Students' error analysis in solving geometry problems based on the mathematical anxiety under the theory of van hiele

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Abstract. The aim of this research was to describe the students' error analysis in solving geometry problems based on the mathematical anxiety under the theory of Van Hiele. This research was a descriptive research with a qualitative approach. The data were collected by using observation, test, and interview methods. The subjects were selected by using classification test of Van Hiele's level. Van Hiele test was given to 202 students of class VIII of SMP Negeri 2 Purwoharjo. Thus, it obtained the students who were at the visualization level of 49.5%, analysis level of 11.9%, and informal deduction level of 1%. The results of this research showed that the students of visualization level experienced errors in five stages, namely reading error, reading comprehension, transform error, process skill, encoding and showed the anxiety symptoms with indicators of physiological, cognitive and affective. The students of analysis level experienced errors in four stages, namely reading error, transform error, process skill, encoding and showed the anxiety symptoms with indicators of physiological, cognitive and affective. The students of informal deduction level experienced errors in three stages, namely transform error, process skill, encoding and showed the anxiety symptom with cognitive indicator.

1. Introduction

Mathematics is one of the most important sciences in human life. One branch of mathematics is geometry. Geometry is one of topics in mathematics learning which is difficult for the students [1]. One of the aims of geometry learning is to make the students become the good solver. Nevertheless, what has happened so far is that geometry is a difficult material to understand and tends to be hated by most of the students [2]. Geometry learning is still far from the expectation which is indicated by the low understanding of the students.

Based on the information and the teacher's experiences, the students often making errors in solving the questions of two-dimensional figure, one of which is reading comprehension error. Besides, there were still many students who had errors in writing the formula. This could be caused by the students who tended to memorize the formula only, less understanding of the correct concept. In addition of those errors, it is possible that there are still other errors made by the students which caused the low achievement of mathematics learning. This is in line with a research done by [3], showed that the

students made errors in understanding the properties of a square and rectangle viewed from its sides and diagonals, error of understanding the material of a square and rectangle circumferences, error in understanding the area of a square and rectangle. In fact, this material is very important to learn the further materials at a higher level of education.

Several researches related to the students' errors in solving geometry problems in mathematics learning had been many conducted. The research conducted by [4] that the Newman Error Analysis (NEA) helped in finding the students' difficulties in mathematical problems and the teacher was helped to determine in which the error occurred. The Newman Error Analysis is designed as a simple analysis procedure. Newman attaches five stages that must be passed by the students in a scope of questions in the form of a story including reading stage, comprehension stage, transformation stage, process skill stage, and encoding stage. The indicators used are developed but still refer to the existing indicators, can be seen in the Table 1.

Table 1. Type of Error and Indicator

No.	Error Type	Indicators
1.	Reading Error	a. The students incorrectly read the information on quantities and units or symbols of the questions
		b. The students incorrectly read the words of the questions
2.	Reading Comprehension	a. The students do not write what is known from the question
		b. The students write what is known but not exactly what is known in the questions
		c. The students do not write what is asked from the questions
		d. The students write what is asked but not exactly what is asked in the questions
3.	Transform Error	a. The students do not write at all the step of method in solving the questions
		b. The students write incorrect step or method in solving the questions
		c. The students do not write the complete step or method because they do not write the mathematical formula to be used in solving the questions
		d. The students do not use the formula
4.	Process Skill	a. Students are wrong in doing calculations.
		b. Students do not continue the completion step based on the chosen method (not writing the formula)
		c. Students do not write down the stages in calculating.
		d. Students pay less attention to different units of measurement
		e. Students do not write units
5.	Encoding	a. Students do not write conclusions.
		b. Students write conclusions but are incorrect (wrong answers)
		c. Students do not write the appropriate unit from the final answer.

NEA also provides direction so that teachers can use affective teaching strategies. Whereas, according to [5] that there is an error made by the research subject in working on the matter of distance in building the space using the Newman procedure. The types of mistakes made are in understanding problems, processing capabilities, and writing answers. Followed by research according

to [6], stated that from the mistakes made by students, the highest percentage of errors is the error of understanding the problem while the lowest percentage of errors is reading errors. Many students still have difficulty in solving geometry problems. This difficulty will give rise to a negative response to mathematics lessons especially on geometry material. Negative responses experienced by students continuously will turn into math anxiety.

