



## The Concept Attainment Learning Model in Improving Understanding of Mathematics Concepts in Primary Schools

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### Abstract

*This research was motivated by the low understanding of Mathematics concepts in class III students at SDN 004 Salo. This is because the learning model has not been able to improve students' understanding of Mathematics concepts in the learning process. One solution to overcome this problem is to apply the Concept Attainment learning model. This research aims to describe increasing students' understanding of Mathematics concepts by applying the Concept Attainment learning model for class III students at SDN 004 Salo. This research method is classroom action research (PTK) which is carried out in two cycles. Each cycle consists of two meetings and four stages, namely planning, implementation, observation and reflection. The research subjects were 20 class III students. Data collection techniques include interview techniques, observation, tests and documentation. Based on the results of data analysis, it can be seen that there was an increase in students' results of Understanding Mathematical Concepts before the action, the average completeness of students' Understanding of Mathematical Concepts results was only 25% with classical completeness of 59%, then in the first cycle of the first meeting it increased to 35% with classical completeness of 65. 25%, then in cycle I, meeting II increased to 50% with classical completeness of 71.5%. Furthermore, cycle II, meeting I increased to 65% with classical completeness of 73% and cycle II, meeting II increased to 80% with classical completeness of 80.5%. So it can be concluded that the application of the Concept Attainment Learning model can improve the understanding of Mathematics concepts for class III students at SDN 004 Salo.*

**Keywords:** *Concept Attainment Learning Model, Understanding Mathematical Concepts, Elementary School*

### Introduction

The basic component of language is vocabulary. Education is a very important aspect in supporting the nation's progress in the future. Through education, humans as development subjects can be educated, nurtured and develop their potential. So the government also pays great attention to the implementation of education programs in Indonesia. It is proven that the implementation of education in Indonesia

has been regulated in the preamble to the 1945 Constitution of the Republic of Indonesia (UUD 1945), namely that the Indonesian government participates in making the nation's life more intelligent.

The learning process is a phase in a series of educational implementations that is crucial to student learning success. Nowadays, there are still many teachers who view learning as a transformation of knowledge. Therefore, in learning there is

still weak interaction with cognitive processing that occurs in students, while process skills are less developed in students. In learning mathematics, this makes mathematics subjects less interesting and considered difficult by students. As Ruseffendi said, "there are many children who, after learning even simple parts of mathematics, do not understand many things, many concepts are understood incorrectly. Mathematics is considered a difficult, complicated and deceptive science.

Mathematics is a subject that has a very important role in the world of education (Marta, 2018). In learning mathematics, understanding a mathematical concept is very important because by mastering the concept in learning mathematics, students have the ability to understand mathematical concepts, explain the relationship between concepts and apply concepts or algorithms, flexibly, accurately, efficiently and precisely, in understanding concepts (Marta, 2018)).

Understanding mathematical concepts is the basis for learning mathematics meaningfully. Mathematics exists to organize students' understanding so that they have the ability to develop themselves in mathematics in particular, as well as in various other scientific disciplines (Surya, 2017). Understanding concepts is very important in the learning process, because understanding concepts will make it easier for students to learn mathematics. If in each lesson mastery of concepts is emphasized more, then students can have good basic provisions to achieve other basic abilities such as reasoning, communication, connections and understanding concepts.

Understanding concepts is one of the things that must be achieved in the student learning process. This is important so that students can not only work on the questions given, but also be able to interpret or explain the lesson material using their own sentences. If students have the ability to explain or interpret a concept, then the

student has understood the concept of a lesson even though the explanation given has a sentence structure that is not the same as the concept given but the meaning is the same (Fadhilaturrahmi, 2017).

