EFFECT OF COOPERATIVE LEARNING MODEL TYPE STUDENT TEAM ACHIEVEMENT DIVISION ON THE ABILITY OF UNDERSTANDING MATHEMATIC CONCEPT STUDENT FIFTH GRADE ELEMENTARY SCHOOL

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ABSTRACT

This was a quasi-experimental research that aimed to know about the influence of cooperative learning model of Student Team Achievement Division type towards student's conceptual understanding of mathematics. This research used a posttest only control design. The population is all student of fifth grade consisting of two class VA is 36 students as an experimental and class VB is 36 student as an control. The data was value of concept understanding ability of mathematics which obtained by test. Based on the results of hypothesis test, concep understanding ability of mathematics of students who taught by the cooperative learning model of Student Team Achievement Division type was better than conventional learning. It can be concluded that cooperative learning model of Student Team Achievement Division type influenced concept understanding ability of mathematics of fifth grade elementary school state 060819 of Medan academic year of 2016/2017.

Keywords:-*Concept Understanding Ability of Mathematic, Cooperative Learning Model, Student Team Achievement Division.*

1. INTRODUCTION

Education in the country of Indonesia is done in an effort to improve the quality of society. The success of an education can be seen from the success of the learning process. The higher the success rate of the learning process then the quality of society in the country the better. This is in accordance with Permendiknas No. 20 of 2003 which states that education is a conscious and planned effort to create an atmosphere of learning and learning process so that students actively develop their potential to have spiritual spiritual strength, self-control, personality, intelligence, noble character, as well as the skills needed by him / herself, nation and state.

Mathematics is a pure science that is very useful, especially in everyday life. The purpose of learning mathematics in school, quoted from Permendiknas No. 22 in 2006 is that students have the ability to understand mathematical concepts, using reasoning in patterns and traits, solving problems, and communicating ideas with symbols, tables, diagrams or other media to clarify circumstances or problems. In the purpose of learning mathematics mentioned above can be done well if students have a good concept of understanding. So it can be concluded we can achieve the objectives of other mathematics learning if the understanding of mathematical concepts has been achieved well. This is in line with the opinion of Ruseffendi (2006: 156) that there are many learners who, after learning mathematics, are unable to understand even in the simplest parts, many concepts are misunderstood so that mathematics is regarded as difficult and difficult.

Achievement of learning objectives of mathematics in schools certainly can not be separated from the role of teachers. In this case, the teacher as a learning facilitator is demanded creatively. Based on the results of interviews of

mathematics teacher grade V in elementary school state 060819 Medan, students of grade V elementary school has a low ability in learning mathematics, thus impacting on the low understanding of mathematical concepts in math-matika lessons. This can be seen from the average value of the odd semester class of the academic year 2016/2017 is 46.48 which is still below the criteria of minimal mastery.

One of the causes of the low understanding of mathematical concepts in mathematics lessons is that teachers dominate in the learning process. The formulation of the problem in this research is "Does the cooperative learning model of Student Team Achievement Division type influence the students' understanding of mathematical concept?". The purpose of this study is to determine the effect of cooperative learning model of Student Team Achievement Division type to the students' understanding of mathematical concepts.

Piaget (in Trianto 2009: 29) in the view of constructivism views cognitive development as a process whereby children actively build systems of meaning and understanding of reality through their experiences and interactions. John Dewey (in Dimyanti and Mudjiono, 2010: 44), defines learning as a process through integration, experience, knowledge, observation and action.

Ratumanan (2004: 45) suggests that Vygotsky's work is based on two main ideas. First, intellectual development can be understood only when viewed from the historical and cultural context of the child's experience. Second, development depends on signaling systems referring to symbols created by culture to help people think, communicate and solve problems, thus the cognitive development of children requires a system of cultural communication and learning to use these systems to adapt thinking processes self.

According to Slavin (Ratumanan, 2004: 49) there are two major implications of Vygotsky's theory in education. Firstly, it is desirable that classroom settings take the form of cooperative learning between different groups of students with different abilities so that students can interact in difficult tasks and generate effective problem-solving strategies within their respective proximal development areas. Second, Vygotsky's approach to learning emphasizes scaffolding. With scaffolding, the longer the students are able to take responsibility for their own learning.

Skinner (Trianto, 2009: 89) believes learning is a stimulus and response relationship that is created through the process of behavior. Moving from the above opinions about learning, generally speaking of these opinions there are similarities in meaning, namely the definition of learning concepts point to a process of behavioral or personal change of a person based on a particular practice or experience that begins the stimulus and response as a series of activities carried out A person in his interaction with an environment that produces changes in himself, both his knowledge, attitudes, and skills.

The learning model of cooperative learning type Student Team Achievement Division is a learning model that forms a learning group consisting of 4-5 people, in which members of the group are heterogeneous, which means having differences in academic ability, gender, ethnicity, and race . And eventually the students will help each other in understanding the concepts, discussing in solving problems and tasks given by Master. Where the Student Team Achievement Division's learning model also has a goal, so that students' academic learning outcomes are improved and students can receive a variety of diversity from their peers, as well as develop social skills.

