
Differences In The Ability Of Mathematical Communication Of Students Who Are Taught By The Method Of Elaboration And Cooperative Type Stad On The Material Logic

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ABSTRACT

The purpose of this study was to determine the use of the method of Student Teams Achievement Division (STAD) on the material of Learning mathematics with the method of Elaboration there are differences in the Ability of Mathematical Communication on the Material Logic. The population of this research there are 80 students. The sample of this research is class X-1 as an experimental class that diajarkan with STAD totaling 40 students, and the class X-2 as the control class taught by the method of Elaboration by the number of students 40 students. The average score of posttest experimental class one $\bar{x}_1 = 5,83$ with sandart deviation $se_1 = 2,41$, while the average score of posttest experimental class two $\bar{x}_2 = 7,29$ with a standard deviation $se_2 = 2,69$. The difference score is the average value of Posttest for the experimental class two with the use of model elaboration is high compared to the score of the average value of posttest by using the cooperative model STAD of 1.46 with a standard deviation of 0.28. Based on the scores of posttest class ekaperimen one and experiment two, the obtained results of the test of significant t-test, so that the obtained value of $t = 4,48$ Results are in accordance with the testing criteria that H_0 is accepted $t_{table} > t$ or $-3,96 < 4,48$. From the description above it can be concluded that there is a difference of students who are taught with STAD by the method of Elaboration on the Material Logic. Where the alternative hypothesis (H_a) is accepted and at once reject the Hypothesis of Zero (H_0) with the good category.

Keywords : Student Teams Achievement Division (STAD), the Ability of Mathematical Communication

INTRODUCTION

one of the learning methods that are creative, innovative in improving the thinking skills mathematics level high is a method of cooperative STAD. Cooperative learning STAD is a method of learning that their students are formed into small groups consisting of 4 to 6 people, work collaboratively with the structure of the heterogeneous group (Slavin,1995) approach or a series of strategies specifically designed to give a boost to the students to cooperate during the course of the learning process and look for yourself based on the knowledge they already have (Haryanto,2000). Cooperative learning Model STAD demanding the cooperation of students and interdependence in the structure of the task, purpose, and reward/award. The structure of the task trigger to 2 things, namely in the way of learning that is organized and the type of activities performed by the students themselves. Cooperative learning Model STAD demanding the cooperation of students and interdependence in the structure of the task, purpose, and reward/award. The structure of the task trigger to 2 things, namely in the way of learning that is organized and the type of activities performed by the students themselves. Cooperative learning STAD can help improve communication skills in the students and can improve the positive attitude in mathematics. To individual students build confidence in their ability to solve maths problems. It will be able to reduce or even eliminate the feeling of anxiety towards mathematics (mathematics anxiety) experienced by many students. This study focuses on the subject of Logic, because on the subject of this often happens penyampaiaan learning materials that are less precise, misalkan course the Logic is delivered with a lecture course. Whereas in this subject students are required capable of constructing knowledge in the mind and demanded to be able to berimajinasai in mind and demanded to be able to imagine in the space, and they themselves must be actively involved in all processes of the learning activities of mathematics. So the students are able to even adept at connecting mathematics and communicate mathematics find useful for themselves and this effect on student learning outcomes. The teacher only as a facilitator. Based on the description above that the results of learning mathematics sangatlahdibutuhkan communication between students and teachers both in the methods of elaboration and methods of cooperative STAD , because of the communication skills of students in mathematics learning is one key to success in learning mathematics. Therefore, based on the description above , the researcher interested in examining the success of the students communicate mathematics with through the application of a method of learning and poured in the thesis entitled : “Differences in the ability of mathematical communication of students who are taught by the method of elaboration and cooperative type STAD on the material Logic.

RESEARCH METHODS

Learning Elaboration

Learning elaboration is learning to add any additional ideas based on what a person already know before. For the achievement of the learning objectives of a material is necessary learning model that has been prepared in such a way, so we move the hierarchy of conceptual ketas and down for the information presented. One learning model that can move the hierarchy of conceptual up and down is for the information presented is a model of elaboration. Model elaboration is a model who started teaching by giving a general

explanation, simple, and fundamental, or in other words, this concept should be explained by the logic of deduction right.

This Model gives preception to create the structure and to sort the topic of teaching. But this model does not provide a guide to teach parts of the knowledge and skills of individuals with regard to the topic of the. Model elaboration is the integrity of a number of theories on strategy macro is done. By Reigeluth in (Hamzah, 2007).

