Vol. 9, No. 2, pp. 209-219, 2019 DOI: 10.23960/jpp.v9.i2.201923

Jurnal Pendidikan Progresif

e-ISSN: 2550-1313 | p-ISSN: 2087-9849

http://jurnal.fkip.unila.ac.id/index.php/jpp/

Problem Solving Ability of Junior High School Students Towards Geometry: Gender and Mathematical Disposition Analysis

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Received: 11 October 2019 *Accepted: 03 November 2019* *Published: 15 November 2019*

Abstract : **Problem solving ability of Junior High School students towards geometry: Gender and mathematical disposition analysis.** **Objectives:** The purpose of this study aimed to analyze the effect of gender and mathematical disposition towards the problem-solving ability of geometry at Junior High School students in Bandar Lampung City. **Methods:** The study used a survey method with two-way analysis of variance. Gender and mathematical disposition are independent variables, while the problem-solving ability of geometry is dependent variables. **Findings:** The results showed that there was no difference in the average of the problem-solving ability of geometry between male students and female students. Moreover, there was no interaction effect gender and mathematical disposition towards the problem-solving ability of geometry. Last, the average the problem-solving ability of geometry of students who had a high mathematical disposition was higher than students who had a low mathematical disposition. **Conclusions:** The difference in geometry problem-solving ability occured in male and female students.

Keywords: Problem-solving ability, geometry, gender, mathematical disposition.

Abstrak: Kemampuan pemecahan masalah geometri siswa SMP: Suatu analisis gender dan disposisi matematis. ***Tujuan:*** *Penelitian ini bertujuan untuk menganalisis pengaruh gender dan disposisi matematika terhadap kemampuan pemecahan masalah geometri pada siswa SMP di Kota Bandar Lampung.* ***Metode:*** *Penelitian ini menggunakan metode survei dengan analisis varian dua arah. Gender dan disposisi matematika adalah variabel independen, sedangkan kemampuan pemecahan masalah geometri adalah variabel dependen.* ***Temuan:*** *Hasil penelitian menunjukkan bahwa tidak ada perbedaan dalam rata-rata kemampuan pemecahan masalah geometri antara siswa laki-laki dan siswa perempuan. Selanjutnya, tidak ada efek interaksi jenis kelamin dan disposisi matematika terhadap kemampuan pemecahan masalah geometri. Rata-rata kemampuan pemecahan masalah geometri siswa yang memiliki disposisi matematika tinggi lebih tinggi daripada siswa yang memiliki disposisi matematika rendah.* ***Kesimpulan:*** *Perbedaan kemampuan pemecahan masalah geometri terjadi pada siswa pria dan wanita.*

Kata Kunci: *Kemampuan pemecahan masalah, geometri, gender, disposisi matematis.*

To cite this article:

Sutrisno AB, J. (2019) Problem Solving Ability of Junior High School Students towards Geometry: Gender and Mathematical Disposition Analysis. *Jurnal Pendidikan Progresif*, *9*(2), 209-219. doi:10.23960/jpp.v9.i2.201923.

INTRODUCTION

Problem-solving ability is needed in life. There fore, problem-solving ability needs to get attention in learning mathematics at school. Problem-solving ability is demanded and emphasized explicitly in the mathematics curriculum. These capabilities are basic abilities that must be developed and can be integrated into several relevant materials. Problem-solving ability as competencies to be achieved, mathematics learning needs to be optimized to achieve these competencies.

Learning mathematics in schools must teach children to solve problems. Children are introduced to mathematics as a problem-solving tool. Learning needs to provide mathematical problem-solving exercises. Students are given various types of problems that can be solved using mathematics. How students can use mathematics in problem-solving activitiesif they do not have mathematics learning experience as a problem-solving activity. Freudenthal (1973) said how to use mathematics for solving problems if people do not have experience in mathematics as a problem-solving activity.

