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Description of Mathematical Connection Ability from Student Learning Styles In Online Learning Using Discovery-Based Worksheets

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Abstract

This study aims to determine the description of the mathematical connection ability of class XI MIPA students based on the learning styles of students of convergers, divergers, accommodators, and assimilators in online learning using discovery-based worksheets. This type of research is a qualitative descriptive study. The subjects of the study were the students of class XI MIPA SMAN 17 Pandeglang. Data collection is done through learning style questionnaires, tests of mathematical connection abilities, and interviews. All students of class XI MIPA were identified by the type of learning style using the Kolb learning style questionnaire. Data about mathematical connection ability is analyzed with interview data. 8 students consisting of 2 students representing learning styles were selected to interview their mathematical connection abilities. Based on the analysis of the data obtained a description of the results of research that in general students of the type of converger, diverger, accomodator, and assimilator have good mathematical connection abilities. the assimilator type is rather weak on the indicator using the mathematical connection ability indicator. As for the type of accomodation learning style, it is rather weak in finding and understanding concepts in mathematical connection abilities. Students of the Converger learning style style and assimilator understand the material by reading and observing in the ongoing learning while students of the Diverger learning style type and the accomodator understand the concepts in general by following the learning process in progress and actively trying to try in working on the discovery-based worksheets.

Keywords: Mathematical connection ability; Learning style; Online Learning; Discovery Based Worksheet.

Introduction

Mathematics is one of the subjects that has an important role in developing students' mathematical abilities. This is in line with the learning objectives of mathematics formulated by the National Council of Mathematical Theachers (NCTM), namely learning to communicate (mathematical communication), reasoning (mathematical reasoning), solving problems (mathematical problem solving), learning to link ideas (mathematical connections), the formation of a positive attitude towards mathematics (positive attitudes toward mathematics) (Muhamad, 2013)

One of the goals of learning mathematics according to the National Council of Teachers Mathematics (NTCM) is the ability of students' mathematical connections, namely learning to link ideas (mathematical connections). The ability to associate ideas is also called mathematical connection ability. Mathematical connection ability is a basic mathematical ability that students must possess when implementing the learning process. Because students' mathematical connections are indicators that encourage students to be active in solving problems related to mathematical connection problems.

The indicators of mathematical connection ability can be seen from one of the research experts. Mathematical connection indicators can be used in (Sumarmo, 2006) are: 1) Finding and understanding the relationship of various representations of concepts and procedures. 2) Using mathematics in other fields of study or everyday life. 3) Understanding equivalent representations of concepts or procedures.

4) Looking for the connection of one procedure to another in an equivalent representation. 5) Using connections between mathematical topics, and between mathematical topics and other topics.

One way to improve mathematical connection skills is to create an interesting learning atmosphere for students to follow. Learning that attracts students' attention will provide a stimulus so that students are active in mathematics learning activities. One learning model that can make students active in learning activities is by applying an activity to students by providing a worksheet based on discovery, so that it can trigger student activities in learning. With current state conditions, due to the spread of an epidemic caused by the corona virus called Covid-19, which infects life all over the world, so it is not only Indonesia, but many countries are also affected by the spread of disease outbreaks caused by this corona virus.

With the spread of this disease outbreak, a major impact on the learning process in the world of education, especially in Indonesia, so that face-to-face learning directly becomes distance learning (online). By not reducing achievement in the objectives of the learning process, the implementation of learning remains in the form of finding solutions so that the implementation of learning runs actively and effectively so that students can devote all their abilities when following the learning process, even though the learning uses online learning.

The learning method given by the teacher in the form of online learning that must be considered by the teacher is that the students feel comfortable so they can learn optimally so that the learning objectives can be achieved well. In addition to the learning methods provided, another thing that must be considered by the teacher so that students are maximum in learning is the teacher must know the learning styles of each student, so students can devote all their abilities based on the learning styles possessed by each student. This is in line with research (Fuad, 2015) that learning methods have a relationship with student learning styles.