The aim of understanding mathematical concepts is so that the knowledge conveyed can be understood by students. Good education is an effort that successfully brings students to the goal they want to achieve, namely so that the learning conveyed can be fully understood by students (Humairoh, 2022). Several definitions of understanding have been expressed by experts. According to the Ministry of National Education (2017) understanding can be defined as a process of understanding a certain meaning or significance and the ability to use it in other situations. According to Purwanto (2015), understanding is a level of ability that expects students to be able to understand the meaning or concepts, situations or facts they know. In line with this, Suharsimi (2016) stated that understanding is how someone differentiates, suspects, expands, concludes, gives examples, rewrites and estimates.

Based on the results of observations carried out by researchers in class III of SDN 004 Salo on March 10 2023, students' mastery of understanding concepts regarding mathematics material is still low and there are also obstacles during the teaching and learning process, including teachers using more conventional learning models (lectures). Teachers mostly lecture during the learning process, so students become bored and don't understand the material being taught. Students also do not focus on listening to explanations from the teacher, students tend not to be able to understand concepts, are not sensitive to the problems that occur so they cannot understand and solve problems, and are unable to apply concepts in different situations.

A teacher must be able to apply learning methods that are appropriate to the subject matter, because choosing the right

learning method is an alternative in an effort to improve the quality of knowledge, so that students can easily understand what is being studied. Students' mastery of conceptual understanding of mathematics material is still low, out of 20 students, not even half of the students can restate a conceptual understanding. There are still many students who are confused and have difficulty working on questions related to the material of comparing two fractions. In the mathematics learning process, it can be seen that students still have a low understanding of the concepts in the material being taught. The involvement of students is only limited to the information conveyed by the teacher in the form of a lecture method, but the teacher has tried to ensure that the students like and understand the mathematics lessons being taught.

This can be seen from the student score data listed in the attachment, from the results of the recapitulation of the learning completion of class III students at SDN 004 Salo, it can be seen that out of a total of 20 students, only 5 students completed it or 25%. Meanwhile, 15 students did not complete or 75%. From the test results, it can be seen that students are unable to solve the problems given in the questions, according to indicators of conceptual understanding, such as: restating a concept that has been studied, grouping certain material (according to the concept), giving examples and non-examples of a concept, apply concepts or algorithms in understanding concepts.

One alternative learning model solution that makes it possible to increase students' conceptual understanding is the *concept attainment model*. By using the *concept attainment learning model*, which is a learning model that has the view that students are not only required to be able to form concepts through the process of classifying data but they can also form an arrangement of concepts with their own abilities. This model is very suitable for improving concept understanding because the *concept attainment model* focuses

heavily on the process of achieving concepts from the material being studied.

Based on the description above, the researcher wishes to carry out Classroom Action Research with the title: "Application of the *Concept Attainment Learning Model* in Improving Understanding of Mathematics Concepts in Elementary Schools".

### Method

This research is classroom action research. More broadly, classroom action research can be interpreted as research that is oriented towards implementing actions with the aim of improving the quality or understanding of concepts in a group of subjects being researched and observing the level of success or consequences of their actions, to then provide follow-up actions in the form of perfecting actions or adapting them to conditions and situations. so that better results are obtained (Ananda, 2017). Classroom action research is also research that is developed based on problems that arise in learning activities which aim to improve and enhance the teaching and learning process in the classroom (Aprinawati, 2017).

This research was carried out in class III at SDN 004 Salo, in the mathematics subject of plane shapes. This research was carried out in the even semester of the 2022/2023 academic year. The subjects in this research were class III students at SDN 004 Salo in 2023. This research was conducted in the even semester with one class, with a total of 20 students, 11 men and 9 women. The object of this research is the application of the *concept attainment model* to improve understanding of mathematical concepts. The variable of this research is the application of the *concept attainment model* as (variable The classroom action research model consists of 2 cycles, each cycle containing four steps, namely: planning, acting, observing, and *reflecting*.

Accurate and complete data is very necessary in a research process, so to obtain

this data various data collection techniques are needed, therefore there are 3 data collection techniques used in this research, namely tests, observation and documentation. Meanwhile, the data analysis techniques used are qualitative analysis techniques and quantitative analysis techniques.

