Pedagogy p-ISSN: 2502-3802
Volume 8 Nomor 1 e-ISSN: 2502-3799

THE INFLUENCE OF THE CORE LEARNING MODEL ON THE ABILITY OF MATHEMATIC CONCEPT COMPREHENSION OF STUDENTS OF HIGH SCHOOL

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Abstract

This study aims to determine the effect of the CORE learning model on the ability to understand mathematical concepts of Al-Ma'shum Kisaran Private High School students for the 2021/2022 academic year. This type of research is quasi-experimental with a Pretest-Posttest Control Group Design. The population in this study were all of class XI consisting of 4 classes. Sampling was done by simple random sampling technique. In class XI MIA-1 as the experimental class using the CORE learning model and XI MIA-2 as the control class using the Direct learning model. Based on the value of the ability to understand the concept obtained, the average value of the experimental class was 83,4838 while the control class was 73.6774. The analysis technique using the t-test is obtained and because it is accepted $t_{count} = 4{,}8607 t_{table} = 1{,}6408$, so $t_{count} > t_{table}$ with the result that $H_1$is accepted. Thus, it can be concluded that the students ability to understand mathematical concepts using the CORE model is better than the ability to understand students mathematical concepts using the Direct learning model.

Keywords: CORE, Ability to Understand Students Mathematical Concepts

A. Introduction

According to (Syahputra et al., 2017) Mathematics is a scientific discipline that discusses subject matter in the form of abstract objects that are interconnected from one concept to another. In line with the opinion (Iyam Maryati, 2018) the purpose of learning mathematics at the educational level stated in the National Education Standards Agency (BSNP, 2006) is to instill the ability to understand concepts to students in understanding the concept of learning mathematics by linking concepts and applying concepts appropriately in solve math problems. So the ability to understand mathematical concepts is very important for students in learning mathematics.

According to (Effendi, 2017) understanding of mathematical concepts is an ability that students master in understanding mathematics learning, because students not only remember and know the concepts that have been learned, students must be able to re-express concepts in other forms that are easy to understand, provide interpretation of data and be able to apply concepts in accordance with knowledge it has. However, in the process of learning mathematics to understand a concept is not easy. Many students cannot understand mathematical concepts, students only focus on existing formulas and question

s. If given a problem that cannot be solved using the existing formula, students assume that learning mathematics is boring and difficult. This is caused by teacher-centered learning, where teachers use direct learning models.

