Analysis of Ability to Understand Concepts Using the Contextual Teaching and Leaning Learning Model in Class XI SMA Negeri 1 Ulu Idanotae

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Abstract
This research is based on the results of observations and interviews with teachers at SMA Negeri 1 Ulu Idanotae where researchers obtained information that the ability to understand students' concepts was low, making it difficult for students to explain math problems, this is evidenced by the average student test scores. only around 59 with sufficient category. This study aims to find out how students' understanding abilities when using the Contextual Teaching and Learning model. This type of research is quantitative research with a descriptive approach. The research design used is the One-Shot Case Study. The research instrument used was a test of the ability to understand mathematical concepts. The number of population in this study is 215 people with a large sample of 36 people taken using nonprobability sampling with purposive sampling technique. Based on the results of the research, after learning in class using the Contextual Teaching and Learning learning model, it was obtained that the average ability to understand students' mathematical concepts was 75.38 which was in the good category. This is inversely proportional to the average ability to understand students' mathematical concepts when making initial observations, which were only around 59 in the sufficient category. It can be shown that the mathematical understanding ability of students at SMA Negeri 1 Ulu Idanotae increased when learning was implemented using the Contextual Teaching and Learning model.
Keywords: Concept Understanding Ability, Contextual Teaching And Learning

INTRODUCTION

Education is one of the most important things in a person's life. Education intends to help students to develop their potential abilities. Education is aimed at increasing the standard of living of the nation and state and being able to reduce the lag of developed countries, so the Indonesian people carry out development in all fields. One of them is the development of education. According to Law no. 20 of 2003 that: Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and the skills needed by themselves, society, nation and state.

In Regulation of the Minister of National Education of the Republic of Indonesia No. 58 of 2014 states the main goals of mathematics education include students being able to think logically, think systematically, and solve problems. This means that it is necessary to have student creativity in dealing with each problem solving, especially in learning math problems, with this students can get used to thinking creatively, both during the learning process and in solving math problems faced by students. According to Livne in Samura (2019) argues that mathematical creative thinking refers to the ability to generate various new solutions to open-ended mathematical problems. In line with Munandar's opinion, he also defines the ability to think creatively mathematically, namely the ability in mathematics which includes four criteria, including fluency, flexibility (flexibility), originality (originality) and detail (elaboration).

In this case the improvements that must be made by the teacher are related to the selection of the learning model used. This is because mathematics is an abstract science that requires a learning model that can bring students into active learning situations. In such a learning situation, it is hoped that students' understanding of mathematical concepts can be well developed. A good understanding of concepts can help students achieve good learning outcomes as well. Joyce & Weil (Rusman, 2018) suggests that "learning models can be used as patterns of choice, meaning that teachers may choose appropriate and efficient learning models to achieve their educational goals."

Based on the results of interviews with mathematics teachers at SMA Negeri 1 Ulu Idanotae, it was found that students' ability to understand concepts and mathematical communication skills was still low. Some problems related to students' abilities are caused by students' incomplete understanding of a concept being studied. Lack of concern in learning such as not wanting to ask questions and not wanting to look for other sources when they do not understand the material provided by the teacher. Most students cannot work on problems that are different from the examples given and there are still students who are unable to apply mathematical concepts.

In accordance with the objectives of learning mathematics, one of which is that students can understand mathematical concepts in learning. Good results need a high understanding of the concept. But in reality, the ability of students is still lacking in applying concepts correctly in various mathematical problem solving. This is evidenced by the average score of the Odd Semester Final Assessment Test (PAS) for students of SMA Negeri 1 Ulu Idanotae before the remedial was held, shown in the table below:

Table 1. Average Pass Scores of Class XI Students in the Aspect of Understanding Mathematical Concepts in Odd Semesters of SMA Negeri 1 Ulu Idanotae Academic Year 2020/2021

Class	Semester	Average Value Aspects of Understanding Mathematical Concepts	Criteria
XI-IPA	Odd	59	Cukup

(Source: Mathematics teacher at SMA N 1 Ulu Idanotae TP. 2020/2021)

Based on information from subject teachers, it was stated that there were still many students who were lacking in solving math problems. This was due to students' lack of understanding of the concepts being taught, which led to low learning outcomes obtained by students. This can be seen clearly in table 1.1 that the average value of students' conceptual understanding is 59 in the sufficient category.

