Investigating Middle School Students Generalization of Number Pattern Based on Learning Style

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Abstract: Pattern generalization is an important aspect of mathematics contained in every topic in teaching. This study aims to investigate middle school students' generalization of number patterns based on learning style. Descriptive qualitative, portraying or describing the events that are the center of attention (problem-solving abilities, student learning styles) qualitatively.This study explored 4 participants (12 to 13 years old) with their constructed number pattern they had generalized during individual task-based interviews. Questions that include indicators of the problem solving process in terms of student learning styles, and interviews. The data analysis used was namely data reduction, data presentation, drawing conclusions. We found that students who are converger, diverger, accommodator, and assimilator understands the problem by knowing what is known and asked and explains the problem with their own sentences. The converger and assimilator students look back without checking the counts involved, the diverger students do not see other alternative solutions and do not check the counts involved, accommodator students consider that the solutions obtained are logical, ask themselves whether the question has been answered, check the counts that are done, reread the question, and use other alternative solutions. The implication of this study indicated that students of the type of converger, diverger, accommodator, and assimilator are able to solve problems through the stages of implementing plans by interpreting problems in mathematical form, implementing strategies during the process and counting takes place. Based on several studies on pattern generalization, there have not been researchers who have revealed the number pattern generalization of high school students based on learning styles.

Keywords: Problem solving ability, generalization of number, learning style

1. Introduction

Mathematics is one of the disciplines which becomes the basis of knowledge development. Its position as a queen for other sciences, as well as serving other sciences (Firdaus et al., 2019; Jurdak & El Mouhayar, 2014). Mathematics grows and develops for itself as a science, also to serve the needs of science in its development and operation. Meanwhile, mathematics according to (Ikram et al., 2020; Wilkie, 2019) is a pattern of thinking, pattern of organizing, and logical proof. The need for understanding and using mathematics in daily life as well as in the working world is getting increasing and growing. Therefore, learning mathematics in schools is expected can give all students the opportunity to understand mathematics and assist the students in developing mathematical knowledge that directs them to solve problems and explore new ideas, inside and outside the classroom. Mathematical problem solving plays an important role in schools, where this ability is an ability that requires students to solve mathematical problems quickly and carefully (Firdaus et al., 2019; Mason, 2008; Rivera & Becker, 2016; Walkowiak, 2014).

Problem-solving is an activity to find solutions to the mathematical problems faced by using all the stock of mathematical knowledge possessed (Lannin, 2003). The importance of problem-solving ability is also expressed by (Muhtarom et al., 2019), that problem-solving ability is the heart of mathematics. The students' ability in problem-solving has a connection with the stage of solving mathematical problems. The stages of solving mathematical problems include: (1) understanding the problem, (2) making a solution to the plan, (3) implementing the plan, and (4) looking back (Siswono, 2010).

According to (Ellison, 2009), the problem-solving ability is one important aspect of independent learning and helps to move away from teaching that is educational. Suggests "four steps of the problem-solving process, namely: understanding the problem, designing problem solving, carrying out problem-solving, and checking again" (Siswono, 2010). Describes mathematical problems in two types, namely problem to find and problem to prove (Ikram et al., 2020). The problem of finding is a problem that aims to find, determine, or get the value of certain objects that are not known in the problem and provide appropriate conditions. While the problem proves

that is the problem with a procedure to determine a statement is true or not true. Problem-solving is one of life's tasks that must be faced in daily life with a range of difficulties ranging from the simplest to the most complex (Muhtarom et al., 2017).

Based on observations at SMPN in October 2019 and interviews with mathematics teachers, it was found that students' abilities were still lacking. This can be seen from the many students who still use the quick formula in solving mathematical problems. Not only that, but some students also seem unable to understand the problem when working on math problems given by the teacher. In line with the importance of problem-solving skills in mathematics, the need for mathematics teaching is packaged in such a way that it can provide experience for students to improve and develop their problem-solving abilities. The educators of course also have to strive for learning that can help students to try to find solutions to problems and produce knowledge that is truly meaningful. In addition, it provides an opportunity for students to apply their ideas and learn according to their own learning styles to solve mathematical problems faced by the students. There are many factors and variables that influence such as learning style, mathematics anxiety, lack of self-confidence, teacher trust, environment, lack of parents' attention, and gender (Firdaus et al., 2020; Muzaini et al., 2019; Radford et al., 2011).

