

Analysis of Mathematical Concept Understanding Based on Students' Learning Interest in Solving Algebraic Problems

Hasnna Kariimah^{1✉}, Findi Auliya Fatikhah²

¹Universitas Islam Negeri
Profesor Kiai Haji Saifuddin
Zuhri Purwokerto, Indonesia

²Universitas Muhammadiyah
Purwokerto, Indonesia

✉ Corresponding email:
2017407064@mhs.uinsaizu.ac.id

Received February 6, 2024
Accepted November 20, 2024
Published December 31, 2024

<https://doi.org/10.24090/ijrme.v2i2.10675>

Abstract: This research aims to analyze the influence of the level of learning interest on the mathematical concepts understanding among seventh-grade students at As-Subkiyah Junior High School in Kota Bekasi, specifically when solving algebraic problems. Understanding mathematical concepts serves as a critical foundation for effective mathematics learning; however, many students face challenges in grasping these concepts. The study employs a descriptive qualitative research method. Data were collected using learning interest questionnaires and tests designed to assess students' comprehension of mathematical concepts. The research subjects consisted of seventh-grade students at As-Subkiyah Junior High School in Kota Bekasi. The results show that students' comprehension of mathematical concepts is significantly influenced by their level of learning interest. Students with high learning interest demonstrate excellent comprehension and mastery of all tested indicators. Students with moderate learning interest exhibit sufficient comprehension, although they master only some of the tested indicators. Meanwhile, students with low learning interest struggle to understand mathematical concepts and are only able to master a small portion of the tested indicators. The study also identified common errors in understanding, such as misconceptions about variables, terms, coefficients, and constants in algebraic expressions.

Keywords: algebra; mathematical concept comprehension; student learning interest

Copyright © 2024 by Author/s. This is an open access article distributed under the Creative Commons Attribution-ShareAlike 4.0 International License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

A. Introduction

Science and technology have evolved significantly year by year, with the field of education being the most prominent. All forms of learning processes can be carried out easily. One of the things that can be done in the learning process is through education. According to Law of the Republic of Indonesia No. 20 of 2003 Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state. education is a learning process that has the aim of improving personal quality (Mutmainah & Nuha, 2023). Education deals with the learning process carried out by each person with the aim of changing and shaping personalities that are in accordance with positive values in society and culture. To achieve effective educational facilities that are able to convey knowledge, a learning process is needed. Student self-motivation and teacher support are important components in fulfilling students' learning needs to achieve learning goals (Bureau et al., 2022).

Learning is a process of interacting with each other, where instruction is given by an educator or teacher, and the receipt of information and understanding occurs in students (Suardi, 2018). The role of teachers in applying educational principles and learning theories is a major factor in achieving educational success. Learning can be interpreted as communication and interaction between teachers and learners, sometimes with the help of various learning resources or media. Therefore, learning is defined as a communication process that facilitates relationships between teachers and learners with other learners, involving learning experiences. One of the subjects that must be studied is mathematics.

Mathematics is a way to find answers to problems faced by humans, namely a way of using information, knowledge of shape and size, knowledge of counting (Khasanah & Setiaji, 2023). Mathematics is one of the subjects that can change the way of human thinking, especially in the modern era based on information and communication technology. To keep up with the development of science and technology, understanding mathematics is very important because mathematics serves to develop the ability to calculate, measure, and apply mathematical formulas in everyday life. In the school environment there are several lessons provided, one of which is mathematics learning.

Mathematics learning can be interpreted as the process of gaining new knowledge and experience about mathematics through a series of planned and structured activities (Ulva, M, & Rizki, A, 2020). The purpose of developing students' thinking in mathematics learning is to form logical thinking skills, so that students are not only proficient in calculations, but also able to use reason and logic. It is important to remember that mathematics is an abstract and unreal concept because it consists of numbers and symbols. Because each learner has a different thinking pattern, therefore, it is necessary to analyze the comprehension ability of learners by understanding the objectives of learning mathematics first.

In accordance with the objectives of mathematics learning according to Permendiknas No. 58 of 2014 it is explained that mathematics has the aim of developing students' ability to understand mathematical concepts, connect these concepts, and apply them efficiently and appropriately in solving problems. The ability to understand this concept is included in cognitive aspects, especially in the context of mathematics subjects and is often referred to as the ability to understand mathematical concepts. In the process of learning mathematics, understanding concepts is an important key in learning, especially in mathematics.

Understanding mathematical concepts is very important for students to learn mathematics in the process of learning and solving problems, both in the learning process itself and in real life (Hidayana, 2022). Heris, et al emphasized that this ability is important in learning mathematics to obtain meaningful knowledge (Heris, et al., 2017). According to Ela Suryani, concept understanding is a person's ability to understand or understand a concept after it is known or remembered (Suryani, 2019). In the context of learning mathematics, students need to have a strong understanding of these concepts, because these concepts become the foundation for higher-order thinking skills. Lessons are not only given to be memorized, but also to ensure students understand the concepts of the material taught (Maulana, 2019).