According to Nasution (Fatkhiyyah, Winarso, & Benefits, 2019) that learning style is the attitude of students in using impulses or impulses in the learning process and student reactions in the learning process. And according to (De Porter & Hernacki, 2007) Learning style is a combination of ways or attitudes of students in receiving, understanding and organizing and processing the information they receive. So that mathematics learning goes well and provides optimal results because the teacher must know student learning styles in order to determine the right method or model of learning. With the learning styles possessed by each of these students, so that students in online learning, can contribute to online learning according to the ability of students according to their learning styles. Because online learning also has several characteristics that students must master according to the learning styles they have. In learning mathematics there are several learning styles raised by experts, but in this study, researchers only took one type of student learning style according to Kolb, this is due to time constraints in research and learning styles according to Kolb students have been studied with research-research previous. According to Cassidy (Handoko, 2014) describes learning styles as one's preference in doing something in a learning situation. Kolb and other experts who follow Kolb's thoughts, assume learning styles are not an irreversible trait, but are different learning tendencies, which will change little by little from situation to situation.

Learning styles according to Kolb as quoted by (Pratiwi, et al, 2006) 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. This means that students have real experiences, then observe and reflect on them from various points of view, then form abstract concepts and generalize into theories and finally actively experience these theories and test what they have learned in complex situations. Learning styles based on these four things include the learning styles of convergers, divergers, accommodators, and assimilators. In the learning style survey according to Kolb using a learning style questionnaire according to Kolb in class XI MIPA students of SMAN 17 Pandeglang, it was found that out of 28 students of class XI MIPA there were 5 students who had converger learning styles, 8 students had diverger learning styles, 11 students had learning styles accommodator, and 9 students have an assimilator learning style. This means that in one class different types of learning styles are found.

The identification of student learning styles by the teacher is very important. This is because students who know the type of their learning style will adjust to the learning to be carried out. Meanwhile, identification of learning styles according to Sukadi (Papilaya & Huliselan, 2016) revealed that learning styles are a combination of the way a person absorbs knowledge and how to organize and process the information or knowledge gained. Meanwhile, according to Nasution (Papilaya & Huliselan,

2016), a learning style is a consistent way practiced by a student in capturing stimulus or information, how to remember, think, and solve problems.

Furthermore, (Özgen, Tataroğlu, & Alkan, 2011) states that learning styles themselves are one of the factors that influence how students learn mathematics. Mathematical connection skills that are still lacking need to be studied further to find out how mathematical connection skills for each student with different learning styles. So that the description of students' mathematical connection abilities can be better known, then in this study students are directed to use the stages of mathematical connection abilities given to online learning using discovery-based worksheets. According to Effendi in the teacher's guided discovery worksheet only as a facilitator who guides students through questions that direct students in the discovery process ". (Revita, 2019)

Based on the background description above, it is necessary to have further research on "the description of the mathematical connection ability of students of Class XI MIPA in terms of student learning styles in online learning using discovery-based worksheets". This research is expected to be an in-depth study of mathematical connection skills in terms of student learning styles in online learning using discovery-based worksheets.

Method

This research uses a qualitative approach. As the definition of Bogdan and Taylor (Nugrahani, 2014: 4), a qualitative approach is a research procedure that produces data in the form of written or oral words from people and observable behavior. The characteristics of qualitative research according to Moleong quoted from (Bachri, 2010) are: (1) having a natural setting, (2) researchers as the main instrument, (3) using qualitative methods, (4) inductive data analysis, (5) theories from the bottom, (6) are descriptive, (7) are more concerned with the process rather than the results, (8) the limits determined by the focus, (9) the existence of specific criteria for the validity of the data, (10) the design is temporary, and (11)) research results are negotiated and agreed upon.

This study seeks to describe the mathematical connection skills of students of class XI MIPA based on the learning styles of convergers, divergers, accommodators and assimilators. Sources of data in this study were students of class XI MIPA SMAN 17 Pandeglang. Meanwhile eight students will be selected from research data sources based on the results of the learning style questionnaire and the results of tests of mathematical connection abilities. The learning style questionnaire used was the Kolb learning style questionnaire taken from the Miami University website and subsequently conducted content and construct validation by English and Indonesian language teachers who had a minimum level of linear S2 education.

Meanwhile for the mathematical connection ability test used, content and contract validation was also carried out by two lecturers at the UNTIRTA mathematics education department. Eight students selected as interview subjects mathematical connection skills were chosen based on representation from each student's learning style. Interviews were conducted to strengthen the initial assumptions on the results of the analysis of mathematical connection ability tests. Apart from that the interview also functions as a triangulation with the method. While interviews with two different subjects for each type of learning style, triangulation of data source functions. Furthermore, the data analysis of all data analysis is carried out with the following steps: data reduction stage, data presentation stage and verification or conclusion stage.

