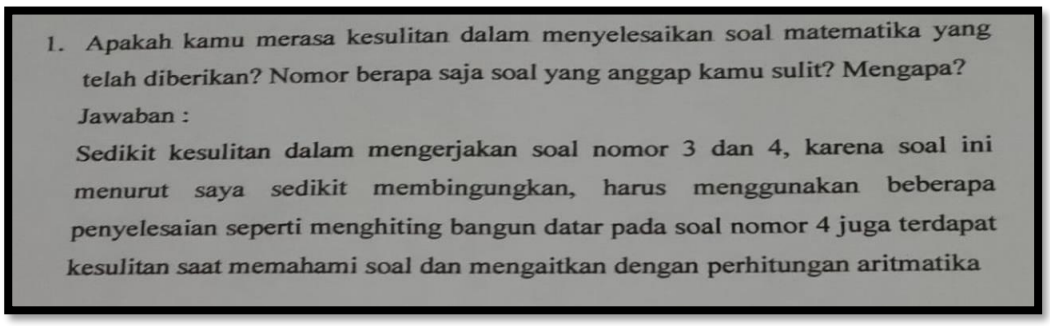

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Figure 7. High Category Student Interview Results in Question 1

Based on Figure 7, the indirect interview in question 1 shows that students with high categories have little difficulty in working on questions numbers 3 and 4 because, according to him, confusing questions must use several solutions to answer these questions and there are difficulties in linking the questions into arithmetic calculations. Furthermore, the results of student interviews with the medium category are shown in Figure 8.

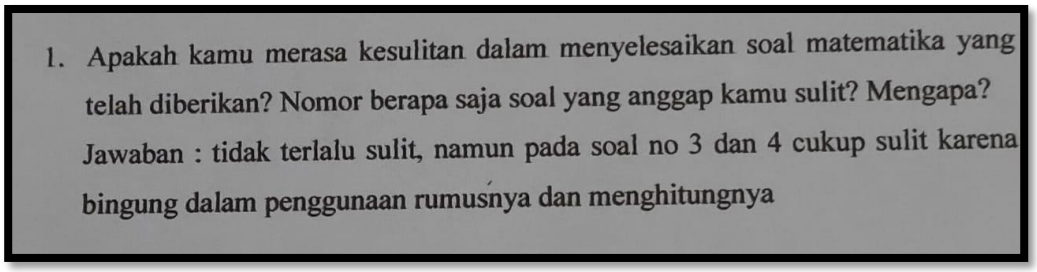
1. Apakah kamu merasa kesulitan dalam menyelesaikan soal matematika yang telah diberikan? Nomor berapa saja soal yang anggap kamu sulit? Mengapa?
Jawaban : tidak terlalu sulit, namun pada soal no 3 dan 4 cukup sulit karena bingung dalam penggunaan rumusnya dan menghitungnya

Figure 8. Student Interview Results in the Medium Category in Question 1

Based on Figure 8, the indirect interview in question 1 shows that students in the moderate category are having difficulties because they do not understand the questions, which causes confusion in determining and using formulas. Furthermore, the results of student interviews with low categories are shown in Figure 9.

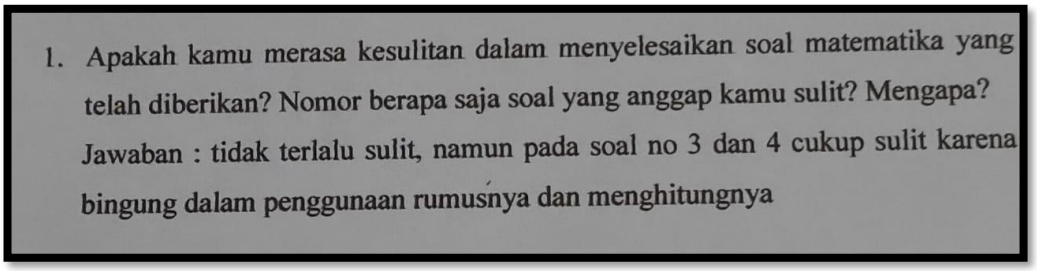
1. Apakah kamu merasa kesulitan dalam menyelesaikan soal matematika yang telah diberikan? Nomor berapa saja soal yang anggap kamu sulit? Mengapa?
Jawaban : tidak terlalu sulit, namun pada soal no 3 dan 4 cukup sulit karena bingung dalam penggunaan rumusnya dan menghitungnya

Figure 9. Results of Low Category Student Interviews in Question 1

Based on the results of indirect interviews with students in the low category, students experienced difficulties, especially in question number 4, because they could not understand what was contained in the questions. Furthermore, the results of indirect interviews with students in the high, medium, and low level categories in question 2 are shown in Figure 10.