The ability to understand students' mathematical concepts can be seen through various signs or clues. According to the National Education Standards Agency (BSNP), it mentions

indicators that show the ability to understand mathematical concepts, namely: Restating concepts that have been studied, Classifying objects according to certain properties (according to their concepts), Giving examples and not examples, Presenting concepts in various forms of mathematical representation, Developing necessary or sufficient conditions of a concept, Using, selecting, utilizing certain procedures or operations, and Apply problem-solving concepts or algorithms (BSNP, 2006).

One of the main goals in mathematics education is to ensure that students have a solid understanding of mathematical concepts. Therefore, the achievement of mathematics learning objectives is a shared responsibility of teachers and students. But in practice, mathematics learning often focuses on a theoretical approach, with the provision of problems and example exercises that encourage students to record every concept of mathematics presented, without really understanding the concept. One of the factors that affect student achievement is interest in learning.

Interest is not something that is inherent in a person, but is something that can be developed and influenced over time. Therefore, it is possible to understand and influence one's interest in something. Building an interest in a particular subject can encourage more learning. Interest can be a trigger for motivation when someone is in a state of freedom to choose, the midat can encourage them to teach what they want (Zebua, 2021). Some experts, among whom have put forward their views on interest, such as being seen actively and feeling interested in a particular activity are vivid examples of interest, while an individual's determination to fully focus on learning is also an important aspect of interest.

Learning interest is the psychological aspect of a person through symptoms such as arousal, desire and feeling like to change behavior through activities such as seeking knowledge and experience (Sirait, 2016). In other words, interest in learning is a person's attention, liking and interest in learning which is reflected in their enthusiasm, participants and activeness in the learning process. This results in individuals who have an interest in learning tend to be highly motivated, which in turn leads to deep concentration of the learning material, thus facilitating deep understanding. Students who are interested in learning can be seen as follows: 1) a sense of liking or pleasure in learning activities, 2) a sense of interest in learning, 3) awareness to learn without being asked, 4) participating in learning activities, 5) paying great attention to learning (Septiani et al., 2020).

It can be concluded that a person's interest in learning manifests when they begin to change their behavior, turn their attention to certain things, and continuously develop the skills and talents they learn. In addition, they are also able to face challenges without external encouragement or outside pressure. The indicators of interest in learning include, feelings of pleasure in learning, student linkage in learning, student involvement during learning, diligent in studying and diligently doing mathematical tasks, diligent and disciplined in studying and having a study schedule (Hendriana, 2017).

Mathematics is often considered a challenging subject for some students, especially on algebraic material. Algebra is a branch of mathematics that studies mathematical structures, as well as relationships and quantities (Hidayani, 2012). In algebra, we manipulate mathematical symbols and formulas to understand the underlying patterns and properties of mathematics.

Algebra is applied in many fields, including physics, computer science, engineering, and economics, making it one of the important tools in problem solving in various disciplines. With concepts such as equations, matrices, and group theory, algebra helps us unearth deep insights into the world of mathematics and provides a solid foundation for understanding and solving problems in a variety of contexts.

Algebraic form problems involve the use of symbols and letters to represent values or variables in a mathematical expression (Hasibun, 2015). In these problems, students are usually given information in natural language or in the form of problem statements, and they must convert it into appropriate mathematical expressions based on relevant algebraic concepts. It involves the use of variables, mathematical operations such as addition, subtraction, multiplication, and division, as well as the application of algebraic laws such as distribution. Algebraic form problems aim to test students' understanding of algebraic concepts and their ability to apply them to solve problems in a variety of mathematical contexts.

This research can provide a foundation to identify areas that require improvement in mathematics learning approaches, especially in terms of understanding algebraic concepts, so that student learning outcomes can be improved. The problem of algebraic forms is one aspect that requires a strong understanding of concepts. A strong understanding of mathematical concepts is an important foundation for students' ability to solve math problems, including those related to algebra. The role of teachers and teaching methods in overcoming students' difficulties as well as increasing their interest in mathematics are factors to be considered in this study.

The interview conducted by researchers on mathematics subject teachers at MTs As Subkiyah Kota Bekasi, is in line with some of the explanations above, namely according to his narrative the problem that often occurs in mathematics learning in grade VII students is the lack of understanding of concepts in mathematics learning. Judging from student learning interests, there are differences in how to understand learning between students. Some students find learning mathematics an interesting learning to follow, some students also find mathematics difficult and unpleasant, so they lose interest in learning. In addition, understanding mathematical concepts is also a frequent problem. Some students only memorize formulas for solving methods without understanding the basic concepts, making it difficult to apply these mathematical concepts in everyday life.

From the description above, this study aims to analyze the ability to understand mathematical concepts in algebraic form material in terms of student learning interests in the high, medium or low categories.