Results and Discussion Results

In this study, research findings include the results of validation and implementation for each instrument used. There are four instruments used in this study, namely: (1) Instrument for implementing online learning planning using a student worksheet based on discovery, (2) Kolb learning style questionnaire instrument, (3) Test instruments for mathematical connection abilities, and (4) Guiding instruments Interview. A benchmark to know the types of student learning styles used Kolb learning style instruments, then translated into Indonesian English teachers and grammatically validated by Indonesian language teachers. Before the learning style questionnaire was tested in the research class, the student learning style questionnaire pre-research activity was held. Pre-research activities are intended to determine whether there is subject data for each learning style. From the pre-research

activity, it was found that there were 5 students of the converger type, 8 students of the diverger type, 11 students of the accommodator type and 9 students of the assimilator type.

Thus the learning style questionnaire instrument that was created had been tested for its empirical validity. As for the instruments to determine the ability of students' mathematical connections, a mathematical connection ability test is used with derived material. Meanwhile, to find out the mathematical connection capabilities obtained from the test results in accordance with the actual state of students, interviews were conducted. Interviews conducted based on interview guidelines that have been made. The interview guidelines refer to indicators of mathematical connection ability. After the student learning style questionnaire was conducted in class XI MIPA, the results of the learning style questionnaire can be seen in table 1 below :

Tuble 11 I el centuge of Itolo Cluss III MIII II Leur ning Style				
Learning Style	Total students	Persentagei		
Converger	4	14,28 %		
Diverger	8	28,57 %		
Accommodator	9	32,14 %		
Assimilator	7	25,00 %		

Table 1. Percentage of Kolb Class XI MIPA Learning Style

The results of the mathematical connection ability of class XI MIPA students for each learning style can be seen in table 2. below:

Gaya Belajar	Total Students	Average
Converger	4	75,50
Diverger	8	73,50

Accommodator

Assimilator

Table 2. Average Test Results of Mathematical Connection Skills for Each Learning Style

The results of interviews on eight research subjects with two representative subjects learning styles obtained scores of mathematical connection ability can be seen in table 3. as follows:

9

7

70.78

73,71

Tuble 0. Intel view Results of the Subjects		Muthematical Connection Ability Test Resul		i est itesuits
Learning Style	Interview Subject	Interview Implementation	Test scores	Average
Converger	OV	Wednesday, May 27, 2020	84	
	DN	Wednesday, May 27, 2020	78	- 81
Diverger	LY	Wednesday, May 27, 2020	80	76
	AL	Wednesday, May 27, 2020	72	_ /0
Accomodator	UO	Thursday, May 28, 2020	72	75
	HM	Thursday, May 28, 2020	78	75
Assimilator	NA	Thursday, May 28, 2020	86	- 20
	WL	Thursday, May 28, 2020	74	- 80

Table 3. Interview Results of the Subjects' Mathematical Connection Ability Test Results

Discussion

Description of Mathematical Connection Capabilities for Converger Learning Style Types

(Richmond & Cummings, 2005) state that Converger type students learn through abstract conceptualization and active experimentation. With learning styles through the conceptualization

abstraction stage, converger students are able to have a focus on the logic, ideas, and concepts from which they are given. This allows the converger to search for and understand the relationship of various representations of concepts and procedures, look for connections from one procedure to another in an equivalent representation, use connections between mathematical topics with other topics and use mathematics in other fields of study or everyday life.

In the study, it was found that students of converger learning style types (OV and DN) were able to find and understand the relationship of various representations of concepts and procedures, look for connections from one procedure to another in equivalent representations, use connections between mathematical topics with other topics, and use mathematics in other fields of study or daily life with own sentences. By learning through abstract conceptualization, converger type students will use systematic planning (Richmond & Cummings, 2005). Converger type students will be able to understand the relationship between various representations of concepts and procedures, looking for connections from one procedure to another in an equivalent representation. Meanwhile, by learning through the active experimentation stage, converger type students will try to practice and make simulations related to the connection of material with one another with the given problem, where students of converger type will be able to use connections between mathematical topics with other topics and use mathematics in other fields of study or everyday life. This can be seen from the results of the acquisition of the mathematical connection ability test on test no. 2 and no. 5. The results of OV and DN student work can be seen in the following figures 1 and 2 :



