

## Conceptual Understanding of Class V Students Judging from Curiosity on Learning Models Group Investigation with Hands on Activity Assisted by Teaching Aids.

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### Abstract

The purpose of this study (1) to test the effectiveness of the Group Investigation learning model with Hands on Activity assisted by teaching aids on conceptual understanding (2) to describe the understanding of the concept of class V students in terms of students' curiosity. The method used is the research *Mix Method*, and the design *Concurrent Embedded*. This research was conducted at the Semarang Elementary School Lab. The population of this study was the fifth grade students of the SD Lab School Semarang in the academic year 2017/2018. From the V classes at the Semarang Elementary School Lab 2 classes were randomly selected to get the VA class as the experimental class subjected to the learning model *Group Investigation* with *Hands on Activity* assisted by teaching aids and the VB class as the control class subjected to the expository learning model. Learning *Group Investigation* assisted by *Hands On Activity* with teaching aids on volume material and beam surface area in class V students proved effective. Students with high categories with high curiosity have been able to reach all four aspects of the ability to understand mathematical concepts; students with curiosity are able to achieve three aspects. the ability to understand mathematical concepts, and for students with low curiosity can only achieve one aspect of the ability to understand mathematical concepts.

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## INTRODUCTION

Primary school is the most basic level of formal education, where at this level the mathematics learning material provided contains basic and important concepts and cannot be excluded. Accuracy in presenting these concepts is very necessary so that students are able to understand them correctly and precisely, because the impressions and views that students receive on a concept in elementary school will always carry over to the next level.

Isleyen and Ahmet (2003: 93) argue about some of the advantages of learning by including understanding concepts namely learning to be fun and students enjoying learning, students are able to remember topics that are learned more and planting concepts can be more deeply embedded in students, concepts that new can be more easily learned, students can learn more independently, improve students' problem solving skills.

Abstract mathematical concepts make it difficult to understand and learn by students at school. Dian (2018) stated that the difficulty is felt mainly by students at the elementary school level. According to Piaget's cognitive theory, cognitive development of basic age children is in two phases, namely the first concrete operational phase (7-11 years) is the phase where the child can function the reason for logical, rational and objective thinking, but for concrete objects. The two formal operational phases (11-12 years and above) are phases where the child can think of something that will or might happen (hypothesis) and something abstract. The majority of elementary school teachers are still verbally giving mathematical material, even though students have not been able to solve the problem well without concrete materials.

According to Permendiknas Number 22 of 2013, one of the objectives of the K13 curriculum in mathematics is so that students have the ability to understand mathematical concepts, explain the interrelationships between concepts, and apply concepts or algorithms,

flexibly, accurately, efficiently, and precisely, in problem solving. Learning systems implemented in schools must pay attention to understanding the concept so that the concept can be embedded properly with students. In accordance with curriculum objectives, understanding the concept must have a place to be improved in schools. Galih (2014) stated that based on the results of the class VII daily mathematics test on the building material of flat side space in Dawe Kudus Junior High School 1/2013/2014, it was found that the average test scores were still below the minimum completeness criteria (KKM). Amin (2013) Facts in the field indicate the existence of learning outcomes in the material calculating the surface area of beams and cubes is still low, namely in class V of State elementary school 1 Pengasih, Kulon Progo. Therefore understanding the concept must be improved early. Because the material calculates the surface area and volume of beams and cubes is also found in the second grade of the seventh grade junior high school.

Based on preliminary observations of daily V class math results on volume material and the surface area of beams and cubes at the Semarang Elementary School Lab 2017/2018 school year, it was found that the average test scores were still below the KKM and lack of active students in mathematics. So the effort that must be made to improve the ability to understand the concept and character of students' curiosity is by improving the teaching and learning process, namely the teaching and learning process which is usually teacher-centered (*teacher centered*) to be (*student-centered*) and present teaching aids as a means for students to channel messages and can stimulate students' thoughts, feelings, attention and willingness so that they can encourage the learning process in students to become active. Props are teaching media that contain or carry the characteristics of the concepts being studied (Estiningsih, 1994: 7). The main function is to reduce the abstract concept so that students are able to grasp the meaning of the concept.

According to Sudjana (1989: 76) props are a tool to educate or teach so that what is taught is easy to understand for students

The activeness of students is manifested by students' curiosity. Curiosity of students must be grown early. The character formation of students' curiosity in learning activities is also one of the important things because this student's curiosity cannot be formed instantly but requires a repetitive process to become a habit. To achieve this goal, it is necessary to create a learning environment that can teach students, encourage students to learn, and provide opportunities for students to actively construct knowledge in learning concepts and train students' skills in practicing analytical thinking skills and raising curiosity in students.