B. Methods

The method used in this study is qualitative research. Qualitative methods are research approaches used to understand, describe, and explain social phenomena and human behavior in depth, without quantitatively measuring or calculating (Helaluddin, 2019). Qualitative research is a research method used to understand and explain social, cultural, or human behavior phenomena in a more in-depth and descriptive way (Anggito, A, & Johan, S, 2018). The qualitative method in this study uses a type of descriptive research supported by data

obtained through words from data sources (observed students) both written and oral. This research was conducted at MTs As-Subkiyah Kota Bekasi which is located Jl. Raya Mustikasari, Pengasinan, Rawalumbu, Kota Bekasi, West Java.

The study dimension is an aspect or element that is the center of attention in an analysis or research. This helps the researcher or analyst to guide their focus and limit attention to a particular aspect of the topic under study. The dimensions of the study in this study are questionnaires, tests and interviews.

In determining the subject of qualitative research using sampling techniques. A sampling technique is a method used in research to select a portion of the population in a representative manner so that the data obtained can be used to make generalizations about the population as a whole (Sumargo, 2020). The sampling technique applied in this study is purposive sampling, where researchers selectively select participants based on certain criteria and objectives that are relevant to the research question or topic being studied. Grade VII students are subjects for learning interest questionnaires as well as tests of ability to understand mathematical concepts. The source of information chosen in this study was students' learning interest in the high, medium and low learning interest categories, then a concept understanding ability test was carried out and then the interview process was carried out again.

In this study, several methods used to collect data needed for research purposes include:

1. Questionnaire

In the context of this study, questionnaires were used to identify each student's learning interests. Through the use of questionnaires, data regarding students' learning interests can be collected. Indicators of interest in learning include, feelings of pleasure in learning, student linkage in learning, student involvement during learning, diligent in studying and diligent in doing mathematical tasks, diligent and disciplined in learning and having a study schedule (Hendriana, 2017).

In measuring through questionnaires, researchers use the Likert scale as a measurement tool. There are four alternative answers to the learning interest questionnaire, namely: SS (Strongly Agree), S (Agree), TS (Disagree), and STS (Strongly Disagree). SS to STS answers are given a score of 4 to 1. The questions in the learning interest questionnaire that the researchers conducted had 19 questions. As for the questionnaire, there are 4 alternative answers, for more details can be seen in the following table:

Table 1. Alternative Learning Interest Answers

Description (optional)	Score	
	(+)	(-)
Totally Agree	4	1
Agree	3	2
Disagree	2	3
Strongly Disagree	1	4

The learning interest data that has been obtained will be interpreted in several categories, namely high, medium, and low using the range of the Likert scale as follows:

Table 2. Scale of Determination and Grouping

Score Range	Information
58 – 76	Tall
38 – 57	Keep
19 – 37	Low

2. Test

Data collection through technical tests is carried out by providing a test instrument consisting of a set of questions to obtain data on the ability to understand students' mathematical concepts, especially on algebraic form material. The form of the test used in this study is 7 points of description questions containing indicators of understanding mathematical concepts (BSNP, 2006) which is the focus of research. The description question is a test of the ability to understand mathematical concepts of algebraic form material given to students. Then the researcher described the ability to understand the concept of grade VII MTs As-Subkiyah students in Kota Bekasi.

3. Interview

Interviews were conducted on all students of each level of study interest who had completed the written test, with the aim of a deeper understanding of student responses when answering the written test. The researcher applies a semi-structured interview method, which refers to presenting questions tailored to the subject's situation. Interview guidelines are used by researchers to ensure that interviews are directional, do not deviate from other topics, and do not forget important parts.

4. Documentation

Documentation is very important in this study to record information such as student names, results of learning interest questionnaires, as well as student responses to concept comprehension tests

The presentation of data in this study includes the results of questionnaires about learning interests, tests of the ability to understand mathematical concepts, and interviews based on indicators of the ability to understand mathematical concepts such as, restating a concept, classifying objects according to certain properties according to the concept, providing examples and not examples of a concept, presenting concepts in various forms of mathematical representation, developing the necessary and sufficient conditions of a concept, use, utilize and select specific procedures or operations, and apply them problem-solving concepts or algorithms.

The study distributed questionnaires of interest in learning and presented test questions on the ability to understand mathematical concepts to students. Next, data on students' learning

interest levels are grouped by questionnaires, and information taken from test results and interviews is summarized and collected. Data reduction in this study focused on students by referring to indicators of students' concept understanding ability which was based on grouping the level of interest in learning from questionnaires filled out by grade VII MTs As Subkiyah Kota Bekasi students.

In qualitative research, the hope is to come to conclusions that are groundbreaking findings that have never been revealed before. These findings can be in the form of descriptions or descriptions of objects that were previously uncertain or just assumptions, and after research, they now become clearer. This conclusion describes the results of data collection methods that have been carried out by researchers. The conclusion found in this study is in the form of an analysis of understanding mathematical concepts of grade VII MTs As-Subkiyah Kota Bekasi students in terms of learning interest.