Figure 1. OV Answer mathematical connection ability test no. 2

In Figure 1 above, the answer OV on the mathematical connection ability test no.2 shows that the OV has not been able to master the mathematical connection ability indicator that is using mathematics in other fields of study or daily life, this is due to the lack of maximum in understanding the concept, so in the process there are still errors. As for the answers of students with the initials DN can be seen in Figure 2 below :

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	journe
	x(t) = s'(t)
	$= 6 3t^2 - 6t + 0$
	$V(t) = 3t^2 - 6t$
	$V(2) = 3(2)^2 - 6(2)$
	= 12 - 12
	V(2)= D m/dent
	Jach, becepartain burda terrebut dalam t=2 dept
	adatach Om/dept.

Figure 2. DN Answer mathematical connection ability test no. 5

In Figure 2 above, the DN answer on test no. 5 on indicators of mathematical connection ability is where DN has been able to use connections between mathematical topics, and between mathematical topics with other topics or use mathematics in other fields of study, this DN has understood the concepts on these indicators, so that the process is correct. This is because DN tries its best to actively participate in learning activities and understand concepts optimally.

In this study, converger learning style students (OV and DN) can search for and understand the relationship of various representations of concepts and procedures, use mathematics in other fields of study or everyday life, understand equivalent representations of concepts or procedures, look for

connections of one procedure to other procedures in equivalent representation, and using connections between mathematical topics, and between mathematical topics and other topics. By learning through the conceptualization abstraction stage, converger type students can use abstract symbols (Ramadan, et. Al, 2011). In this case the symbol or sentence in mathematical form. Thus, on indicators using mathematics in other fields of study or everyday life in this study, converger type students (OV and DN) are able to use connections between mathematical topics, and between mathematical topics with other topics, and use mathematics in other fields of study or daily life in the form of mathematical sentences.

In certain cases, converger type students have not been able to find and understand the relationship of various representations of concepts and procedures. This is because there are other factors that cause this to happen. For example, due to time management factors that have not been good or it could also be due to not understanding the material to the fullest. It is as experienced by DN that there are still wrong answers when taking test number 1. A person who has learned the type of converger will give emphasis in terms of decision making (Cavas, 2010). This is known from the way students learn the type of converger through the conceptualization abstraction stage. A converger will make another decision to look for and understand the relationship between various representations of concepts and procedures, for example, to make a decision to use other means of finding and understanding the relationship between various representations of concepts and procedures. So that in this study it was found that convergent type students (OV and DN) looked for and understood other ways when they could not seek and understand the relationship of various representations of concepts and procedures previously studied.

In Indicators of the ability to search for a connection of one procedure to another in an equivalent representation, converger type students are able to find a connection of one procedure to another in an equivalent representation. Because the type of converger is learning through abstraction conceptualization which emphasizes more on solving problems and finding practical solutions (Cavas, 2010).

The converger type student will consider everything he decides to solve the problem. However, in cases where the converger type student does not examine or recheck the work he is doing, the converger type student also will not be able to properly carry out the chosen strategy in solving a problem. The converger type student does not tend to be patient and does not reflect everything he has done (Richmond & Cummings, 2005). From this, the role of the teacher is needed. The teacher needs to invite students to practice being patient and accustomed to reflecting on what has been done. Thus, students will be able to create better mathematical connection skills.

Description of Mathematical Connection Capabilities for Diverger Learning Style Types

(Richmond & Cummings, 2005) state that students with divergent learning styles learn through the stages of concrete experience and reflexive observation. Concrete experience means the stage where students learn through self-involvement in the learning experience of mathematics, reflextive observation means where the stage where students learn through observation in learning mathematics. The mathematical connection capabilities of diverger type students are as follows.

Students who learn through concrete experience, learn through what they have experienced when learning takes place (Ramadan et.al, 2011). Because at the time of learning mathematics, students are asked to be able to understand the problem by looking for and understanding the relationship of various representations of concepts and procedures, understanding equivalent representations of concepts or procedures, using connections between mathematical topics, and between mathematical topics with other topics and using mathematics in the field other studies or everyday life. then this study, diverger type students (LY and AL) have mathematical koneki ability by being able to find and understand the relationship of various representations of concepts and procedures, using connections between mathematical topics, and between mathematical topics, and between mathematical topics, and between mathematical topics, understanding equivalent representations of concepts or procedures, using connections between mathematical topics, and procedures, understanding equivalent representations of concepts or procedures, using connections between mathematical topics, and between mathematical topics, and between mathematical topics with other topics and use mathematics in other fields of study or everyday life.