One learning model and approach that trains students' skills in practicing analytical thinking skills and raises curiosity is the model *Group Investigation (GI)*. Cooperative learning type *Group Investigation (GI)*, is cooperative learning that involves a small group where students work using cooperative inquiry. The problems in this research are (1) how the effectiveness of the learning model *GI Hand On Activity* aided teaching aids to the understanding of the concept of class V students Elementary Lab School Semarang (2) How does the character curiosity of students in learning by *Hands On Activity aided by props?*. The purpose of this study is to (1) test the effectiveness of learning *GI with Hand On Activity* assisted props in enhancing the ability to understand concepts in volume material and the surface area of beams and cubes (2) Describing the character of students' curiosity in learning *GI*.

## METHOD

The method used in this study is the *mix method*. The combination design in this study is type *concurrent embedded*. *Concurrent embedded* (a mixture that is not balanced) is a research method that combines qualitative and quantitative research methods by mixing the two

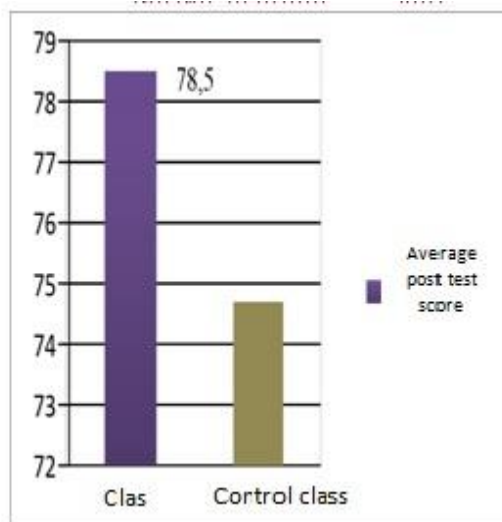
methods unequally (Sugiyono, 2013). This research was conducted at the Semarang Elementary School Lab. The population of this study was the fifth grade students of the SD Lab School Semarang in the academic year 2017/2018. From the fifth grades at the SD Lab School Semarang two classes were randomly selected. as a research sample according to the research design. The technique of determining quantitative research samples is based on *cluster random sampling*. From the technique the VA class was obtained as an experimental class subjected to the learning model *Group Investigation* with *Hands on Activity* assisted by teaching aids and the VB class as a control class subjected to the expository learning model. Quantitative data analysis is divided into two, namely initial data analysis and final data analysis. The analysis of the initial data was taken from the results of the initial tests of students 'understanding of mathematical concepts with the aim of knowing that the two sample classes originated from the same initial conditions, while the final data analysis was taken from the final test results of students' understanding of mathematical concepts whose data was used for classical completeness testing average difference test For qualitative data analysis 6 students from the experimental class were selected with 2 students each with a high, medium and low level of curiosity

Data collection techniques in this study consisted of: observation, tests, and interviews. The type of test in this study is the concept understanding test. Concept understanding tests are carried out after students carry out the learning process on the material to calculate the surface area and volume of beams and cubes for the experimental and control classes. Interviews are designed to explore the extent of conceptual comprehension, and students' curiosity character. Whereas, observation is only used to measure the extent of curiosity.

## RESULTS AND DISCUSSION

### Result

Cooperative learning type *Group Investigation (GI)*, is cooperative learning involving small groups in which students work using cooperative inquiry, planning, projects and group discussions and then present their findings to the class (Suyatno, 2009: 56). In this study using the concept comprehension ability test, the concept understanding test is a test that is used to determine students' conceptual comprehension abilities in the material surface area and volume of beams and cubes. The average value of the experimental class and control class is presented in the following figure.



**Figure 1.** Average score Test concept comprehension ability

### Discussion

Based on the results of the analysis of learning statistics in the experimental group using the learning model *Group Investigation (GI)* with *Hand On Activity* assisted by *teaching aids*, meeting graduation standards 75% of students have reached the minimum completeness limit that is 75. Minimum classical completeness standard can be seen from the test results of the proportions of one party, namely  $-Z_{(0.5-\alpha)} = -Z_{0.45} = -1.64$  and  $Z_{\text{count}} = 2.04$ . So  $z = -1.64 < z_{0,45} = 2,04$  then  $H_0$  accepted. This means that the experimental class learning outcomes subject to

Learning *Group Investigation (GI)* with *Hand On Activity* assisted by *teaching aids* have achieved classical learning completeness, which is 75%.

Based on the results of statistical analysis after learning in the experimental group by using the Learning model *Group Investigation (GI)* with *Hand On Activity* assisted by *teaching aids* and the control group, it can be seen that the learning outcomes of the two classes differ significantly or significantly. This can be seen from the results of the t test which is  $t_{\text{count}} = 2.41$  and  $t_{\text{table}} = 1.99$  because  $t_{\text{arithmetic}} > t_{\text{table}}$  means that  $H_0$  is rejected, in other words that the average learning outcomes of fifth grade students at SD Lab School Semarang at material surface area and volume of cubes and beams using the learning model *Group Investigation (GI)* with *Hand On Activity* assisted by *teaching aids* is better than the average learning outcomes of students using the expository learning model.