The steps are as follows:
1) Teachers form groups of 4 people heterogeneously (mix by achievement, gender, ethnicity, etc); 2) The teacher presents lessons; 3) The teacher assigns a task to the group to be done by the group members. Its knowing members explain to the other members until all the members in the group understand; 4) Teacher gives quiz / question to all students. When answering a quiz can not help each other; 5) Evaluate; 6) Conclusion.
According to Davidson (in Nurasma, 2006: 26), the advantages of Student Team Achievement Division learning model include: improving individual skills, increasing group skills, increasing commitment, eliminating prejudice against peers, not competitive
According to Slavin (in Nurasma 2006: 2007), the lack of learning models of Student Team Achievement Division types are: the contribution of low achieving students to less, high achievers will lead to disappointment because the role of clever members is more dominant.

2. METHODOLOGY

This research was conducted in class V semester I of academic year 2016/2017 elementary school state 060819 Medan which is located at Jl. Brother No. 66A Kelurahan Sudirejo II Medan City. The population of this research is the students of class V consisting of two classes namely VA class amounted to 36 and VB which amounted to 36 people. The VA class class becomes the experimental class and the VB class becomes the control class. This study is a quasi-experimental research that aims to determine the effect of cooperative learning model of Student Team Achievement Division type to the students' mathematical concept. The design of this research is posttest only control design.

Table 1 Research Design

Group	Treatment	Posttest
E	X	O_1
P	C	O_2

Information:
E   : Experiment class
P   : Control class
X   : STAD type learning
C   : Conventional learning
O1: Post-test scores on the class
      Experiment
O2: Post-test scores on the class
      control

The steps in this research are:
1. School orientation, to know the number of classes, number of students, how teachers teach and characteristics of students
2. Develop a lesson plan (RPP) for the experimental class and control class
3. Preparing the test instrument and its scoring rules
4. Validate the instrument
5. Conducting an instrument test
6. Repair the instrument
7. Conducting treatment in the experimental and control class
8. Conducting test on expression-class and control class
9. Analyzing data
10. Make a conclusion.

The data in this research is the value data understanding of mathematical concepts obtained by the method of ability to comprehend the concepts of mathematical students at the end of learning (posttest). Instruments in this study is a tool of understanding the concept of students in the form of questions in the form of description. Preparation of research instruments is done by making lattice problem, item about essay, and rubric of assessment. The item must meet the qualification of the question that is suitable for data retrieval, which must be valid and reliable.

After the test question is valid, test is done about the test in class V elementary school state 060819. After testing the reliability test, then analyze the test results to determine the reliability. According to Arikunto (2007: 109) a test is said to be reliable if the reliability coefficient is> 0.70. Based on test test analysis, test instrument coefficient obtained r11 = 0,73. Then the test instrument is considered reliable and can be used in research to measure students' mathematical understanding.

After the calculation of the test results data understanding of mathematical concepts to the class that uses cooperative learning model of Student Team Achievement Division type and class using conventional learning, obtained data summarized in the following table:

Table 2 Summary Data Test Result Ability Understanding Mathematical Concepts

Class	average	Standard deviation
STAD	61,22	10,94
Conventional	53,75	13,29

Based on the data in Table 2, the average grade of the Student Team Achievement Division is more than the average grade in the conventional class. Furthermore, the prerequisite test is tested normality and homogeneity test.

Table 3 Summary of Test Results Data Normality Ability Understanding Student Mathematical Concept

Class	X^2_{count}	X^2_{table}	Test Decision
STAD	5,02	9,49	Accept H_0
Conventional	1,63	9,49	Accept H_0

Based on Table 3 summarizing the results of normality test data of the ability of understanding of mathematical concepts above, it can be seen that $X2_{count}$ of cooperative learning model type Student Team Achievement Division and conventional $<X2_{table}$. Means the normality test decision in this study is receive H0 which means the sample data comes from the normal distributed population.

Table 4 Summary of Homogeneity Data Test Results Ability to Understand Student Mathematical Concept

Class	F count	F table	Test Decision
STAD Conventional	1, 47	1,78	Accept H_0

Based on Table 4 summarizes the results of homogeneity test of the ability of the mathematical concepts above, it can be seen that the data of students' mathematical concept comprehension using cooperative learning model of Student Team Achievement Division type and students using conventional learning has F arithmetic <F table which means receive H0 And both populations have the same variance. Based on prerequisite test result, it can be concluded that both data are normal and homogeneous distributed, hence hypothesis test using t-test.

3. RESULT AND DISCUSSION

After the prerequisite test and the result of the two data are normal and homogeneous distribution, then do hypothesis test using t-test.

Table 5 Summary of Hypothesis Test Results Data Ability Understanding Student Mathematical Concept

Class	T count	T table	Test Decision
STAD Conventional	2,56	1,67	Accept H_0

Based on the results of the calculation of conceptual ability data, obtained t arithmetic> t table with $\alpha = 0.05$ and dk = 70 then the decision test reject H0 and accept H1 which means that the average value of the ability of understanding the concept of a class that uses cooperative learning model type Student Team Achievement Division is more than the average value of conceptual understanding in a class that uses conventional learning.