Based on the results of interviews conducted with several junior high school mathematics teachers in Bandar Lampung City, information was obtained that students' ability to solve mathematical problems was not excellent or lacking. There were still students who have not been able to translate story problems or problem-solving problems. And they made mistakes in writing what should be known and what was asked in the question. This situation was not only in Bandar Lampung City. As stated in the research report of Karsim, Suyitno, and Isnarto at Semarang state Junior High School 41, that more than 60% of students had less ability in problem-solving. Obtained information that lack of skill in problem-solving of the students could be seen when students completed the story problem, before completing students were not accustomed to writing what was known and writing what was asked, so students often misinterpreted what was being discussed from the question (Karsim, Suyitno,& Isnarto, 2017).

There are many understandings of problem-solving that have been raised by experts in various interpretations. Polya as quoted by Chamberlin (2008), defines that problem-solving can be interpreted as an attempt to find a way out of a difficulty, achieving a goal that is not immediately achievable. According to Mayer (Mayer, 2013), problem-solving is an activity or cognitive process that is directed to achieve goals that require methods in its completion.

In problem-solving activities through learning, students will get some rules that are of a higher level or complex rules. The problem-solving activity requires students to recall some more straightforward rules that they have learned before. But to master these more straightforward rules, students must master various concrete concepts. Thus, problem-solving is the most sophisticated intellectual and intellectual process. Problem-solving is not only defined as a solution in the field of mathematics. Fadlelmula (2010) explained that problem solving is a complex task that involves more than just a simple repetition of memories from a fact or application of procedures/ stages that have been understood.

Problems that are often encountered by students in mathematics, can be in the form of questions or tasks that must be completed. In solving problems, it requires rules or sequences that need to be applied. Without specific rules or stages, students will find it difficult to answer questions or assignments given to them. Problem-solving requires or involves various information. To get the solution, the information is used. In general, this information is concepts or principles in mathematics. Thus not all math problems can be said to be a problem. Something is said to be a problem if one has to combine some information and with certain ways to solve it (Pehkonen,

Naveri, & Laine, 2013)

In explaining the problem, according to Hudoyo (2001), students are expected to have an understanding of the process of resolving the issue and are skilled in identifying conditions and choosing relevant concepts, seeking generalizations, drafting plans and organizing abilities and skills possessed.

With a problem-solving approach, mathematical aspects and objects are developed. The ability to present and establish mathematical problems is a skill needed to solve everyday problems. The importance of problem-solving for students, the curriculum recommends that mathematics learning be focused on problem-solving. Problem-solving is not only a goal to be achieved, it is also a process in learning mathematics. It happens because problem-solving is an ability and has functions and benefits that are very important in life.

Aydogdu & Keşan (2014), emphasize that problem solving is very important in mathematics learning because one of the goals of mathematics learning is to develop student reasoning and problem-solving skills. Habituation and skills in solving problems during school, so that as individuals can take part and care about problems in people's lives in the future. In addition, Suherman revealed that in a mathematics curriculum, problem-solving is a significant part. Through problem-solving students are expected to gain knowledge and experience and the ability to be applied to solving problems that are not routine (Suherman, 2001).

Through solving or problem-solving activities, aspects of critical mathematical abilities such as mastery and application of concepts, discovery and formulation of patterns, generalizations, connections and accurate communication and others, can be developed better. To develop problem-solving skills, mathematics learning must be oriented and increasing or optimizing the interaction of learning components, namely teachers, students, and facilities; 2) increasing or optimizing student participation, including creating learning by doing (Soedjadi, 2000).

Based on the explanation above, mathematical problem-solving skills need attention. The ability to solve mathematical problems is not only seen as a goal but also as a process in learning mathematics. As a process, problem-solving must be the central core of the mathematics curriculum. Learning prioritizes the methods and strategies applied in solving problems, rather than results-oriented. As a goal and process skill, problem-solving abilities are said to be the basic competencies to be achieved in mathematics learning.