Mathematical anxiety is generally defined as feelings of tension, fear, or fear that interfere with mathematical performance [7]. According to [8] anxiety can be indicated by indicators that are present in physiological symptoms and a person's behavior. The anxiety indicators used are twelve which developed but referring to existing indicators, can be seen in Table 2.

Table 2. The Indicator of Anxiety Components

Concept	Aspect	Indicator
Anxiety can be expressed directly through physiological symptoms	Physiological (Behavior shown by individuals in their environment. Can be in the form of attitudes and sleep disorders)	Heart beating Feel like going to faint Chest pressure Go back and forth Blinking eyes Appetite disappears Nausea Cannot hold urine Sweating Pale face Blushing face
Anxiety can be expressed directly through behavioral symptoms	Cognitive behavior (mind)	Attention disturbed Bad concentration Thinking obstacles Confused Afraid Forgetful Difficulty in completing assignments
	Affective behavior (emotions)	Easily disturbed Sensitive to noise Trembling Shy Cannot wait Restless Tense Nervous Worried Guilty feeling Shy

[9] explains that there is existence of a negative relationship between anxiety and problem solving abilities through the mathematics anxiety process. It is proven that anxiety also affects students in solving problems. This is based on research [10] cognitive abilities and mathematical understanding affect students' mathematical achievements in geometry, and problem solving in the form of stories and not stories. If students feel anxious, many students make mistakes when students are told to solve a problem. This is in line with the research conducted by [11] that these errors arise because students have anxiety in dealing with mathematical situations, thus inhibiting the problem solving so that the higher the student's anxiety level, the lower the ability to solve the problem.

According to [12] good teaching of geometry must be in accordance with the abilities of the child. The figures that are directly related to the geometry of learning are Pierre Marie Van Hiele and Dina Van Hiele-Geldof. According to Van Hiele's theory, a hierarchical level of understanding in learning geometry someone will go through five [13]. Those five levels are level 0 (visualization), level 1 (analysis), level 2 (informal deduction), level 3 (deduction), level 4 (rigor). The implementation of Van Hiele's theory was believed to be able to overcome the obstacles in solving the geometry problems. It was due to Van Hiele's theory which explained the development of student's thinking in learning geometry. This statement was supported by several researches carried out by previous researchers. These studies proved that the implementation of van Hiele's theory had a positive effect on learning geometry. [14] states that a learning emphasizing on the level of thinking development by Van Hiele's (level 0 (visualization), level 1 (analysis), level 2 (informal deduction), level 3 (deduction) and level 4 (rigor)) helped in planning the learning and provided satisfying result. [15] states that the achievements of high school students in writing geometric proof were positively related to Van Hiele's theory.

Several researches showed that the students in junior high school were just at level 0-2 on van Hiele's theory. It was supported by [16] stating that the level of thinking of junior high school students in learning geometry was at level 2 as the highest (informal deduction) and most were at level 0 (visualization). This statement was also in line with a statment [17] which pointed out most of SMP/MTs students were between level 0 (visualization) to level 2 (informal deduction).

Based on the description above, this research was intended to describe the profile of students' errors in solving geometric problems based on mathematical anxiety based on Van Hiele theory.