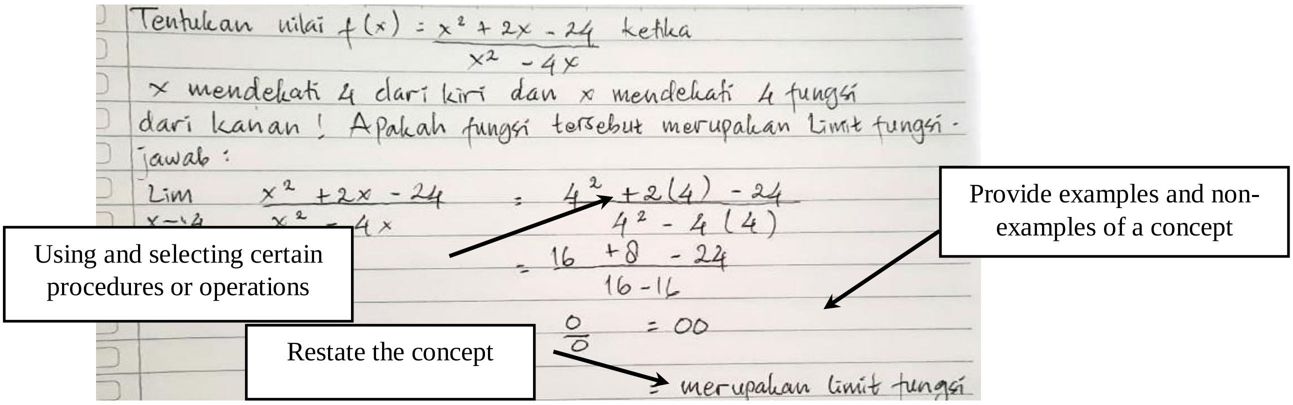

Figure 1.1 Mathematical Concept Understanding Ability Test Results

Based on the answers to questions from one of the AL-MA'SHUM private high school students, the range was good, but based on the indicators of students ability to understand mathematical concepts, there were several indicators that had not been reached. One of them is that students have not been able to use and choose certain procedures, students cannot restate concepts and students cannot provide examples and non-examples of limit algebraic functions so that students' answers in solving questions are not correct. It can be seen from the students answers that the students only worked on the same questions as the teacher exemplified so that students could not analyze linkages between concepts on the question so that the student's answer is wrong and does not use other methods so that the answer to the question is correct.

Therefore, the CORE (Connecting, Organizing, Reflecting, and Extending) learning approach is required in order to excite students, promote students critical attitudes, and strengthen students retention of a subject.. According to (Martanovi et al., 2017) the CORE learning model is a learning model that has stages, in the connecting stage students connect previous knowledge and new knowledge that are interrelated between concepts. At the organizing stage students organize knowledge so they can understand the material with group discussions. At the reflecting stage students rethink and deepen the knowledge gained at the organizing stage. At the extending stage students evaluate knowledge during the learning process by doing assignments individually. By using the CORE learning model, it can give students chances to learn how to understand ideas on their own and put more emphasis on student participation in the learning process.

Based on the description, researchers conducted a study to find out how much influence the CORE learning method had on the ability to understand mathematical concepts. For this reason, this study the researchers gave the title "The Influence of the CORE Learning Model (Connection, Organizing, Reflecting, Extending) on the Understanding of Mathematical Concepts for AL-MA'SHUM Private High School Students in the Year 2021/2022 Range".

B. Method

This research was conducted in class XI MIA-1 AL-MA'SHUM private high school students Kisaran Barat on street Batu Asah No. 2, Sidodadi, Asahan, North Sumatra. This type of research uses a quantitative approach with a quasi-experimental method, to see the ability to understand students' mathematical concepts after implementing the CORE learning model. The design used by researchers in conducting this study was the Pretest-Posttest Control Group Design. According to (Sugiono, 2019) in this study there were two randomly selected groups which were made into one experimental class (given treatment) and one control class (no treatment). Then it can know the difference in the ability to understand students' mathematical concepts. The following presents the research design used in this study.

Table 1.1 Research Design

Group	Pretest	Treatment	Posttest
Experiment	T_1	Z_1	O_1
Control	T_2	Z_2	O_2

Source:(Sugiono, 2019)

Information:

T_1= *Pretest*in the experimental class

T_2= *Pretest*in the control class

O_1 =*Posttest In* the control class

O_2= *Posttest In* the experimental class

Z_1 = Learning mathematics using the CORE learning model

Z_2= Learning mathematics using a direct learning model

The technique used in sampling using simple random sampling techniques. The instrument used in this study was a test sheet consisting of a pretest and posttest related to the ability to understand the concept of the limit of an algebraic function. The indicators of the ability to understand mathematical concepts used in this study are as follows: (1) Restate the concept; (2) Classifying objects according to their properties; (3) Provide examples and non-examples of a concept; (4) Presenting the concept of various forms of mathematical representation; (5) Using and selecting certain procedures or operations. The instrument was previously validated,reliability, discriminating power and level of difficulty first so that 4 valid questions are obtained. The analytical test used by the researcher is the data normality test, data homogeneity test and data population test.

C. Results and Discussion

Pretest data on students ability to understand mathematical concepts in the experimental class and control class. Descriptively, the research data can be stated in the table below:

Table 1.2 Pretest Value of Experimental Class and Control Class

Class	$\bar{x}$	s^2	SD	Max	Min
Experiment	46,90323	61,6236	7,8500	63	59
Control	44,54839	59,25591	7,6977	36	27

Based on Table 3.1 it is known that the average, variance, standard deviation, maximum score and drinking pretest experimental class are higher than the average pretest score of the control class.

