COMPARISON OF LEARNING MATH LEARNING RESULT STUDENTS WITH SAVI MODEL AND NHT MODEL ON STUDENT SMKN 1 KOLAKA

The formulation of the problem in this research are: (1) How the result of learning mathematics of students after taught by SAVI learning model?, (2) How the result of learning mathematics of students after taught by NHT learning model?, (3) Is the result of learning mathematics of students who taught with SAVI learning model is higher than students taught by NHT learning model. The purpose of this study are: (1) To know how the results of learning mathematics students after teaching with SAVI learning model, (2) To find out how the results of learning mathematics students after being taught with NHT learning model, (3) To determine whether the results of learning mathematics students taught by SAVI learning models higher than students taught by NHT learning models. Type of research using experimental method. The population in this study is all students of class X spread in 11 parallel classes with the number of 310 people. Sampling was done by using cluster random sampling technique. In this research as a sample taken 2 classes from the entire population that is class X A3 as experiment class 1 using SAVI learning model and class X A1 as experiment class 2 using NHT learning model. From result of data analysis obtained that: (1) result of student learning taught by using SAVI learning model which consist of 25 students show minimum value 62, maximum value 96, mean (mean) 80,36, with standard deviation 9,10; (2) student learning outcomes taught using NHT learning model consisting of 25 students showing minimum score 62, maximum value 96, mean (mean) 79,62, with standard deviation 10,512; (3) result of t-test analysis using independent sample t-test obtained tcount = 0,302 at = 0,05 with degrees of freedom (dk) = 48 obtained t table = 2,011. Because t < t table then Ha is rejected and H0 is accepted. So it can be concluded that the mathematics learning outcomes of students who were taught with the SAVI model was not higher than the students taught by the NHT model.

Kata Kunci: Cooperative Learning, SAVI, NHT, Mathematics learning outcomes.
A. Introduction

Each media, approach and teaching methods used by teachers in teaching is very influential on student learning outcomes both learning outcomes in terms of cognitive, affective and psychomotor. Teachers have four strategic roles in educational activities that is as educator, facilitator, motivator, evaluator. Teacher as an educator means there are two things that must be done by the teacher, which teaches children the virtues of goodness and familiarize children do good. As a facilitator means teachers are expected to be able to manage the class well, as a motivator means teachers always provide positive inputs to students, so that students are excited and enthusiastic in learning, as evaluators means teachers should be able to evaluate student learning outcomes.

In relation to the lessons learned, Suyono (2006: 13) said that the weakness of mathematics learning done by teachers in school are: (1) the low ability of teachers to use varied teaching methods, (2) the teaching ability of teachers is only limited to answer the questions, (3) teachers are reluctant to change teaching methods that are already considered to be true and effective, and (4) teachers only use conventional learning methods without regard to students' thinking. This can lead to less active students and lower the students' learning spirit. Therefore, teachers are required to understand and be able to apply various models of learning are "appropriate" with the specificity of the material and characteristics of students so as to facilitate student activity in learning.

Based on information obtained from mathematics teacher at SMKN 1 Kolaka, especially class X teachers that students sometimes have difficulty in solving problems given, especially questions that form the story or the story. This is because students may not understand and understand the purpose of the given problem, and even the students seem passive when given the questions to be solved. The results of interviews with some students in SMKN 1 Kolaka obtained information that some students if given the problems very difficult to answer because they do not understand the purpose of the given problem. As a result students feel that math is a very difficult lesson.

With the difficult conditions of students in solving the problems given, which occur in the field, then a teacher in the learning process needs to use an approach, methods, and teaching techniques that can directly activate students in the learning process, especially in solving problems given by the teacher. One of the students 'difficulties in solving such problems is the lack of students' ability to examine the purpose of the given problem / question. So that needed an approach that will give solution in solving problem experienced by student that is by using model approach of Somatis, Auditory, Visual, and Intellectual (SAVI) that direct student to learn involve entire body and mind, learn by talking and listening, observing, , and learning with problem solving or reflection and using the Numbered Heads Together (NHT) approach model where students are numbered by teachers in a group so that each student on the team has a different number, so the teacher mentions a number and from each group with the same number raised hands to prepare answers for the entire class so that student s' involvement in working on the given questions is more assured. In other words, the use of SAVI or NHT methods together using cooperative learning model where students are divided into several groups and given opportunities to work together and responsible in solving problems and motivating each other to achieve among members of the group.

Based on the description put forward, then in general the problem in this study are:
1. How is the result of mathematics learning after being taught by SAVI learning model?
2. How are students' mathematics learning outcomes after being taught using the NHT learning model?
3. Are the students' mathematics learning outcomes taught by the SAVI learning model higher than those taught by the NHT learning model?

The purpose in this study as follows.
1. To find out how the results of learning mathematics students after being taught by SAVI learning model
2. To find out how the results of learning mathematics students after being taught with NHT learning model

To find out whether the mathematics learning outcomes of students taught by the SAVI learning model are higher than those taught by the NHT learning model.