In solving problems, usually begins with writing or formulating the problem at hand. Then plan the settlement by paying attention to the data and information that already exists and that needs to be collected. Conduct analysis or calculation in data collection and use the data to get the desired answer. After all the processes are implemented, it needs correction and re-translation to get the necessary conclusions.

Based on the steps in problem-solving, Sumarmo (2014), details the indicators of problem-solving abilities based on the following steps: a) understand the problem through identifying the known elements, and asking questions, and checking the adequacy of data; b) compile or formulate a mathematical model; d) implement strategies that have been planned in solving problems; c) carry out elaboration or calculation; e) re-examine the truth of the answer to the problem. Polya (2004), describes the stages of problem-solving in four stages, namely: 1) understanding the problem; 2) planning problem solving; 3) Carry out the plan; 4) re-examine the process and results.

In implementing the problem solving described above, everything begins with understanding the problems faced and then

formulating the problem. After the problem is formulated then plan a solution in which to see what data already exists and that needs to be sought by paying attention to things that are known and the relation of things that are known. Then carry out the solution through calculations and analysis that need to be done using the concepts and principles needed. Conduct checks and draw conclusions based on analysis or calculations that have been done.

The various steps or stages of problem-solving that have been raised by experts, basically, in solving or solving problems are done in stages to get the right solution. In this study, it can be explained the steps in solving mathematical problems, namely: 1) Formulation of the Problem, at this stage begins by understanding what is being asked. Identify situations that are said to be a problem. Then formulate or formulate the problem in a clearer form. 2) Data Collection, at this stage data collection or information, is needed. Express data and information relevant to the problem to be resolved. 3) Analysis/Calculation, at this stage, perform calculations and analysis using concepts, principles, and mathematical operations in collecting and integrating data, as well as calculation and completion analysis to solve problems that have been formulated. 3) Draw conclusions, re-examine the entire process of answers that have been done, write conclusions or answers based on the data analysis that has been done.

Geometry is a field or branch of mathematics that is taught at all levels of education, both at the level of basic education to the level of secondary education. Geometry is a branch of mathematics that needs to be studied because it is very useful for everyday life. Therefore, geometry learning is one of the fields of study in mathematical material that gets a large portion for students to study in school. Geometry learning objectives so students can have the knowledge and understand the properties and relationships between elements of geometry and can solve problems well. Geometry is a field of mathematics that is very close or related to student life. Almost all visual objects around students are geometric objects.

There is a learning theory concerning geometry learning proposed by Van Hiele. Learning theory is adapted to the stages of a child's mental development in geometry (Suherman, 2001). The three main elements, according to Van Hiele in geometry are time, material and teaching method. If arranged in an integrated manner, it will be able to develop children's thinking skills to the higher stages of thinking ability. Van Hiele stated that there are 5 stages of a child's ability to learn geometry, namely: 1) the stage of introduction, 2) the stage of analysis, 3) the stage of sequencing, 4) the stage of deduction, 5) the stage of accuracy.

Students at the junior high school level are expected to have achieved geometric learning skills at the stage of deduction. Students canconclude deductively, namely concluding in general towards specific things. Students are expected to be able to use the knowledge that can be in the form of concepts, principles, and operations to find a new experience or solve problems. As an illustration, students are given problem-solving story problems. From these questions, students can write down what is known and asked. Then think what concepts or formulas can be applied. What information or data that already exists or is known, what data needs to be searched. To find data or information that is not yet known, use a concept or formula from which it is known to look for unknown data. Perform calculations or analysis to get data and answer the questions asked. Then examine and conclude according to the issues raised. This ability is greatly influenced by how children learn and how the teacher applies to learn. The more active the child explores and exercises as the application of the concept that has been owned,

the better the ability to think and the ability to solve the problem.