2. Method

This research was a descriptive research with qualitative approach. The objective of this resarch was to analyze the students' errors in solving geometry problems related to square and rectangle based on mathematical anxiety concerning van Hiele's theory. The subjects of this research were selected by using van Hiele test. The test of classifying van Hiele levels was given to 197 students of class VIII at SMP Negeri 2 Purwoharjo adopted from [18], so that the selected students were at 49.5% of visualization level, 11.9% of level of analysis, 1% of informal deduction level and 37, 6% of students did not meet all requirements. The results of Van Hiele test are presented on Figure 1.
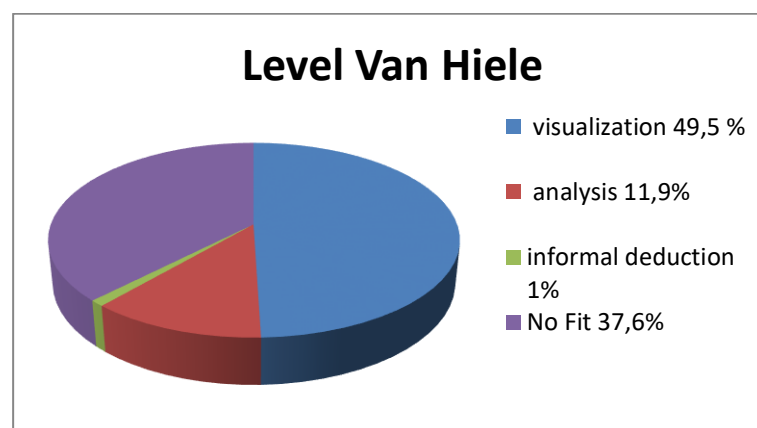

Figure 1. The Diagram of Geometry thinking Ability Level

The data collection methods used were observation, test, and interview. The researcher did it through the steps to get the research data as follows: (1) giving the test of Van Hiele Geometry thinking ability to 197 junior high school students of class VIII.. This Van Hiele test described the thinking process applied in a geometric context. Van Hiele Geometry Test consisted of 25 multiple choice questions arranged into 5 levels, each level divided into 5 questions. Questions 1-5 were level

0 (visualization), questions 6-10 were level 1 (analysis), questions 11-15 were level 2 (informal deduction), questions 16-20 were level 3 (deduction) and questions 21-25 were level 4 (rigor); (2) analyzing the results of geometric thinking test and classifying the students into groups based on the level of geometric thinking; (3) selecting 3 subjects consisting of 1 student at visualization level, 1 student at analysis level, and 1 student at informal deduction to be the subjects of this research; (4) the subjects were given a test aiming to determine the students' errors based on Newman's analysis in solving geometry problems; (5) the researcher observed the subjects directly while working on the test aiming to observe what was done as long as the subjects were doing the test. The data from the observations were also analyzed as secular sources to obtain the information about students' mathematical anxiety. (6) after completing the geometry problem error test, the researcher immediately had the interview with the subjects. This was done so that students did not forget about what they did and thought while working on the problem. The interview data were analyzed to determine the students 'errors in solving mathematical problems based on students' mathematical anxiety. (7) analyzing all data obtained. Analyzing student observation sheets, student error test results, and interview results. This analysis was a way to achieve the research objectives. (8) The final stage, summarizing the results of the research. Conclusions were obtained through observations and students worked in solving geometric problems at the Van Hiele level of thinking at the level of visualization, analysis, informal deduction and interview results.

QUESTIONS

The questions given to the students were to know the error and anxiety experienced by the students during the test. The questions were as follow:

1. A square floor has 6cm length side. The floor would be attached with a square tile of 30cm x 30cm size. How many tiles needed to cover the floor?
2. A house has a rectangle terrace with size of 39m length and 17m width. An iron fence would be installed around the terrace at a cost of Rp 97.000 per meter. How much does the cost needed to install the iron fence?

3. Results and Discussion

The data analyzed in this study were the results of observations, the results of error tests, and the results of interviews conducted by 3 students, each of which was chosen based on the level of visualization, analysis, and informal deduction class VIII of SMPN 2 Purwoharjo, it obtained the results of the research, as follows:

3.1 The students' error based on the Van Hiele Level

3.1.1   The Student's Error of Visualization Level (S1 and S2)

a. Reading error

Student are wrong reading the words on the question correctly. S1 and S2 make an error in reading the symbol of rupiah currency (Rp). S1 and S2 make en error because they do not read the rupiah currency symbol (Rp) correctly. Based on the results of interview, it indicated that the students actually understood the extension of "Rp" is rupiah, because students are accustomed to only reading the nominal without reading the symbol of the currency.