Learning style can be defined in various ways, depending on each person's perspective (Cavas, 2010). Further (Cavas, 2010) explained the learning style is a way for someone to collect and master new and difficult information during the learning process. There are several learning styles models that are commonly used to identify types of student learning styles. According to (Montgomery & Groat, 1998), there are three models of learning styles that are commonly used in research related to learning styles, including the Myers-Briggs' learning style, Kolb's learning style, and Felder Silverman's learning style.

Student learning styles according to Kolb as quoted by (Eyyam et al., 2011) are based on 4 stages of learning. Most people go through these stages in the order of concrete experiences, reflective observation, abstract conceptualization, and active experimentation. It means that the students have real experiences, then observe and reflect on them from various points of view, then form abstract concepts and generalize them into theories and finally actively experience these theories and test what they have learned in complex situations. Based on the opinion above, the problem-solving ability that is still lack needs to be studied further to find out how the problem-solving ability for each student with different learning styles. The purpose of this study was to determine the students' mathematical problem-solving ability of number patterns material in terms of learning styles in Grade VIII students. This research is expected to be an in-depth study of students' problem-solving abilities based on students' learning styles.

2.Method

The type of this research is descriptive qualitative, portraying or describing the events that are the center of attention (problem-solving abilities, student learning styles) qualitatively and based on qualitative data [1, 19, 20]. The data generated will be in the form of words or utterances obtained from the results of the interview and writing or numbers obtained from the results of the interview.

Participant

The participant of the data in this study was the eighth-grade students of SMPN in the 2019/2020 school year. Then 4 students were chosen who had different learning styles according to Kolb's learning style that is Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualization (AC), and Active Experimentation (AE).

Research instrument

The instruments used in this study included the use of tests of mathematical problem abilities, mathematics learning style questionnaires, and with semi-structured interview guidelines for obtaining data on students' ability to solve questions about number patterns, referring to indicators of mathematical problem-solving abilities.

Data collection

Data collection methods that will be used in this study are documentation study will be conducted to collect secondary data in the form of a list of VIII grade students who will be examined, school profiles, and photos of research, in this study student learning styles will be measured by an instrument in the form of a questionnaire, the test is a measuring tool so that it can show the condition of the subject. The test method that will be used is in the form of questions that include indicators of the problem solving process in terms of student learning styles, and interviews.

Data analysis

After students fill out the learning style questionnaire, the next step is analyzing the learning style questionnaire data to identify and classify the types of student learning styles. This step is carried out based on the existing (Kolb & Kolb, 2005) Learning Style Inventory. CEscores are obtained from the sum of all statement scores in the first column, RO scores are obtained from the sum of all statement scores in the second column, AC scores are obtained from the sum of all statement scores in the third column, and AE scores are obtained from the sum of all

statement scores in the fourth column. After that using the analysis model of (Miles, H., & Huberman, 2014)namely data reduction, data presentation, drawing conclusions. Apart from that, this study uses data validity testing using time triangulation (Firdaus et al., 2020; Muzaini et al., 2019).

With all the things and risks that will happen in the future, I'm as author will take responsibility as it should be.

3.Results and Analysis

After completing the questionnaire of learning styles for students in grade VIII SMPN, the results of the implementation of the questionnaire can be seen in Table 1 below.

Table 1. *Results of Learning Style Questionnaire on Grade VIII*

Type of Learning Style	Numberof students
Converger	3
Diverger	8
Accommodator	2
Assimilator	7
Total	**20**

Meanwhile, the results of the problem-solving ability test (PSAT) by grade VIII students in SMPN for each type of learning style can be seen in Table 2 below.

Table 2. *PSAT Results for Each Type of Learning Style*

Learning Style	PSAT Average Score
Converger	83,2
Diverger	86,6
Accommodator	81,6
Assimilator	83,7

The interview was conducted after knowing the type of learning style and problem-solving abilities of each student. Each category of students' problem-solving abilities per learning style is taken by 1 student who has the correct answer on the problem-solving ability test. The results and implementation of the interview schedule on four subjects with one subject for each type of learning style obtained by the problem-solving ability score (PSA) as follows.