Problems in mathematics can be in the form of questions or tasks that students must complete. Geometry is a field or part of mathematics that is taught at every level of education. Not all mathematical problems relating to geometry can be said to be geometric problems. A said as a problem if in its completion someone must combine some information and in a certain way. In solving or solving problems requires a variety of information. To get the correct solution, use that information. This information can be concepts or principles in geometry. Thus the problem of geometry is a problem that can be in the form of questions or tasks which in its completion use concepts or principles in geometry with certain stages.

In learning mathematics, the students must have the abilitites for learning geometry, such as: (1) analyzing the properties of various shapes or geometric constructs, both in two dimensions or in three dimensions, and able to provide mathematical arguments with regard to geometric relationships with other fields, (2) specifying the position of a point, description of spatial relations in coordinate geometry, (3) using transformation symmetrically to analyze mathematical situations, (4) utilizing spatial reasoning, visualization, and geometry models to solve problems (National Council of Teachers of Mathematics, 2010).

Founded by Muhassanah (Muhassanah, Sujadi, Riyadi, 2014), so students can apply geometry skills to students need mastery of useful concepts. In addition, a good pattern of thinking is also needed to be able to use a theory and problem-solving skills in solving geometry problems. In reality, there are still students experiencing difficulties in learning and answering tasks or geometry questions.

Based on the description above, then in this study what is meant by geometric problem-solving ability is the ability shown by students in solving geometric problems faced by using the knowledge and skills they already have, taking into account the process of finding answers based on certain stages. In this study, the geometry problem in question is in the form of questions or tasks that must be solved with regard to the geometry material that has been studied, which in its completion requires knowledge regarding concepts, principles, and mathematical operations through stages: (1) formulating problems, (2) collecting data/information, (3) analysis/ calculation, (4) drawing conclusions/products.

The problem of weaknesses and difficulties of students in understanding geometric concepts can be made possible due to various factors that originate from within themselves or from outside of students such as teachers, facilities, learning environment, parents and so on. Classically, the weakness of understanding geometric concepts for students in general, is the impact of conventional learning processes that arrange memorization on the formula alone, without being accompanied by a fundamental understanding of the concepts being taught. Besides that, the learning that is applied has not been optimally paid attention to by empowering the characteristics that exist in the students.

One of the characteristics that exist in students is gender differences. Discussion of gender differences in learning has been discussed for a long time. It shows that in learning gender differences need attention. Problem-solving ability is the result of learning. To master this ability, the characteristics of students need to be considered especially in the selection of learning strategies. Gallagher et al. (2000), explained that gender differences are a source of strategy flexibility in mathematics learning that pays attention to problem-solving. It is said that the use of intuitive strategies in solving unconventional problems, male students is better than female students.

Most of the literature explains that there are gender differences in solving mathematical

problems. As a reflection of different patterns in solving mathematical problems between genders, related to cognitive abilities and other psychological characteristics can be mediated by learning experiences. Many complex variables include biological, psychological and environmental variables that contribute to gender differences in solving mathematical problems (Zhu, 2007).

Every student has a difference. Differences must be accepted and utilized in learning. Students have diverse ways of learning and thinking. This difference is likely to be influential in solving mathematical problems. The study by Indrawati & Tasni (2016), explained that in female subjects in solving mathematical problems tended to be very careful, hesitant, and so structured while in male subjects tended to be quick to take a position, less systematic, and less neat. But basically, in terms of cognitive aspects, there is no significant difference in the ability to solve mathematical problems between women and men. The results of the study relating to problem-solving geometry of junior high school students by Thournee (2017), showed that male students were less careful while female students were comprehensive.

Mathematical soft skills that need attention in the learning process are mathematical dispositions. Mathematical disposition is one of several factors that influence students in learning mathematics. Mathematical disposition is a component of the affective domain in mathematics learning. Mathematical disposition can be interpreted as self-confidence and a positive attitude towards values in mathematics. Mathematical disposition has a big impact on one's success in learning mathematics. The fact shows that mathematics learning outcomes, especially the ability to solve mathematical problems as described above, are not as expected. Mastery and geometric abilities of students have not achieved optimal results from the expected goals. Students generally consider mathematics as a lesson that imposes. Many students consider geometry material to be material that is difficult to learn. Negative attitudes towards mathematics such as it indicates that mathematical dispositions need attention. The mathematical disposition that is not particularly good for geometry material certainly has an impact on understanding geometry that is still low.