After the data is obtained, then the analysis prerequisite test is carried out. The prerequisite analysis test used is the normality test and homogeneity test.

The normality test is used to find out whether the data from each class is normally distributed or not, both classes using the CORE learning model and classes using the direct learning model. The normality test uses the Liliefors test with and significant level$n = 31$, $\alpha = 0{,}05$. The normality test results for both sample classes can be seen in table 1.3

Table 1.3 Normality Test Results for Experimental and Control Classes

Class	r	N	L_{count}	L_{table}	Information
Experiment	0,05	31	0,15306	0,15913	Normal Distribution
Control	0,05	31	0,15402	0,15913	Normal Distribution

Homogeneity test is a test of whether or not the variables studied are the same. To test the homogeneity of the sample variance using the F test. With , significant (dk numerator) and (dk denominator) is 1,8408. After the homogeneity test was carried out in the experimental and control classes according to the predetermined steps, table data 1.4 was obtained $n = 31$, $\alpha = 5\%$, $v_1 = n_1 - 1$ and $v_2 = n_2 - 1$

Table 1.4 Pretest Homogeneity Test Results

r	N	F_{count}	F_{table}	Information
0,05	31	1,0399	1,8408	Homogeneous

Posttest data on the ability to understand students mathematical concepts in the experimental class and control class. Descriptively, the research data can be stated in the table below:

Table 1.5 Posttest Value of Experimental Class and Control Class

Class	$\bar{x}$	s^2	SD	Max	Min
Experiment	83,48387	64,65806	8,0410	100	86
Control	73,67742	61,82581	7,8629	70	59

Based on Table 1.5 it is known that the average, variance, standard deviation, maximum score and drinking pretest experimental class are higher than class mean pretest score control. After the data is obtained, then the analysis prerequisite test is carried out. The prerequisite analysis test used is the data normality test, homogeneity test and data population test.

The normality test is used to find out whether the data from each class is normally distributed or not, both classes using the CORE learning model and classes using the direct learning model. The normality test uses the Liliefors test with and significant level $n = 31$, $\alpha = 0{,}05$. The normality test results for both sample classes can be seen in table 1.6

Table 1.6 Normality Test Results for Experimental and Control Classes

Class	r	N	L_{count}	L_{table}	Information
Experiment	0,05	31	0,15136	0,15913	Normal Distribution
Control	0,05	31	0,11266	0,15913	Normal Distribution

Homogeneity test is a test of whether or not the variables studied are the same. To test the homogeneity of the sample variance using the F test. With , significant (dk numerator) and (dk denominator) is 1,8408. After the homogeneity test was carried out in the experimental and control classes according to the predetermined steps, table data 1.7 was obtained $n = 31$, $\alpha = 5\%$, $v_1 = n_1 - 1$ and $v_2 = n_2 - 1$

Table 1.7 Posttest Homogeneity Test Results

r	N	F_{count}	F_{table}	Information
0,05	31	1,0458	1,8408	Homogeneous

Based on the normality test and homogeneity test that has been carried out, it turns out that both classes are normally distributed and have a homogeneous variance. Therefore, to test this hypothesis, a t-test is performed. after the t-test is carried out according to the predetermined formula, the test results can be seen in table 1.8

Table 1.8 Posttest Hypothesis Test Results

Class	$\underline{x}$	N	S	t_{count}	t_{table}
Experiment	83,4838	31	7,9525	4,8607	1,671
Control	73,6794	31			

Based on the results of calculations with the t-test obtained $t_{count} = 4{,}8607$ while $t_{table} = 1{,}671$ at level α = 0.05. It means that $t_{count} > t_{table}$ is $4{,}8607 > 1{,}671$, then H_0 is rejected and H_1 is accepted. So it can be concluded that there is an influence of the CORE learning model on the ability to understand mathematical concepts of private high school students AL-MA'SHUM Kisaran.