But in certain cases (such as those experienced by LY and AL while taking test number 5), diverger type students are less able to use mathematics in other fields of study. This is caused by several reasons such as inaccurate, forgetfulness and not yet fully understanding how to use mathematics in other fields of study when taking the given test. By learning through the reflextive observation stage, diverger type students have the ability to identify examples of a concept so that they are able to find and understand the relationships of various representations of concepts and procedures and understand

equivalent representations of the same concepts or procedures. The next type of diverger student will be able to find and understand the relationship between various representations of concepts and procedures and to understand the equivalent representations of the same concepts or procedures before running smoothly

In this study, diverger type students (LY and AL) are able to find and understand the relationship of various representations of concepts and procedures by looking for one concept's relationship with another and carry out according to the procedure when doing the test. In certain cases, diverger type students who have not been able to look for conceptual relationships with one another and carry out in accordance with the procedure when doing the test takes place. This is because when searching for and understanding the relationship of various representations of concepts and procedures students have difficulty, so they cannot complete the test optimally.

By learning through the reflexive observation stage, diverger type students are able to reflect on what has been done (Kolb & Kolb, 2015) So that in this study, diverger type students (LY and AL) are able to look at problems and their solutions by considering that the solutions obtained are logical, asking ask yourself whether the question has been answered, and re-read the question. Conversely there are diverger students who do not consider that the solution obtained is logical. As experienced by LY and AL, that LY and AL are not sure of the answers obtained and have not found which part was wrong, from the work done. This can be seen in Figures 3 and 4 in the LY and AL answers when taking test number 5.



Figure 3. Answer LY mathematical connection ability test no. 5



Figure 4. Answer AL mathematical connection ability test no. 5

In figures 3 and 4 above LY and AL have not been able to master the mathematical connection ability test indicators, namely using connections between mathematical topics, and between mathematical topics with other topics or using mathematics in other fields of study. This LY and AL do not fully understand the capability indicators, so there is an error in the test number 5.

Description of Mathematical Connection Capabilities for Accomodator Learning Style Types

(Richmond & Cummings, 2005) state that students with a learning style of accomodation 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. Mathematical connection skills of type students with accomodator learning styles are as follows.

Students learn through concrete experience, learning through what they have experienced during learning (Ramadan et.al, 2011). Because at the time of learning mathematics, students are asked to be able to search for and understand the relationships of various representations of concepts and procedures, understand equivalent representations of concepts or procedures, use connections between mathematical topics, and between mathematical topics with other topics, and use mathematics in other fields of study or everyday life.

So that in this study, students with the type of accomodator are able to find and understand the relationship of various representations of concepts and procedures, understand equivalent representations of concepts or procedures, use connections between mathematical topics, and between mathematical topics with other topics, and use mathematics in other fields of study. or daily life in one's own sentence.Students learning style accomodator learning through the stage of active experimentation so as to enable them to be able to make experiments and simulations. Indicators such as being able to use connections between mathematical topics with other topics and using mathematics in other fields of study or everyday life, through experiences while attending mathematics learning. So that in this study, students of accomodator learning style are able to use connections between mathematical topics, and between mathematical topics with other topics and use mathematics in other fields of study or everyday life, through experiences while attending mathematics learning. So that in this study, students of accomodator learning style are able to use connections between mathematical topics, and between mathematical topics with other topics and use mathematics in other fields of study or everyday life.

In certain cases, students with the type of accomodator have not been able to understand the equivalent representation of the same concept or procedure and use mathematics in other fields of study or everyday life. UO does not remember the simple things taught by the teacher. The same thing was experienced by HM, when searching for relationships of various representations of concepts and procedures, HM could not work properly so that he still made mistakes in the process of solving problems no. 1. This can be seen in Figure 5 below:



Figure 5 Answer HM mathematical connection ability test no. 1

In Figure 5 above it can be seen that HM's answer on test number 1, HM has not been able to master the indicators of mathematical connection ability that is looking for and understanding the relationship of various representations of concepts and procedures. This matter is not yet optimal in participating in learning, and lack of understanding the concept of material in test number 1, so that HM answers there are errors that do not match the answers on test number 1.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 in the form of mathematics. In this study, students of accomodator learning style, are able to use mathematics in other fields of study or everyday life and use connections between mathematical topics, and between mathematical topics with other topics during the test taking place. This can be seen with the results of the mathematical connection ability test work on the initial UO students in Figure 6 below.