Damon (2005), explains that disposition is a trait or character that leads a person to make certain choices and experiences. Dispositions are guided by self-confidence and attitudes related to values. This opinion is reinforced by the explanation that mathematical dispositions refer to beliefs or tendencies that show behaviour, consciously and voluntarily to learn mathematics (Atallah, Bryant, & Dada, 2010).

Mathematical disposition as an attitude towards mathematics is a tendency to think and act positively. This tendency can be said as the interest and confidence of students in doing and working in learning mathematics. Mathematical disposition can also be explained as the willingness to diligently explore and persevere in solving mathematical problems, and desire to reflect on the results of his thinking in learning mathematics (Anku, 1996).

Wardani (2008), defines mathematical disposition as interest and appreciation for mathematics is a tendency to think and act positively, confidently, curious, enthusiastic, diligent, persistent in learning, flexible, willing to share with others, and reflective in activities mathematics. Disposition to mathematics can also be defined as a change in the tendency of students to see, behave, and act in learning mathematics. For example, when students can solve non-routine problems, their attitudes and beliefs about mathematics as a student increase positively. The more mathematical concepts he

mastered, the more convinced that mathematics could be mastered (Hendriana H, Rohaeti E E and Sumarmo, 2016).

Mathematical disposition as a productive attitude is an attitude towards mathematics as something logical and views mathematics that can produce something useful. Indicator of mathematical disposition is showing: passion in learning mathematics, serious attention in learning, persistence in facing problems, confidence in learning and solving problems, high curiosity, and the ability to share with others (Syaban, 2009). One way to arouse students 'interest and help them gain confidence in learning mathematics is through developing mathematical concepts from students' real-life experiences, as well as from theidea that they have mastered. Students will be interested in learning mathematics, if learning is created is fun learning.

From the various opinions above, it can be concluded that mathematical disposition is an attitude towards mathematics which is a tendency to think and act positively towards mathematics as indicated by a) confidence in learning mathematics, b) flexibleto find alternatives in solving mathematical problems, c) interest, curiosity, perseverance, diligence in working on mathematical assignments, d) passionate, monitor, reflect on appearance and own reasoning, and severe attention in learning mathematics, e) apply mathematics to other situations, f) appreciate the role of mathematics, expectations and metacognition, and g) share opinions with others.

METHOD

The research method used is a survey method with two-way analysis of variance analysis. Gender and mathematical disposition are independent variables, while the problem-solving ability of geometry are dependent variables. The population in this study was the eighth-grade students of the State Junior High School in Bandar Lampung City. Samples were taken using a multistage random sampling technique concerning the rank and location of the school, obtained 355 students from 11 schools. After being sorted from the sample by gender (A), it consisted of 124 men (A_1) and 231 women (A_2).

Based on mathematical disposition (B), 30% of the high group (B_1) and 30% of the low group (B_2) were taken. To collect mathematical disposition data (B), a questionnaire was used, while the problem-solving ability of geometry (Y) was used as a test technique. The instruments used are known to be valid and reliable.Testing the hypothesis through two-way analysis of variance (factorial 2x2), followed by the t-test. Before testing hypotheses, first test the requirements analysis which includes the normality test and the variance homogeneity test.

RESULT AND DISCUSION

The problem-solving ability of geometry is described by the score of the test results. From the results of the geometry problem-solving ability test, the data written in the following table.

