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Analysis of Representative Ability and Mathematical Disposition by Using a Guided Inquiry Learning Model in Review of Gender Students in MTsN 2 Medan

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Abstract: *This study aims to analyze: (1) students' mathematical representative ability through the application of guided inquiry learning model in terms of gender representative abilities. Whereas in terms of female gender in the aspect of representative in MTsN 2 Medan, (2) students' mathematical disposition through the application of guided inquiry learning model in terms of gender in MTsN 2 Medan, and (3) the difficulty of representative experienced by students in solving problems of representative ability through the application of model guided inquiry learning in terms of the gender of students in MTsN 2 Medan. This type of research used in this research is qualitative research. The subjects in this study were students of class VIII MTsN 2 Medan. While the object in this study is the ability of representative, mathematical disposition and difficulties experienced by students in solving problems of representative ability through the application of guided inquiry learning model in terms of gender. The results showed: (1) students with high representative ability in terms of male and female genders were able to present pictures to solve problems, had written members of a set and were able to explain their reasons using words or written text. Students with the ability to represent are being viewed from the gender of men who have not been able to aspects of words or written texts. Whereas in terms of gender female are not yet capable of aspects of visual representative and the words or written texts. Students with low representative ability in terms of male gender have not been able to in all three aspects of the visual present images but are still wrong. Then, aspects of mathematical expressions or expressions and written words or text have not been able to make mathematical model and written words or text. (2) the level of mathematical disposition in terms of male gender is obtained that as many as 5 students from 34 students obtained high categories (14.70%), moderate categories as many as 10 students from 34 students (29.41%) and in the low category as much as 0 students from 34 students (0%). While the level of mathematical disposition in terms of female gender is obtained that as many as 5 students from 34 students received high categories (14.70%), moderate categories were 13 students from 34 students (38.23%) and in the low category were 1 students from 34 students (2.9%). (3) the difficulties experienced by students in solving problems of representative ability using guided inquiry learning model in terms of the gender of men experiencing difficulties in terms of principles, verbal aspects and procedural terms. While the gender of female experiences difficulties in terms of concepts, aspects of principles, aspects of verbal and procedural terms.*

Keywords: *Representative Ability, Mathematical Disposition, Guided Inquiry Learning Model*

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I. Introduction

Improving the quality of Human Resources (HR) is needed by a country in harmony with the development of science and technology. One effort to improve HR is through education. Based on the Pancasila and the Constitution of the Republic of Indonesia, one of the goals of National Education is to create generations of people who are responsive to the demands of changing times. This is stated in the National Education System Law Number 20 Year 2003 article 1 paragraph 2 that "National Education is education based on the Pancasila and the 1945 Constitution of the Republic of Indonesia which is rooted in religious values, the national culture of Indonesia and responsive to the demands of changing times" (Ministry of National Education, 2003:3).

All efforts have been made by the government to realize quality education, one of which is to change the curriculum from 1975 to 2013 which was perfected into the 2013 curriculum. Changes in the curriculum were made not only to improve the curriculum, but also to advance the world of education including in deep mathematics lessons. In National Education, mathematics is a subject that has an important role both in the

application of daily life and in the development of other sciences. The importance of mathematics has been studied since the beginning from elementary schools to universities.

The National Council of Teachers of Mathematics (2000:7) establishes five basic mathematical abilities that students must master in learning mathematics. (1) problem solving ability, (2) reasoning, (3) communication, (4) connection and (5) representative. One ability that needs to be developed among students is the ability to represent. In fact, based on the results of researchers' interviews with mathematics teachers it was found that students were rarely given the opportunity to present their own representative. Students tend to imitate the way the teacher in solving problems that result in the ability of student representative to be undeveloped.

This is also in line with the preliminary study conducted by researchers at MTsN 2 Medan to find out the students' initial ability in mathematical representative showing that (1) the difficulty of using visual representative (pictures) to clarify the problem, (2) the difficulty of making mathematical models and (3) difficulty using mathematical models to solve mathematical problems. The cause of students' mistakes in solving the mathematical representative problem is inaccuracy in reading problems, weaknesses in analyzing problems, inaccurate and difficulty connecting between concepts.