Table 3. *Results of PSA Interviews*

Typesof Learning Style	Interview Subject	PSA Test Score	Average
Converger	CV1	90	90
Diverger	DV2	85	85
Accommodator	AC3	82,5	82,5
Assimilator	AS4	90	90

(Richmond & Cummings, 2005) States that students with accommodator learning style types, learn through the stages of concrete experience and active experimentation. Concrete experience is the stage where students learn through real experience. Active experimentation is the stage where students learn through experimentation and action.

By going through several tests of problem-solving ability in accordance with the problem solving proposed by (Maf'ulah et al., 2017) and several semi-structured interviews.

3.1 Analysis of Problem Solving Skills of Converger Learning Style Type Students (CV1)

Troubleshooting Capability Analysis 1

Based on the results of the interview, the subject converger was able to understand problem 1. It can be seen CV1 writes down all known information on issue 1 in full. CV1 writes $U1, U2, U3.$ In addition CV1 is able to write the question of problem 1 precisely namely U_{10}. CV1 also writes down what is known and asked using its own language and sentences. This is evident from the sentence used, although not much different from the question, but CV1 does not write the question back, but writes the known and asked using its own language.

Based on the results of the interview, the subject converger was able to make a problem solving plan 1. It can be seen CV1 writing down its plans in detail and order. In its plan, CV1 is able to determine the differences and formulas used correctly. In addition, CV1 is also able to identify sub destinations to look for before determining the number of seats in the next row and able to sort the information available to answer questions.

Based on the results of the interview, the subject converger was able to implement problem solving plan 1. It can be seen cv1 is able to carry out strategies during the process and calculations that take place. Based on the

formula and entering the values aand b and the nth value created, CV1 also determines the number of seats in the $10th$ row correctly and gets the exact final result of 51.

Based on the results of the interview, the subject of converger wrote down the things that have been done to answer problem 1. CV1 is able to look back at problem solving 1. CV1 looks back at the important information that has been identified at a glance. However CV1 does not check the calculations involved because it is sure the answer obtained is correct.

Troubleshooting Capability Analysis 2

Based on the results of the interview, the converger subject was able to understand problem 2. It can be seen CV1 writes down all known information on issue 2 in full. CV1 writes $U1, U2, U3$. In addition CV1 is able to write the question of problem 2 precisely namely U_7. CV1 also writes down what is known and asked using its own language and sentences. This is evident from the sentence used, although not much differents from the question, but CV1 does not write the question back, but writes the known and asked using its own language.

Based on the results of the interview, the subject converger was able to make a problem solving plan 2. It can be seen CV1 writing down its plans in detail and order. In his plan, CV1 was able to determine the difference and formula used correctly even though he did not write down how to find a difference. In addition, CV1 is also able to identify sub destinations that must be searched before determining the number of fruits the next day and able to sort the existing information to answer questions.

Based on the results of the interview, the subject converger was able to implement problem solving plan 2. It can be seen CV1 is able to carry out strategies during the process and calculations that take place. Based on the formula and entering the values a and $b$and the nth value created, CV1 also determines the number of fruits on the 7th day correctly, but it gets an incorrect final result of 140.

Based on the results of the interview, the subject of converger wrote down the things that have been done to answer the problem 2. CV1 is able to look back at troubleshooting 2. However CV1 did not check the calculations involved because of the rush and was confident the answers obtained were correct.