Table 1. Data the Problem-solving Ability of Geometry

Data Description	A	A_1	A_2	A_1B_1	A_2B_1	A_1B_2	A_2B_2
Total Sample	355	124	231	37	69	37	69
Highest	95,00	95,00	92,50	95,00	90,00	62,50	70,00
Lowest	22,50	22,50	25,00	42,50	37,50	22,50	25,00
Average	52,39	51,96	52,62	69,12	67,54	34,39	36,88
Deviation Standard	18,54	19,04	18,30	12,12	12,65	10,18	11,38

The results of the analysis of variance in the framework of testing hypotheses are summarized in the table analysis of variance as follows.

From the table analysis of variance above, it is known that: $F(A) < F_{table}$ at a significant level of 0.05 and 0.01 then H_0 is accepted. There is no significant difference of average the problem-solving ability of geometry between male students and female students. $F(B) > F_{table}$ at a significant level of 0.05 and 0.01 then H_0 is rejected. There is a very significant difference of average the problem-solving ability of geometry between

Table 2. Table Analysis of Variance

Sourceof Variation	df	SS	ASS	F_{value}	F_{table}	
					0,05	0,01
Between A	1	9,902	9,902	0,072		
Between B	1	54528,302	54528,302	395,098	3,89	6,76
Interaction AB	1	200,223	200,223	1,451		
In	208	28706,502	138,012			
Total	211	83444,929				

students who have a high mathematical disposition with students who have a low disposition. The average of the problem-solving ability of geometry of students who have a high mathematical disposition is higher than students who have a low mathematical disposition. $F(AB) < F_{table}$ at a significant level of 0.05 and 0.0 1 then H_0 is accepted, thus there is no interaction effect of gender and mathematical disposition towards the problem-solving ability of geometry. From the results of calculations between A_1 and A_2 on B_1 obtained $t_{value} = 0.662$ while in B_2 obtained $t_{value} = 1.041$. It is known that between A_1 and A_2 on B_1 and B_2 that is $t_{value} < t_{table}$ at a significant level of 0.05 and 0.01 then H_0 is accepted. Thus for students who have a high mathematical dispositions and low mathematical dispositions, there is no significant difference of average the problem-solving ability of geometry between male students and female students.

From the results of calculations between B_1 and B_2 on A1 obtained $t_{value} = 12,715$ while in A_2 obtained $t_{value} = 15,325$. It is known that between B_1 and B_2 on A_1 and A_2 that $t_{value} > t_{table}$ at a significant level of 0.05 and 0.01 then H_0 is rejected. Thus for male and female students, the average the problem-solving ability of geometry of students who have a high mathematical dispositions are higher than students who have a low mathematical disposition.

The results showed that there was no difference inthe average the problem-solving ability of geometry between male students and female students. Besides that, it is known that there is no interaction effect of gender and mathematical disposition towards the problem-solving ability of geometry. There was no difference of average the problem-solving ability of geometry between male students and female students, indicating that outside of gender differences, other factors were more dominantly affecting students' ability to solve geometry problems.

There is a very significant difference of average the problem-solving ability of geometry between students who have a high mathematical disposition with students who have a low disposition. The average of the problem-solving ability of geometry of students who have a high mathematical disposition is higher than students who have a low mathematical disposition. In both male and female students, the average the problem-solving ability of geometry of students who had high mathematical dispositions were higher than students who had a low mathematical disposition.

It can be said that there is an influence of mathematical disposition towards the problem-solving ability of geometry. The results of this study indicate mathematical dispositions as students' attitudes towards mathematics need attention. Students will find it challenging to get excellent achievements in learning mathematics if their beliefs or dispositions towards mathematics are not right. Necessary attitudes or dispositions in learning mathematicsrequires curiosity, persistent will, imagination, the desire to experiment, and sensitivity to others in activities. Students who have mathematical dispositions, care about their cognitive abilities and are happy to face more challenging tasks such as questions related to solving mathematical problems. For those factors that can lead to positive dispositions of mathematics such as intelligence must get attention.

