Journal of Research in Instructional
e-ISSN: 2776-222X
Vol. 2(1) 2022, pp. 65 – 86

The analysis of English education students' interest in mathematics courses

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Abstract: The purpose of this study was to analyze the interest in learning mathematics of twenty English education students at a university in West Papua. This research method is a qualitative research method using descriptive techniques. The procedure of this research starts from the development of the questionnaire instrument, the development of the interview instrument, the validation of the instrument, the distribution of the questionnaire, the determination of the subject, and the interview. Based on the results of data analysis, it is known that the interest in learning mathematics of English education students based on indicators of student interest in learning mathematics is categorized into three groups, namely students who are not interested in learning mathematics, quite interested in learning mathematics, and interested in learning mathematics. Students in the category of the uninterested group have not been able to meet the indicators of interest in learning mathematics. Meanwhile, students in the moderately interested groups can fulfill three indicators of interest in learning mathematics: students' feelings of pleasure in mathematics, students' interest in mathematics, and students' attention to mathematics. Students from the interest group category can fulfill the four indicators of interest in learning mathematics: students' feelings of pleasure in mathematics, student interest in mathematics, student attention to mathematics, and student involvement in mathematics.

Keywords: Learning, mathematics, interest, English education

Analisis minat mahasiswa pendidikan bahasa Inggris pada perkuliahan matematika

Abstrak: Tujuan dari penelitian ini yaitu untuk menganalisis minat belajar matematika dua puluh mahasiswa pendidikan bahasa inggris di salah satu universitas di Papua Barat. Metode penelitian ini merupakan metode penelitian kualitatif dengan menggunakan teknik deskriptif. Prosedur penelitian ini yaitu dimulai dari pengembangan instrumen angket, pengembangan instrumen wawancara, validasi instrumen, penyebaran angket, penentuan subjek, dan wawancara. Berdasarkan hasil analisis data diketahui bahwa minat belajar matematika mahasiswa pendidikan bahasa inggris berdasarkan indikator minat belajar matematika mahasiswa dikategorikan kedalam tiga kelompok yaitu mahasiswa yang tidak berminat belajar matematika, cukup berminat belajar matematika dan berminat belajar matematika. Mahasiswa dalam kategori kelompok tidak berminat belum dapat memenuhi indikator dari minat belajar matematika. Sedangkan mahasiswa dalam kategori kelompok cukup berminat dapat memenuhi tiga indikator minat belajar matematika yaitu perasaan senang mahasiswa terhadap matematika, ketertarikan mahasiswa terhadap matematika dan perhatian mahasiswa terhadap matematika. Untuk mahasiswa dari kategori kelompok berminat dapat memenuhi keempat indikator minat belajar matematika yaitu perasaan senang mahasiswa terhadap matematika, ketertarikan mahasiswa terhadap matematika, perhatian mahasiswa terhadap matematika dan keterlibatan mahasiswa terhadap matematika.

Kata Kunci: Belajar, matematika, minat, pendidikan bahasa inggris

Received: 27-03-2022
Accepted: 26-06-2022

To cite this article: Pangadongan, S. P., Purwati, P., & Wyrasti, A. F. (2022). The analysis of English education students' interest in mathematics courses. *Journal of Research in Instructional*, 2(1), 65–86. https://doi.org/10.30862/jri.v2i1.40

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INTRODUCTION

Mathematics is a very important science and is always used in everyday life. Therefore mathematics must be learned and mastered by every student in the hope that they can achieve better learning outcomes. One of the most influential variables on learning outcomes is student characteristics, including student interest in learning (Lestari, 2015). Interest is a desire from within a person for a certain object, for example, interest in a lesson or sport. Therefore, someone interested in something will appear interested from within himself to carry out activities on a particular object. Interest is a supplier of power to behave in a directed manner so that it can achieve certain goals (Pribadi & Susanto, 2018). Someone not interested in doing something will find it difficult to do it with a happy heart. The person will do it just like that regardless of right or wrong what he has done. In contrast to someone who does something according to his interests, that person will do it with a happy heart, and the results will be better because it is done wholeheartedly, as well as an interest in learning from someone.

Interest in learning is a sense of interest in a person in a lesson that will encourage individuals to pursue and study the lesson so that it can cause changes in knowledge, skills, and behavior. Sirait (2016) says that a person's interest in learning is a psychological trait that shows up in many ways, such as desire, passion, and the desire to change behavior through different activities, like getting more information and experience.. Interest in learning mathematics is a tendency in a person who shows interest or pleasure in learning mathematics according to his wishes by getting maximum results and giving satisfaction to the individual. According to Daniyati and Sugiman (2015), interest in learning mathematics must be grown to achieve better learning achievement. The absence of interest can cause students to be lazy to study mathematics, which can impact their learning achievement. Interest is an important motivational tool for learning mathematics (Carmichael et al., 2017). Individual interest is a stable and fundamental disposition activated in certain situations (Harackiewicz & Hulleman, 2010).

Interest is a psychological state of attention, influence on a particular object or topic, and a lasting tendency to re-engage over time (Harackiewicz et al., 2016). However, ineffective classroom management, poorly designed course environments and lack of full involvement in math content reduce students' opportunities to develop independence and positive attitudes toward mathematics (Rowan-Kenyon et al., 2012). Variables, teaching factors, student factors, learning strategies, mathematics anxiety, and infrastructure problems are positively related to students' interest in learning mathematics (Anigbo & Indigo, 2015). Teacher motivation also positively affects students' interest in mathematics and the methods and approaches teachers to use in teaching mathematics (Arthur et al., 2014). Interest is important for student learning success, but little is known about the developmental dynamics between interest and social support in the classroom (Lazarides et al., 2019). But learning mathematics is not easy because of its abstract nature. Students find it difficult to learn mathematics because of a lack of interest in these subjects (Subrahmanyam, 2021).

According to Hidayat (2018), interest is one of the most basic and very important factors for students in learning. Because the student's interest in learning will be able to determine the success of learning, some of the phenomena that occur today are students taking lectures in mathematics courses not always of their interests but because there are

other factors such as demands from the faculty as one of the graduation requirements to take the lecture. University students have a higher age than the rest of the school, which affects their decline in interest in mathematics (Carmichael et al., 2017). Mathematics learning at the university level has changed in terms of material content and student learning environment (Rach et al., 2017). This condition causes changes in student interest because it is not in harmony with the conditions of the learning environment (Kosiol et al., 2019). Characteristics of students, such as interest related to lectures are an important trigger for successful learning to be carried out (Harackiewicz & Hulleman, 2010; Obielodan et al., 2021; Ufer et al., 2017).