Table 1. Learning steps Elaboration

Fase	Activities
I	Analysis of the purpose and characteristics of the field of study : at this stage a designer of learning set learning goals that will be implemented.
II	Analysis learning resources: determine the sources of learning that can be used and determine the constraints that may arise.
III	Hold the estimation of the things that are associated with learning resources.
IV	Analysis of the characteristics of students : make observations on the characteristics of the students.
V	Set learning objectives and content of learning : creating learning objectives (TPK/ICT), further define the specification or what the results will be obtained by students in each chapter on the process of learning.
VI	Setting the strategy of organizing the content of learning : determine how the learning will be organized.
VII	Set the strategy, learning management : the management of learning is highly dependent on the efforts of designers of learning in determining the character of the students. because in this stage the required input on the characteristics of the students in an attempt to determine the scheduling of the use of the components of the strategy of organizing the delivery of learning, pengelolaan motivational, making note of the progress of student learning and control of learning (Degeng, 1997:16)
VIII	Measurement of learning outcomes include the level of effectiveness, efficiency, and attractiveness of learning.

Isjoni (2009:91) Student Teams Achievement Division (STAD) is a cooperative approach to the most simple. Methods of learning STAD app Developed by Slavin (2008), this method is a learning method that is based on cognitive theory. STAD is one type of cooperative learning to encourage students to help each other and motivate mastering the skills given by the teachers. The teacher creates an environment that is conducive, while students should be able to find and solve the problem themselves without the learning process. The implementation of the method of learning STAD has the following steps (a) presentation of the subject matter of materials or the subject matter of mathematics introduced by the teacher through the presentation of the material or the presentation in class X.

The presentation of the subject matter is done by teaching directly. The presentation of the material is need to emphasize on 3 stages, among others : (1) introduction, development and practice of controlled, (2) the activities of the group, the group formed by the teacher in a heterogeneous, so that at the time of the discussion will be started, all the students sat down in accordance with their respective groups. For learners working in groups, the teacher as the

facilitator to monitor the activities of each group, (3) the implementation of the quiz of the individual, the quiz individually implemented after one or two periods of delivery of material by the teacher or after one or two periods of group work, (4) the value of the development of the individual values individual development aims to provide maximum final results in learners. It is based on the initial value obtained from the average value of the students on the implementation of the same test ,(5) reward, the reward is pengakuan or award in learning. This award can be realized by giving something good or useful gifts for the learning activities at the next meeting. Giving penghargaan not necessarily based on the observation of the course, the teacher can also apply the principle of individual points, the points the group also is a combination of individual points obtained by each member of (lie,2002). The value of the development of the acquired group included in the three levels of awards to the group's achievements, namely : super team or a team of privileged, great team or a great team, and a good team or a team better. STAD is one type of learning to encourage students to help each other and motivate mastering the skills given by the teachers.

RESULTS AND DISCUSSION

Type Of Research

This type of research is quasi-experimental research(Quast Experiment) about the differences in the ability of mathematical communication of students taught with the type of model elaboration and students who are taught with STAD cooperative model. This study was conducted to determine whether learning method type elaboration gives a significant influence on the ability of mathematical communication students compared with STAD cooperative.

Description Of The Data

This study aims to determine the difference of Cooperative learning model STAD and model Elaboration on the ability of mathematical communication of students on the material Logic. The Data obtained in this study is the result of the value of learning mathematics students in class X1 and X2, each of which consists of 42 students by doing a test.

On the Test communication of students in the teaching with the use of the cooperative method of obtaining the average value of 5.83 while students who were taught by using the method of elaboration to obtain the average value of 7.29.

The Results Of The Tests Of Mathematical Communication Students Communication of Student Learning By Using the method of Cooperative.

For the students who were given learning by the method of Cooperative STAD values obtained while the average value of 5.83 by the standard deviation to 2.41.

Be aware that classroom experiments using the Cooperative method is obtained which has the ability of mathematical communication there are 14 students (33% of students have the ability of mathematical communication high), 21 students have the ability of mathematical communication medium (50% students have the ability of mathematical communication seating) and 6 students have the ability of mathematical communication is low (17% of students have the ability of mathematical communication low).

Communication Of Student Learning By Using The Method Of Elaboration

Students are given learning By the Method of Elaboration obtained the average value of n the average value of posttest of 7.29 with a standard deviation of 2.69.