Efforts to improve the understanding of mathematical concepts of students with different personalities need serious attention and effort from the teacher. The teacher is one of the important factors determining the success of learning mathematics in schools. Teachers have a role in planning, managing, directing, and developing learning materials including the selection of models. In accordance with Wahyudin's opinion in Dariyanto (2016) that; One way to achieve optimal learning outcomes in mathematics is if teachers master the material to be taught and are able to choose appropriate learning strategies or models in each learning process.

Learning models should be selected and designed in such a way as to help students improve understanding, present data in an interesting way. One learning model that supports the understanding of mathematical concepts is learning with a contextual approach, because this learning is characterized by the principles of constructivism, asking, finding, society, learning, modeling, reflection, and actual assessment. Nurhadi (Rusman, 2018) revealed that; Contextual learning (Contextual Teaching and Learning) is a learning concept that can help teachers relate the material they teach to real-world situations of students and encourage students to make connections between the knowledge they have and its application in their lives as members of the family and society.

In Contextual Teaching and Learning (CTL) learning, students are guided to construct their own knowledge based on real experiences they have gained in their daily lives. The material conveyed by the teacher must be related to the real life of students, through discussion, question and answer, and discovery methods so that students can build their thinking concepts, linking what students already know with new concepts so that this process runs naturally and student learning more meaningful. As according to Rusman (2018) "learning is the process of students interpreting for themselves what they will learn, not just knowing without any natural understanding". In contextual teaching and learning the teacher conveys lessons to students, but how can students interpret and understand what they learn.

From the data and facts stated above, the researcher wants to find out how students' ability to understand mathematical concepts uses the contextual teaching and learning learning model. In order for this research to be directed, the researchers formulated the following problem: What is the ability to understand students' concepts using the Contextual Teaching and Learning learning model in class XI IPA at SMA Negeri 1 Ulu Idanotae? The research objectives that the researchers wanted to achieve in this study were: To describe students' conceptual understanding abilities using the Contextual Teaching and Learning learning model in class XI IPA SMA Negeri 1 Ulu Idanotae.

RESEARCH METHODS
Research Design
This research was conducted at SMA Negeri 1 Ulu Idanotae in the even semester. The type of research used in this study is quantitative research because in this study it is required to use numbers, starting from data collection, interpretation of the data and the appearance of the results. The approach used in this study is a quantitative descriptive approach in which the data obtained in this study will be described by the researcher. In line with the opinion of Sugiyiono (2017) that "descriptive is statistics used to analyze data by describing or describing the collected data without intending to make general conclusions".

Research Variable
According to Arikunto, (2020) Variables are objects of research, or what is the focus of a study. In this study the type of variable used is a single variable namely; The use of the Contextual Teaching And Learning (X) learning model to analyze students' conceptual understanding abilities.

Research Design
In this study, the researcher used the One-Shot Case Study design, which included the Pre-Experimental study design. According to Sugiyono (2017), the One-Shot Case Study design is a study in which "a group is given a treatment which will then be observed for the results of the treatment".

Research Population
According to Arikunto, (2020) says that "the population is the entire research subject. The population in this study were all Class XI Students of SMA N 1 Ulu Idanotae for the 2021/2022 academic year, totaling 112 people. The condition of the study population is as follows:

Table 2. Population of Class XI Students at SMA Negeri 1 Ulu Idanotae for the 2021/2022 Academic Year

Class	Total		Total
	Male	Female	
XI-IPA	22 peoples	14 peoples	36 peoples

XI-IPS 1	16 peoples	20 peoples	36 peoples
XI-IPS 2	18 peoples	22 peoples	40 peoples
Jumlah			**112 peoples**

Source: Administration of SMA Negeri 1 Ulu Idanotae

Research Sample

According to Arikunto, (2020) says that "samples are part or representative of the research". In this study, the researcher took samples using the Non Probability Sampling technique with purposive sampling where the sample was selected from among the populations according to what the researcher wanted, so that the sample could represent the characteristics of the desired population. Therefore, the sample used by the researcher was class XI-IPA at SMA Negeri 1 Ulu Idanotae. Class XI IPA SMA Negeri 1 Ulu Idanotae was chosen as the research sample because learning mathematics in the science department is more focused. So that researchers get the data as expected.

Data Type

The type of data needed in this study is quantitative data, namely primary data obtained directly from the respondents. The data is in the form of descriptive results of students' ability to understand mathematical concepts with the Contextual Teaching and Learning learning model.