Troubleshooting Capabilities for Convergent Types

In this study, it was found that the students who are in converger learning style type (CV1) were able to understand the problem by understanding what was known and asked about the problem and explained the problem using their own sentences. Converger students will make plans systematically, in order, and conceptualized. Meanwhile, by learning through the active experimentation stage, converger students will try to practice and make simulations related to problem-solving plans. In this study, students of the converger learning style type (CV1) make a plan for solving it by simplifying problems, making experiments and simulations, looking for sub-goals (things that need to be sought before solving problems), and sorting information. By learning through the abstract conceptualization stage, converger type students can use abstract symbols. At the stage of carrying out the plan in this study, converger students (CV1) are able to carry out plans by interpreting the problem given in the form of mathematical sentences. After being able to go through the two previous stages of problem-solving, the converger type student will be able to carry out the strategy during the process and the calculation takes place. In certain cases, converger students have not been able to implement the strategy during the process and counting takes place. This is because there are other factors that cause this to happen. For example due to time management factors that have not been good. This is as experienced by CV1 when working on problem 2. Someone who has converger learning will give emphasis in terms of decision making (Cavas, 2010). This is known from the way of learning of convergent students who go through the abstract conceptualization stage. So that in this study it was found that converger students (CV1) used a strategy or another way of solving it when they could not use the strategy that was previously used.

In the stage of looking back (relook), the converger student is able to look back at the problem and its solution by considering that the solution obtained is logical, using other alternative solutions, asking yourself if the question has been answered, and rereading the question. The converger student will consider everything he decides to solve the problem. However, in cases where a converger student does not examine or recheck the work, he is doing, the converger student also will not be able to properly implement the strategy he has chosen in solving a problem. The converger student does not tend to be patient and does not reflect everything he has done (Richmond & Cummings, 2005).

3.2 Diverger Learning Style Type Student Problem Solving Skills Analysis (DV2)

Troubleshooting Capability Analysis 1

Based on the results of the interview, the diverger subject is able to understand problem 1. It can be seen DV2 writes down all known information on issue 1 in full. DV2 writes $U1, U2, U3$. In addition DV2 is able to write down the question of problem 1 precisely namely U_{10}. DV2 also writes down what is known and asked using its own language and sentences. This is evident from the sentence used, although it is not much different from the problem, but DV2 does not write the question back, but writes the known and asked using its own language.

Based on the results of the interview, the diverger subject was able to make a problem solving plan 1. It can be

seen DV2 writing down its plans in detail and in order. In its plan, DV2 is able to determine the differences and formulas used correctly. In addition, DV2 is also able to identify sub destinations to look for before determining the number of seats in the next row and able to sort the information available to answer questions.

Based on the results of the interview, the subject of the diverger is able to implement the problem solving plan 1. It can be seen DV2 is able to carry out strategies during the process and calculations that take place. Based on the formula and entering the values a and b and the nth value created, DV2 also determines the number of seats in the 10th row correctly and gets the exact final result of 51.

Based on the results of the interview, the subject of the diverger is able to write down the things that have been done to answer problem 1. DV2 is able to look back at troubleshooting 1. DV2 looks back at the important information that has been identified at a glance.

Troubleshooting Capability Analysis 2

Based on the results of the interview, the diverger subject is able to understand problem 2. It can be seen DV2 writes down all known information on issue 2 in full. DV2 writes $U1, U2, U3$. In addition, DV2 is unable to write down the question of problem 2 appropriately. DV2 also writes down what is known using its own language and sentences. This is evident from the sentence used, although not much different from the problem, but DV2 does not write the question back but writes the known one using its own language.

Based on the results of the interview, the subject of the diverger was able to make a problem solving plan 2. It can be seen DV2 writing down its plans in detail and in order. In its plan, DV2 is able to determine the differences and formulas used correctly. In addition, DV2 is also able to identify the sub objectives that must be searched before determining the number of fruits the next day and able to sort the existing information to answer questions.

Based on the results of the interview, the subject of the diverger is able to implement a problem solving plan 2. It can be seen DV2 is able to carry out strategies during the process and calculations that take place. Based on the formula and entering the values a and $b$and the nth value created, DV2 also determines the number of fruits on the 7th day correctly, and gets the final result of 130.

Based on the results of the interview, the subject of the diverger is able to write down the things that have been done to answer the problem 2. DV2 is able to look back at troubleshooting 2. DV2 does not check the calculations involved because of the timing of the pick-up and is sure the answer obtained is correct.

Troubleshooting Capabilities for Diverger Types

Students who learn through concrete experience, learn through what he has experienced when learning takes place (Eyyam et al., 2011)because when learning mathematics, students asked to be able to understand the problem by knowing what is there and what sought from the given problem. At In this study, diverger type students (DV2) can understand the problem by identifying what is known and asked about the issue and explain the problem according to the sentence itself.