From the results above, the learning model *Group Investigation (GI)* with *Hand On Activity* is effective on students' problem solving abilities. This is because (1) the percentage of students in learning *Group Investigation (GI)* with *Hand On Activity* has achieved completeness, that is 75 more than 75% (2) the average test results of the ability to understand the concept to measure students' ability to understand the concept of learning *Group Investigation (GI)* with *Hand On Activity* is better than students who are subjected to expository learning. The results of this study are in line with the results of the study. This is in line with the research of Yunardi (2010) stating that learning assisted by teaching aids can help improve student learning outcomes of the material being studied. Nainggolan (2014) concluded that the application of learning models *Group Investigation* can improve understanding of mathematical concepts.

learning *Group Investigation* assisted by *Hands On Activity* with teaching aids on volume material and the surface area of beams in elementary school students of the Elementary

School is effective not only effective in understanding concepts, but also having the advantage that students are more active, creative, and communicate well. Volume material and the surface area of beams and cubes are found in grade VII SMP II semester II with KD 5.3. Calculate the surface area and volume of cubes, beams, prisms and pyramid. If the repetition material should not have any more obstacles, according to Galih (2014) the results of the class VII daily mathematics test on the material in the flat side space in Junior high school 1 Dawe Kudus in the academic year 2013/2014, it was found that the average test scores were still below the KKM.

If the results in junior high school have not been completed, it is possible to have 2 causes; the first possibility is that students forget about this material or the possibility that the two students do not understand the material at the elementary school. If students forget about the material that needs attention is when doing apperception. According to Nurhasnawati (2015), apperception aims to shape understanding. As quoted in his book entitled Teaching Strategies, that is, if the teacher will teach new subject matter, it needs to be connected with things that have been mastered by students or relate it to the experience of previous students and in accordance with the need to facilitate understanding.

If students find it difficult to answer questions from the teacher, the teacher can present a teaching aid that serves to recall the material they have received before. Presenting props here is not to find concepts but only aims to stimulate the previous material. With knowledge of apperception on the other hand it is very helpful in forming the character of children in school. Because, the content of apperception values is also builds a national character culture. We can package the apperception with interest so that students appear curious, because it is very important that students' curiosity is presented in learning. If students do not understand since in elementary

school, they can use the learning model *Group Investigation*, because this model is not only for elementary school level but all levels. The Model *Group Investigation* makes students active in learning activities, students think and use their own abilities to find the final results, besides that it fosters students' curiosity because of the new learning model for students. Furthermore, understands the concept of students in learning *Group Investigation* with *Hands on Activity* Assisted by Teaching Tools in Review of Curiosity Character. In this study, the ability to understand mathematical concepts was analyzed based on students' curiosity. The curiosity referred to in this study was curiosity as a student at school in learning mathematics. Students' curiosity is divided into three levels, namely high curiosity, moderate curiosity, and low curiosity. Based on the level of curiosity of these students, then the ability to understand mathematical concepts was analyzed. The ability to understand students' mathematical concepts refers to four aspects, namely classifying objects according to certain characteristics, presenting concepts to mathematical representations, using certain procedures or operations, applying problem solving algorithms or algorithms. A summary of the results of the analysis that has been carried out can be seen in Table 1

**Table 1.** Summary of Concept Understanding Ability Analysis from Curiosity Students

Aspects of Understanding Ability Concept	Curiosity		
	High	Medium	Low
Classify objects according to certain traits.	Students have been able to classify objects according to certain characteristics.	Students have been able to classify objects according to certain characteristics.	Students have been able to classify objects according to certain characteristics.
Presenting concepts to mathematical representations.	students have been able to present mathematical representations.	students have not been able to present mathematical representations.	students have not been able to present mathematical representations.
Use certain procedures or operations.	students have been able to use certain procedures or operations.	students have been able to use certain procedures or operations.	students have not been able to use certain procedures or operations.
Apply problem solving algorithms or algorithms.	students are able to apply problem solving algorithms or algorithms.	students are able to apply problem solving algorithms or algorithms.	students have not been able to apply problem solving algorithms or algorithms.

Based on table 1., it can be seen that for students with high curiosity have been able to reach all four aspects of conceptual comprehension ability mathematics, students with moderate curiosity are able to achieve three aspects of understanding the mathematical concepts, and for students with low curiosity are only able to achieve one aspect of the ability to understand mathematical concepts.

## CONCLUSION

Learning *Group Investigation* aided *Hands on Activity* by props on the material volume and surface area of the beam at the elementary fifth grade students effectively to understanding the concept but it also has the advantage that students are more active, creative and communicate well. Students with high categories with high curiosity have been able to reach all four aspects of the ability to understand mathematical concepts; students with curiosity are able to achieve three aspects. the ability to understand mathematical concepts, and for students with low curiosity can only achieve one aspect of the ability to understand mathematical concepts.

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