Research Instruments

There is also an instrument in this research is a test. The test questions used are questions about the ability to understand mathematical concepts in the form of descriptions arranged based on the test grid and adapted to the applicable curriculum. The content of the test used was validated by a professional mathematics teacher in order to determine the validity level of the test.

RESEARCH RESULTS AND DISCUSSION
Based on Final Score

Based on the final scores obtained by students in completing the concept comprehension ability test in Appendix 13, it was found that there were several students who had final scores according to the success category as shown in the following table:

Table 3. Description of the Final Value of the Concept Understanding Ability Test

Category	Students	Average
Very good	6 peoples	88,34
Good	24 peoples	76,08
Enough	3 peoples	65,34
Very low	3 peoples	29,34

Based on these results it can be found that 30 out of 36 students obtained a satisfactory final test score or it can be said above the criteria and an average score of 73.34 in the "Good" category.

Based on Aspects of Understanding Concepts

Based on the aspect of understanding the concept refers to the score obtained by students on each item of questions. The questions used by the author are made based on aspects of understanding the concepts listed in the literature review. The following are the results of the scores obtained by students:

Table 4. Description of Student Acquisition Scores Based on Concept Understanding Aspects

Category	$\bar{x}$ S1	$\bar{x}$ S2	$\bar{x}$ S3	$\bar{x}$ S4	$\bar{x}$ S5
Very good	9,5	9	8,33	5	12,33
Good	7,92	7,79	7,5	4,75	10,08
Enough	7,33	6,33	5,67	3	10,33
Very low	5	3	2,33	2,67	1,67

Based on the table above, it can be found that students' achievement of the aspect of understanding the concept which is the aim of the research. Comparison of the acquisition score with the maximum score that must be obtained by students can be seen in the following diagram:
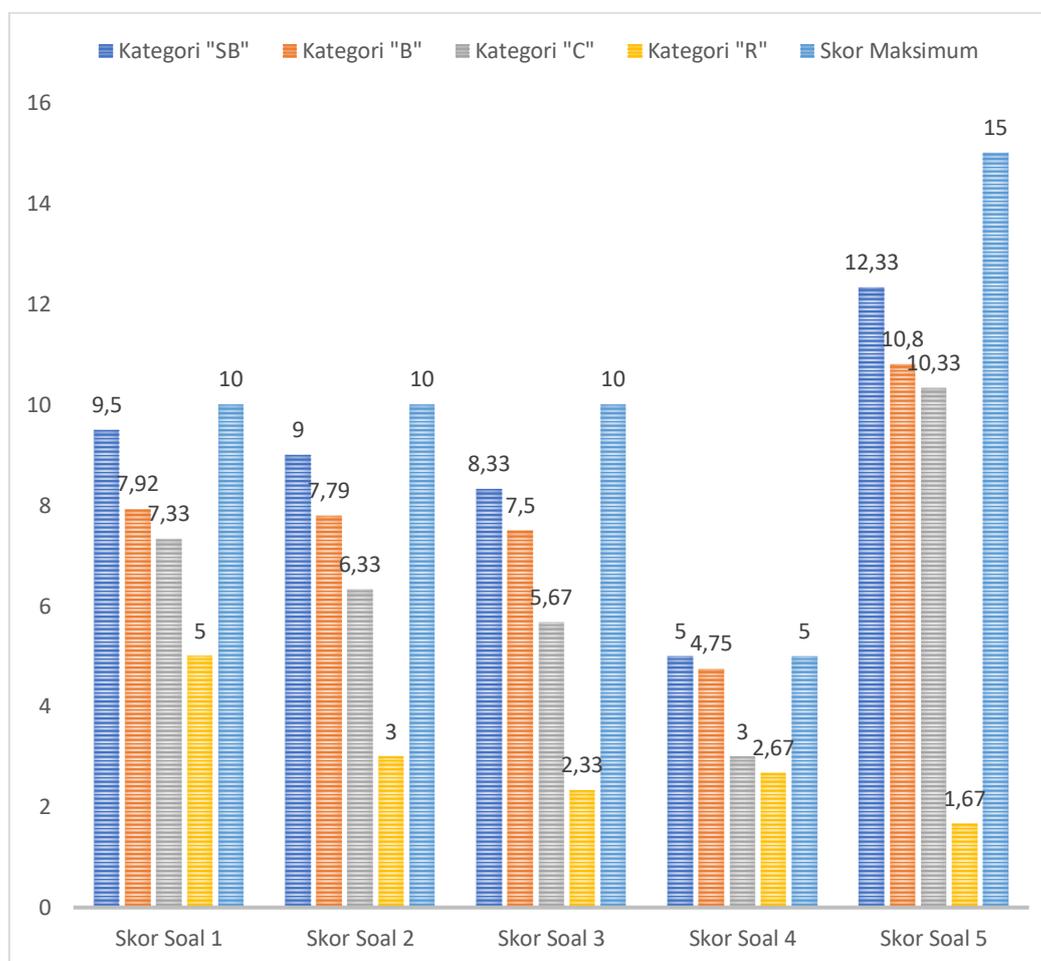
Figure 1. Diagram of Comparison of Scores for Each Category with the Maximum Score for Each Question