The validity of the data is strengthened through the use of triangulation. Triangulation is an approach in research that combines various methods, data sources, or viewpoints to verify or validate research results with the aim of gaining a deeper understanding and better reliability. In addition to collecting data, triangulation can also test the credibility of data with various data collection techniques and data sources (Sugiono, 2013). In this case, researchers apply source triangulation, which involves collecting data from multiple sources to ensure the accuracy of information. Using this source triangulation, researchers can verify the validity of the data by matching data from several participant sources, based on written test results and interview data.

C. Results and Discussion

1. Research Results

This research was carried out at MTs As-Subkiyah Kota Bekasi with the subject of this research being grade VII students. The purpose of this research is to describe the ability to understand students' mathematical concepts when viewed from learning interests.

The study was carried out 4 times face-to-face, namely on November 19, November 20, November 27 and November 28, 2023. As for data collection in the form of data from questionnaires classifying learning interests, then a test of the ability to understand concepts was carried out on 31 subjects.

Based on the results of the questionnaire scores from the answers of 31 students who have been corrected, the scores obtained are grouped into three categories, namely the categories of students with high, medium, and low interest in learning. The criteria for the level are based on the range of the Likert scale as follows:

Table 3. Likert Scale Score Range	
Score Range	Information
58 – 76	Tall
38 – 57	Keep
19 – 37	Low

The following are the results of the class VII Learning Interest questionnaire with a total of 31 students, according to the category limit:

Table 4. Results of Learning Interest Questionnaire

No.	Student Code	Score	Category
1.	AH	60	Tall
2.	KIS	63	Tall
3.	AZ	38	Keep
4.	CKN	44	Keep
5.	DRR	46	Keep
6.	DAJ	51	Keep
7.	FZ	51	Keep
8.	GAI	48	Keep
9.	ILH	50	Keep
10.	AF	40	Keep
11.	MKA	40	Keep
12.	MS	45	Keep
13.	MTA	49	Keep
14.	MHK	49	Keep
15.	MIS	44	Keep
16.	NAP	44	Keep
17.	NO	41	Keep
18.	NAT	44	Keep
19.	RR	41	Keep
20.	RAL	50	Keep
21.	RAD	50	Keep
22.	RNT	43	Keep
23.	RNH	42	Keep
24.	SOK	51	Keep
25.	SS	48	Keep
26.	SN	46	Keep
27.	ZJ	56	Keep
28.	DDD	39	Keep
29.	MKBR	34	Low
30.	MNR	37	Low
31.	NA	36	Low

From the table above, it can be observed that from 31 students there are 2 students who have a high level of interest in learning, 26 students who have a moderate level of interest in learning, and 3 students who have a low interest in learning. Furthermore, researchers conducted concept comprehension ability tests on 31 subjects to explore information about how students' concept understanding when viewed from learning interests. The following data on the results of tests conducted by researchers on 31 subjects from each level of learning interest:

Table 5. Student KPKM Results

No.	Indicators	Research Results
1.	Restate concepts that have been learned	<u>High, Medium, Low</u> a. Students answer correctly that is, it consists of 2 tribes that have 1 counting operation. <u>Low</u> a. Students answer 3 terms namely $5x + 8y - 6$ then students think that 2 terms are 2 different variables and students do not understand the concept of tribes. b. Students perceive that $2y$ is 2 tribes and students do not understand the concept of tribes
2.	Classify objects according to specific properties	<u>High, Medium, Low</u> a. In variables, students name all letters attached to numbers. b. In variables, students only mention the initials of the letters, namely x and y.

No.	Indicators	Research Results
		c. In the coefficient, students do not write the number 1 even though the number is not written, namely x and xy^2 have a coefficient of 1. d. At constant, the student answers correctly which is 7, and in the syllable, the student answers correctly which is 6 <u>Keep</u> a. On the coefficient, the student names all the numbers attached to the letter. b. In the coefficient, the student mentions 3 and 2 which are the binders of the variables. c. On a constant, the student answers 6y which is the last term that has numbers and letters. d. In tribes, students do not answer questions related to tribe, so students do not understand related to tribe. <u>Low</u> a. In terms, students answer 5 terms and the student considers numbers that have no variables, namely constants are not calculated
3.	Provide examples instead of examples	<u>High, Medium</u> a. The student answers correctly that is, giving an example of an algebraic form of term 3 consisting of 3 terms and there are 2 counting operations, and which is not an example of an algebraic form of term 3 is more than or less than 3 terms. <u>Medium, Low</u> a. Students mention similar and unsimilar algebraic forms, which are not examples and are not examples of algebraic forms of term 3, but if calculated there are 2 terms which are not examples of algebraic forms of tribe 3, then students do not understand the problem <u>Low</u> a. Students give examples and not examples of algebraic forms of terms 3 which are both terms 3, because students think $6x + 4y - 8x$ on the variable x is not counted 2 but 1 because the variables are the same, so x and y which have 2 terms which are not examples of algebraic forms of term 3, then students do not understand the problem
4.	Presenting concepts in various forms of mathematical representation	<u>High, Medium, Low</u> a. Students correctly present concepts from pictures into algebraic form. <u>Keep</u> a. In the picture of money, students do not write answers because students assume the money is put in a piggy bank. b. Students add both piggy banks and students assume that piggy banks are a kind and have room to put money. <u>Low</u> a. Students add a picture of a chicken piggy bank and the money to 10y, because the student thinks the money is put in the chicken piggy bank
5.	Developing necessary conditions and sufficient	<u>High, Medium, Low</u> a. Students do not share the results of their weekly savings and students do not understand the story <u>High, Medium</u>