Therefore, the ability of representative to get the full attention of the teacher so that it is easier to get a solution of mathematical problems. This was stated by Surya and Nur (2015:171) that "the ability of representative is needed by students to find and make a tool or way of thinking in communicating mathematical ideas from abstract or concrete traits, so students are easy to understan".

In addition to the ability of student representative to be improved in learning, other internal factors that are affective aspects also need to be improved. This is in line with the purpose of mathematics education is the formation of student attitudes. Therefore, it is appropriate that in the process of learning mathematics it is important to pay attention to students' attitudes towards mathematics, namely mathematical disposition. According to Sumarmo (2012:343) said that "mathematical disposition as a desire, awareness, dedication and a strong tendency in students to think and carry out mathematical activities (doing mathematics) in a positive way". This expression is in line with the opinion of Kilpatrick et.al (2001:131) which states that "mathematical disposition is a positive attitude and habit to see mathematics as a logical, useful and useful".

In fact, students' mathematical dispositions are still low. This can be seen from the results of research conducted by Trihatun (2016:210) showing that "most of the students are thought to still have a low mathematical disposition". It was seen from the following factors. (1) students are reluctant to go forward to work on problems in front of the class, (2) students do not pay attention to the teacher's explanation well, (3) students rarely ask questions related to the mathematics being studied, (4) students complain when given homework or assignments,) students do not know the mathematical material they will learn before being told by the teacher and (6) students do not want to try to work on difficult problems and seem resigned to the math scores obtained.

Based on the results of researchers' interviews with mathematics teachers at MTsN 2 Medan, students do not yet have a good mathematical disposition. That is because students are easily discouraged in solving problems and are not interested in trying in other ways or trying again to get answers. Therefore, students need a mathematical disposition so that they involve themselves directly in finding and solving problems and feel the emergence of self-confidence, hope and awareness in maximizing their abilities so that learning success is achieved and students' mathematics learning outcomes are good.

Based on the explanation above, it shows how important mathematical representative and disposition abilities are in the process of learning mathematics. But in reality, most teachers still use the lecture and assignment methods. This results in students tend to be passive, only receive information, students rarely ask questions about the material presented and students also often have difficulty in solving problems. Therefore, learning needs to be designed that can develop students' mathematical representative and disposition abilities, namely the guided inquiry learning model.

Hutahaean and Siagian (2016:32) said that "guided inquiry learning model is a model of inquiry learning in which the teacher provides extensive guidance or instructions for students". According to Febriawan et.al (2016:1740) the process of teaching and learning with guided inquiry, students are required to find concepts through instructions as needed from a teacher. The instructions are generally in the form of questions that lead to the development of inquiry activities carried out by students. The teacher also provides explanations as needed when students will conduct the experiment.

Based on the description above, then in guided inquiry learning, the teacher's role is as follows. (1) choosing a problem or learning material to be learned by students and (2) planning an experiment. On the contrary, the role of students is. (1) carrying out experiments, (2) finding concepts or principles based on data obtained from experimental results and (3) providing an explanation of data obtained from experimental results (Febriawan et.al, 2016:1740).

Another factor that can contribute to students' mathematical representative and disposition abilities in learning mathematics is gender. According to Firmanto (2013:27) that "gender factors influence mathematics learning outcomes, he suggested that female students tend to have lower motivation in learning mathematics than male students". This is in line with Gurian's research (2010:129) written in his book entitled Boys and Girls Learn Differently: A Guide For Teachers and Parents that "the right hemisphere of male students has stronger abilities in numerical and logic than hemisphere female students' right hemisphere, while female students' left hemisphere has advantages in the aesthetic and religious fields than male students' left hemispheres. High intelligence in female tends to never have a total interest in theoretical questions like men ".