When teachers are able to make connections between mathematical ideas and real-world issues and experiences, as well as establish interconnections between different types of mathematical knowledge, mathematics instruction becomes more engaging for pupils. This kind of instruction is fundamental to the teaching and learning of mathematics at all educational levels (Arthur et al., 2018). Unfortunately, all pupils are forced to learn the same method and at the same speed from the instructor (Hwang et al., 2012). Mathematics learning can be done by reducing conventional learning through active learning models that increase student interest in learning (Yeh et al., 2019). Students' interest in a subject depends on their interests. High interest in a subject will bring seriousness to studying it. Conversely, low interest will lead students to move further away from the course. Many students show low interest and confidence in learning mathematics (Lee, 2012). The process of learning mathematics emphasizes a very complex cognitive load that can be very burdensome for students because it requires a lot of effort. As a result, these students need a lot of motivation to cope with the learning (Ogochukwu, 2010).

The condition also happened to students of the English Education Study Program at a university in West Papua when studying mathematics courses. Not all students are interested in these courses. The initial interview results with two students of the Mathematics English Education Study Program were interesting and challenged them to learn it. Then other students said that learning mathematics could add knowledge to the process of counting. Still, these students sometimes find it difficult to understand some mathematical concepts and formulas, so it is difficult to follow the learning process. There is no data on how many students are interested in the material and how many are not. Based on this description, the researcher is interested in analyzing the interest in learning mathematics in the students of the English Education Department. This study aims to analyze the interest in learning mathematics of twenty English education students at a university in West Papua.

METHOD

This study examines the interest in learning mathematics of twenty students of English education using qualitative research methods with descriptive techniques. Broadly speaking, the research was conducted through four stages, namely:

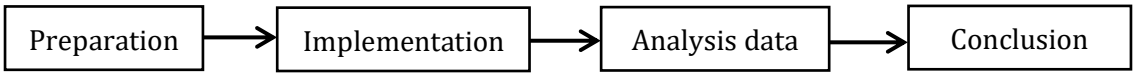

Figure 1. Research procedure

Preparation phase

Activities that have been carried out at the preparation stage in this research are making instruments in the form of questionnaires and interview guidelines and conducting instrument validation.

Creating a questionnaire instrument and interview guide

The learning interest questionnaire instrument is made in several written statements used to determine student interest in learning. This learning interest questionnaire consists of 10 statements, and the ten statements are positive. Student interest in learning is divided into four indicators: student feelings of pleasure as many as three statements, student interest as much as 2 statements, student attention as many as two statements, and student involvement in as many as three statements. In the statement, the researcher gave four answer options: Strongly Agree (SS), Agree (S), Disagree (TS), and Strongly Disagree (STS), and students were only allowed to choose one answer choice. Strongly Agree (SS) has a score of 4, Agree (S) has a score of 3, Disagree (TS) has a score of 2, and Strongly Disagree (STS) has a score of 1.

Validation of research instruments by validators

The validation that has been carried out in this study is validation by experts (in this case, mathematics education lecturers) with the type of validity, namely content validity. Instruments that have been validated in this study are student learning interest questionnaires and interview guidelines. After the research instrument is validated, the next thing to do is arrange a research permit to conduct research in the department used as the research location.

Implementation stage

Activities carried out at this stage are:

Carry out the distribution and filling of questionnaires

The distribution and filling out of interest in learning questionnaires has been carried out to English language education students in Batch 2018 using google forms. The questionnaire was distributed on Friday, July 30, 2021.

Determine the research subject

After the students fill out the questionnaire, the next step is the researcher will determine the research subjects from several students who will be chosen randomly, representing each category of learning interest that has been obtained through the questionnaire. The data from student questionnaires are grouped into three categories: the not interesting category, the moderately interesting category, and the interesting category. The grouping is based on the criteria for interest in learning mathematics, as shown in Table 1.

Table 1. Categories of student learning interest questionnaire

Score	Student Interest Category
$10 \leq x \leq 20$	Not interested
$21 \leq x \leq 30$	Enough
$31 \leq x \leq 40$	Interested

x : Scores obtained by students

Interviews with research subjects

After the researcher determines the subject, the next step is that the researcher will conduct interviews with three students who have been selected as research subjects. Interviews were conducted online via telephone due to conditions that made it impossible to meet face to face in light of the COVID-19 pandemic.

Data Analysis Stages

After the data from the questionnaires, interviews, and documentation are collected, then the researcher will process and analyze the data by describing the data on students' interest in learning mathematics.

Conclusion Drawing Stage

The activities carried out at this stage conclude the research conducted by answering the research problem formulation based on the results of data analysis and research findings. Furthermore, provide suggestions or recommendations to parties related to the research results.

RESULTS

The research findings presented are data obtained from the results of questionnaires and interviews with three students who are the research subjects. The purpose of this interview is to find in-depth information about interest in learning mathematics that cannot be seen in the questionnaire results. This interview is also to validate the research subject's questionnaire results.

Results of questionnaire data analysis

Questionnaires are given to students with a total of 10 statements. The results of filling out the students' interest in learning mathematics questionnaire were then checked and scored according to the scoring guidelines using the Likert scale that had been made, as shown in Table 2.

Based on the data from the questionnaire in Table 2, the researchers chose three respondents who were used as research subjects for interviews. M1 represents students from the uninterested group category. M1 was chosen to represent students from the category of the uninterested group because M1 had not been able to fulfill the four indicators of interest in learning mathematics. Then M10 represents students from the category of moderately interested groups. The reason for choosing M10 as the research subject is because M10 can only fulfill three indicators of interest in learning mathematics. M20 will represent students from the interest group category because M20 can meet all indicators of interest in learning mathematics.

The following is an explanation of the questionnaire data that has been filled in by the research subjects from the student's interest in learning mathematics questionnaire and its analysis accompanied by excerpts from interviews with students. The questionnaire results on students' interest in learning mathematics are based on the category of not interested group, moderately interested group category, and interesting group category, along with excerpts from interviews conducted between researchers and research subjects.

Table 2. Percentage of student questionnaire scores

Student code	Score each item statement										Amount	Category	%
	1	2	3	4	5	6	7	8	9	10			
M1	3	2	2	2	1	2	1	2	2	1	18	Not interest	15
M2	2	3	2	1	2	2	1	2	2	2	19		
M3	1	3	1	3	3	3	1	3	1	1	20		
M4	3	3	3	3	2	2	2	2	3	1	24	Enough	50
M5	3	3	3	3	2	2	2	2	2	2	24		
M6	2	3	2	3	2	3	2	2	3	3	25		
M7	3	3	2	2	2	3	3	3	3	2	26		
M8	3	3	3	2	3	3	2	2	3	2	26		
M9	3	2	3	1	3	2	3	2	4	3	26		
M10	4	3	3	3	3	3	2	2	2	3	28		
M11	3	3	2	4	4	3	3	2	3	2	29		
M12	3	3	4	4	2	2	3	2	3	3	29		
M13	3	4	3	4	4	3	2	2	2	3	30		
M14	4	3	3	3	3	3	3	3	3	3	31	Interest	35
M15	3	4	4	2	2	3	3	3	4	3	31		
M16	3	4	4	3	3	4	3	3	3	2	32		
M17	3	4	3	4	3	4	3	2	3	4	33		
M18	3	3	4	4	4	3	3	3	4	3	34		
M19	4	4	4	4	3	3	3	4	4	4	37		
M20	4	4	4	4	4	4	3	3	4	4	38		

Note: M1: Student 1, etc.