Be aware that classroom experiments using the method of Elaboration of the obtained which has the ability of mathematical communication, there were 36 students (85% of students have the ability of mathematical communication high), 4 students have the ability of mathematical communication medium (10% of students have the ability of mathematical communication seating) and 2 students have the ability of mathematical communication is low (5% of students have the ability of mathematical communication low).

4.3 Hypothesis Testing

The test result of the increase in the average pretest score of the students kelompok experiment one and experiment two have indigo t is in the interval $-t_{count} < t_{table}$, it can be concluded that the scores of the students in the class eksperimen one and experiment two relatively the same or it can be said there is no influence students ' mathematics learning outcomes in both groups.

The hypothesis to be tested is :

$$H_0 = \mu_{e1} = \mu_{e2}$$

$$H_1 = \mu_{e1} \neq \mu_{e2}$$

With :

μ_{e1} =Mean pretest mathematics learning outcomes of students in the experimental class one

μ_{e2} = Mean pretest mathematics learning outcomes of experimental class students two

H_0 = the Hypothesis of increased where the mean pretest class experiment one and experiment two are not different / same

H_1 = a working Hypothesis where the mean pretest class experiment one and experiment two different / not the same.

The value of t_{table} with degrees of freedom $df = 42+42- 2 =82$ and $\alpha = 0,01$ (test two parties $\frac{1}{2} \alpha = 0,005$) of 3.96. Testing criteria is H_0 is accepted if $-3,96 > t_{count} > 3,96$, in addition H_0 is rejected. Because t_{count} are outside $-3,96$ up of 3.96, then in this research, the H_0 is rejected and at once receive H_a .

It can be concluded from the results of the average value of the pretest and posttest experimental class one and class experiment two, with the value of the average pretest score $x_{e1} = 5,83$ with standard deviation = to 2.41, while $x_{e2} =$ of 7.29 with standard deviation = 2,69 there is a difference between the communication skills of students who are taught with the model elaboration and cooperative STAD on the material.

Discussion

From the results of hypothesis testing showed that there was a significant difference between the ability of mathematical communication of students taught with the use of model elaboration and methods of cooperative STAD . Thus it can be concluded that the hypothesis alternatif (H_a) is accepted and at once reject the hypothesis of zero (H_0). And from the findings of this research can be known that the ability of mathematical communication of students as a result of learning, which is taught with the model elaboration is better than the communication skills of students who are taught with STAD is in accordance with that expressed by (Slavin,2005)

Learning using STAD Cooperative Can be said to have the ability of mathematical communication students high but just need more time so in this study the process of learning by using the method of Elaboration is to have the communication skills of students is high. This is because elaboration is because this model illustrates the use of string of prerequisite learning of the parts of the simple to the more complex, and provide an overview as well as the conclusion with a systematic way of teaching of general kerinci or from simple kekompleks at a certain level so that the material taught is understood in detail compared with the method using STAD method which is a method of learning that is based on the theory of cognitive learning (Sudjana,2010) Educators only act as a facilitator and not as information. The atmosphere of the class into the tempest and the time allocated is not sufficient because the learning model that shaped kelompoksiswa not students with learning that too free.

It can be concluded that the ability of mathematical communication of students is better taught with the model elaboration compared with the Cooperative model on the material Logic.

CONCLUSION

Based on the results of research and discussion, it can be concluded the following things :

1. 1. The average score of posttest experimental class one $\bar{x}_1 = 5,83$ with standart deviation $se_1 = 2,41$, while the average score of posttest experimental class two $\bar{x}_2 = 7,29$ with a standard deviation $se_2 = 2,69$.
2. 2. The difference score is the average value of Posttest for the experimental class two with the use of model elaboration is high compared to the score of the average value of posttest by using the cooperative model STAD of 1.46 with a standard deviation of 0.28. From the difference of these results it can be concluded that the learning model Elaboration would be better applied in the learning because it can affect the increase in the ability of mathematical communication students.
3. 3. Based on the scores of posttest class ekaperimen one and experiment two, the obtained results of the test of significant t-test, so that the obtained value of $t = 4,48$ Results are in accordance with the testing criteria that H_0 is accepted $t_{table} > t$ or $-3,96 < 4,48$. From these results it can be concluded that there are differences in the communication skills of students significantly between students who are taught with you always use the Cooperative model STAD model the .

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