Figure 6. Answer UO test mathematical connection ability no. 2

In certain cases, students of the accomodator learning style have not been able to carry out the strategy during the process and work on the test. This is related to indicators using mathematics in other fields of study or everyday life. When students make mistakes in completing tests, it is possible that students also make mistakes when searching for and understanding the relationship of various representations of concepts and procedures. Especially if the indicators understand the relationship of various representations of this concept, students do not understand correctly. This is as experienced by HM, when searching for and understanding the relations of concepts and

procedures, using connections between mathematical topics, and between mathematical topics with other topics and using mathematics in other fields of study or everyday life there are still errors in the process work on the test.

Students learning style accomodator learning through the concrete experience stage, thus allowing them to reflect back on what they have done as instructed by the teacher. This allows students to learn accomodator style of learning to see the solution that has been carried out by considering that the solution obtained is logical, asking themselves, whether the question has been answered, re-reading the question, and re-checking the calculations made, and using other alternative solutions. Student types of accomodators will use alternative solutions when they are not able to work on strategies that were previously done to complete the mathematical connection ability test. While there are types of accomodation learning style students who do not consider that the solution obtained is suitable / logical, this happens when they have not found a solution to the problem given. Consider the solution obtained is correct or can not be done when the solution has been found by students. This is for example as experienced by HM when working on test number 1.

Description of Mathematical Connection Capabilities for Assimilator Learning Style Types

(Richmond & Cummings, 2005) state that students with a learning style assimilator type of learning go through the stages of abstraction conceptualization and reflextive observation. By learning the conceptualization abstraction stage it allows students the assimilator learning style type to focus on logic, ideas, and concepts. Including the concept of a given problem. The concept of how the problem was built with mathematical ideas. Including the concept of a problem starting from finding and understanding the concept of the problem. So that in this study, students with assimilator learning style types are able to search for and understand the relationships of various representations of concepts and procedures, understand equivalent representations of concepts or procedures and look for connections from one procedure to another in representations equivalent to their own sentences based on the results of the analysis obtained when learning takes place or independent learning. In addition, through reflective observation allows students the type of learning style assimilator to focus on understanding the meaning of the relationship of various representations of concepts and procedures provided.

Students who have an assimilator learning style usually keep information organized, so this capability allows students of the assimilator learning style type to be able to search for and understand the relationship between various representations of concepts and procedures, understanding equivalent representations of concepts or procedures. Although assimilator type learning style students prefer to think rather than act, assimilator type students are able to conduct experiments and simulations when solving given mathematical problems. Likewise in using mathematics in other fields of study or everyday life, using connections between mathematical topics, and between mathematical topics with other topics. Because basically students type learning style assimilator through abstract conceptualization who are 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 which are indicators of mathematical connection ability, that is, looking for and understanding the relationship of various representations of concepts and procedures. This is because students are still confused with the solutions he is working on. This then becomes a problem when completing test number 1. As happened to WL when completing the test, WL felt confused while taking the test. The WL test results can be seen in Figure 7 as follows:

 $f(x) = X^2 + 5x - 3$ f(x+h) = x+ + + x + 3h + -3 $(x) = \lim_{x \to \infty}$ f (xth) - f(x) × ->O 5 (x=+5x +3h +-37 f x (x) = (im)× 2+5× +5h +-2 X-PO lim 6 64

Figure 7 WL Answers mathematical connection ability test no. 1

By learning through abstract conceptualization, assimilator type students are able to manipulate abstract symbols, thus enabling assimilator type students to interpret problems in mathematical form. Through abtract conseptualization also allows assimilator type students to analyze ideas carefully so that they are able to carry out the strategy during the counting process. In this study, students with assimilator learning style types are able to use mathematics in other fields of study or everyday life, and use connections between mathematical topics, and between mathematical topics with other topics. This can be seen the results of the work of students with the initials NA when taking test number 2. Although in certain cases, students with learning styles of assimilators have not been able to use mathematics in other fields of study or everyday life, and use connections between topics, it is possible not to understand the initial stages of the ability of connection capability indicators, namely searching for and understanding the relationship of various representations of concepts and procedures and looking for connections from one procedure to another in equivalent representations. This can be seen in Figures 7 and 8 of the results of the NA and WL work in test number 2.