Qualitative analysis will be used to analyze the data obtained in the form of words or descriptions about students' ability to understand mathematical concepts using teacher activity observation sheets and student activity observation sheets during the learning process. Meanwhile, quantitative analysis will be used to analyze students' ability to understand mathematical concepts. The quantitative data in this research is useful for measuring the extent to which students' ability to understand mathematical concepts has increased by using the *Concept Attainment learning model*.

After data on students' conceptual understanding abilities is collected through observation, the data is processed using the following percentage formula:

$$p = \frac{F}{N} \times 100\%$$

Information:

P = Percentage Number

F = Frequency to be searched for

N = Many Individuals

100% = Fixed Number

In determining the assessment criteria for research results, 5 assessment criteria are grouped, namely very good, good, sufficient, poor and very poor. The criteria are as follows.

**Table 1.** Criteria for the ability to understand mathematical concepts

Category	Score
90-100%	Very well
80-89%	Good
70-79%	Enough
60-69%	Not enough

<60%	Very less
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**Source:** Riduwan and Sunarto, 2013

This research was conducted to determine the level of students' ability to understand mathematical concepts at the end of each meeting. Data on the ability to understand mathematical concepts is processed using the following formula:

$$KI = \frac{\text{Jumlah Skor yang Diperoleh}}{\text{Skor Maksimal}} \times 100\%$$

To determine classical learning completeness, the following formula can be used:

$$KK = \frac{\text{Jumlah Siswa yang Tuntas}}{\text{Jumlah Siswa Seluruhnya}} \times 100\%$$

*Concept Attainment* learning model is said to be successful if it reaches the completeness criteria of 80% (Wardhani, 2017). If the average value of students' ability to understand mathematical concepts increases in each cycle, then the use of the *Concept Attainment learning model* is said to be able to improve students' ability to understand mathematical concepts.

**Results and Discussion**

The results and discussion in this research can be seen from the comparison of students' ability to understand mathematical concepts before taking action, cycle I, and cycle II in learning using the *Concept Attainment learning model*. Students' low ability to understand mathematical concepts can be seen from not having achieved the predetermined indicators of ability to understand mathematical concepts. The initial data on students' ability to understand mathematical concepts in class III at SDN 004 Salo can be seen in the table below.

**Table 2.** Results of Students' Concept Understanding Ability Test in Pre-Action

Information	Results
Total amount	5 students (25%)
Incomplete amount	15 students (75%)
Category	Very less

**Source:** 2023 Research Data Processing Results

Based on the data in the table above, it can be concluded that students' ability to understand mathematical concepts is in the very poor category. Based on the data described above, students' ability to understand mathematical concepts has not yet reached the category determined by researchers, namely achieving 80% classical completeness. So researchers make learning improvements through implementing the *Concept Attainment learning model* to improve the ability to understand mathematical concepts of fifth grade students at SDN 004 Salo. The results of students' ability to understand mathematical concepts in cycle I can be seen as follows:

**Table 3.** Results of Cycle I Mathematical Concept Understanding Ability Test

Information	Cycle I	
	PI	PII
Complete	7 students (35%)	10 students (50%)
Not Completed	13 students (65%)	10 students (50%)
Category	Not enough	Not enough

Source: 2023 Research Data Processing Results

Based on these data, the researcher concluded that the implementation of learning in cycle I had improved compared to pre-action. However, it has not yet reached the target set by researchers, namely 80% classically. For this reason, researchers and observers carry out actions in the next cycle, namely cycle II.