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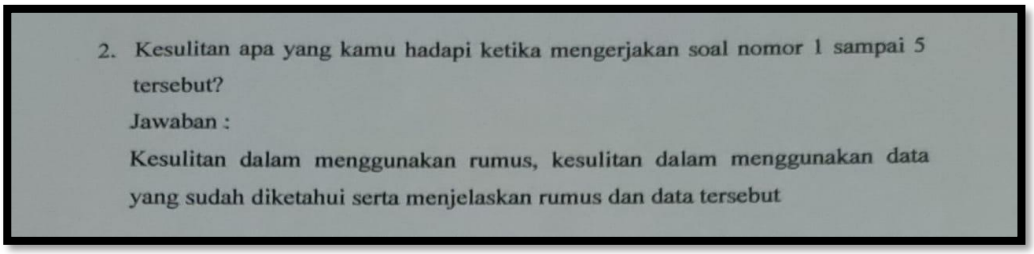
2. Kesulitan apa yang kamu hadapi ketika mengerjakan soal nomor 1 sampai 5 tersebut?
Jawaban :
Kesulitan dalam menggunakan rumus, kesulitan dalam menggunakan data yang sudah diketahui serta menjelaskan rumus dan data tersebut

Figure 10. High Category Student Interview Results in Question 2

Based on Figure 10, the indirect interview in question 2 shows that students in the high category also have difficulty understanding the concept, so that students have difficulty using the formula and students have difficulty using data that is already known to be entered into the formula. Furthermore, the results of indirect interviews with students in the medium category are shown in Figure 11.

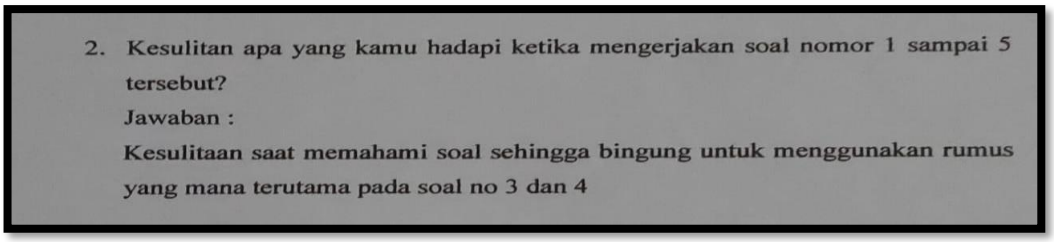
2. Kesulitan apa yang kamu hadapi ketika mengerjakan soal nomor 1 sampai 5 tersebut?
Jawaban :
Kesulitaan saat memahami soal sehingga bingung untuk menggunakan rumus yang mana terutama pada soal no 3 dan 4

Figure 11. Student Interview Results in the Medium Category in Question 2

Based on Figure 11, the indirect interview in question 1 shows that students in the moderate category have difficulty understanding the questions, especially in questions 3 and 4, causing errors in solving the given social arithmetic problems. Furthermore, the results of student interviews with low categories are shown in Figure 12.

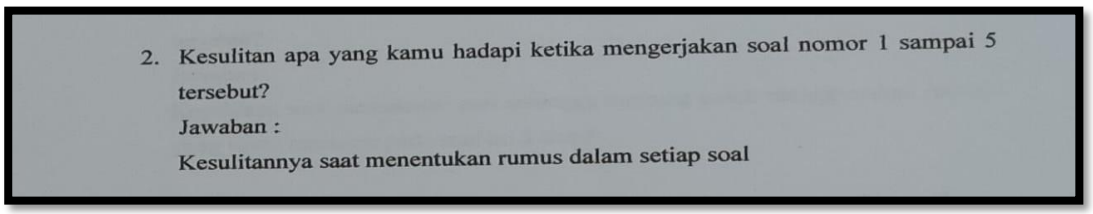
2. Kesulitan apa yang kamu hadapi ketika mengerjakan soal nomor 1 sampai 5 tersebut?
Jawaban :
Kesulitannya saat menentukan rumus dalam setiap soal

Figure 12. Low Category Student Interview Results in Question 2

Based on the results of student interviews on the second question with a low category, students have difficulty understanding the questions, so they are confused in determining the

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formula they want to use to solve the problem. Furthermore, the results of indirect interviews in question 3 are shown in Figure 13.