By learning through the concrete experience stage, diverger type students can make plans by simplifying problems, making experiments and simulations, finding sub-goals, and sorting information. By learning through the reflective observation stage, diverger type students can identify examples of a concept so that they can interpret problems in mathematical form. The diverger type student will then be able to carry out the strategy during the process, and the calculation takes place if the previous two stages run smoothly. In this study, diverger type students (DV2) can carry out plans by interpreting problems in the form of mathematical sentences and implementing strategies during the process, and counting takes place.

In some instances, students are diverse types who have not been able to carry out the strategy during the process, and counting takes place. It is because at the previous time (looking for sub-objectives when making plans), students who correct difficulties, so they are not able to make the next stage.

By learning through reflective observation, the diverger student can reflect on what he has done(Kolb & Kolb, 2005). Related, in this study, the diverger (DV2) type students can look back at the problem and help by considering the logical solution, ask themselves whether the question has answered, and re-read the question. It hoped that there would be diverger type students who do not consider the solution obtained logically.

3.3 Analysis of Student's Problem Solving Skills Accommodator Learning Style Type (AC3)

Troubleshooting Capability Analysis 1

Based on the results of the interview, the subject accommodator was able to understand problem 1. It can be seen AC3 writes down all known information on issue 1 in full. AC3 writes $U1, U2, U3.$ In addition, AC3 is able to write down the question of problem 1 precisely namely $U10.$ AC3 also writes down what is known and asked using its own language and sentences. This is evident from the sentence used, although not much different from the question, but AC3 does not write the question back, but writes the known and asked using its own language.

Based on the results of the interview, the subject was able to create a problem solving plan 1. It can be seen that AC3 wrote down its plans in detail and in order. In its plan, AC3 is able to determine the differences and formulas used correctly. In addition, AC3 is also able to identify sub-purposes to look for before determining the number of seats in the next row and being able to sort the information available to answer questions.

Based on the results of the interview, the subject is able to implement problem solving plan 1. It can be seen that AC3 is able to carry out strategies during the process and calculations that take place. Based on the formula and entering the values a and b and the nth value created, AC3 also determines the number of seats in the 10th row correctly and gets the exact final result of 51 even when entering the value does not use parentheses.

Based on the results of the interview, the subject was able to write down the things that had been done to answer problem 1. AC3 is able to look back at troubleshooting 1. AC3 looks back at the important information that has been identified at a glance and reads the question many times. However, AC3 does not check the calculations involved because it is sure the answer obtained is correct.

Troubleshooting Capability Analysis 2

Based on the results of the interview, the subject is able to understand problem 2. It can be seen AC3 writes down all known information on issue 1 in full. AC3 writes $U1,\ U2,\ U3.$ In addition, AC3 is able to write down the question of problem 2 precisely namely $U_{7.}$ AC3 also writes down what is known and asked using its own language and sentences. This is evident from the sentence used, although not much different from the question, but AC3 does not write the question back, but writes the known and asked using its own language.

Based on the results of the interview, the subject was able to create a problem solving plan 2. It can be seen that AC3 wrote down its plans in detail. In his plan, AC3 was able to determine the difference and formula used correctly even though he did not write down how to find a difference. In addition, AC3 is also able to identify sub-purposes to look for before determining the number of fruits the next day and is able to sort the existing information to answer questions.

Based on the results of the interview, the subject is able to implement problem solving plan 2. It can be seen that AC3 is able to carry out strategies during the process and calculations that take place. Based on the formula and entering the values a and b and the nth value created, AC3 also determines the number of fruits on the 7th day correctly with the final result of 130.

Based on the results of the interview, the subject was able to write down the things that had been done to answer the problem 2. AC3 is able to look back at troubleshooting 2. However, AC3 did not check the calculations involved because of the rush and was confident the answer was correct.

Troubleshooting Capabilities for Accommodator Types

Students who learn through concrete experience learn through what he has experienced when learning takes place (Eyyam et al., 2011)because when learning mathematics, students asked to be able to understand the problem by knowing what is there and what sought from the given problem. So that in this study, accommodator type students can understand the problem by identifying what is known and asked of the problem and can explain the problem in their sentences.