No.	Indicators	Research Results
	conditions of a concept	a. Students provide correct solutions and correct answers. <u>Keep</u> a. Students do not provide ways to solve the question and the answer results are not correct, so students do not understand the problem. <u>Medium, Low</u> a. Students do not provide a way to solve the problem, but the results given are correct
6.	Using, selecting or utilizing specific operations	<u>High, Medium, Low</u> a. The student does not provide a way to solve the question and the answer results are not correct, then the student does not understand the problem. <u>High, Medium</u> a. Students provide how to solve calculation operation problems on algebraic forms correctly. <u>Keep</u> a. Students give answers by mentioning variables, coefficients, constants and students do not understand the problem <u>Medium, Low</u> a. The student gives a way to solve the problem, but the results given are incorrect, and the student does not understand the calculation operations on the algebraic form
7.	Apply concepts or algorithms to problem solving	<u>High, Medium</u> a. Students provide steps to solve the problem correctly. <u>Keep</u> a. Students do not provide steps to solve the question and the answer results are not correct, then students do not understand the problem. b. Students give answers by mentioning variables, coefficients, constants, and students do not understand the problem <u>Medium, Low</u> a. Students provide steps to solve the problem, but the results given are not correct, then students do not understand the calculation operations on algebraic forms. b. The student does not give an answer and the student does not understand the question. <u>Low</u> a. Students answer the questions by simplifying the results in length and width in the fields and students do not understand the questions

Based on the presentation of the data above, there is evidence of student findings on the ability to understand mathematical concepts (KPKM) as follows:

1) $5x + 8y - 6$, $7x + 5y - 3$

2) $5x^3 - xy^2 + 2x^2 + x - 6y + 7$

koefisien: $5x^3$ $2x^2$ $6y$ konstanta: $+7$

variabel: x^3 xy^2 x y suku: 6 suku

5) $84 \times 25 = 2,100.000$

6) $(2p^2 + 5p + 3) - (p^2 + p - 3)$
 $= 2p^2 + 5p + 3 - p^2 + p - 3$
 $= 2p - p^2 + 5p + p - 3 - 3$
 $= 2p + 6p$

Figure 1. Answering the Three Tribes

Interview results:

Q: What form of algebra did you make?

N: Tribe 2 ka

Q: Why do you say the tribe is tribe 2?

N: Because the variable x equals y different so there are 2

From the interview results showed that, students think 2 terms are 2 different variables and in constant is not considered a tribe, then students do not understand the concept of tribe.

1. $2y$

2. Variabel = x dan y
 koefisien = $x \rightarrow 5$
 $x \rightarrow 2$
 $y \rightarrow 6$
 konstanta = 7
 suku = 5

3. $-5 + 4$

4. $3x + 3y + 1$

5. $84,000 \times 25 = 287.000$

6. $4x^2 + 5p + 3 = 17 - 21 - 3$

7. $2x - 3p = 1x$

Figure 2. Answer 2y

Interview results:

Q: What form of algebra did you make?

N: 2 ka

Q: Why do you say the tribe is tribe 2?

N: Because 2y is 2 tribes

From the interview results show that, students view 2y as 2 terms consisting of 2 and y, so students do not understand the concept of tribes.

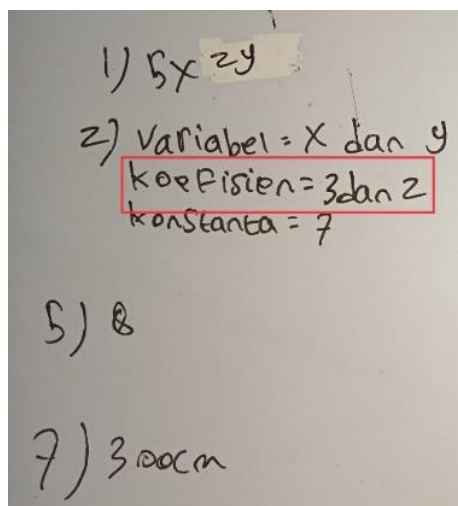


Figure 3. On the Coefficient of Answering the Power of the Variable

Interview results:

Q: How do you mention the variables, coefficients, constants and terms in question number 2?

N: If the letter variable, its power coefficient, the number constant

Q: The tribe?

N: Gatau ka

From the interview results show that, students think coefficient is rank, so students do not understand the concept of coefficient.