This can happen because in CORE learning students form heterogeneous study groups consisting of 5-6 people and are given Group WorkSheets at each meeting. Each group worksheet contains several problems that students work on in stages according to the CORE stages. The first stage is Connecting, namely connecting. Connecting is connecting previous knowledge and new knowledge between several concepts that have been studied. The second stage is Organizing, which means arranging, organizing and holding. Organizing is an activity of organizing knowledge and training the ability to organize and manage knowledge of understanding mathematical concepts previously owned.

At the reflecting stage, which means describing, representing, and thinking, Reflecting is an activity to rethink and explore the knowledge that has been obtained to strengthen the concepts that one has. At the extending stage, which means developing, delivering, and expanding. Extending is a developing activity, broadening the knowledge that has been obtained in group discussions and being able to find new useful concepts and knowledge. At this stage, students can apply the knowledge gained from the discussion to solve problems individually. Students can find out their own conceptual understanding by solving problems with the knowledge gained at the connecting, organizing, and extending stages.

However, the ability to understand students' mathematical concepts using the CORE learning model is better than using the direct learning model. Students who are accustomed to using direct learning models contribute to this because they consistently accept what the teacher says. Direct learning starts when the teacher explains the material and the students both listen to and write down what the teacher says. Then the teacher gives examples of questions and their solutions. The application of learning like this causes the understanding and information possessed by students to be limited and only come from the teacher. In the next stage, students are given the opportunity to ask questions if something is not understood. Then, students are given practice questions whose completion process is similar to the example questions. As a result, when students are faced with problems that are different from the examples, they will experience difficulties in solving these problems. Students seem confused about how to work on the group worksheet at the first meeting because they are used to being in charge of their own learning. Also, the way the class is set up doesn't make it easy to have group discussions, and presenting the results of those discussions is also hard. On the other hand, during the discussion, the students asked quite a lot of questions to the teacher, even though it had been previously explained; apart from that, there were some students who actively walked around the class to ask other groups. There are also many students who only rely on their group mates, who have higher abilities, to solve problems found in group worksheets.

Therefore, to overcome this problem, the teacher gives a lot of direction to students in finding concepts that must be found during the learning process. When one group presented the findings of the discussion in front of the class, the other groups paid less attention to the explanation of the presenting group; thus, the instructor must explain when a misunderstanding occurs during the presentation. At the next meeting, students begin to understand the stages of CORE learning and start working independently, although they still often ask the teacher. After that, they presented the results of their discussion, and the other students paid quite close attention to the explanation. Then the teacher and students correct student answers that are not quite right and guide students in drawing conclusions from the findings obtained. Only then do students develop the concepts they already have about the limits of algebraic functions that the teacher has provided.

D. Conclusion

Based on the data analysis and discussion, it can be concluded that the ability to understand students mathematical concepts using the CORE learning model is better than the ability to understand students mathematical concepts using the direct learning model in class XI Senior High School AL-MA'SHUM Private Range, Academic Year 2021/2022. This means, the application of the CORE model has an influence on the ability to understand students' mathematical concepts.

Refference

Effendi, K. N. S. (2017). Pemahaman Konsep Siswa Kelas Viii Pada Materi Kubus Dan Balok. *Symmetry: Pasundan Journal of Research in Mathematics Learning and Education*, *2*(4), 87–94. https://doi.org/10.23969/symmetry.v2i2.552

Iyam Maryati. (2018). Penerapan Model Pembelajaran Berbasis Masalah Pada. *Jurnal Mosharafa*, *7*(1), 63–74.

Martanovi, C., Coesamin, M., & ... (2017). Efektivitas Pembelajaran Connecting, Organizing, Reflecting, Extending ditinjau dari Pemahaman Konsep Matematis Siswa. *Jurnal Pendidikan …*, 549–560. http://jurnal.fkip.unila.ac.id/index.php/MTK/article/view/13061

Sugiono. (2019). *METODE PENELITIAN PENDIDIKAN*. ALVABETA.CV.

Syahputra, M. Z., Matematika, J., Matematika, F., Alam, P., & Medan, U. N. (2017). *MATEMATIS*. 7.