The Comparison of Effectiveness between Think Pair Share (TPS) and Team Assisted Individualization (TAI) Types of Cooperative Learning in Mathematics at Junior High School Students

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DOI: 10.24071/seadr.2019.03

Abstract: The current study aims to describe and compare the effectiveness of TPS type and TAI type of cooperative learning. The effectiveness of learning is seen from a significant increase in learning outcomes, the students' activities are averagely in the active category at minimum, and the students' responses tends to be minimally in the positive category. The research design used was a quasi-experimental study with Pretest and Posttest group design. This study involved two experimental classes. The population in this study was the seventh-grade students of SMP Negeri 3 Walenrang with which the two classes being the samples of the study were class VII.B taught by the use of TPS and class VII.C with TAI type of cooperative learning. The two research instruments used in this study were a test of mathematics learning outcomes and a non-test instrument which is an observation sheet of student activity and questionnaire of student responses. To find out the effectiveness of metaphorical learning through cooperative learning in TPS and TAI type, the data were analyzed with one sample t-test statistics at a significance level of 5%. Then to compare the effectiveness of the two experimental groups, the data were analyzed with an independent sample t-test. The results showed that (1) cooperative learning of TPS and TAI type were significantly effective in increeasing students' mathematics learning outcomes, the average of students' activity was categorized as 'active', and student responses tends to be positive in category, (2) there was no significant differences between TPS type and TAI type of cooperative learning in the seventh grade students of SMP Negeri 3 Walenrang.

Keywords: Cooperative Learning, Think Pair Share, Team Assisted Individualization

Introduction

By the globalization era and the advancement of science and technology, education has certainly emerged to have a very important role. Education is a vehicle to improve and develop the quality of human resources. The success of education is measured by the improvement in the quality of human resources. All education providers in every unit have a great responsibility in educating students to master the competence they should achieve. Teachers in this case play an important role in the education processes. One of which is in mathematics learning.

Generally, the purpose of education for students is interpreted as the development of cultural values and national character of students so that they may gain positive values and characters to be applied in their lives as members of a religious, nationalist, productive, and creative society. To achieve this, educators who play an important role during the learning process need to apply a learning model that can stimulate students to be able to think critically, to analyze, to improve problem solving skills as well as mastery of concepts.

Mathematics is a field of science which is very fundamental. The students' low achievement particularly in junior high school mathematics is still a major problem to teachers in this field in particular and to the world of education in general. The low learning achievement of mathematics is influenced by many factors including the learning process at school. At schools, some teachers tend to choose unsuitable models and approaches to be used to overcome students' difficulties in learning mathematics. Although the 2013 curriculum requires teachers to be creative in choosing the learning models, most of which applied by teachers in Junior High Schools at Walenrang are still monotonous, so the students still have some difficulty in understanding the material being taught to them. There are many learning models and approaches that are designed to help students to improve their mathematics

learning achievement. With that being the case, cooperative learning could be one of the learning models that can increase students' participation in class and place them as the center of learning. Among many cooperative learning models, the researchers chose to apply Think Pair Share and Team Assisted Individualization type of cooperative learning. These two types of cooperative learning models are chosen because group learning and collaboration are thought to be more effective and useful.

According to Slavin (2008: 257), TPS learning is a very simple learning yet very useful by grouping students in pairs which can increase students' interaction, independence, responsibility and participation in learning. By collaborating and discussing with friends their peer students will be able to solve any problems encountered during the class. This is in line with previous research by Utama, et al. (Zuhanisani, 2016) suggesting that TPS type of cooperative learning has a significant effect on student achievement. Whereas research by Siur Asih Siburian emphasizes that TPS is one method that can be used to solve learning problems in junior high schools.

The Team Assisted Individualization (TAI) is another type of learning model from cooperative learning that is able to create an effective learning. This learning model is designed to individually overcome student's learning difficulties, therefore learning activities mostly makes uses of problem solving. A distinctive feature of the Team Assisted Individualization (TAI) learning model is that each student individually learns the lesson which has been prepared by the teacher. This is supported by the previous research conducted by Tarim and Akdenis (Zuhanisani, 2016) which revealed that the TAI type cooperative learning model had a more significant effect than the STAD type cooperative model.

The nature of effective mathematics learning can be fulfilled only if the students' skills to work individually and cooperatively can be raised, and if they have a sense of responsibility. As it is known that the two types of cooperative learning model; Think Pair Share (TPS) and the type of Team Assisted Individualization (TAI) are learning models that can improve the effectiveness of students' learning achievement. Siti Amirah Budiastuti, et al. (2013) in her research stated that mathematics learning achievement of students who were taught with TPS type of cooperative model was as good as TAI and both were better than using conventional learning models. Therefore, the researchers want to compare the two learning models. On the other hand, they also want to see how students' responses and enthusiasm take part in mathematics learning before and after using both Think Pair Share (TPS) and Team Assisted Individualization (TAI) types of cooperative learning models.

Research Method

This research is a quasi-experimental study with Pretest and Posttest groups' research design. The population is all seventh-grade students at SMP Negeri 3 Walenrang and the sample is taken using the simple random sampling technique to obtain class VIIB as an experimental class I which was taught by using Think Pair Share (TPS) type and class VIIC as an experimental class II by using Team Assisted Individualization (TAI) of cooperative learning. The data collection instruments used in this study are a test, a questionnaire, and observation sheets. The test is used to collect data on student mathematics learning outcomes before and after treatment of the sample, meanwhile questionnaires are used to collect students' responses after the application of the learning model, and lastly observation sheets of students' activities are used to collect the data on students' participation during the classes.