The results of the work of M1 subjects from the uninterested group

Based on the data obtained, the researcher can analyze the interest in learning mathematics of Subject M1 through a questionnaire and compare it with the results of interviews to strengthen its validity. Following are the results of the questionnaire analysis of students' interest in learning mathematics and the results of interviews with Subject M1, representing the category of the uninterested group. The first indicator of interest in learning mathematics is the student's feeling of pleasure towards mathematics, represented by statements 1-3. Subject M1's answers to statements Number 1-3 in the questionnaire can be seen in Figure 2.

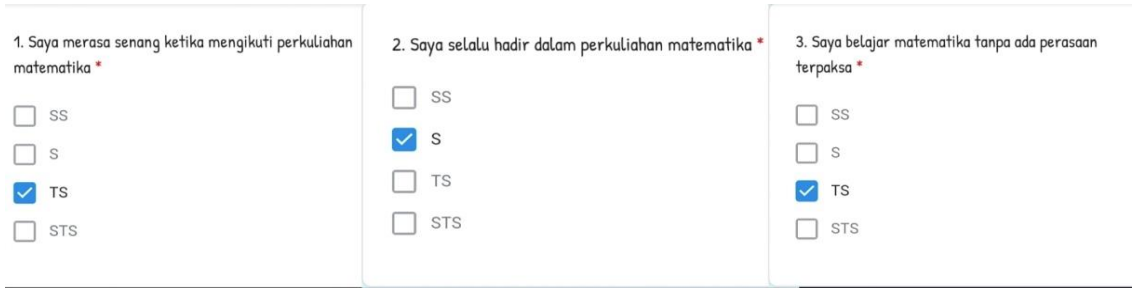

Figure 2. The results of the M1 questionnaire on statements number 1-3 for indicators of students' feelings of pleasure toward mathematics

The questionnaire results showed that M1 did not meet the first indicator, namely the students' feelings of pleasure towards mathematics. This is shown in statements 1 and 3; M1 chose to tick the Disagree (TS) answer. These results are reinforced by the following excerpts from interviews with M1.

Q: Do you enjoy taking math classes?

M1: I think that mathematics is always used in everyday life, but I do not like/enjoy learning mathematics. That's because mathematics is too abstract and difficult to understand.

Following the interview results above, it can be seen that M1 does not have feelings of liking/enjoyment to learn mathematics, because M1 considers mathematics too abstract and difficult to understand. For statement item Number 3 in the questionnaire, the subject chooses the Agree (S) option, which means that M1 agrees with the statement "I always attend mathematics lectures." Explicitly, these results indicate that M1 has feelings of pleasure toward mathematics. However, when interviewed, M1 stated the reason. Following are the interview results with M1 related to item Number 2.

Q: Do you always attend math classes? Why?

M1: Yes, I always attend math classes. Even though I don't like math, I always attend lectures because I don't want to be absent in my absences.

Based on the interview results, it can be seen that M1 does not like mathematics. His motivation for attending lectures was to fill out the attendance list.

Q: Is there a feeling of compulsion to learn mathematics?

M1: Yes, because I'm not too fond of math.

Based on the excerpt of the researcher's interview with M1 above, it can be seen that M1 does not have feelings of liking for mathematics. So M1 does not meet the first indicator, namely the feeling of pleasure in students towards mathematics.

The second indicator, namely student interest in mathematics, is represented by statements 4 and 5. The results of Subject M1's work for Statements Numbers 4 and 5 in the questionnaire can be seen in Figure 3.

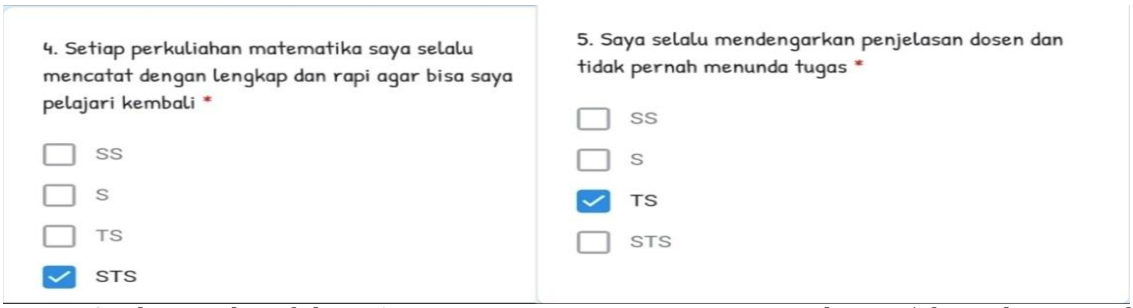

Figure 3. The results of the M1 questionnaire on statements number 4-5 for indicators of student interest in mathematics

The results of the M1 questionnaire, as shown in Figure 3, show that the subject chose to tick Strongly Disagree (STS) on statement Number 4, and on statement number 5, the subject chose to tick Disagree (TS). This shows that Subject M1 is not interested in

mathematics, so it does not meet the second indicator, namely student interest in mathematics. The following interview excerpts reinforce this statement.

Q: In every math class, you always handicapped every material given?

M12: No, I rarely take notes on the material given because when I get home, I won't even open it/study it.

The interview results above show that M1 is not interested in mathematics because the subject has never been handicapped with the materials given, and M1 assumes that when he gets home, the subject will not study it again.

Q: What do you do when the lecturer gives you an assignment?

M1: When the lecturer gives an assignment, I rarely do the assignment if I don't know the answer. However, if I know the answer, I will try to work on it.

Based on the interview results in the quote above, it is known that when given an assignment by the lecturer, M1 often does not complete the task. So, M1 does not meet the second indicator, namely, student interest in mathematics.

The third indicator, namely students' attention to mathematics, is represented by statements Numbers 6 and 7. The results of M1 subject work for statements Numbers 6 and 7 can be seen in Figure 4.