Furthermore, the research results of Dewi et.al (2017:123). Increasing the ability of representative in low and medium categories, male students are higher than female students and there are no male students who have high category representative abilities but there are female students who have high category representative abilities. The ability to represent mathematical models and explain with verbal language, male students are higher than female students. While the ability of representative to make tables and make pictures, female students are higher than male students.

Based on the results of the study above, it can be concluded that gender differences have a part to influence someone in solving mathematical problems, but these differences are not consistent. In this study, gender differences only distinguish between the sexes of men and female associated with mathematical representative and disposition abilities. For this reason, by applying the guided inquiry learning model, the mathematical and disposition abilities of male and female students are expected to be better than before.

II. Literature Review

2.1 Representative Ability

Lestari and Yudhanegara (2015:83) "the ability of representative is the ability to restate notations, symbols, tables, images, graphs, diagrams, equations or other mathematical expressions into other forms". Meanwhile, according to Hudiono (2005:19) that "the ability of representative can support students in understanding the concepts of representative being studied and their relevance to communicate students' mathematical ideas, to get to know (connections) between mathematical concepts, or to apply mathematics to problems. realistic representative through modeling ".

Based on some of the definitions above, it can be concluded that mathematical representative is an ability by restating mathematical ideas or problems with a substitute form or modeling into mathematical form in the form of images, objects, diagrams, graphs, charts, words, mathematical expressions or other symbols to understand a concept, communicate to solve the problem presented as a result of the interpretation of his mind.

2.2 Mathematical Disposition

NCTM (in Izzati, 2017:35) states "the mathematical disposition is the connection and appreciation of mathematics which is a tendency to think and act in a positive way". Wardani (2008:15) defines a mathematical disposition is "interest and appreciation for mathematics that is the tendency to think and act positively, including self-confidence, curiosity, perseverance, enthusiasm in learning, persistent in dealing with problems, flexible, willing to share with others, reflective in mathematical activities (doing math) ". In line with this, Sumarmo (2010:5) argues that "mathematical disposition is a strong desire, awareness, and dedication to students to learn mathematics and carry out various mathematical activities".

Based on the above understanding that mathematical disposition shows self-confidence, expectations and metacognition, passion and serious attention in learning mathematics, persistence in facing and solving problems, high curiosity, and the ability to share opinions with others.

2.3 Guided Inquiry Learning Model

According to Hasanah (2014:73) the guided inquiry model is "a learning model of students thinking on their own to find a particular outcome expected by the teacher, the implementation is carried out by students on the basis of instructions given by the teacher. The instructions given by the teacher are questions that guide students to the findings so that the findings are as expected by the teacher ". The stages of the guided inquiry learning model are (1) presentation of the problem, (2) data collection and verification, (3) data collection through experiments, (4) data formulation and processing, (5) analysis of the inquiry process and (6) drawing conclusions through teacher guidance.

III. Method

This type of research used in this research is qualitative research.

3.1 Research Subjects and Objects

The subjects in this study were students of class VIII MTsN 2 Medan. While the object in this study is the ability of representative, mathematical disposition and difficulties experienced by students in solving problems of representative ability through the application of guided inquiry learning models in terms of gender.