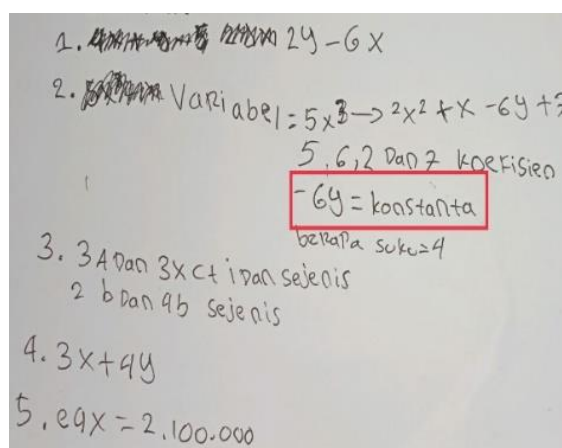


Figure 4. On the 6y answering constant

Interview results:

Q: How do you mention variables, coefficients, constants, and terms in question number 2?

N: The variable is a letter, a number coefficient, a number constant equal to the last letter

From the interview results show that, students think constants are numbers and letters on the right, so students on constants do not understand the concept of constants.

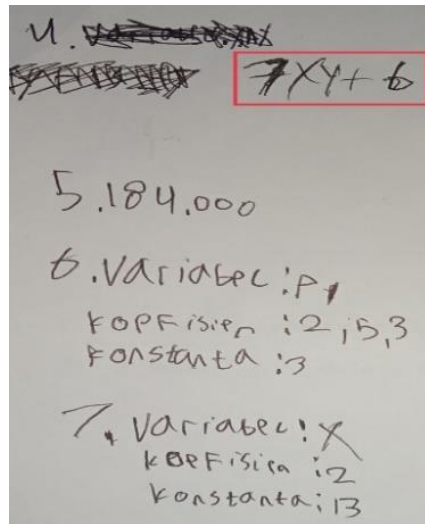


Figure 5. Adding 2 Piggy Banks

Interview results:

Q: How do you determine the result of the algebraic form?

N: 7 from his piggy bank plus 6 money

Q: Is the piggy bank added?

N: Both piggy banks ka so added

From the results of the interview, it shows that, students think piggy banks are a kind and have space to put money.

2. Discussion

The following is a discussion of research results related to the ability to understand mathematical concepts of grade VII MTs As Subkiyah Kota Bekasi students in terms of learning interest.

a. High Learning Interest Student Category

From the results of the questionnaire, there were 2 students who were included in the category of high interest in learning. AH subjects scored 60 and KIS subjects scored 63 in the learning interest questionnaire. In the indicator of restating the concept that has been learned, the student has answered correctly, that is, stating the algebraic form of term 2. On the indicator of classifying objects according to certain properties, the student has answered correctly, but there is a mistake in the mention of variables and coefficients. On indicators give examples and not examples students have answered correctly, that is, give examples and not examples of

algebraic forms of term 3. In the indicator of presenting concepts in various forms of mathematical representation, students have answered correctly, that is, re-presenting concepts from pictures into algebraic form. In the indicator of developing necessary conditions and sufficient requirements, a concept has been answered correctly, but there are students who do not understand related to the story. In the indicators of using, selecting or utilizing certain operations students have answered correctly, but there are students who do not understand calculating operations on algebraic forms. In the indicator of applying concepts or algorithms to problem solving, students have answered correctly, namely applying concepts to problem solving with appropriate steps.

This is in line with research conducted by Rizky Aoliya Nurdyana, et al, stating that students' high interest in learning in mathematics contributes to improving their mathematical comprehension abilities. Therefore, a high level of interest in learning becomes an important factor in improving mathematics understanding during the learning process (Nurdyana., 2022).

Thus, it can be concluded that students' interest in learning in the high category in class VII MTs As Subkiyah Kota Bekasi is able to meet the indicators of the ability to understand concepts, meaning that students in the high learning interest category can be said to be able to understand mathematical concepts well.

b. Student Category Medium Learning Interest

From the results of the learning interest questionnaire, there were 26 students who were included in the medium learning interest category. In the indicator of restating the concept that has been learned, some students have answered correctly, but there is 1 student who thinks that 2 terms are 2 different variables, so the student does not understand the concept of tribe. In the indicator of classifying objects according to certain properties, some students have answered correctly, but some are wrong, namely there are errors in variables and coefficients, then there are students who say the coefficient is the power of a variable, then on the constant there are students who answer 6y is the last term that has numbers and letters, and in the student term answers 5 terms that there are constants that are not calculated. In the indicator of giving examples and not examples, some students have answered correctly, but there are some that are wrong, namely, students give answers with similar and unsimilar variables that are not examples and not examples of algebraic forms of term 3, then students do not understand the problem. In the indicator presenting concepts in various forms of mathematical representation, some students have answered correctly, but there are some that are wrong, first on the picture of money students do not write answers, because students assume the money is put in a piggy bank. Second, students add both piggy banks, and students assume that piggy banks are a kind and have space to put money in, and third, students add a picture of a chicken piggy bank and money becomes 10y, because students think the money is put in a chicken piggy bank. In the indicators of developing necessary conditions and sufficient requirements of a concept, some students have answered correctly, but there are some who are wrong first, students do not divide the results of savings per week. Second, students do not provide a way to solve the question and the answer results are not correct, and third, students do not explain how to solve but the results given are correct. In the indicators of using, selecting or utilizing certain operations,