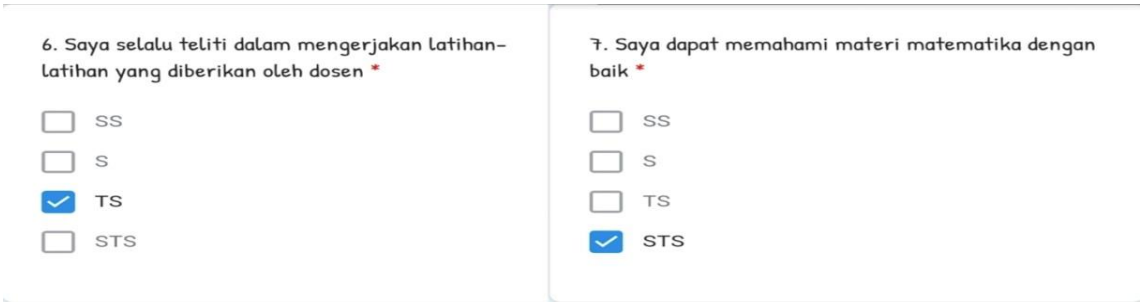

Figure 4. The results of the M1 questionnaire on statements number 6 and 7 for indicators of student attention to mathematics

The results of the M1 questionnaire, as shown in Figure 4, show that M1 chose to tick Disagree (TS) on statement number 6. Then in statement Number 7, the subject chose to tick Strongly Disagree (STS). This shows that Subject M1 does not have attention to mathematics learning, so it does not meet the third indicator, namely student attention to mathematics. The following interview excerpts reinforce this statement.

Q: When you are working on practice questions, are you careful in doing it?

M1: When I'm working on a question, sometimes I'm careful, sometimes I'm not careful, because if I think it's correct, I'll do it.

The interview excerpt above shows that M1 is still not interested in working on any of the questions given. This means that M1 has not been able to meet the third indicator, which is that students are paying attention to math. For statement number 7, the subject chose the Strongly Disagree (STS) option, along with the interview results.

Q: When you do not understand the material explained by the lecturer or friend, what do you usually do?

M1: When I don't understand the explained material, I usually ask my friends to explain the material again. But if I do not understand what has been explained by a friend, then I will not ask again.

Based on the excerpt of the researcher's interview with M1 above, it can be seen that M1 has not met the third indicator, namely students' attention to mathematics.

The fourth indicator, namely student involvement in mathematics, is represented by statements 8-10. The results of the work of Subject M1 for statements 8-10 can be seen in Figure 5.

Figure 5. The results of the M1 questionnaire on statements number 8-10 for indicators of student involvement in mathematics

Based on the M1 Subject questionnaire results, as shown in Figure 5 in statements 8-10, the subject chose to tick Disagree (TS) in each statement answer. This shows that Subject M1 does not want to be involved in learning mathematics, so the subject does not meet the category of student involvement in mathematics. The following interview excerpts reinforce this statement.

Q: What do you do when discussing with your friends/groups?

M1: Sometimes, I rarely get involved in discussions with friends/groups. However, when other friends had invited me many times, I was forced to participate in the discussion.

From the interview excerpt above, it can be seen that M1 is rarely involved in any discussions with friends or group discussions. This shows that M1 has not been able to meet the fourth indicator, namely student involvement in mathematics. This is also supported by the interview excerpt below.

Q: What do you do when there is the material you don't understand?

M1: If there is the material that I do not understand, then I will ask a friend who understands better. However, if I can't understand a friend's explanation, I don't have the initiative to ask or find out again.

Q: Do you always try to answer the questions given by the lecturer or friends?

M1: Never, because I don't know the answer to that question.

Based on the description of the data above, it can be seen that M1 has not met the fourth indicator, namely student involvement in mathematics.

The results of working on subject M10 from the group are quite interesting

Based on the data obtained, the researchers were able to analyze the interest in learning mathematics of M10 Subjects through the questionnaire results. Subject M10 fills out all statement items from the ten numbers that have been presented. The first indicator is the student's feeling of pleasure towards mathematics, represented by statements 1-3. Subject M10's answer to statements Numbers 1-3 in the questionnaire can be seen in Figure 6.

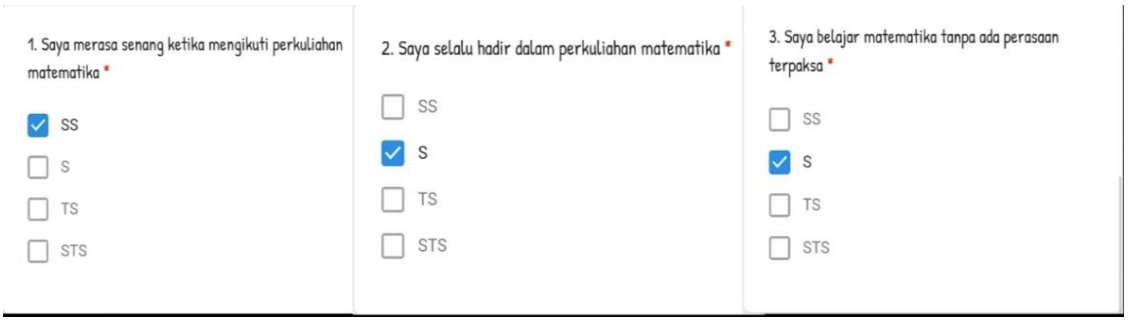

Figure 6. The results of the M10 questionnaire on statements number 1-3 for indicators of students' feelings of pleasure toward mathematics

The results of filling out the questionnaire in Figure 6. show that the subject feels very happy attending mathematics lectures. This can be seen from the answer to statement Number 1; the subject chose to tick Strongly Agree (SS). Then, on statements 2 and 3, the subject chose to tick the Agree (S) answer. This shows that M10 fulfills the first indicator: the student's feeling of pleasure towards mathematics. The following is an excerpt from the researcher's interview with M10.

Q: Do you enjoy taking math classes? Why?

M10: Yes, because mathematics is important and is always used in everyday life.

From the interview excerpt above, it can be seen that M10 enjoys learning mathematics because M10 considers mathematics important and is always used in everyday life. This shows that M10 can fulfill the first indicator: students' feelings of pleasure towards mathematics. The following interview excerpts can also strengthen this.

Q: Do you always attend math classes? Why?

M10: When it comes to mathematics, I always go because I don't want to miss the material.

It can be seen that M10 has a happy feeling toward mathematics because M10 always participates in every mathematics lecture and does not want to miss the material. Excerpts from further interviews can be seen below.

Q: Is there a feeling of compulsion to learn mathematics?

M10: No, because if I understand, I will be happy, and I will be excited.

Based on the interview excerpt above, the subject is always present to attend mathematics lectures; the subject also feels happy and excited when he understands the material. This shows that M10 has a happy feeling toward mathematics, so the subject fulfills the first indicator of interest in learning mathematics.