The accommodator type students learn through the active experimentation stage to enable them to be able to make experiments and simulations. Indicators such as being able to simplify the problem, find sub-goals, and sort information obtained through experience while attending mathematics learning in class. So, in this study, students of accommodator learning style types can make plans by simplifying problems, making experiments and simulations, finding sub-goals, and sorting information.

By learning through the concrete experience stage, students have gained learning experience so that they can understand the meaning of mathematical ideas, making it possible to interpret problems into mathematical form. In this study, students of accommodator learning style, can carry out plans by interpreting the problem into mathematical form and implementing strategies during the calculation. In some instances, accommodator type students have not been able to implement the strategy during the process, and counting takes place. It is related to the indicator of finding sub-objectives at the planning stage. When students make mistakes in finding sub-goals, there is a possibility that students also make mistakes when implementing strategies. Especially if at the stage of looking back, students do not check again. It is the case with AC3 when searching for sub-objectives is not thorough, so there is an error in the counting process that is taking place.

The accommodator type of students learns through the concrete experience stage, thus allowing them to reflect on what they have done as instructed by the teacher. It will enable students of the accommodator type to look back at the solution that has carried out by considering that the solution obtained is logical, asking themselves if the question has been answered, re-reading the question, and rechecking the calculations made and using other alternative solutions. Accommodator type students will use other alternative solutions when unable to work on strategies that previously done to solve the problem. Meanwhile, there are accommodator type students who do not consider that the solution obtained is suitable or logical, it happens when viewing the solution obtained is correct or cannot be done when students have found the solution.

3.4 Assimilator Learning Style Type Student Problem Solving Skills Analysis (AS4)

Troubleshooting Capability Analysis 1

Based on the results of the interview, the subject of the assimilator is able to understand problem 1. It can be seen AS4 writes down all known information on issue 1 in full. AS4 writes $U1, U2,\ U3.$ In addition, AS4 is able

to write down the question of problem 1 precisely namely $U10$. AS4 also writes down what is known and asked using its own language and sentences. This is evident from the sentence used, although not much different from the question, but AS4 does not write the question back, but writes the known and asked using its own language.

Based on the results of the interview, the subject of the assimilator is able to make a problem solving plan 1. It can be seen AS4 writing down its plans in detail and in order. In its plan, AS4 is able to determine the differences and formulas used correctly. In addition, AS4 is also able to identify sub-purposes to look for before determining the number of seats in the next row and is able to sort the information available to answer questions.

Based on the results of the interview, the subject of the assimilator is able to implement problem solving plan 1. It can be seen that AS4 is able to implement the strategy during the process and calculations that take place. Based on the formula and entering the values a and b and the nth value created, AS4 also determines the number of seats in the 10th row correctly and gets the exact final result of 51.

Based on the results of the interview, the subject of the assimilator is able to write down the things that have been done to answer problem 1. AS4 was able to look back at the resolution of issue 1. AS4 looks back at the important information that has been identified at a glance that has been done all or not. But AS4 did not check the calculations involved because it was confident the answers were correct.

Troubleshooting Capability Analysis 2

Based on the results of the interview, the subject of the assimilator is able to understand problem 2. It can be seen AS4 writes down all known information on issue 2 in full. AS4 writes $U1, U2, U3$. In addition, AS4 is able to write down the question of problem 2 precisely namely $U7$. AS4 also writes down what is known and asked using its own language and sentences. This is evident from the sentence used, although not much different from the question, but AS4 does not write the question back, but writes the known and asked using its own language.

Based on the results of the interview, the subject of the assimilator is able to create a problem solving plan 2. It can be seen AS4 writing down its plans in detail and in order. In its plan, AS4 is able to determine the differences and formulas used correctly. In addition, AS4 is also able to identify sub destinations to look for before determining the number of fruits the next day and is able to sort the information available to answer questions.

Based on the results of the interview, the subject of the assimilator is able to implement problem solving plan 2. It can be seen that AS4 is able to implement the strategy during the process and calculations that take place. Based on the formula and entering the values a and $b$and the nth value created, AS4 also determines the number of fruits on the 7th day correctly, but it gets an incorrect final result of 150.