3.2 Data Collection Instruments and Techniques

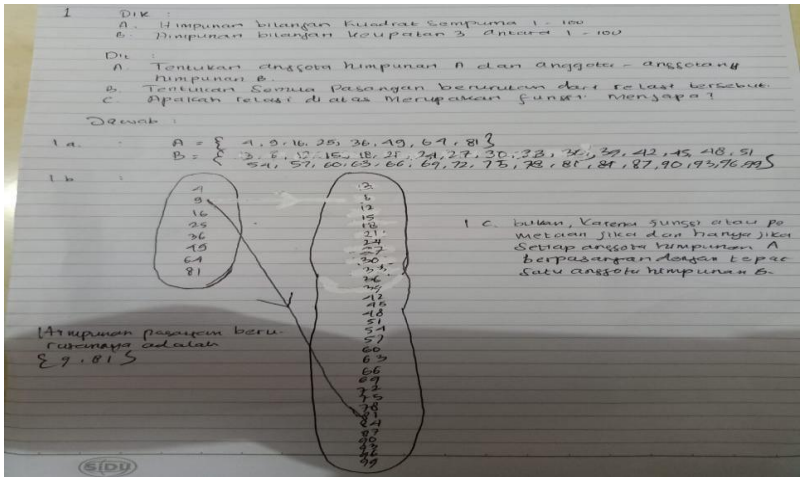
The main instrument in this study is the researcher himself, which means the position of the researcher is the key (determinant) in the selection and analysis of data. Sugiyono (2012:59) states that "In qualitative research the instrument or research tool is the researcher itself". In addition to the researcher as the main instrument in research, a simple instrument will be developed to sharpen and complement the research data. The instruments included tests of representative ability, mathematical disposition questionnaires and interview guidelines. Interviews were conducted with subjects chosen directly between the researcher and the informant in a dialogical manner, questions and answers and discussions

IV. Results and Discussion

4.1. Representative Ability Viewed From Gender

a. Analysis of The Ability of High Capability Representative in Terms of Male Gender

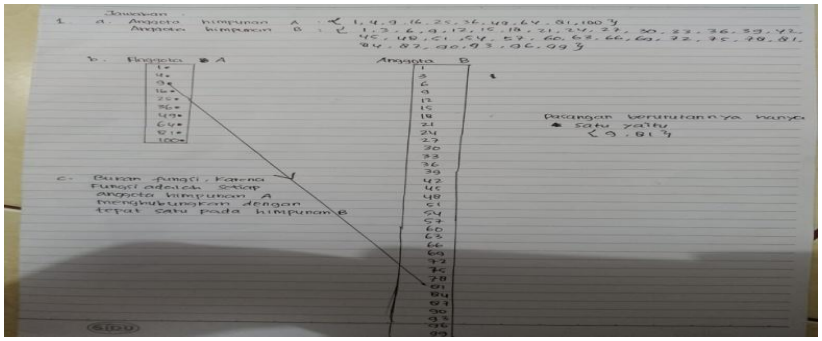
The answer to the ability of high capability representative in terms of male gender is on the S-12 subject as follows:



Based on the written test results above, it can be concluded that (1) aspects of visual representative; Subject S-12 was able to draw it into the arrow diagram by pairing each member of set A and member B of group B and was able to write the set of sequential pairs from the arrow diagram he had made, (2) aspects of the equation or mathematical expression; Subject S-12 already knows the set of member A and the set of member B and write down all the members of set A and set of member B, and (3) aspects of words or written text; Subject S-12 has written down the reason that drawing an arrow diagram is not a function.

b. Analysis of The Ability of High Capability Representative in Terms of Female Gender

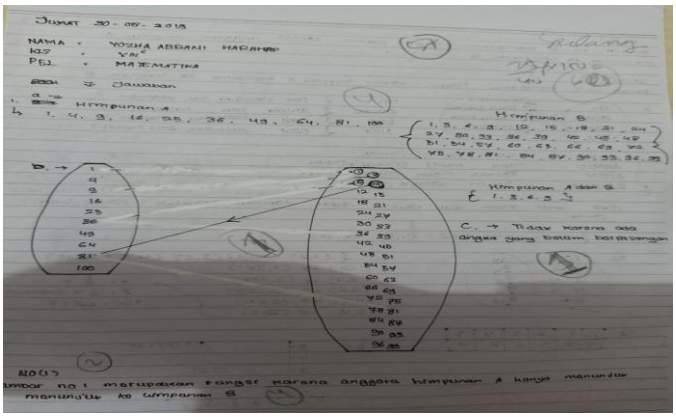
The answer to the ability of high capability representative in terms of female gender is on the subject of S-23 as follows:



Based on the written test results of S-23 subjects above, it was found that (1) aspects of visual representative; Subject S-23 has solved the problem correctly and paired each of the members of set A to the members of set B by means of the arrow diagram and writing the sequential pair of the arrow diagram, (2) aspects of the equation or mathematical expression; Subject S-23 can write the set of member A and set of member B, and (3) aspects of words or written text; The S-23 subject can give good reasons to strengthen his opinion about non-function.

c. Analysis of The Ability of Representative of Being Evaluated from Male Gender

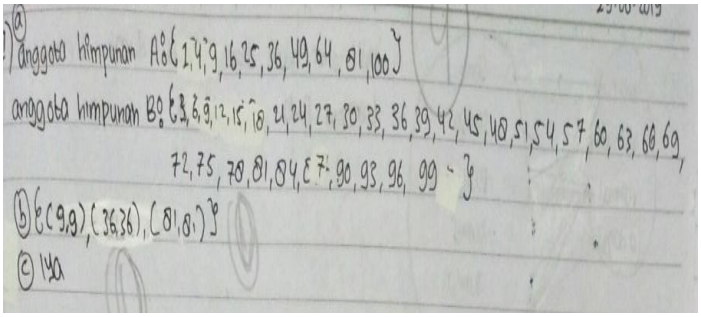
The answer to the ability of representative of being able to test the ability of representative is on the subject S-34.



Based on the written test results of S-34 subjects above, it appears that (1) aspects of visual representative; Subject S-34 can already make a diagram by pairing each member of set A to the set member B and being able to write sequential pairs, (2) aspects of equation or mathematical expression; Subject S-34 lists member A and member B, and (3) aspects of words or written text; The S-34 subject was not able to give a good reason to strengthen his opinion about non-function.

d. Analysis of The Ability of Representative of Being Evaluated from Female Gender

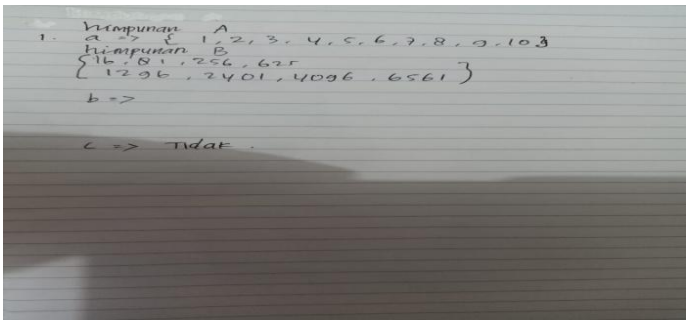
The answer to the ability of representative of being able to test the ability of representative is on the subject S-38.



Based on the written test results of S-38 subjects above, it appears that (1) aspects of visual representative; Subject S-38 makes sequential pairs but is still wrong and does not make arrow diagrams to solve the problem, (2) aspects of equations or mathematical expressions; Subject S-38 already knows and is able to write down the set of member A and set of member B, and (3) aspects of words or written text; The S-38 subject was unable to give a reason for what he wrote.

e. Analysis of The Ability of Low Ability Representative in Terms of Male Gender

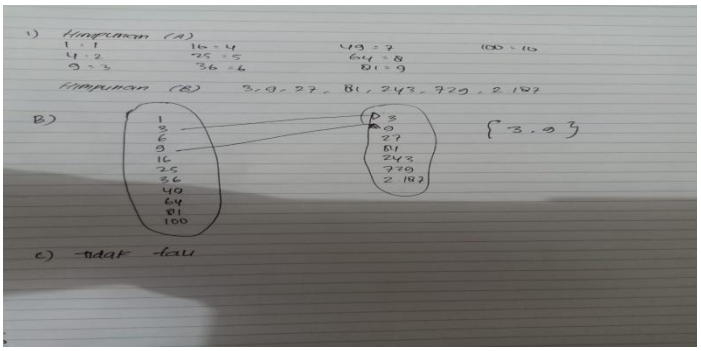
The answers to the ability of low ability representative with the ability to test the representative of the subject S-7.