The second indicator, namely student interest in mathematics, is represented by statements 4 and 5. Subject M10's answers to statements Numbers 4 and 5 in the questionnaire can be seen in Figure 7.

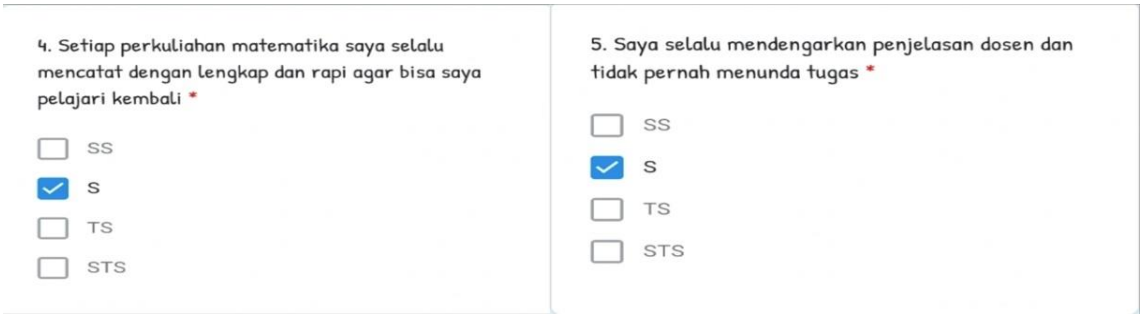

Figure 7. The results of the M10 questionnaire on statements number 4-5 for indicators of student interest in mathematics

The results of the M10 questionnaire, as shown in Figure 4.6, show that the subject is interested in learning mathematics. This can be seen from the subject's answer to statements Numbers 4 and 5, which state that in every mathematics lecture, I always take notes completely and neatly so that I can study it again, and I always listen to the lecturer's explanation and never delay assignments. In both statements, the subject chose the answer Agree (S). So from this answer, it can be seen that Subject M10 meets the second category, namely student interest in mathematics. Here's an excerpt from the interview.

Q: Do you always take notes in every math class that is given?

M10: Yes, because I'm afraid that if I don't take notes, I won't be able to understand the material, especially if there are formulas.

From the interview excerpt above, it can be seen that M10 has an interest in mathematics because when the lecturer gives the material, M10 always defects the material given. This shows that M10 can meet the indicators, namely, student interest in mathematics. The following interview excerpt can be seen as follows.

Q: What do you do when the lecturer gives you assignments?

M10: When the lecturer gives an assignment, I usually do it right away, but if there is something I don't know, I will ask my friends who know better.

Based on excerpts from interviews that researchers have conducted, it shows that M10 is interested in attending mathematics lectures because M10 always does the tasks given by the lecturer so that M10 meets the second indicator, namely student interest in mathematics.

The third indicator, namely students' attention to mathematics, is represented by statements Numbers 6 and 7. Subject M10's answers to statements Numbers 6 and 7 in the questionnaire can be seen in Figure 8.

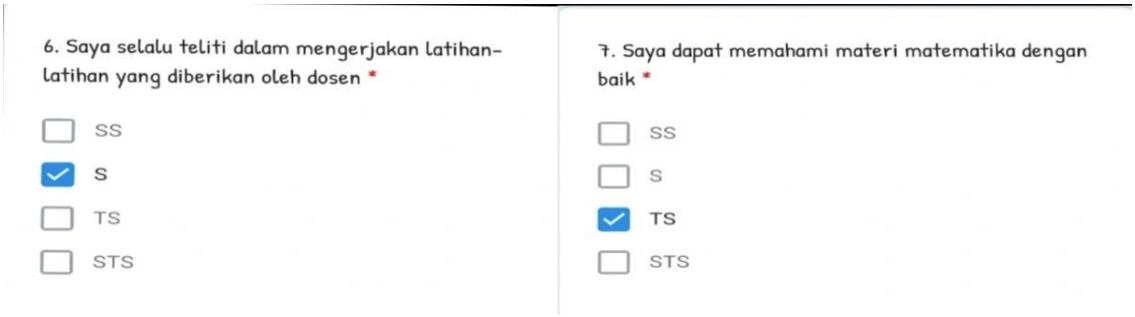

Figure 8 The results of the M10 questionnaire on statements number 6 and 7 for indicators of student attention to mathematics

The results of the M10 questionnaire, as shown in Figure 8, show that the subject meets the indicators of student attention to mathematics. This can be seen from the subject's answer to the questionnaire that was given; in statement Number 6, the subject chose to tick Agree (S) for the statement that I am always careful in doing the exercises given by the lecturer. Then in statement 7, the subject chose to tick Disagree (TS). The results of filling out the questionnaire show that Subject M10 is sufficient to meet the third indicator, namely students' attention to mathematics. For more details, the following is an excerpt from the interview.

Q: When you are working on a question, are you careful in doing it?

M10: Yes, be careful, because if you are not careful, the answers will all be wrong.

This shows that M10 is always careful in working on every question the lecturer gives. M10 is worried that the questions he is doing will be wrong if he is not careful in doing the work.

Q: When you do not understand the material explained by the lecturer or friend, what do you usually do?

M10: Usually, I look for the material on google or YouTube.

Based on the excerpt of the researcher's interview with M10 above, it can be seen that the subject can find out for himself if there is the material that has not been understood on YouTube or Google. This shows that M10 can meet the third indicator: students' attention to mathematics.

The fourth indicator, namely student involvement in mathematics, is represented by statements 8-10. Subject M10's answers to statements Numbers 8-10 in the questionnaire can be seen in Figure 9.

Based on the M10 Subject questionnaire results, as shown in Figure 9, it shows that the subject meets the fourth indicator, namely student involvement in mathematics. This can be seen from the subject's answers to statements Numbers 8-10; in statements Numbers 8 and 9, the subject chose to tick disagree (TS) for the statement I always express opinions in class or group discussions. I always ask questions when I don't understand the material being taught. The following are excerpts from interviews that have been conducted by researchers with M10.

Q: What do you do when discussing with your friends/groups?

M10: What I do when discussing with friends/groups is mostly silent because I am ashamed to express my opinion in front of my friends.