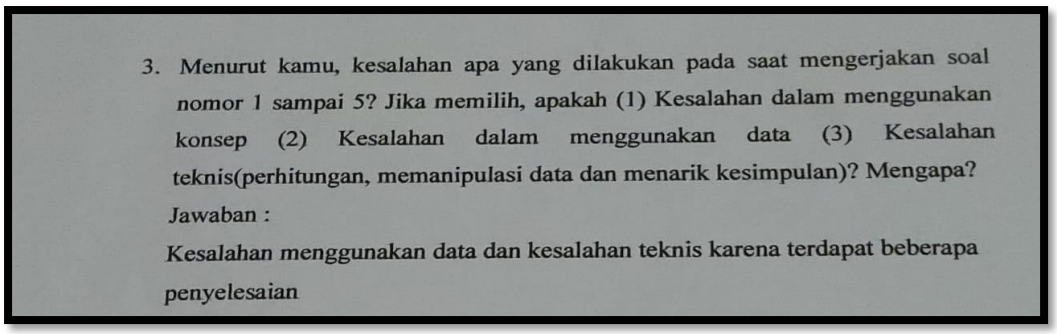
3. Menurut kamu, kesalahan apa yang dilakukan pada saat mengerjakan soal nomor 1 sampai 5? Jika memilih, apakah (1) Kesalahan dalam menggunakan konsep (2) Kesalahan dalam menggunakan data (3) Kesalahan teknis(perhitungan, memanipulasi data dan menarik kesimpulan)? Mengapa?
Jawaban :
Kesalahan menggunakan data dan kesalahan teknis karena terdapat beberapa penyelesaian

Figure 13. High Category Student Interview Results on Question 3

Based on Figure 13, the indirect interview on question 3 shows that students with high categories express a conscious error in solving questions numbers 1 to 5, namely errors in using data and technical errors, because, according to him, there are several solutions to each item related to everyday life. -day. Furthermore, the results of the interviews on the questions of 3 students in the medium category are shown in Figure 14.

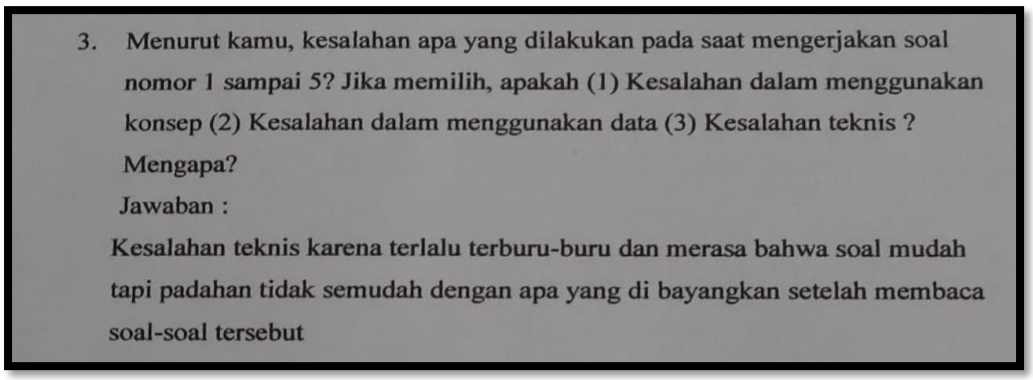
3. Menurut kamu, kesalahan apa yang dilakukan pada saat mengerjakan soal nomor 1 sampai 5? Jika memilih, apakah (1) Kesalahan dalam menggunakan konsep (2) Kesalahan dalam menggunakan data (3) Kesalahan teknis ? Mengapa?
Jawaban :
Kesalahan teknis karena terlalu terburu-buru dan merasa bahwa soal mudah tapi padahan tidak semudah dengan apa yang di bayangkan setelah membaca soal-soal tersebut

Figure 14. Interview Results of Medium Category Students on Question 3

Based on Figure 14, the indirect interview in question 3 shows that students in the medium category stated that they realized that they had made several mistakes, especially technical errors, because students felt rushed and took the questions lightly before studying them first. Furthermore, the results of indirect interviews on question 3 with low-category students are shown in Figure 15.