Based on the written test results of S-7 subjects above, it appears that (1) aspects of visual representative; S-7 subjects cannot understand and use appropriate visuals in representing mathematical problems, (2) aspects of equations or mathematical expressions; Subject S-7 is not able to make mathematical model equations from the problems given correctly, and (3) aspects of words or written text; Subject S-7 is not able to use representative to answer questions using words or written text.

f. Analysis of The Ability of Low Ability Representative in Terms of Female Gender

The answers to the ability of low ability representative with the ability to test the representative test are on the S-33 subject as follows:



Based on the written test results above, it was concluded that (1) aspects of visual representative; Subject S-33 has presented the arrow diagram but how to pair each member of set A to the set member B is not correct, (2) aspects of equation or mathematical expression; Subject S-33 is not correct in writing members of set A and set members B, and (3) aspects of words or written text: Subject S-33 does not know the concepts of relations and functions so that it is unable to use representative to answer questions using words written words or text.

4.2 Mathematical Disposition Viewed from Male Gender

The description of students' mathematical dispositions can be seen through the average mathematical disposition questionnaire of students for each indicator. For more details, can be seen in the following Table 1.

Table 1 Average Mathematical Disposition Scores for Each Indicator

No	Mathematical Disposition Indicator	Average Score Per Indicator	Average Total Score
1	Confident	7,32	
2	Flexible and try various alternatives in solving problems	2,47	
3	Working diligently on mathematical tasks	6,11	
4	Demonstrates interest and curiosity	5,05	
5	Monitor and reflect on Mathematics performance/ learning	5,05	
6	Assessing math applications	6,58	37,67
7	Appreciation for the role of mathematics	5,05	

Based on Table 1 above, it can be seen that the highest average indicator score is confidence, second followed by indicators assessing mathematical applications, third followed by indicators diligently doing mathematical tasks, fourth followed by indicators monitoring and reflecting mathematics performance/learning,

fifth followed by indicators showing interest and curiosity, sixth followed by indicators of appreciation for the role of mathematics and finally the flexible indicators and trying various alternatives in solving problems. Thus it can be concluded that the mathematical disposition in terms of male gender is more dominant on indicators of self-confidence.

4.3. Mathematical Disposition Viewed from Female Gender

The description of students' mathematical dispositions can be seen through the average mathematical disposition questionnaire of students for each indicator. For more details, can be seen in Table 2 below.

Table 2 Average Mathematical Disposition Scores for Each Indicator

No	Mathematical Disposition Indicator	Average Score Per Indicator	Average Total Score
1	Confident	9,17	47,23
2	Flexible and try various alternatives in solving problems	3,05	
3	Working Diligently on mathematical tasks	7,35	
4	Demonstrates interest and curiosity	5,79	
5	Monitor and reflect on Mathematics performance/learning	6,67	
6	Assessing math applications	8,29	
7	Appreciation for the role of mathematics	6,88	

Based on Table 2 it can be seen that the average score of the highest indicator is confidence, second followed by indicators assessing mathematical applications, third followed by indicators diligently doing mathematical tasks, fourth followed by indicators of appreciation for the role of mathematics, fifth followed by indicators monitoring and reflecting mathematics performance/learning, the sixth is followed by indicators showing interest and curiosity, and finally the flexible indicators and trying various alternatives in solving problems. Thus it can be concluded that the mathematical disposition in terms of female gender is more dominant on indicators of self-confidence.