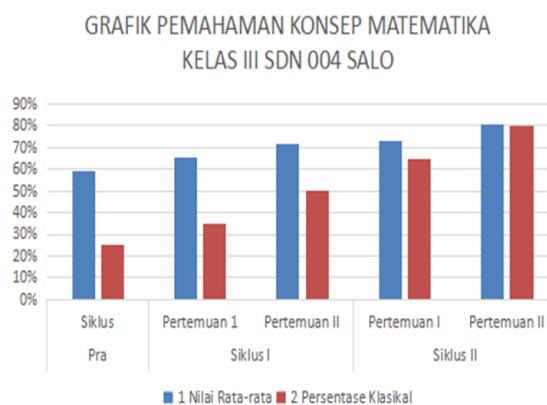
The results of students' ability to understand mathematical concepts in cycle II can be seen as follows:

**Table 4.** Results of the Ability Test for Understanding Mathematical Concepts in Cycle II

Information	Cycle II	
	PI	PII
Complete	13 students (65%)	16 students (80%)
Not Completed	7 students (35%)	14 students (20%)
Category	Enough	Good

Source: 2023 Research Data Processing Results

Based on the data obtained, the researcher concluded that the implementation of learning in cycle II was said to be successful. To clearly understand the increase in each action, see Figure 1 below:



**Figure 1.** Diagram of Pre-action Students' Understanding of Mathematical Concepts, Cycles I and II

After seeing the recapitulation of understanding of Mathematics concepts for class III students at SDN 004 Salo, it can be seen in the picture above that there has been an increase from before the action to cycle II. Then it can be seen that the students' understanding of Mathematics concepts in cycle II, namely 80%, has reached or exceeded the specified indicator of completeness, namely 80% or is in good criteria. For this reason, researchers do not need to carry out the next cycle.

Based on the results of implementation in cycle I, learning was still not optimal. Students are expected to increase cooperation and responsibility when given the opportunity to move forward. This is due to the lack of teacher supervision of students when students are doing group assignments, students are noisy when doing group assignments, so that there are still students who do not work in completing their group assignments. Another cause is that students are still passive when learning takes place, meaning that there are still students who do not dare

to express their opinions when the teacher asks questions about the material being taught.

In this case, teachers need to provide more guidance to students, so that students feel comfortable so they dare to express their ideas or opinions regarding learning. Based on the results of observations, the implementation of the learning carried out was able to run well, although there were several obstacles in cycle I due to the teacher's lack of mastery of the class. and the application of the steps of the *Concept Attainment learning model* which are not well understood by students. In cycle II, things went better than in cycle I. This was indicated by students paying more attention to the teacher when the teacher delivered learning material, students were also more active in the learning process, did not make a fuss when doing group assignments, and a sense of self-confidence emerged. and able to work well with group members. Of the five indicators that use understanding of Mathematics concepts, the highest student scores are found in the first and third indicators. It is easier for students to remember and make models based on their drawings. Based on the results of learning implementation in cycle I and cycle II in Mathematics subjects using the *Concept Attainment learning model* , it can increase teacher activity and student activity.

### Conclusion

Based on the results of research carried out by researchers, using the *Concept Attainment* learning model can improve the ability to understand mathematical concepts for class III students at SDN 004 Salo. Based on data before the implementation of the *Concept Attainment* learning model, it is known that the average score for understanding Mathematics concepts for class III students at SDN 004 Salo from the pre-cycle was 59%, there was an increase in the first cycle at the first meeting of 65.25%, then increased again at the first meeting. II to 71.5%. In cycle II, meeting I, the average student score was

73%, then there was an increase in meeting II of 80.5%. Likewise, the classical completeness of understanding of Mathematics concepts for class III students at SDN 004 Salo from the pre-cycle was 25% and then increased in the first cycle at the first meeting by 35% and at the second meeting to 50%. Then there was an increase in cycle II at meeting I by 65% and increased again at meeting II by 80%. This shows that of the 20 students there were 16 students who achieved classical completeness individually in the good category. Based on this description, it can be concluded that by using the *concept attainment* learning model, students' understanding of Mathematics concepts increases.

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