B. Literature Review

Learning Outcomes of Mathematics

Ali (2007: 14) states that the nature of behavior change in learning is permanent. Thus the learning outcomes can be identified from the ability to do something permanently, can be
repeated with the same results. Learning outcomes are the abilities that students get after learning. According Sumarni (2007: 30) there are three aspects of learning are cognitive, affective, and psychomotor. Thus, the result of the mathematics learning that is intended in this study is the value obtained by students in the field of mathematics study during the learning process which can be assessed from the test of learning outcomes and activities during the learning process.

**Cooperative Learning Model Type SAVI (Somatic, Auditory, Visual, and Intellectual)**

SAVI stands for Somatic, Auditory, Visual, and Intellectual. SAVI belongs to a student-centered approach (Student Centered Approach). DePorter (2000: 112) reveals that children have 3 different learning styles as an early modality in learning that is Visual, Auditory and Kinesthetic / Somatic.

Based on the basic ideas of Meier (2002: 99), learning using SAVI principles is as follows:

1. **Somatic**
   "Somatis" is derived from Greek which means body / soma. So, learning somatic means learning by using the sense of touch, kinesthetic, practical-involving the physical and using and gestures while learning.

   Here are some ways that can be used to optimize learning somatis:
   1. Make a model in a process,
   2. Physically move the various components in a process or system,
   3. Creating charts, diagrams, pictogram,
   4. Demonstrate a process, system, or a set of concepts,
   5. Completing a project that requires physical activity,
   6. Conducting active learning training (simulation, learning games, etc.),
   7. In teams, creating active learning training for the whole class

2. **Auditory**
   Auditory thinking is stronger than imagined. Everyone who speaks and hears, some important areas of the person's brain become active. Learning auditory becomes very important even has become a standard way of learning for all people since the beginning of history.

   Here are some ways that can be taken to optimize auditory learning activities in learning mathematics for example:
   - Talk about what is learned and how to apply it.
   - Ask students to model something and explain what they did.
   - Listen to the material presented and summarize it.

3. **Visual**
   Visual acuity is very strong in each individual because in the brain more devices to process visual information than other senses. Visual learning learns best if they can see examples from the real world, diagrams, idea maps, icons, images, and images of all kinds of things while they are learning

4. **Intellectual**
   Intellectual is the creator of meaning in the mind, the means by which humans "think", unite experiences, create new neural networks, and learn. In the absence of intellectual learning, any learning training would be superficial, as well as what happens on learning that involves only the aspect of S-A-V, without the intellectual of this lesson only promising at the beginning of learning, but will be annihilated when the rains of reality come down. This shows how important it is to incorporate the intellectual aspects of learning.

**Cooperative Learning Model Type NHT (Numbered Heads Together)**

Numbered Heads Together (NHT) is one of the structural methods in cooperative learning. Yulianingsih (2010: 11) states that by involving the people students in reviewing the material covered in a lesson and checking or checking their understanding of the content of the lesson. Ibrahim (2000: 33) instead of direct questions to the whole class, the teacher uses a 4-step structure, which is as follows:

a. **Step 1 - Numbering**
   Teachers divide the students into groups or teams of 3 to 5 people and give them a number so that each student on the team has a different number.

b. **Step 2 - Questioning**
   The teacher asks the students questions. Questions may vary, from specific to general.

c. **Step 3 - Thinking Together (Heads Together)**
   All group members discuss questions from teachers and make sure each member knows the answer to the question.

d. **Step 4 - Answering**
The teacher mentions a number and the students from each group with the same number raised their hands and prepared the answers for the whole class.