The type data of this current study is quantitative. This data was obtained from a student learning achievement test. Quantitative data analysis was performed using statistical tests on the pretest, posttest, and test improvement scores in the learning outcomes of both classes. The data were analyzed to test the research hypotheses stated as follows:

H0: There is no significant increase in mathematics learning outcomes of students who received treatment in the form of TPS and TAI type of cooperative learning

H1: There is a significant increase in mathematics learning outcomes of students who received treatment in the form of TPS and TAI type of cooperative learning

Differences in student learning outcomes in the two classes; experimental class I taught using the Cooperative Learning Model Think Pair Share (TPS) type and experimental class II taught using the Team Assisted Individualization (TAI) type of cooperative model were determined by using the

Independent Sample T-test analysis test. Before conducting the analysis, the researcher previously conducted the Data Normality Test and the Variant Homogeneity Test. In addition to those, the researcher conducted the Paired Sample T-Test to see whether there was an increase in learning outcomes after implementing the TPS type cooperative learning model or the TAI cooperative type.

Discussion

Before applying the treatment to the experimental class, the sample must be in a balanced state, the data used must be normally distributed. Based on the normality test, the sig. value in the experimental class I who were taught using a TPS type of cooperative model is 0.44 greater than 0.05. It was then concluded that H_0 was accepted (normally distributed data) and sig values. In the experimental class II taught using the TAI type cooperative model is 0.124 greater than 0.05, so it was concluded that H_0 was accepted (normally distributed data). While from the homogeneity test results, it was obtained that the probability or sig. value is 0.097 and it was greater than 0.05, so it is concluded that both groups and samples come from populations that have the same variance (homogeneous).

Based on paired sample t-test, the average score of students' learning outcomes after being taught with TPS type of cooperative learning is better than the average score of student learning outcomes before TPS being implemented. Based on the average value of students in experimental class I, it was obtained that the average score of students after and before being taught with being taught with TPS type of cooperative learning are respectively 89.4 and 35. Because the average value of posttest is higher than the posttest, it can be concluded that there is an increase in student learning outcomes after being taught by using TPS type of cooperative learning. As for the experimental class II, the average score of student learning outcomes after being taught with TAI type of cooperative learning is better than the average score of students' learning outcomes before being taught with TAI type of cooperative learning.

Based on the students' average scores, the average score of students after and before being taught with TAI type of cooperative learning are respectively 82.95 and 30.33. Because the posttest average score of students is higher than the pretest, it can be concluded that there is an increase in the learning outcomes of students taught with cooperative learning type of TAI. While the results of the independent sample t-test obtained a significance value of 0.091, which means H1 was rejected. So, it can be concluded that there is no difference in the improvement of students' mathematics learning outcomes taught by the TPS type and the TAI type of cooperative models. Based on the achievement of learning effectiveness, both TPS and TAI types of cooperative learning are effective to be applied in the lesson topic of Integers in seventh grade students of SMP Negeri 3 Walenrang. The details are presented in the Table 1.

Table 1. The effectiveness of learning outcomes

Cooperative learning types	Results of Learning outcomes	Average students' participation during the class	Average students' responses during the class	Difference between pretest and posttest
TPS	100% (accomplished)	3,36 (effective)	3,17 (Good)	54,15
TAI	100% (accomplished)	3,1 (effective)	3,48 (Good)	52,35

Based on the results of the analysis by comparing the average difference between pretest and posttest, it was found out that the average learning outcomes of students who are taught with TPS and TAI types of cooperative learning are in category of complete. It can be seen in the average activity of students who are taught with TPS model which is greater than the average activities of students taught with TAI type, both are in the effective category. But the response of students taught with TAI type was greater than the response of students taught with the TPS type and both were in the good category. Moreover, the difference between the pretest and posttest scores in the class taught with TPS model is

greater than the difference in the pretest and posttest in the class taught by the TAI type. It can be concluded that students' participation, student responses and average outcomes of student learning in TPS type are better than those in TAI type. But the results of data analysis show that the probability value obtained is greater than 0.05, meaning that the average difference between student learning outcomes before and after being taught with TPS and with TAI type has no difference (similar) with mathematics learning outcomes after being taught with TAI type cooperative learning. There are several findings during the study such as (1) the increase of learning outcomes in the TPS taught class is greater than of which in TAI taught class, although there is no significant difference. (2) The rejection of the hypothesis that says there is a difference in the increase of mathematics learning outcomes of students who were taught using TPS and TAI types. It may happen in the TAI class due to discussion group members' assignment which was based on different abilities. The students may think it was less pleasing because they did not want to part away from group members which they usually discuss with during the class. Students felt that the success or failure of group discussions depended on whether the group members are smart or not. In fact, one element of cooperative learning is the existence of mutual cooperation and positive interdependence. TPA and TAI types are learning process that uses the skills of being on duty, taking turns, listening actively, and willingness to ask questions about the unknown, Van Wyk (Budiastuti, 2013).

Conclusion

Based on the results of data analysis and discussions, it can be concluded the results of the study are as follows: (1) students respond positively to the application of TPS and TAI types, (2) student activities during the application of TPS and TAI types are relatively effective, (3) Student mathematics learning outcomes have increased after the application of TPS and TAI types, (4) There is no significant difference in the improvement of learning outcomes after the application of TPS type and TAI type of cooperative model.

Based on the conclusion of the above research results, the author can provide some suggestions summarized as follows: (1) Referring to the results of this study, TPS and TAI types of cooperative type can improve student mathematics learning outcomes. With that being the case, the teacher can use the learning models in mathematics learning. (2) In implementing TPS and TAI types, it is expected that the teacher prepares the best and maximizes the role of group discussion so that the learning process can take place effectively. (3) Other researchers can conduct research on the effectiveness of the TPS and TAI types of cooperative models on students of different subject matter.

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