1. What is known from the problem? the problem is finding as many tiles as needed
-What was asked about the problem? many tiles are needed to cover the floor
-What steps and formulas are used to solve the problem? step must find the area and many tiles needed to cover the floor
-What is the floor area?
  L s xs = 30 cm x 30cm
      = 60 cm
  s xs = 6 x6 = 36 cm
-What is the area of the tile? 30 x 30 = 900cm
-How many tiles does it take to cover the floor?
  s x s = 6 x 6 = 36
  tiles measuring 30 x 30 = 900 cm
  many tiles needed are 36 x 90 = 3240 tiles
  So, many tiles needed are 3240 tiles

2. What is known from the problem?
look for the costs required for the installation of iron fences.
  p = 39 m
  l = 17 m
  cost = 97,000 / m
-What was asked about the problem? costs required for the installation of iron fences
-What steps and formulas are used to solve the problem? step must look for how much it costs to install an iron fence by calculating how extensive
- How much perimeter will an iron fence install?
  K=p + l + p + l
    = 36 + 17 + 36 + 17
    = 106 m
-How much does it cost to install an iron fence?
  106 x 97.000 = 10.282.000
-So, the cost required for the installation of iron fences is 10,282,000

Figure 2. *Answer S1*

1. What is known from the problem? the floor to be installed in tiles
-What was asked about the problem? a lot of tiles are required to cover the floor
-What steps and formulas are used to solve the proble?
 - L = S2, - L tile = S2, - Many tile =
-What is the floor area?
  L floor = s x s = 6 x6 = 36 cm
-What is the area of the tile? 0,3 m
-How many tiles does it take to cover the floor? 2160
 So, many tiles needed is 2160

2. What is known from the problem? the yard to be fitted with a rectangular iron fence
-What was asked about the problem? costs required for the installation of iron fences
-What steps and formulas are used to solve the problem? K = 2x (p+l)
- How much perimeter will an iron fence install? 112
-How much does it cost to install an iron fence? Rp. 5.432.000
-So, the fee required is Rp. 5.432.000

Figure 3. *Answer S2*

b. Reading comprehension

Students are categorized into reading comprehension if students cannot or incorrectly write what is known and write what is asked in the question. Based on the results of test and interview showed that S1 and S2 made errors in understanding the question that were they could not write what was known in the question, this because S1 was confused, did not understand what was known and was lazy to write what was known, while S2 understood what was known but was lazy to write it. S1 and S2 wrote what was asked correctly.

c. Transform error

Students are categorized into transform error if students incompletely write the method or steps because they do not write the mathematical formula to be used to solve the question. Based on the results of test and interview, S1 incorrectly wrote the method or steps because did not write the mathematical formula to be used in solving the question and only wrote the formula of circumference in number 2 because S1 did not know the formula for number 1 and 3 while S2 wrote the method or steps incorrectly because did not completely write the mathematical formula to be used in solving the question and the students did not write the method or steps but they only wrote the formula of circumference.

d. Process skill

Students are categorized into process skill if students do not write the steps in calculating, students are wrong in calculating, students pay less attention on different units and do not write units at the end of their answer. Based on the results of test and interview, S1 was wrong in calculating, students paid less attention on different units and incorrectly wrote units at the final answer because S1 was careless and did not know the formula while S2 had quite similar error but S2 did not know what formula should be used, he used careless formula to solve the question.

e. Encoding

Students are categorized into encoding if students do not write the conclusion, students incorrectly write the conclusion and write the correct units at the final answer. Based on the results of test and interview, S1 was wrong in calculating, the student paid less attention on different units of measurement and incorrectly wrote units at the final answer because S1 was careless and did not know the formula while S2 had quite similar error but S2 did not know what formula should be used, he used careless formula to solve the question.