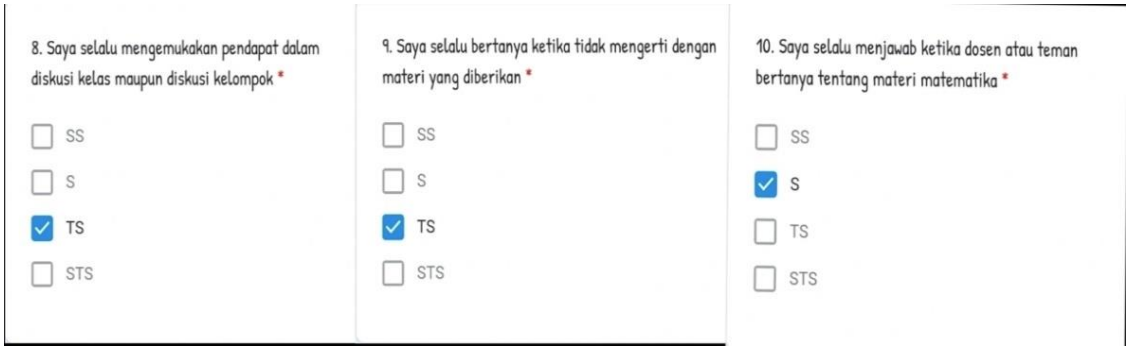

Figure 9. The results of the M10 questionnaire on statements number 8-10 for indicators of student involvement in mathematics

This shows that M10 is still lacking in engaging in mathematics. M10 feels ashamed to express his opinion in front of his friends. The following interview excerpts can also strengthen this.

Q: What do you do when there is the material you don't understand?

M10: When there is the material I do not understand, then I will google the material.

Q: Do you always try to answer questions given by lecturers or friends?

M10: When I don't know the answer, I will be silent, and even though I know the answer, I will remain silent because I am too shy to answer.

Based on the results of the interview quotes above, M10 is still less or not always involved in every activity that occurs in mathematics lectures. So M10 has not been able to meet the fourth indicator, namely student involvement in mathematics.

M20 subject work results from interested groups

Based on the data obtained, the researcher can analyze the interest in learning mathematics of Subject M20 through a questionnaire and compare it with the results of interviews to strengthen its validity. The first indicator is the student's feeling of pleasure towards mathematics, represented by statements 1-3. Subject M20's answer to statements Numbers 1-3 can be seen in Figure 10.

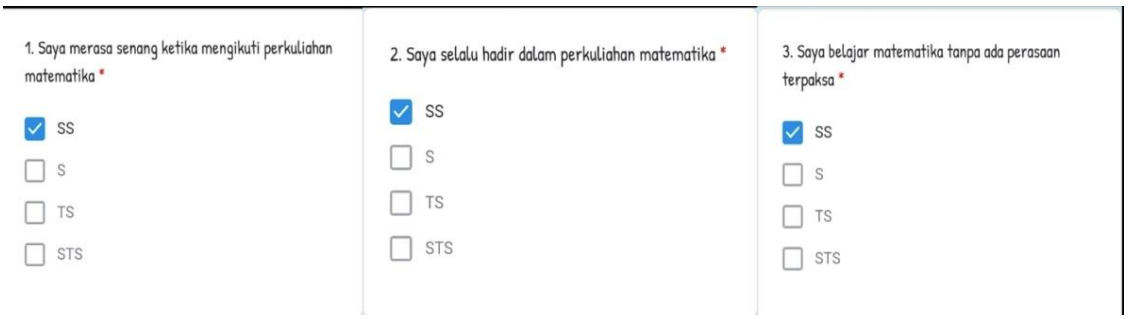

Figure 10. The results of the M20 questionnaire on statements number 1-3 for indicators of students' feelings of pleasure toward mathematics

The results of the questionnaire showed that the subject felt very happy when attending mathematics lectures; this could be seen in the subject's answers to the completed questionnaire. Subjects chose the answer Strongly Agree (SS) on statements Numbers 1-3. This shows that M20 fulfills the first indicator: the student's feeling of pleasure in mathematics. The following interview excerpts reinforce this statement.

Q: Do you enjoy taking math classes? Why?

M20: For that, yes, because mathematics is challenging for me, and since high school, I have liked mathematics.

From the excerpt of the interview with the researcher and Subject M20 above, it can be seen that the subject has a happy feeling toward mathematics since the subject was studied in high school. The following interview excerpts can also strengthen this.

Q: Do you always attend math classes? Why?

M20: Yes, because the first thing is mathematics is important in everyday life, so it must be studied. Then the second is that I am a person who is very interested in mathematics, so every time there is a mathematics lecture, I always look forward to it.

The subject considers that mathematics is important in everyday life. So M20 is always present in every mathematics lecture. This shows that the subject can meet the first indicator: the student's feeling of pleasure towards mathematics.

Q: Is there a feeling of compulsion to learn mathematics?

M20: My feelings when taking math classes depend on every explanation the lecturer gives.

The interview excerpt above shows that M20 is happy when taking mathematics courses. M20 can state the reasons why he has feelings for mathematics.

The second indicator is student interest in mathematics, represented by statements 4 and 5. Subject M20's answers to statements Numbers 4 and 5 in the questionnaire can be seen in Figure 11.

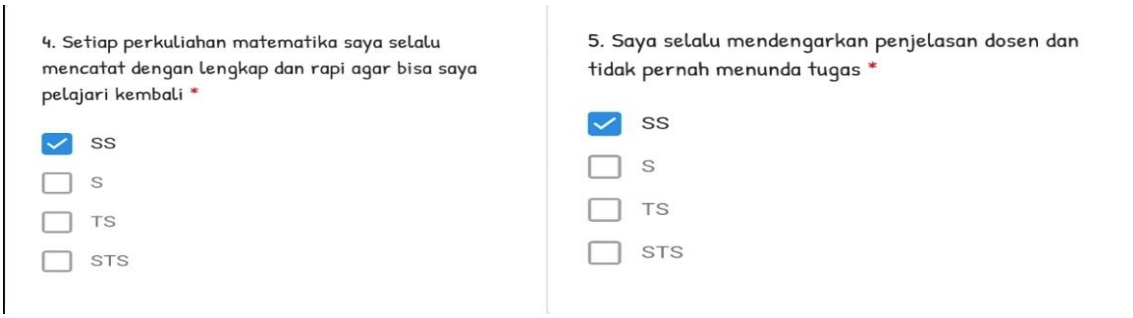

Figure 11. The results of the M20 questionnaire on statements number 4 and 5 for indicators of student interest in mathematics

The results of the M20 questionnaire, as shown in Figure 11, showed that the subject met the second indicator. This can be seen from the subject's answers to the completed questionnaire. Subjects chose the answer Strongly Agree (SS) on both statements. The following interview excerpts can strengthen this statement.

Q: Do you always take notes in every math class that is given?

M20: When the lecturer teaches in front of the class, I always pay attention to each lecturer's explanation and take notes when there are material and formulas.

The interview excerpt above shows that M20 can fulfill the second indicator: student interest in mathematics. This can be seen from M20's enthusiasm and enthusiasm when participating in the lecture process, namely by handing down all the material provided by the lecturer. The following interview excerpts can also show that M20 has an interest in mathematics.