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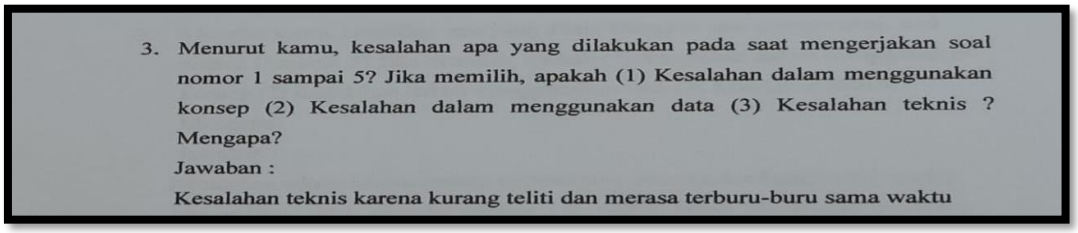
3. Menurut kamu, kesalahan apa yang dilakukan pada saat mengerjakan soal nomor 1 sampai 5? Jika memilih, apakah (1) Kesalahan dalam menggunakan konsep (2) Kesalahan dalam menggunakan data (3) Kesalahan teknis ? Mengapa?
Jawaban :
Kesalahan teknis karena kurang teliti dan merasa terburu-buru sama waktu

Figure 15. Low Category Student Interview Results on Question 3

Based on the results of indirect interviews on question 3 with students in the low category, they have made technical errors in solving problems because they are not thorough and feel in a hurry. Furthermore, the results of indirect interviews on question 4 based on high, medium, and low categories are shown in Figure 16.

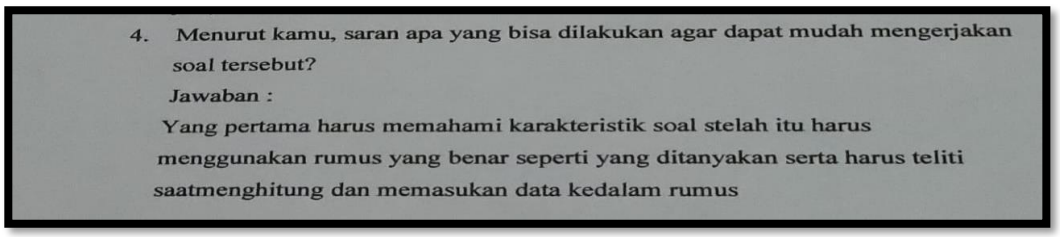
4. Menurut kamu, saran apa yang bisa dilakukan agar dapat mudah mengerjakan soal tersebut?
Jawaban :
Yang pertama harus memahami karakteristik soal stelah itu harus menggunakan rumus yang benar seperti yang ditanyakan serta harus teliti saatmenghitung dan memasukan data kedalam rumus

Figure 16. High Category Student Interview Results on Question 4

Based on Figure 16, indirect interviews in question 4, it is shown that students with high categories give suggestions in order to facilitate the process of working on questions 1 to 5. First, they must understand the characteristics of the questions. After that, they must use the right formula for the target, and students say that in the work they must be careful. when calculating carefully when using and entering data into the formula. Furthermore, the results of indirect interviews with students with moderate categories are shown in Figure 17.