Discussion

The test results obtained can be described as student learning success which focuses on understanding concepts using the Contextual Teaching and Learning learning model as follows:

Aspect 1: Restating a Concept

The first aspect that becomes an assessment of understanding the concept is "Restating a Concept". The data for the first aspect can be seen from the scores obtained by students on the first question. From the scores obtained, the average score obtained by students for the first question was 7.89.
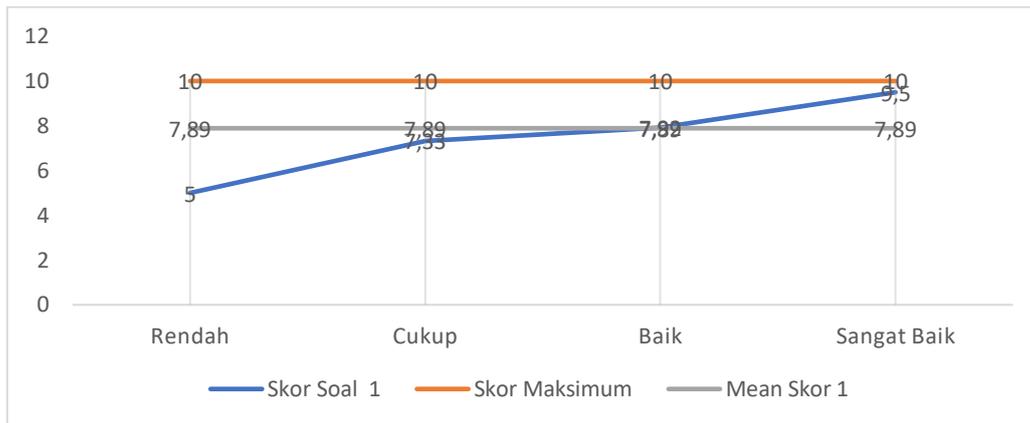
Figure 2. Graph of Scores Obtained by Students on the First Problem

From the graph above, it is explained that the score obtained by students is above the average of the overall score. As it is known that the number of students who are in the "Good" category is 24 peoples and in the "Very Good" category is 6 peoples. So it can be concluded that Aspect 1 namely "Restating a Concept" has been achieved.

Aspect 2: Classifying Objects According to Specific Properties According to the Concept

The second aspect that becomes an assessment of understanding the concept is "Classifying Objects According to Certain Properties According to the Concept". The data for the second aspect can be seen from the scores obtained by students in the second question. From the scores obtained, the average score obtained by students for the second question was 7.47.
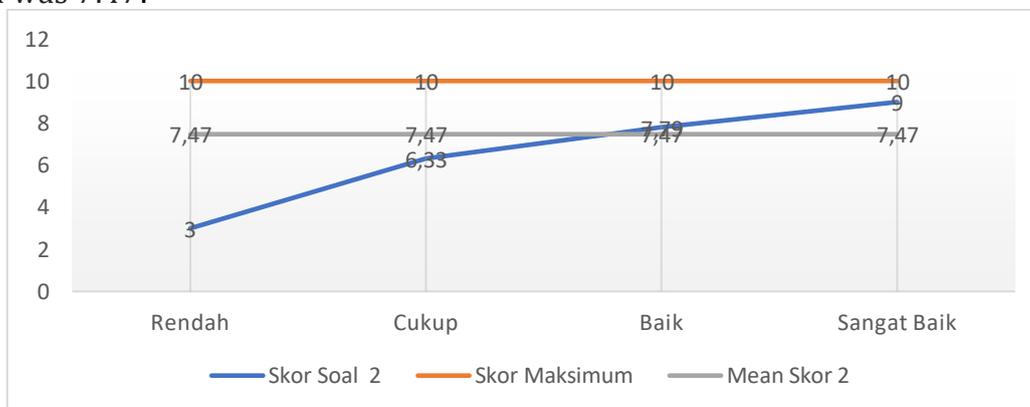

Figure 3. Graph of Students' Obtained Scores in the Second Problem

From the graph above, it is explained that the score obtained by students is above the average of the overall score. As it is known that the number of students who are in the "Good" category is 24 peoples and in the "Very Good" category is 6 peoples. So it can be concluded that Aspect 2 namely "Classifying Objects According to Certain Properties According to the Concept" has been achieved.