3.1.2   The Analysis Results of the Students' Error of Analysis Level

1. What is known from the problem? a floor to be installed in the form of a square tile
-What was asked about the problem? the number of tiles needed to cover the floor
-What steps and formulas are used to solve the proble? determine the floor area first
-What is the floor area? L = s x s = 36 m^2
-What is the area of the tile? L = 30 x 30 = 900 cm^2
-How many tiles does it take to cover the floor?
   L floor = 30 m = 3600 cm
   L tile = 900 cm
   number of tiles needed = ...
So, the number of tiles required is 4 tiles

2. What is known from the problem? a house that will install an iron fence
-What was asked about the problem? costs for installing an iron fence
-What steps and formulas are used to solve the problem? determine the amount of perimeter of the house
- How much perimeter will an iron fence install? Biaya (cost)
-How much does it cost to install an iron fence?
-So, the fee required is Rp 13.962.000

Figure 4. *Answer S3*

1. What is known from the problem? a square-shaped floor and the floor will be fitted with square-shaped tiles
-What was asked about the problem? many tiles are needed to cover the floor
-What steps and formulas are used to solve the proble? square area formula, after knowing the area then reduced
-What is the floor area? L floor =
-What is the area of the tile? 900
-How many tiles does it take to cover the floor?
   lots of tiles = L floor : L tile = 3600 : 900 = 4
So, Many tiles needed are 4

2. What is known from the problem? a rectangular home page and the yard will be installed iron
-What was asked about the problem? costs required for the installation of the iron fence
-What steps and formulas are used to solve the problem? looking around the rectangle first then added to the cost of the iron fence per meter
- How much perimeter will an iron fence install?
-How much does it cost to install an iron fence?
-So, the cost required for the installation of the iron fence is 98.362

Figure 5. *Answer S4*

   a. Reading Comprehension
      Students are categorized into reading comprehension if students cannot or incorrectly write what is known and write what is asked in the question. Based on the results of test and interview, S3 and S4 made errors in reading comprehension that was not writing what was known in the question, this because S3 did not really understand when doing the question but after the interview was conducted, he actually understood what was known while S4 was confused on what was known when doing the question but after the interview was conducted, he actually understood what was known.
   b. Transform Error
      Students are categorized into transform error if students incompletely write the method or steps because do not write the mathematical formula to be used in solving the question. Based on the results of test and interview, S3 incompletely wrote the method or steps because did not write the mathematical formula to be used in solving the question, S3 deliberately did not write the formula because he understood the what formula should be used to solve the question, while S4 incompletely wrote the method or steps because did not the mathematical formula to be used in solving the question because for number 1, he did not know the formula on how many tiles covering the floor but he only

knew the formula of area and number 2 also did not know the formula on the installation fence cost, S4 just guessed it.

c. Process skill

Students are categorized into process skill, if students do not write the steps in calculating, students do not continue the completion steps based on the chosen method (not writing the formula), students do wrong calculation, students pay less attention to different units of measurement and do not write units at the end of the answer. Based on the results of the test and interview, the S3 was wrong in carrying out calculations, students did not continue the completion step based on the chosen method (did not write the formula), students did wrong calculations, students did not pay attention to different units of measurement and were not careful in writing the unit at the end of the answer S3 did not write the formula but he understood what formula used to solve the question, and S3's inaccuracy in calculating caused him to be wrong in the final result, while S4 was almost the same but S4 in numbers 1 and 2 did not know what formula to use he used a careless formula to solve the questions, for number 3 S4 was sure and understood better if the answer was correct but did not write the formula at all.

d. Encoding

Students are categorized into encoding, if students do not write conclusions, students write conclusions but are not correct, and write the appropriate unit of the final answer. Based on the results of the test and interview, the S3 wrote conclusions correctly but the answer was wrong for numbers 1 and 2 because S3 was not accurate in calculating, while S4 was almost the same but S4 misused the formula, did not know what formula to use, he used the careless formula to solve the question and was less careful in calculating.