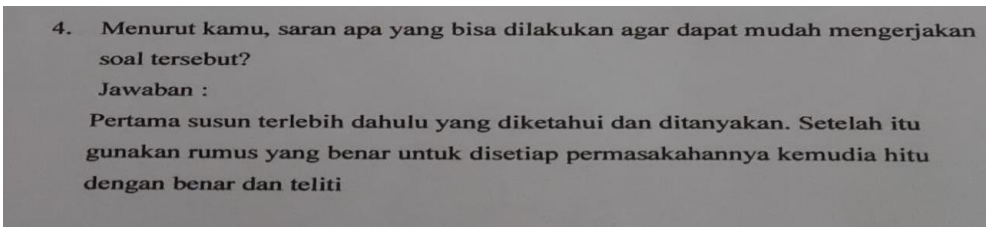
4. Menurut kamu, saran apa yang bisa dilakukan agar dapat mudah mengerjakan soal tersebut?
Jawaban :
Pertama susun terlebih dahulu yang diketahui dan ditanyakan. Setelah itu gunakan rumus yang benar untuk disetiap permasakahannya kemudia hitu dengan benar dan teliti

Figure 17. High Category Student Interview Results on Question 4

Based on the results of indirect interviews, students in the medium category in question 4 expressed suggestions to make it easier to do the first work. They first compile what is known and

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what is being asked, then must understand the question and calculate correctly and thoroughly. Furthermore, the results of indirect interviews with students with low categories are shown in Figure 18.

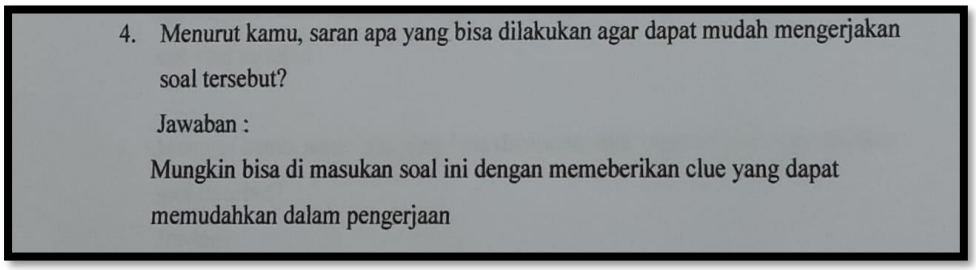
4. Menurut kamu, saran apa yang bisa dilakukan agar dapat mudah mengerjakan soal tersebut?
Jawaban :
Mungkin bisa di masukan soal ini dengan memeberikan clue yang dapat memudahkan dalam pengerjaan

Figure 18. High Category Student Interview Results on Question 4

Based on the results of indirect interviews, students with low categories in question 4 express suggestions to make it easier to work, namely by giving clues to make it easier to understand what is contained in the questions and make it easier to work on.

Based on the results of indirect interviews given to students with high, medium, and low level categories, the author concludes that the main factors causing students to often make mistakes in mathematical understanding abilities is that first students find it difficult to understand social arithmetic problems, so that students make mistakes in using and entering data into formulas and that students make technical errors such as arithmetic operations, addition, and subtraction due to the lack of accuracy of students when working on mathematical understanding skills in the Capita Selecta course, especially in social arithmetic material.

Analysis of mathematical understanding ability showed that the results of the mathematical understanding ability test in the Capita Selecta course, especially on social arithmetic material, in solving 5 questions from 15 people who were students of the mathematics education study program, some students were in low criteria. From the results of the analysis above, students' errors in solving problems of mathematical understanding ability, students do not understand the concepts contained in the questions, and students are not able to see the relationship between concepts, so that the completion process given is less precise. Students are not able to see every

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relationship between one concept and another. Mathematical understanding is an ability related to students' ability to understand a concept. Putra, Setiawan, Nurdianti, Retta, & Desi (2018). Students must understand the concepts in a material so that they have good understanding skills.

Based on analysis of student answers errors based on error indicators, it was found that students made conceptual errors, errors in using data, and technical errors. From the three indicators of error in solving problems of mathematical understanding ability, it can be seen from table 3 that the dominant student made an error using the data. This shows that the errors experienced by students include making errors in using data, conceptual errors, and technical errors. This is in line with the results of Fitria's research (2013), revealing that the errors that often occur in students are conceptual errors, errors in using data, facts, and technical errors. Research on error analysis has also been carried out, including: error analysis in solving math problems (Istiqomah, 2016).