some students have answered correctly, but there are some who are wrong first, do not provide a way of solving the problem and the answer results are not correct. Second, students give answers by mentioning variables, coefficients, constants that are not the answer to the problem, and third, students give ways to solve the problem but the results given are incorrect and the student does not understand the calculation operations in algebraic form. In the indicator of applying concepts or algorithms to problem solving, some students have answered correctly, but there are some who are wrong first, students do not provide steps to solve the problem and the answer results are not correct. Second, students give answers by mentioning variables, coefficients, constants that are not the answer to the question. Third, students provide steps to solve the problem but the results given are not correct, and fourth, students do not give answers and students do not understand the problem.

This is contrary to the research of Indah Husna, et al, stating that students with moderate mathematical abilities have a good mathematical understanding, are able to explain back the concepts that have been learned, can group the objects that make up the concept, are able to connect various mathematical concepts, and can apply these concepts in various forms of mathematical representation (Husna et al., 2020).

Thus, it can be concluded that the ability to understand mathematical concepts of students interested in learning is medium class VII MTs As Subkiyah Kota Bekasi is able to meet only a few indicators, meaning that students in the category of medium interest in learning can be said to have not been able to understand mathematical concepts well.

c. Student Category Low interest in learning

From the results of the learning interest questionnaire, there were 3 students who were included in the low interest in learning category. MKBR subjects obtained a score of 34, MNR subjects a score of 37, and NA subjects a score of 36. In the indicator of restating the concept that has been learned, students have answered correctly, but there are some things that are wrong, namely students think that 2 terms are 2 different variables and students think that $2y$ is 2 terms, then the student does not understand the concept of tribe. In the indicator of classifying objects according to certain properties, some students have answered correctly, but there are some that are wrong, namely, there is an error in the mention of variables and coefficients, and in the term students answer 5 terms in which there are constants that are not calculated. In the indicator giving examples and not examples, students answer incorrectly that is, students give answers with variables that are similar and not similar, which are not examples and not examples of algebraic forms of terms 3, and students give examples that are not examples of algebraic forms of terms 3 are algebraic forms of terms 3, but students think that variables x and y have 2 terms, Then students do not understand the concept of tribe. In the indicator of presenting concepts in various forms of mathematical representation, students have answered correctly, but there is a wrong student, that is, students add pictures of chicken piggy banks and money, because students think the money is put in the piggy bank of chickens. In the indicator of developing necessary conditions and sufficient requirements for a concept, students answered wrong, namely students did not divide the results of savings per week, and students did not provide a way to solve the problem but the results given were correct. In the indicator of using, choosing or utilizing certain operations, students answer incorrectly, that is,

students do not provide ways to solve questions and the answer results are not correct, then students give ways to solve questions but the results given are not correct, then students do not understand calculating operations in algebraic forms. In the indicator of applying concepts or algorithms to problem solving, students answer incorrectly, namely students provide steps to solve the problem, but the results given are not correct, then students do not give answers and students answer questions by simplifying the results in length and width in the fields, then students do not understand the problem.

This is in line with Junitasari and Fanny Hayati research, which states that students with low interest in learning have not achieved all standards of mathematical comprehension ability (Junitasari, & Fanny, H, 2019). In this study, it was also seen that students with low interest in learning have not been able to achieve the indicators well.

Thus, it can be concluded that the ability to understand mathematical concepts of students in the low learning interest category of class VII MTs As Subkiyah Kota Bekasi has not been able to meet the indicators of the ability to understand the concepts mastered, namely students in the low learning interest category can be said to have not been able to understand mathematical concepts correctly.

From the results of this study, researchers can conclude that there are several findings in grade VII MTs As Subkiyah Kota Bekasi students. The first finding is that students think tribes are different variables and on constants do not belong to tribes. The second finding is, $2y$ is 2 terms consisting of 2 and y . The third finding is, students answer on the coefficient is the power that is in the variable. Keemoat's finding is that students answer to a constant is 1 term consisting of numbers and letters attached and is on the right. The fifth finding is that in the math representation problem students add 2 pictures of piggy banks that have different shapes, and students think piggy banks are a kind and have space to put money in.

In indicators develop necessary conditions and sufficient conditions for a concept, indicators use, choose or utilize certain operations, and indicators apply concepts or algorithms to problem solving, that is, these indicators become the main problem, because students who answer correctly are very small, then most of the mistakes are lack of accuracy in understanding story problems, and students do not understand counting operations in algebraic forms. It can be concluded that students who have a high interest in learning show a very good understanding of mathematical concepts, so that those with high interest in learning have a high understanding of concepts. Students interested in learning are having a fairly good understanding of concepts, but it can affect their lack of accuracy, too sure, confidence and they tend not to evaluate the results of the answers, resulting in incorrect answers in solving a problem. Then, students with low interest in learning, get a category that is not good in the ability to understand concepts, because they tend not to be able to control their learning activities and cannot evaluate their own learning outcomes.