3.1.3 The Results of Students' Error Analysis in Informal Deduction Level

1. What is known from the problem? floor side mounting = 6 m, tile size = 30 cm x 30 cm
-What was asked about the problem? lots of tiles to cover the floor
-What steps and formulas are used to solve the proble?
  1. look for the floor area
  2. find the area of the tile with the square formula that is s x s
-What is the floor area? L floor =
-What is the area of the tile? L tile =
-How many tiles does it take to cover the floor?
  lots of tiles = 3600 : 900 = 4 tiles
So, many tiles to cover the floor are 4 tiles

2. What is known from the problem? page size = p = 39 m, l = 17 m cost per meter IDR 97,000
-What was asked about the problem? costs required for the installation of iron fences
-What steps and formulas are used to solve the problem?
  1. find out first how much around the home page with the formula around the rectangle that is = K = 2 x (p + l)
  2. multiplies the cost of installing an iron fence
- How much perimeter will an iron fence install?
-How much does it cost to install an iron fence? cost = K x cost of iron fence
-So, the cost required to install an iron fence is Rp. 10,864,000

Figure 6. *Answer S5*

1. What is known from the problem?
   -The floor length is 6 cm
   - sweet potato size 30 cm x 30 cm
-What was asked about the problem? how many tiles are needed to cover the floor
-What steps and formulas are used to solve the proble?
find the floor area, change the unit to cm $L_L = s \times s$
-What is the floor area?
-What is the area of the tile?
-How many tiles does it take to cover the floor? lots of tiles =
So, Tile required 4 seeds

2. What is known from the problem?
   known = house size = p = 39 m, l = 17 m
   fence cost = 97,000 per meter
-What was asked about the problem? how much does it cost to install a fence
-What steps and formulas are used to solve the problem?
   determine the circumference of the page = 2 x (p + l) and multiply by the installation cost of the fence cost Rp
- How much perimeter will an iron fence install?
-How much does it cost to install an iron fence?
   fence cost = K fence x iron fence cost
   installation costs = 112 x 97,000 = Rp 10,864,000
-So, The installation fee is IDR 10,864,000

Figure 7. *Answer S6*

a. Transform Error

Students are categorized into transform error, if students do not write the steps or methods completely because they are not clear enough to write the mathematical formulas that will be used in solving the problem. Based on the results of interview directly through the transcript of the interview results in Appendix 19, it can be seen that S5 wrote methods or steps but it was not correct because it was incomplete written mathematical formula to be used in solving questions and also S5 felt a little confused how to calculate after changing unit m to cm, while S6 wrote the method or steps but was less precise because did not write the mathematical formula to be used in solving the question number 1 completely. S6 forgot to write the formula for how many tiles were needed.

b. Process skill

Students are categorized into process skill, if students do not write down the steps in calculating, students make mistakes in calculating, students pay less attention to different units of measurement and do not write units at the end of the answer. Based on the results of the interviews directly through the transcript of the interview results in Appendix 19, it can be seen that S5 and S6 were wrong in calculating, and students paid less attention to different units of measurement (still changing units of m to cm) due to inaccurate miscalculation and not continuing completion steps based on the method chosen (did not write the formula) because it was customary to do not write the formula faster.

c. Encoding

Students are categorized into encoding, if students do not write conclusions, students write conclusions but are not correct, and write the appropriate unit of the final answer. Based on the results

of the interview directly through the transcript of the results of the interview in Appendix 19, it can be seen that the S5 and S6 results of the error test indicated that students wrote conclusions correctly but the answers were wrong because the error of calculations were not accurate.

3.2 Anxiety According to Van Hiele Level
3.2.1   The Results of the Students' Anxiety of Visualization Level
The results of the observation sheets and interviews with S1 and S2 showed that S1 and S2 felt the heart beat faster than usual when they knew that they were given a test, they were nervous and afraid they could not do the problem and were afraid of miscalculating. Then, confused after reading the question number 1. Furthermore S1 and S2 also did not feel that they were holding their noses, eyes glancing right-left, holding their chins, scratching their head, holding their feet, hands resting on the head, playing pens, wiping their hands due to sweating. Things done by S1 and S2 when working on students' mistakes problems were symptoms of anxiety. Anxiety symptoms experienced by S1 are symptoms of anxiety in physiological indicators (palpitations and sweating), cognitive (fear, confusion, forgetfulness, difficulty working on tasks), and affective (nervous).

S1 experienced the symptoms of anxiety in physiological indicators (heart pounding and sweating), cognitive (being scared, confused, forgetful, difficult when working on tasks), and affective (nervous).