Based on the results of the interview, the subject of the assimilator is able to write down the things that have been done to answer the problem 2. AS4 was able to look back at problem solving 2. But AS4 did not check the calculations involved in the hurry and was confident the answers were correct.

Troubleshooting Capabilities for Assimilator Types

In this study, students with assimilator learning style types by understanding the problem by knowing what is known and asked of the problem and explain the problem with their sentences. Besides, learning through reflective observation enables students of the assimilator learning style type to focus on understanding the meaning of mathematical ideas, including understanding the meaning of a given problem.

Students who have an assimilator learning style usually keep information organized, so this ability allows students of the assimilator type to sort the information that exists from the problem. In this study, students with assimilator learning style types can make plans by simplifying problems, making experiments and simulations, finding sub-goals, and sorting information.

Although assimilator type students prefer to think rather than act, assimilator type students can do experiments and simulations when solving given mathematical problems. Likewise, simplifying the problem and finding sub-objectives that need to found first. Because basically assimilator type students learn through abstract conceptualization, which is more interested in things that are abstract concepts such as those in mathematics.

In certain cases, there are also students with assimilator learning style types who at the stage of making a plan, have not been able to find sub-goals. It is because students are still confused with the work he is doing. It is what then becomes a problem when solving mathematical problems. As happened with AS4 when solving problem 2, AS4 felt confused while working on the problem.

By learning through the abstract conceptualization stage, assimilator type students can manipulate abstract symbols, thus enabling assimilator type students to interpret problems in mathematical form. Through abstract conceptualization also allows assimilator type students to analyze ideas carefully so that they are able to carry out strategies during the counting process.

In this study, students with assimilator learning style types can carry out plans by interpreting problems in the form of mathematics and implementing strategies to solve problems. In some instances, students with assimilator learning style types have not been able to implement strategies to solve problems. It because, as discussed earlier, there are difficulties from students when solving a given problem. Students forget the simple things that have been explained by the teacher when learning takes place.

By learning through reflective observation it allows students of the assimilator type to reflect on what has done during the problem-solving process, for example, by doing some indicators at the stage of looking back. So that in this study, students with assimilator learning style types can look back at the problems and solutions obtained by considering that the solutions obtained are logical, read the questions again, and ask themselves whether the questions have answered.

In some instances, assimilator type students do not recheck the calculations that have been made. This does not mean that assimilator type students do not reflect on their work as they learn through reflective observation, but because assimilator type students feel that their work has been done carefully, so there is no need to double check. Other conditions besides that are the difficulties when working on a given problem. As previously explained, there are assimilator type students who do not remember the simple things that have been explained by the teacher during learning. Assimilator type students who learn through reflective observation have the ability to consider wisely, so what if they have not been able to use the method of settlement that was previously used, then they will look for other solutions that might be used.

4.Conclusion

Based on this research, several conclusions can be obtained as follows. Students of the type of converger, diverger, accommodator, and assimilator are able to solve problems through the stage of understanding the problem by knowing what is known and asked of the problem and explain the problem in their own sentences.Students of the type of converger, diverger, accommodator, and assimilator are able to solve problems through the stages of making plans by simplifying the problem, looking for sub-goals, making experiments and simulations, and sorting information.Students of the type of converger, diverger, accommodator, and assimilator are able to solve problems through the stages of implementing plans by interpreting problems in mathematical form and implementing strategies during the process and counting takes place.

Converger type students are able to carry out the stage of seeing again by considering that the solution obtained is logical, asking themselves if the question has been answered, re-reading the question, and using other alternative solutions.Diverger type students are able to carry out the stage of seeing again by considering that the solution obtained is logical, asking themselves if the question has been answered, and re-reading the question. The accommodator type student is able to carry out the stage of seeing again by considering that the solution obtained is logical, asking yourself if the question has been answered, checking the calculation that has been done, re-reading the question, and using other alternative solutions.Assimilator type students are able to carry out the stage of looking back by considering that the solution obtained is logical, asking themselves if the question has been answered, re-reading the question, and using other alternative solutions.

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