D. Conclusion

Based on the results of research and discussion, it was concluded that the ability to understand students' mathematical concepts when viewed from learning interest, that is, based on the results of the ability to understand mathematical concepts in grade VII students with

high, medium, and low levels of learning interest, it can be concluded that subjects with high learning interest have a very good understanding of concepts, mastering all indicators. Students with moderate interest in learning are quite capable, despite mastering only 4 out of 7 indicators. Students with low interest in learning have not been able to understand mathematical concepts well, only mastering 3 out of 7 indicators. It can be concluded that in the indicator of developing necessary and sufficient conditions of a concept, the indicator chooses, uses or utilizes certain operations, and the indicator applies concepts or algorithms to problem solving, in these indicators there is a major problem for grade VII MTs As Subkiyah Kota Bekasi students, because the percentage of students who answer correctly is very low, then most of the errors are found in the lack of accuracy in understanding the problem Stories and students do not yet understand about calculating operations on algebraic forms.

There are several findings in grade VII MTs As Subkiyah Kota Bekasi students. The first finding is that students think tribes are different variables and on constants do not belong to tribes. The second finding is, $2y$ is 2 terms consisting of 2 and y . the third finding is, students answer on the coefficient is a power that is in the variable, the fourth finding is, students answer on the constant is 1 term consisting of numbers and letters attached and is on the right. The fifth finding is, in the mathematical representation problem students add 2 pictures of piggy banks that have different shapes and students think piggy banks are a kind and have space to put money.

References

- Amalia, U. M. dan R. (2020). “Proses Pembelajaran Matematika pada Anak Berkebutuhan Khusus (Autisme) di Sekolah Inklusif” *Journal On Teaching Education*. *Journal On Teaching Education*, 1(2), 9–19.
- Bureau, J. S., Howard, J. L., Chong, J. X. Y., & Guay, F. (2022). Pathways to Student Motivation: A Meta-Analysis of Antecedents of Autonomous and Controlled Motivations. *Review of Educational Research*, 92(1), 46–72. <https://doi.org/10.3102/00346543211042426>
- Hidayana, A. F. (2022). Pengaruh Motivasi Belajar Terhadap Kemampuan Pemahaman Konsep Matematika Siswa Kelas IV MI Nurul Ulum Madiun. *Bimbingan Konseling*, 14(1), 195–210.
- Husna, I., Purwosetiyono, F. D., & Endahwuri, D. (2020). Kemampuan Pemahaman Matematis Siswa dalam Memecahkan Masalah Trigonometri Ditinjau dari Kemampuan Matematika. *Imajiner: Jurnal Matematika Dan Pendidikan Matematika*, 2(6), 501–509. <https://doi.org/10.26877/imajiner.v2i6.6787>
- Khasanah, N., & Setiaji, H. A. (2023). The Effectiveness of Cooperative Learning Model with Group Investigation (Gi) Using Comic Media Towards Mathematical Literacy Ability of Viii Students at SMP Negeri 1 Punggelan. *International Journal of Research in Mathematics Education*, 1(2), 163–174. <https://doi.org/10.24090/ijrme.v1i2.9293>

- Maula, I. (2013). Pembelajaran Matematika Guided Discovery. In *Perpustakaan Nasional: Katalog Dalam Terbitan (KTD)* (Vol. 1, Issue 1).
- Mutmainah, F., & Nuha, M. 'Azmi. (2023). Implementation of Discovery Learning Assisted by Pythagorean Puzzle to Improve Mathematical Problem-Solving Ability. *International Journal of Research in Mathematics Education*, 1(2), 100–115. <https://doi.org/10.24090/ijrme.v1i2.8676>
- nurdiyana rizky aoliya, heni pujiastuti, dan nurul anriani. (2022). Analisis Kemampuan Pemahaman Matematis Siswa Ditinjau dari Soal TIMSS. *Jurnal Ilmiah Dikdaya*, 12(1), 55. <https://doi.org/10.33087/dikdaya.v12i1.274>
- Septiani, I., Lesmono, A. D., & Harimukti, A. (2020). Analisis Minat Belajar Siswa Menggunakan Model Problem Based Learning Dengan Pendekatan Stem Pada Materi Vektor Di Kelas X Mipa 3 Sman 2 Jember. *Jurnal Pembelajaran Fisika*, 9(2), 64. <https://doi.org/10.19184/jpf.v9i1.17969>
- Sirait, E. D. (2016). *Pengaruh Minat Belajar Terhadap Prestasi*. 6(1), 35–43.
- Sugiono. (2016). *Metode Penelitian Kuantitatif, Kualitatif dan R&D* (Issue April).