3.2.2   The Anxiety Results of the Students of Analysis Level
The results of the observation sheets and interview done with S3 and S4 showed that S3 and S4 felt a bit confused and nervous since they were scared of not being able to do the question and miscalculating it. Moreover, S3 and S4 also did not feel that they scratched their backs and heads, moved their legs, held their noses, and played a pen, glanced their eyes from right-left, closed his mouth with his hands and their hands were on chin. Things done by S3 and S4 while working on the question of students' error belonged to symptoms of anxiety. Symptoms of anxiety experienced by S3 and D4 were in physiological indicators (moving limbs), cognitive (being scared, confused, difficult when working on tasks), and affective (worried).

3.2.3   The Anxiety Results of the Students of Informal Deduction Level
The results of the observation sheets and interview done with S5 and S6 showed that the S5 and S6 were scared of working on the question as they forgot to change the units. Furthermore, S5 and S6 also did not feel that they put their hands on their chin, scratched his heads, put the pen in their mouth, scratched their chin, played with his hair, and moved his legs. Things done by S5 and S6 when working on students' error were the symptoms of anxiety in cognitive indicators (scared of doing wrong).

Based on the discussion of errors and anxieties above, it can be seen that the students who had many symptoms of anxiety tended to make a lot of mistakes in solving the problems. Meanwhile, the students who had few anxiety symptoms tended to make a few mistakes in solving problems. This is in line with the research conducted by Muhammad Irfan (2017) entitled Analysis of Students' Errors in Problem Solving Based on Mathematical Learning Anxiety, pointed out that the students with high mathematical anxiety experienced errors in three ways covering : (1) miswriting the mathematical symbols, (2) the meaning of mathematical models, and (3) inconsistencies in the use of symbols. These errors came up as they had the anxiety dealing with mathematical situations, thus it inhibitted their problem solving. Analysis of Students' Errors in Problem Solving Based on the Mathematical Learning Anxiety.

Concerning the mistakes done by the students in this research, the most common errors were errors of reading comprehension, transformation, process skill and encoding.

This research was supported by Seto Satoto, et al., (2013) entitled The Analysis of Students Learning Result in Solving Questions with Newman Procedure, concludes that there was an error done by the research subject in answering the question of spatial figure distance material by using Newman procedures. The type of error done by the students was error in reading comprehension, process skill

and writing answer. From 6 research subjects, all subjects passed the step of reading without error. 4 students or 66.67% did error in reading comprehension. The cause related to the illustration they made. In transform step, 5 from 6 students or 83.3% did not do it. It was because they did not familiar in using Newman procedure in doing mathematics question. Then, 3 from 6 students or 50% did error in process skill and writing answer.

The students' lack of accuracy in doing the calculation added their error to their final answer results. The students' habit of being hurry and laziness to recheck the process and their result was very unfortunate. This is in line with the research by Iwan Junaedi (2012) entitled The Type of Students' Error in Solving Analytical Geometry Question of Error Analytic Based on Newman (Nea) reveals that the error that mostly done by the students in doing proof problem is in the first step of encoding and understanding. The error in this step was the result of the next step. The students had less error in encoding. The error in encoding step was common because of students' lack of accuracy in their answer and they did not recheck the process and their answer result.

4. Conclusion

Based on the result of the analysis of the research data and discussion, it can be concluded that the students of visualization level experienced error in five steps that were reading error, reading comprehension, transform error, process skill, encoding and showing anxiety under the indicator physiology, cognitive, and affective. In the level of analysis, the students experienced error in four steps, which were reading comprehension, transform error, process skill, encoding and showing anxiety under the indicator of physiology, cognitive, and affective. Whereas, in the level of informal deduction the students experienced error in four steps, that were transform error, process skill, encoding and showing anxiety under the indicator of cognitive. The errors appeared because the students had anxiety in facing mathematical situation, so that the higher the students' level of anxiety, the lower their ability to solve problem.

Based on the result of this research in students' error in solving geometry problem based on the mathematical anxiety under the theory of Van Hiele, the researcher gives suggestion to the teacher to give more attention to the students' works results and give better learning to reduce the students' error level.

Acknowledgments

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