The above test results are in accordance with the research of Tran (2013) quoted from International Journal Sciences under the title Effects of Student Teams Achievement Division (STAD) on Academic Achievement, and Attitudes of Grade 9th Secondary School Students toward Mathematics. This study examines the effects of cooperative learning on

academic achievement in mathematics and attitudes of 74 9th grade mathematics students on mathematics at a Vietnamese high school. Using a group-independent none-comparison-pre-test-post-test nonequivalent and t-test for independent samples, it was found that after about 5 weeks the students (n = 36) who were instructed to use cooperative learning achieved significantly higher scores in post-test math than students N = 38) were instructed to use lecture-based teaching, t (72) = 2.68, dk = 58.49, p <0.05. The results of this study also reported that the experimental group had significantly higher scores than the control group on both the Pleasure and Values of attitude scales on mathematics (t (72) = 2.81, dk = 53.68, p <0.05; t (72) = 2.86, dk = 55.58, p <0.05, respectively). The study concludes that cooperative learning is effective in improving the level of academic achievement of participating students, and in promoting students' positive attitudes toward math at Vietnamese high school level.

According to Genkosman's research (2012) quoted from the Journal of Baltic Science Education with the title Effect of Student Teams Achievement Divisions Technique Used In Science And Technology Education On Self-Efficacy, Test Anxiety And Academic Achievement. The study aims to determine the effect of teaching "Generation and Motion" units of Science and Technology classes using Student Teams Achievement Divisions (STAD) techniques on self efficacy, anxiety tests and academic achievement of seventh grade students. STAD technique was applied to the experimental group; Existing programs based on constructivism to control-1 groups, and traditional teaching methods for control-2 groups. The analysis of the obtained data is achieved by using one way variance analysis (ANOVA). In conclusion, it was determined that the experimental group was more effective than the control group in terms of self-efficacy and academic achievement. In addition, significant improvements were gained in student exam anxiety in experiments and control-1 groups compared to those in which traditional teaching methods were used.

In addition, according to Pandey Research (2003) quoted from the Journal of Science and Mathematics Education in s.e. Asia with the title Effect of Cooperative Learning on Cognitive Achievement in Science. This study examines the influence of one method of cooperative STAD learning on achievement in science in the Indian context. This study uses two intact classes of class 9 students with 36 students. Both classes are taught the same context for a duration of twenty five instruction days. Students in the experimental class work in small heterogeneous groups studying the content while the other classes are taught by traditional lecture-discussion methods. Student outcomes are measured by the development of achievement tests for this purpose. Data were analyzed through covariance analysis

Reveals that STAD is more effective than traditional methods for knowledge levels as defined by Bloom's taxonomy. However, both methods are found equally effective for the level of understanding. Theoretically, learning with STAD type cooperative learning model is better than conventional learning model. In STAD type cooperative learning students are required to think and cooperate with their group in doing the LAS, helping each other and ensuring that each student must understand the material because at the end of the learning the students are given the test individually without helping each other. Students look enthusiastic in paying attention to teacher explanations because students want to be best for personal or group interests to increase individual or group points in order to gain an award. To gain group awards, each group member has the same responsibility. Therefore, students are more eager to learn so that students are motivated to improve material understanding that can automatically optimize their learning outcomes. If difficulties occur in the discussion, students do not hesitate to ask the teacher. This shows that the ability of teachers as facilitators in managing learning is necessary for the learning process to run effectively.
In conventional learning students are required to work individually to solve existing problems so that students are embarrassed and afraid to ask friends or teachers about problems that have not been understood. This can be seen from the average of achievement of student indicator that use STAD type cooperative learning is higher than students using conventional learning.

This research is said to be successful or have an effect on the understanding of mathematical concepts of students when the understanding of mathematical concepts of students who are taught by using STAD type cooperative learning model is higher than the class taught by conventional learning model. When viewed from the minimal criteria specified minimal, STAD learning gives effect because the average understanding of mathematical concepts of students is higher than the minimum mastery criteria. This is because students who score above the minimum criteria mastery.

4. CONCLUSION
                 Based on the results obtained, it can be concluded that taught with cooperative learning model type Student Team Achievement Division gives influence to the ability of understanding mathematical concepts of students. Student Team Achievement Division cooperative learning can help students to be more enthusiastic and responsible in learning so as to help students to absorb the material better. This can be seen in the results obtained, that the ability to

understand the mathematical concepts of students using cooperative learning type Student Team Achievement Division better than the understanding of mathematical concepts of students who use conventional learning. Thus the application of cooperative learning model type Student Team Achievement Division have a positive effect on the understanding of mathematical concepts of students of grade V elementary school state 060819 Medan academic year of 2016/2017.
The authors propose some suggestions to:
 a. Teachers who teach in elementary school to use innovative learning strategies or models in teaching one of them is a model of cooperative learning type Student Team Achievement Division as an alternative in learning mathematics.
 b. For advanced researchers to study more deeply about cooperative learning model of Student Team Achievement Division type on other subject and other variables.

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