The unproductive mathematical disposition is the tendency for the habit of seeing mathematics as a futile, impractical, useless, coupled with a lack and low perseverance and confidence in mathematics. Students who have negative mathematical attitudes show higher levels of anxiety about mathematics than their peers, and generally, show low self-confidence in mathematics and lack of motivation to learn mathematics (Song, Daniel, & Wang, 2014). Students who have a productive disposition towards mathematics mean that students have a tendency, the habit of seeing mathematics as something rational or reasonable, useful, valuable, adds benefits, perseverance, and self-confidence (Feldhaus, 2012). Mathematical disposition needs to be developed through mathematics learning. The development of mathematical dispositions means developing characters in mathematics. Character development in mathematics aims to enable students to appreciate mathematics as useful in life, indicated by interest, curiosity, attention in learning mathematics, perseverance and confidence in solving problems.

Disposition or attitude towards mathematics is one of the various factors that influence students in learning mathematics. Mathematical disposition is a component of the affective domain in mathematics learning. Disposition as a character or character that brings a person to make individual choices and experiences. Mathematical disposition can be interpreted as self-confidence and a positive attitude towards values in mathematics. Mathematical disposition has a big impact on one's success in learning mathematicsbecause disposition as a tendency, show patterns of behaviour consciously and voluntarily directed towards achieving goals. When students complete math assignments, it can be seen how their attitude or disposition towards mathematics. Confidence, responsibility, abstinence, perseverance, feeling challenged, and having the willingness to look for ways or other ways, and reflecting on the completion of tasks and ways of thinking that have been done, are characteristics or criteria of someone who has a pleasant disposition towards mathematics.

Mathematical disposition or student attitudes toward mathematics is one of the factors that determine students' success in learning. Attitudes towards mathematics will develop when they learn aspects of other competencies. Like when they build or look for strategies to solve problems, their beliefs and confidence in mathematics will become more positive. The more concepts mastered by students, the more it gives confidence to these students to be able to learn mathematics. Conversely, if students rarely get mathematics learning, such as getting practice questions to solve, students will tend to memorize rather than follow the steps in learning mathematics, which in turn loses self-confidence as a student. When students feel capable of learning mathematics and feel able to solve problems, they will be able to develop their skills and abilities and be able to use adaptive procedures and reasoning.

CONCLUSION

Based on the results of the research and discussion above, it can be concluded that: 1) there was no significant difference of the average of the problem-solving ability in geometry between male students and female students, 2) there was no interaction effect of gender and mathematical disposition towards the problem-solving ability in geometry, 3) there was a very significant difference in the average of the problem-solving ability of geometry between students who have a high mathematical disposition with students who have a low disposition. The average of the problem-solving ability in geometry for students who have a high mathematical disposition is higher than students who have a low mathematical disposition.The difference in geometry problem-solving ability occurs in male and female students.

The implications of the results of this study that in learning mathematics need to pay attention to the characteristics that exist in students, such as intelligence, gender differences, and their dispositions or attitudes towards mathematics. Learning that is implemented is expected to create children who have positive attitudes or dispositions toward mathematics, especially geometry. It happens because geometry is one of the most essential components and gets a large portionin the junior high school curriculum. Children learning geometry begins with understanding simple concepts, then understanding the relationship between geometric concepts and their properties. With a pleasant atmosphere, children are invited to explore the models or geometry that they know everyday. By using geometric concepts that have been mastered, they should practice solving the given examples and exercises to use it. If we expect students to have mathematical dispositions and be able to succeed in learning geometry, especially their ability to solve problems, the learning stage needs to be adjusted to the stage of students' thinking abilities. The development of geometric ideas starts from a simple hierarchical one towards complex geometric mastery. The child first begins to learn the overall form and then analyzes the characteristics or relevant characteristics of the form he is learning. Furthermore, children can see the relationships between forms and make simple deductions. Curriculum development and learning must consider the hierarchy of children's abilities in learning geometry.

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