Analysis of interview data Based on the results of the distribution of interviews indirectly, the factors that cause students to often make mistakes in the matter of mathematical understanding abilities include difficulty in understanding the concepts contained in the questions. When students are interviewed indirectly, students find it difficult to understand the concept, so that students experience errors in using the formula and students have difficulty using known data to be entered into the formula. This can be seen from some of the students' answers when working on questions, errors that are often shown, namely the lack of accuracy when using arithmetic operations, when loading data into formulas, or when understanding related questions that are asked. Students were interviewed indirectly about what mistakes were made when working on questions number 1 to 5. Students felt that the time when working on these questions was rushed. so that students are less thorough in answering and even students do not have time to re-examine the results of their answers. This is in accordance with Wati's research (2017), which states that the error made by students is not to re-examine the results of their work before they are collected.

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4. CONCLUSSION

With this, it can be concluded that the students' mathematical understanding ability on the high, medium, and low criteria is still wrong and makes mistakes, regardless of whether they have high, medium, or low criteria. The errors experienced by students in solving mathematical understanding problems on social arithmetic material include conceptual errors, errors in using data, and technical errors, but students who experience errors are more dominant in errors using data. From the results of indirect interviews, there are several error factors that are often made by students, namely a lack of understanding related to the questions asked and other factors that are less thorough when solving mathematical understanding problems in social arithmetic material.

5. REFFERENCES

Anggriani, A., & Septian, A. (2019). Peningkatan kemampuan komunikasi matematis dan kebiasaan berpikir siswa melalui model pembelajaran IMPROVE. *IndoMath: Indonesia Mathematics Education, 2*(2), 105-116.

Ardiawan, Y. (2015). analisis kesalahan mahasiswa dalam menyelesaikan soal induksi matematika di IKIP PGRI Pontianak. *Jurnal Pendidikan Informatika Dan Sains*, *4*(1), 147–163.

Astuty, K. Y. (2013). Analisis kesalahan siswa kelas V dalam menyelesaikan soal matematika pada materi pecahan di SDN Medokan Semampir I/259 Surabaya. *MATHEdunesa, 2*(3).

Fitria, T. N. (2013). Analisis kesalahan siswa dalam menyelesaikan soal cerita berbahasa inggris pada materi persamaan dan pertidaksamaan linear satu variabel. *MATHEdunesa*, *2*(1).

Istiqomah, N. (2016). Analisis kesalahan dalam menyelesaikan soal matematika siswa kelas XI SMK Tamtama Karanganyar tahun ajaran 2013/2014. *UNION: Jurnal Pendidikan Matematika, 4*(2), 343-352.

Karim, A., & Nurrahmah, A. (2018). Analisis kemampuan pemahaman matematis mahasiswa pada mata kuliah teori bilangan. *Jurnal Analisa, 4*(1), 24-32.

Putra, H. D., Setiawan, H., Nurdianti, D., Retta, I., & Desi, A. (2018). Kemampuan pemahaman matematis siswa smp di bandung barat. *Jurnal Penelitian Dan Pembelajaran Matematika, 11*(1).

Ramdhani, M. R., Usodo, B., & Subanti, S. (2017, November). Student's mathematical understanding ability based on self-efficacy. *In Journal of Physics: Conference Series*, 909(1)

Zellat.ifanny, C. M., & Mudjiyanto, B. (2018). Tipe penelitian deskripsi dalam ilmu komunikasi. *Diakom: Jurnal Media Dan Komunikasi, 1*(2), 83-90.

Wanti, N., Juariah, J., Farlina, E., Kariadinata, R., & Sugilar, H. (2017). Pembelajaran induktif pada kemampuan penalaran matematis dan self-regulated learning siswa. *Jurnal Analisa, 3*(1), 56-69.

DOI: https://doi.org/10.17509/xxxxxxxxxx
p- ISSN 2776-608X e- ISSN 2776-5970

Kristofora, M., & Sujadi, A. A. (2017). Analisis kesalahan dalam menyelesaikan masalah matematika dengan menggunakan langkah polya siswa kelas vii smp. *Prisma*, *6*(1), 9-16.

Widodo, S. A. (2013). Analisis kesalahan dalam pemecahan masalah divergensi tipe membuktikan pada mahasiswa matematika. *Jurnal pendidikan dan pengajaran*, *46*(2).

DOI: https://doi.org/10.17509/xxxxxxxxxx
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