Aspect 3: Give examples and non-examples of the concept

The third aspect that becomes an assessment of understanding the concept is "Giving Examples and Non-Examples of Concepts." The data for the third aspect can be seen from the scores obtained by students in the third question. From the scores obtained, the average score obtained by students for the third question was 7.06.
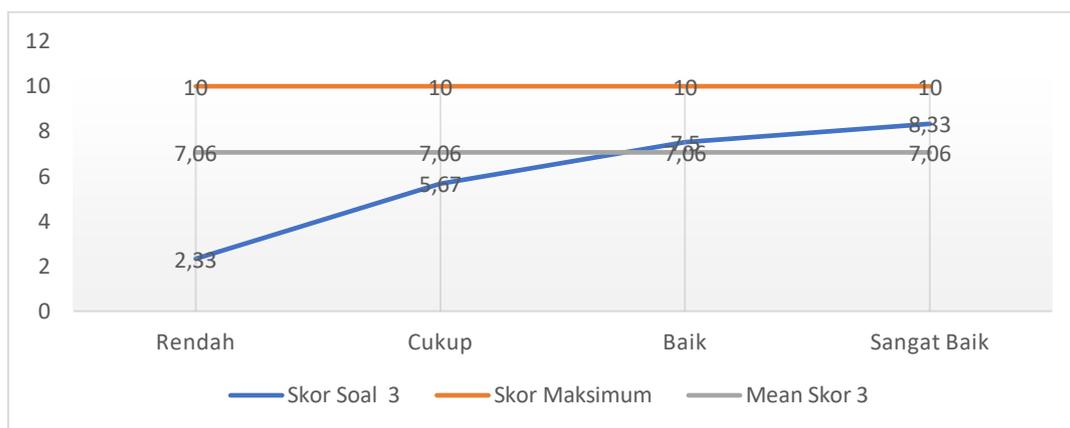
Figure 4. Graph of Students' Obtained Scores in the Third Problem

From the graph above, it is explained that the score obtained by students is above the average of the overall score. As it is known that the number of students who are in the "Good" category is 24 peoples and in the "Very Good" category is 6 peoples. So it can be concluded that Aspect 3 namely "Giving Examples and Non-Examples of the Concept" has been achieved.

Aspect 4: Presenting Concepts in the Form of Mathematical Representations

The fourth aspect that becomes an assessment of understanding the concept is "Presenting Concepts in the Form of Mathematical Representation". The data for the fourth aspect can be seen from the scores obtained by students on the fourth question. From the scores obtained, the average score obtained by students for the fourth question was 4.47.
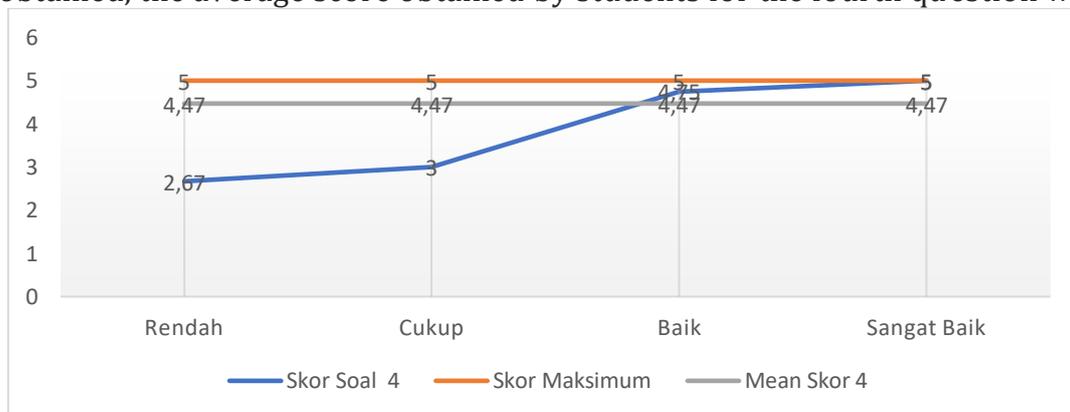

Figure 5. Graph of Student Obtained Scores on the Fourth Problem

From the graph above, it is explained that the score obtained by students is above the average of the overall score. As it is known that the number of students who are in the "Good" category is 24 peoples and in the "Very Good" category is 6 peoples. So it can be concluded that Aspect 4 namely "Classifying Objects According to Certain Properties According to the Concept" has been achieved.