$\begin{array}{c} N(vrv) \\ \hline z. \ buology \ Pagar \\ y + 2x > 120 \\ \hline (xx) = y + \lambda \\ ((x) = y + \lambda \\ ((x) - (120 - 2x)) + \lambda \\ ((x) - (120 - 2x)) + \lambda \\ \hline (x) = (120 x - 2x) \\ \hline x = 2x \\ \hline (x) = (120 x - 2x) \\ \hline x = 2x \\ \hline (x) = (120 x - 2x) \\ \hline (x) = (120 x - 2x) \\ \hline x = (12$	$\begin{array}{c} P = 120 \cdot 2X \\ P = 120 - 2(230) \\ P = 120 - 2(230) \\ P = 120 - 60 \\ P = 60 \\ m \\ Jadi \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$
-4x = -120 x = 30	

Figure 7. Answer NA mathematical connection ability test no. 2

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-	y t 2x f 120	
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Figure 8. Answer WL mathematical connection ability test no. 2

Conclusions and suggestions

Based on the discussion of mathematical connection ability of class XI MIPA students in terms of learning styles on online learning using a worksheet based on the findings in this study the following conclusions are obtained:

- 1) Students with converger learning styles in general they master indicators of mathematical connection ability that is, they are able and very good at finding and understanding the relationship of various representations of concepts and procedures, understanding equivalent representations of concepts or procedures, and looking for connections from one procedure to another. in representations that are equivalent and good enough in applying to indicators using mathematics in other fields of study or everyday life and using connections between mathematical topics, and between mathematical topics with other topics. In converger learning style students they understand the material by reading and observing and understanding from the learning process taking place and by using this discovery-based worksheet they explore the concepts before they do the task, and actively participate in online learning activities while it is taking place.
- 2) Students with assimilator learning styles in general they master indicators of mathematical connection ability that is, they are able and very good at finding and understanding the relationship of various representations of concepts and procedures, understanding equivalent representations of concepts or

procedures, and looking for connections from one procedure to another. in representations that are equivalent but slightly weak in applying to indicators using mathematics in other fields of study or everyday life and using connections between mathematical topics, and between mathematical topics with other topics. In the assimilator learning style students they understand the material by reading and observing and understanding of the learning process underway and by using this discovery-based worksheet they explore the concepts before they do the task, and but are less active in participating in online learning activities while it is underway.

- 3) Students with a diverged learning style in general they master indicators of mathematical connection ability, that is, they are able and quite good at finding and understanding the relationship of various representations of concepts and procedures, understanding equivalent representations of concepts or procedures, and looking for connections from one procedure to another. in equivalent representation. And they are good at applying to indicators using mathematics in other fields of study or everyday life and using connections between mathematical topics, and between mathematical topics with other topics. In the type of diverger learning style students they understand the general conceptual understanding of the material during the learning process takes place they reflect every learning material that has been given carefully and actively also in working on a worksheet based on discovery when online learning takes place.
- 4) Students with accomodation learning styles in general they master indicators of mathematical connection ability that is, they are able but are a bit weak in finding and understanding the relationship of various representations of concepts and procedures, understanding equivalent representations of the same concepts or procedures, and looking for connections from one procedure to another in a representation equivalent. Student types of accomodators are very good at applying to indicators using mathematics in other fields of study or everyday life and using connections between mathematical topics, and between mathematical topics with other topics. Type of accomodator students understand the concept material in general by following the ongoing learning process and actively trying out in working on a worksheet based on discovery. Although the process is sometimes not in accordance with the concepts that have been given.

The suggestions from this research are:

- 1) The teacher needs to pay attention to the difficulties faced by students to be able to remind students not to make the same mistakes when working on problems related to mathematical connection abilities.
- 2) The teacher needs to teach mathematical connection skills according to the type of student learning style.
- 3) Further research is needed as an effort to improve students' mathematical connection abilities.
- 4) Further research is needed to analyze students 'mathematical connection abilities based on student learning styles that involve all indicators of students' mathematical connection abilities.
- 5) Measuring instruments or instruments other than questionnaires need to be used to identify student learning styles according to Kolb.

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