Q: What do you do when the lecturer gives you an assignment?

M20: When the lecturer gives assignments, I always do them and always ask my friends if there is something I don't understand.

The interview excerpt above shows that M20 has an interest in mathematics. This can be seen from the answers to the subjects that have been given.

The third indicator, namely students' attention to mathematics, is represented by statements Numbers 6 and 7. The results of Subject M20's work for statements 6 and 7 can be seen in Figure 12.

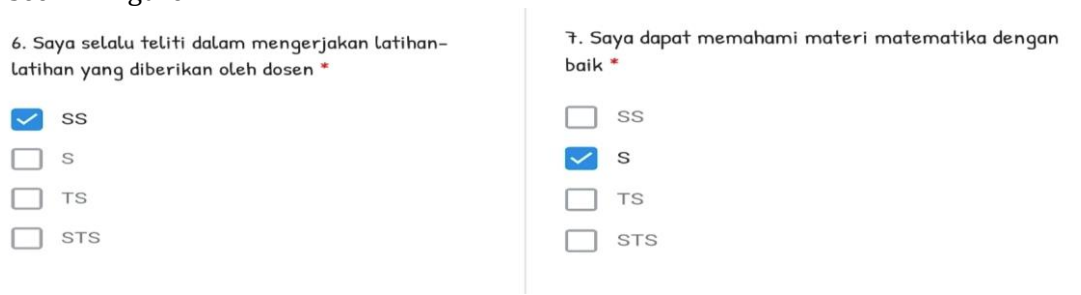

Figure 12 The results of the M20 questionnaire on statements number 6 and 7 for indicators of student attention to mathematics

The results of the M20 questionnaire, as shown in Figure 12, show that M20 has an interest in mathematics. This can be seen from the subject's answers to statements Numbers 6 and 7; the answers chosen are Strongly agreed (SS) and Agree (S). The following are excerpts from interviews that have been conducted by researchers with M20.

Q: When you are working on a question, are you careful in doing it?

M20: Yes, usually when I work on the questions after that, I will be checked again maybe 2 or 3 times, even though there will be errors later, the error might be that I entered the formula wrong, but to be careful, I will definitely be careful.

Q: When you do not understand the material explained by the lecturer or friend, what do you usually do?

M20: Usually, I look for information from youtube, google but most often from youtube so that I can watch it right away.

The interview excerpt above shows that M20 has an interest in mathematics. Subjects can answer questions according to what they have filled in the questionnaire. Based on the questionnaire and interview quotes, it can be seen that M20 fulfills the third indicator, namely students' attention to mathematics.

The fourth indicator, namely student involvement in mathematics, is represented by statements 8-10. Subject M20's answers to statements 8-10 in the questionnaire can be seen in Figure 13.

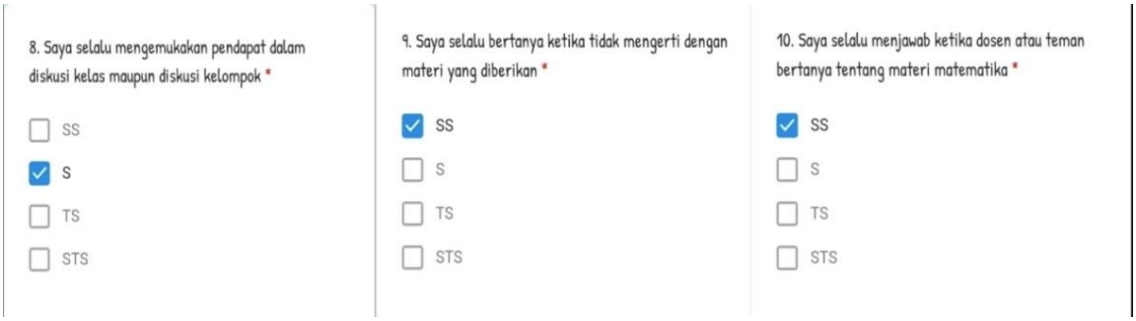

Figure 13. The results of the M20 questionnaire on statements number 8-10 for indicators of student involvement in mathematics

The results of the M20 subject questionnaire, as shown in Figure 13, show that M20 has involvement in mathematics. For more details, see the excerpt of the researcher's interview with M20.

Q: What do you do when discussing with your friends/groups?

M20: When discussing with friends/groups, I always ask if there is something I don't understand and vice versa.

It can be seen that M20 is often involved in every discussion with his friends/groups. M20 will ask and answer if there is the material that has not been understood. This can be strengthened by the interview below.

Q: What do you do when there is the material you don't understand?

M20: I will ask my friends or look for other info because I am usually very highly curious about mathematics. So if there's something I haven't got, I'll try.

Q: Do you always try to answer the questions given by the lecturer or friends?

M20: Yes, I always try even though sometimes it's not quite right; when someone asks, I will try to answer.

Based on the description of the data above, it can be seen that M20 can meet the fourth indicator, namely student involvement in mathematics.

Based on the data from the questionnaire on interest in learning mathematics and the results of interviews that have been conducted, there are several findings. The findings regarding students' interest in learning mathematics based on indicators of interest in learning mathematics are grouped into three categories: the not interesting category, the moderately interesting category, and the interesting category. The following is a description of the study's findings based on data from questionnaires and interviews.

Regarding the results of the data analysis that has been carried out, M1 is the chosen subject to represent students with interest in learning mathematics based on indicators of interest in learning mathematics from the category of the group not interested. Based on the results of filling out a questionnaire containing ten statements and the results of the interviews described above for statements Numbers 1-10 that M1 has not been able to meet

the four indicators which include feelings of pleasure in mathematics, interest in mathematics, attention to mathematics and involvement in mathematics. From the four indicators, the researcher saw that Subject M1 had no interest in learning mathematics while attending lectures. This is because M1 Subjects, when attending mathematics lectures, never involve themselves and do not have feelings of pleasure in every process of mathematics lectures. However, the subject is always present in every mathematics lecture because the subject only wants to fulfill attendance.

Based on the results of data analysis on M10 subjects who represent students with interest in learning mathematics from the moderately interesting category, the results of a questionnaire with ten statements and the results of interviews have been conducted by researchers. For questionnaire statements Numbers 1-10, M10 subjects only met three indicators of four indicators, namely indicators of student enjoyment of mathematics, student interest in mathematics, and student attention to mathematics, but M10 was still lacking in student involvement in mathematics. This is because M10, when discussing with friends or groups, M10 is embarrassed to express his opinion. The subject is also always silent and does not want to answer when the lecturer or his friend asks about the material or questions; this is because M10 is embarrassed to answer questions from the lecturer or his friends.