Aspect 5: Developing Necessary and Sufficient Requirements of a Concept

The fifth aspect that becomes an assessment of understanding the concept is "Developing Necessary Requirements and Sufficient Requirements of a Concept". The data for the fifth aspect can be seen from the scores obtained by students on the fifth question. From the score obtained that the average score obtained by students for the fifth question, namely:
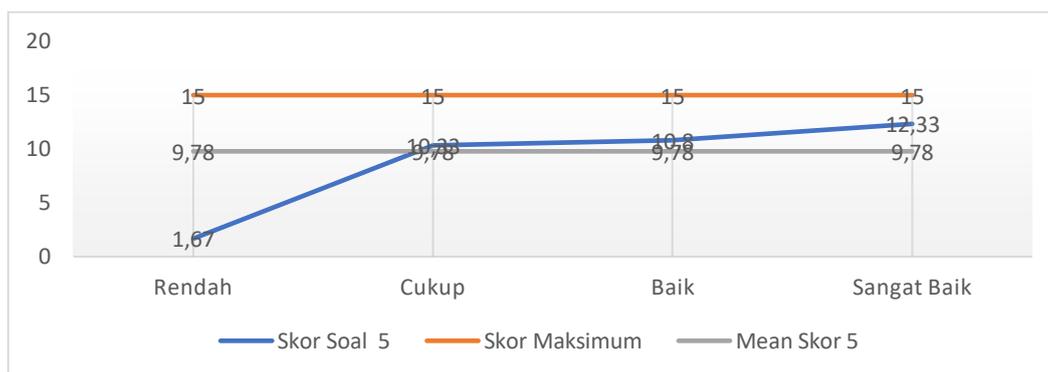
Figure 6. Graph of Student Obtained Scores on the Fifth Question

From the graph above, it is explained that the score obtained by students is above the average of the overall score. As it is known that the number of students who are in the "Good" category is 24 peoples and in the "Very Good" category is 6 peoples and in the "Enough" category is 3 peoples. So it can be concluded that Aspect 5 namely "Developing Necessary Requirements and Sufficient Requirements of a Concept" has been achieved.

Based on what has been put forward by the previous theory that the Contextual Teaching and Learning learning model can solve mathematical problems. Based on the results of the research and data analysis from the results of the tests given to students, the results obtained that the students' conceptual understanding skills in class XI IPA at SMA Negeri 1 Ulu Idanotae were classified as good. It can be seen that when making initial observations, the average ability to understand students' mathematical concepts was 59, which was in the sufficient category. After learning in class using a problem-based learning model, it was obtained that the average ability to understand students' mathematical concepts was 75.38, which was in the good category.

The initial activity process carried out by the researcher was to apply the Contextual Teaching and Learning model to students which was carried out according to the steps in the learning model. The learning activities carried out include preliminary, core and closing activities. For the application of the Contextual Teaching And Learning learning model in the first step, namely student orientation on the problem which includes researchers conveying and explaining the subject matter, learning objectives, and exploring students' initial abilities regarding the material to be delivered and student activities listening to learning objectives and answering questions related to learning material . In this activity students are encouraged to understand the problems found in LKPD.

CONCLUSION

Based on the results of the data analysis, which has been described, it can be concluded that the ability to understand the concepts of class XI IPA at SMA Negeri 1 Ulu Idanotae using the Contextual Teaching And L earning learning model can be seen in the results of the test answers to students' ability to understand mathematical concepts, namely 75.38 at good category. This can be seen in the average ability of students to understand mathematical concepts when making initial observations, it was obtained that the average ability to understand students' mathematical concepts was 59, which was in the sufficient category.

Based on the research findings, discussion and conclusions in this study, the researchers will provide suggestions for useful input, including: In the learning process, mathematics teachers should use the Contextual Teaching and Learning learning model. Mathematics teachers should provide more practice questions to improve students' ability to understand mathematical concepts.

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