4.4 Representative Difficulties Experienced by Students in Resolving the Problem of Representative Ability by Using a Guided Inquiry Learning Model Viewed From Male Gender

Based on the results of the student's representative ability test, it is found that the difficulties experienced by students in solving the problem of representative ability can be seen from several aspects as follows:

Table 3 Aspects of Student Difficulties in Resolving Problems of Representative Ability in terms of Male Gender

No.	Indicator	Explanation and Description
1.	Difficulty in learning concepts	Students have no difficulty in making equations or mathematical models of the problems given
2.	Difficulties in applying principles	Students find it difficult to make sequential pairs because they do not present the arrow diagram
3.	Difficulty in solving verbal problems	Students find it difficult to use written text to answer problems
4	Difficulties in the procedure	Students are not able to present the completion steps correctly

4.5 Representative Difficulties Experienced by Students in Resolving the Problem of Representative .....Ability by Using a Guided Inquiry Learning Model Viewed From Female Gender

Based on the results of the student's representative ability test, it is found that the difficulties experienced by students in solving the problem of representative ability can be seen from several aspects as follows:

Table 4 Aspects of Student Difficulties in Resolving Problems of Representative Ability in Terms of Female Gender

No.	Indicator	Explanation and Description
1.	Difficulty in learning concepts	Students have difficulty making equations or mathematical models of the problems given
2.	Difficulties in applying principles	Students have difficulty making arrows diagrams so that the sequential pairs are incorrect
3.	Difficulty in solving verbal problems	Students have difficulty using written text words to answer problems
4	Difficulties in the procedure	Students are not able to present the completion steps in an orderly and correct manner

V. Conclusion and Suggestion

5.1 Conclusion

1.The ability to represent using the guided inquiry learning model in terms of gender as follows:

a.Students with high representative ability in terms of male and female gender have been able to present pictures to solve problems, have written the set of member A and set of member B and are able to explain the reason by using words or written text.

b.Students with the ability to represent are being viewed from the gender of men not yet able to aspects of words or written texts due to lack of understanding of the concept of the presentation of functions in the form of arrow diagrams. Whereas in terms of gender female are not yet capable of aspects of visual representative and the words or written texts.

c.Students with low representative ability in terms of male gender have not been able to on three aspects of the ability of representative, namely aspects of visual representative, equality or mathematical expression. Whereas in terms of the gender of female in the aspect of visual representative already presents a picture but it is still wrong. In the aspect of equations or mathematical expressions and words or written text has not been able to solve the problem.

2.The ability of mathematical disposition by using the guided inquiry learning model in terms of gender

Based on the level of mathematical disposition in terms of male gender, it was found that as many as 5 students out of 34 students received high categories (14.70%), moderate categories were 10 students out of 34 students (29.41%) and in the low category there were 0 students from 34 students (0%). While based on the level of mathematical disposition in terms of female gender, it was found that as many as 5 students out of 34 students obtained high categories (14.70%), moderate categories as many as 13 students from 34 students (38.23%) and in the low category were 1 students out of 34 students (2.9%).

3.Difficulties experienced by students in solving problems of representative ability using guided inquiry learning models in terms of the gender of men experiencing difficulties in terms of principles, verbal and procedural aspects. While the gender of female experiences difficulties in terms of concepts, aspects of principles, aspects of verbal and procedural terms.

5.2 Suggestion

Based on the research results and conclusions above, suggestions can be given as follows:

1.For mathematics teachers, it should pay attention to the level of representative ability because the three aspects of the ability of representative function to communicate the answers or mathematical ideas concerned to find solutions to the problems encountered.

2.For mathematics teachers, it is expected to create a pleasant learning atmosphere for students so that their desires, awareness, tendencies and strong dedication to thinking and carrying out mathematical activities in a positive way.

3.For mathematics teachers, the use of questions in evaluating school learning needs to be cultivated so that it is expected to be able to encourage students to learn and hone their representative abilities to improve students' thinking patterns.

4.For principals and mathematics teachers socialization needs to be held in developing the ability of representative so that its application is more sustainable and aims to improve student achievement in learning mathematics.

5.For other researchers who want to conduct a research analysis of mathematical representative and disposition abilities so that they can perform each stage of mathematical representative and disposition abilities better, especially indicators of the two abilities.

6.For other researchers it is advisable to provide questions related to contextual. It aims to link the problems faced with knowledge that has been obtained previously in order to deepen the experience of students themselves.

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