The results of data analysis have been carried out on M20, who were selected as subjects representing students with interest in learning mathematics from the category of interested groups. Based on the results of filling out the questionnaire with as many as ten statements and the interviews described above for statements 1-10, it was found that M20 can meet the four indicators of interest in learning mathematics. The four indicators fulfilled are the students' feelings of pleasure towards mathematics, students' interest in mathematics, students' attention to mathematics, and student involvement in mathematics. This is because M20 is highly interested in learning mathematics while attending lectures.

DISCUSSION

Analyzing the data that has been done, it is found that 15% of students do not have an interest in learning mathematics, and 35% of students have a high interest in learning mathematics. Meanwhile, students who are quite interested in mathematics are 50%. Students interested in mathematics are more likely to study mathematics diligently and with pleasure. This is supported by Lestari and Yudhanegara (2015) opinion that interest in learning mathematics is a feeling of pleasure, attention, interest and involvement in mathematics without coercion from others. This can be seen based on the results of filling out student questionnaires on ten statements based on indicators of interest in learning mathematics.

The results of data analysis regarding students' interest in learning mathematics were grouped into three categories: interest in learning mathematics in the category of not interested, moderately interested, and interested. Discussion of the results of the analysis will be described based on the category of interest in learning mathematics, as follows:

Students' interest in learning mathematics in the uninterested category

Based on questionnaires and transcripts of interview results, the selected subjects represent students in the uninterested category; the subject has not been able to meet the

four indicators of interest in learning mathematics, namely the indicator of students' feelings of pleasure towards mathematics, the subject feels displeased and forced to take mathematics lectures because he thinks mathematics is difficult to understand. Students assume that mathematics is abstract and therefore learning mathematics will not produce anything for them (Otoo et al., 2018). Ardila and Hartanto (2017) said that most students did not like mathematics because mathematics was considered a complicated subject; many formulas had to be memorized and were full of numbers. However, the subject is always present in every mathematics lecture, that is because the subject only comes to fill attendance.

Based on the indicators of student interest in mathematics, the results of the analysis that have been carried out on the subject show that the subject has no interest in mathematics. This can be seen from the subject, which rarely records the material given by the lecturer; the subject assumes that when he gets home, the subject will not study it again and is also lazy to do the tasks given. This is in line with the opinion of Wilda et al. (2017), which says if students have no interest or interest in a lesson, they will be reluctant and lazy to learn it.

Based on the indicators of students' attention to mathematics, the subject has less attention to mathematics, so the subject is often not careful in doing the exercises that the lecturer has given, and the subject cannot understand the material well. Based on the indicators of student involvement in mathematics, the subject is rarely involved in peer collaboration or group collaboration; the subject rarely asks friends or lecturers if there is the material that has not been understood, so the subject never answers when a friend or lecturer asks because the subject does not dare to answer because he does not know the answer.

Students' interest in learning mathematics in the moderately interested category

Based on the results of the analysis of questionnaires and transcripts of interviews with research subjects who represent students with moderately interesting categories, it is obtained: (a) Indicators of students' feelings of pleasure towards mathematics. Subjects feel happy when attending mathematics lectures, and there is no feeling of compulsion to follow them because mathematics is important and always used in everyday life. The quality of mathematics learning in non-mathematical students is influenced by their interest in learning (Budiyarti, 2020). Students feel happy when taking lessons, do not feel bored, and are always present during lessons; (b) The indicator of student interest in mathematics, the subject always records every material given by the lecturer, and the subject never delays doing the assignment. Someone who has an interest in a lesson will be interested in it and will cause a sense of love which is indicated by the encouragement and willingness to accept learning and never delay doing all the tasks given (Sughiarti, 2016).

As indicator (c) of students' attention to mathematics, the subject is always careful when working on every practice question given by the lecturer. However, the subject does not always understand well the material given; the subject will try to re-learn it either via google or YouTube. Following the opinion of Sembiring and Mukthar, (2013), students who have an interest in mathematics will have a curiosity about how to find out or solve

problems related to mathematics until they find the right answer; and (d) indicators of student involvement in mathematics, subjects rarely involve themselves in group discussions or class discussions, subjects also rarely ask questions when they do not understand the material provided. However, the subject will still answer if some lecturers or friends ask about the material that has been given.

Students' interest in learning mathematics with interested category

The analysis results were carried out on subjects representing students with interest in learning mathematics in the interested category based on the results of questionnaires and interview transcripts on research subjects. It was found that: (a) indicators of student feelings of pleasure towards mathematics, subjects felt very happy when attending mathematics lectures because they considered mathematics important in everyday life. Subjects also always follow every mathematics lecture without feeling forced. Students are happy to learn mathematics because the topic is fun, and they desire to learn it (Şen & Ünlü, 2020). Mathematics teaching becomes interesting for students when teachers can connect mathematical concepts with real-life problems and experiences and build relationships between various forms of Mathematics knowledge (Arthur et al., 2018).

In indicator (b) students' interest in mathematics, the subject always records every material given and always listens to every lecturer's explanation. This indicates that the lecturer teaches well when learning mathematics. This condition triggers students to be actively involved in learning. The quality of non-mathematical student learning can be improved by innovative learning from the lecturer, for example, active learning (Amir & Kurniawan, 2016).

In indicator (c) of the student's attention to mathematics, the subject is always careful in doing each exercise given, and the subject can also understand the material well. When students can understand mathematics well, it indicates that the lectures are meaningful to them (Vargas-Hernández & Vargas-González, 2022). In indicator (d) of student involvement in mathematics, the subject is always involved in every discussion in class or with his group and always answers when asked by the lecturer or his friends. Student involvement through peer interaction through the discussion process is a predictor of improving student performance (Lo & Hew, 2020). The participation of a person in an item makes that person joyful and increases their interest in the activities associated with the object, whether they are doing those activities or working on them. For instance, participation during debates, participation when asking questions, and participation when responding to questions from lecturers all constitute active participation..

CONCLUSION

The conclusion that can be drawn from the research that researchers have carried out on English education students using a mathematics learning interest questionnaire is that each student's interest in learning mathematics is different. From the research results, student learning interest is 15% in the not interested category, 35% in the moderately interesting category, and 50% in the interesting category. Four indicators of interest in learning mathematics are used: students' feelings of pleasure in mathematics, students' interest in mathematics, students' attention to mathematics, and student involvement in mathematics. Students in the category of the uninterested group have not been able to meet

the indicators of interest in learning mathematics. Meanwhile, students in the category of moderately interested groups can fulfill three indicators of interest in learning mathematics, namely students' feelings of pleasure in mathematics, students' interest in mathematics, and students' attention to mathematics. Students from the interest group category can fulfill the four indicators of interest in learning mathematics: students' feelings of pleasure in mathematics, student interest in mathematics, student attention to mathematics, and student involvement in mathematics

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