C. Methodology
This study used experimental method, by looking at the comparison of students’ learning outcomes with different treatment. In this study there are two variables are as follows:
Results of mathematics learning of students who were taught by SAVI learning model and mathematics learning outcomes of students who were taught with NHT learning model.
The design used in this research is posttest-only control design. In this design, there are two groups of each selected randomly (R).
This research was conducted at SMKN 1 Kolaka which is located at Laloeha Village, Kec. Kolaka, Kolaka District, Southeast Sulawesi. This research will be conducted on 17 May - 17 June 2017. Population in this research is all student of class X SMKN 1 Kolaka Lesson Year 2016/2017 as many as 11 class. In this study as a sample taken 2 (two) classes of the entire population. From 2 (two) classes, will be treated with the model of SAVI (Somatis, Auditory, Visual, and Intellectual) and treated with NHT (Numbered Heads Together) model. Based on how to determine the size of the sample, the sampling technique of the population in this study using cluster random sampling.
Data collection techniques is an activity to obtain the data needed to be processed and presented in accordance with the problems encountered.
The data used in this research are:
1. Quantitative data, which is a test result of learning mathematics students SMKN 1 Kolaka.
2. Qualitative data, ie data in the form of results of teacher observation sheet and student observation sheet.
Technique of collecting data which is done by using the test, used to capture the data of mathematics learning result of students after given the material of mathematics lesson, and data about the implementation of learning and student activity in the form of observation sheet.
The instrument used in this research is a test of ability to solve math problems, which where there are two classes that are given different treatment and in the form of mathematics learning result in the form of essay test.
Validity Problem Problem Analysis
Test validity Validity of item is used to know the support score of each item to the total score. The greater the score the score of the item to the total score, the higher the validity of the item. Thus, to test the validity of each item, then the score of each item is correlated with the total score using Product Moment correlation formula.
Reliability Test Analysis
Understanding reliability refers to the accuracy of the results obtained from a measurement. Nasution and Suryanto (2007: 5.5). After tested the level of validity, then each instrument tested its level of reliability by using the alpha-Crombach formula.
Data Analysis Technique
Data analysis techniques in this study consist of descriptive data analysis and inferential data analysis. The descriptive analysis in this study consisted of: Analysis of teacher activity observation sheet, Analysis of student activity assessment sheet, and Analysis of student mathematics learning outcomes covering mean, standard deviation and variance.
Normality test conducted to determine the normality of existing data in this study. To test the normality of sample data using Chi-Square formula.
This homogeneity test is used to find out whether the two groups have the same level of data variance or not. To test the homogeneity using the F fisher formula.
In testing hypothesis used t-test. The data in this study are normally distributed and homogeneous variance
Hipotesis Statistik
The statistical hypothesis in this research is as follows:
\[ H_0: \mu_1 \leq \mu_2 \]
\[ H_a: \mu_1 > \mu_2 \]
Information:
\[ \mu_1 = \text{average learning outcomes of students taught by the SAVI method} \]
\[ \mu_2 = \text{average learning outcomes of students taught by NHT method} \]
\[ \mu_1 \leq \mu_2 = \text{the mathematics learning outcomes of students taught by the SAVI model were not higher than those taught by the NHT model} \]
\( \mu_1 > \mu_2 \) = the mathematics learning outcomes of students taught by the SAVI model were higher than those taught by the NHT model.

D. Finding and Discussion

1. Findings

Based on the results of descriptive analysis, students’ mathematics learning outcomes that were taught using SAVI learning model (experiment class 1) consisting of 25 students obtained a minimum score of 62, a maximum value of 96, a mean of 80.36 with a standard deviation of 9.10 and mathematics learning outcomes of students taught by the NHT model (experimental class 2) consisting of 25 students obtained a minimum score of 62, a maximum value of 96, a mean of 79.62, with a standard deviation of 10.512. By looking at the percentage of student activity in the process Learning using the SAVI model at the first meeting 90.00% and the second meeting 91.43%. While the average value of the percentage of student activities in the learning process using the NHT model at the first meeting 90.77% and the second meeting 92.31%. The mean value of teacher activity percentage in learning process in experiment class 1 at first meeting 89.23% and second meeting 93.85%. While the average value of teacher activity percentage in learning process in experiment class 2 at first meeting 90.00% and second meeting 94.29%. This can be seen in the following table:

<table>
<thead>
<tr>
<th>Data Description</th>
<th>Experiment 1</th>
<th>Experiment 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Mean</td>
<td>80.36</td>
<td>79.62</td>
</tr>
<tr>
<td>Standar Deviasi</td>
<td>9.10</td>
<td>10.512</td>
</tr>
<tr>
<td>Maksimum</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>Minimum</td>
<td>62</td>
<td>62</td>
</tr>
</tbody>
</table>

The result of hypothesis test using t-test with \( df = 48 \) at significance level \( \alpha = 0.05 \) obtained by \( t_{count} = 0.302 \) and \( t_{table} = 2.011 \). Since \( t_{count} < t_{table} \), the hypothesis testing with t-test shows that Ha is rejected, inferentially this means that there is a significant difference between the SAVI learning model and the NHT learning model.

2. Discussion

The average difference of mathematics learning outcomes taught by using SAVI and NHT learning model is due to the experiment class 2 students are trained and accustomed to the problems given by the teachers because in the process of learning model NHT students are required to prepare answers for the whole class according to the question which teachers provide with the numbering process for each different student. So the involvement of students in working on the given questions is more secure and when students do post-test questions, they are not too difficult to solve. This is in accordance with the statement of Yulianingsih (2010: 11) which states that by involving the students in reviewing the material covered in a lesson and checking or checking their understanding of the content of the lesson. Ibrahim's statement (2000: 33) states that instead of direct questions to the whole class, the teacher uses a 4-step structure, namely (1) Numbering, (2) Questioning, (3) Heads Together, and (4) Answering. And from Yusrianingsih's research (2012: 45) to students of SMPN 1 Baula concluded that there is a significant difference in the students' mathematics learning outcomes that were taught using NHT type cooperative method and TGT type cooperative method.

E. Conclusion

1. The average of mathematics learning result of grade X A3 students who were taught by SAVI learning model which consist of 25 students showed showed minimum value 62, maximum value 96, mean (mean) 80.36, with standard deviation 9.10.
2. Mean of mathematics learning result of class X A1 students taught by NHT learning model which consist of 25 students showed minimum score 62, maximum value 96, mean (mean) 79.62, with standard deviation 10.512.
3. Mathematics learning through NHT learning model is better applied in class X SMKN 1 Kolaka than SAVI learning model especially on linear inequality system material.
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