THINK PAIR SHARE (TPS) COOPERATIVE LEARNING MODEL WITH STRUCTURED SCAFFOLDING (AN EFFORT TO IMPROVE THE QUALITY OF MATHEMATICS LEARNING ON CLASS VII-A SMP NEGERI 1 PALOPO)

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Abstract

The problems of this study were (i) how is the implementation of TPS cooperative learning model involving structured scaffolding on Class VII-Ain SMPN 1 Palopo? (ii) Is the quality of mathematics learning that includes learning and mathematics learning outcomes can be improved through the implementation of the model? The results shows that the quality of learning of mathematics that includes (i) the implementation process of the model conducted in two (2) cycles implies: 1) the activity of teachers in the implementation process of learning is in the high category and for the student activity observation, there are still some aspects that should be improved; (2) in the second cycle, the teacher has to make improvements and an increase in their respective observations on the aspects of student activity; and (ii) the application of the model can improve student learning outcomes in mathematics.

Keywords: SMT type Cooperative Model, structured Scaffolding

Background

One of the main problems in formal education today is low absorptive capacity of students. This is evident from the average student achievement which is always still not satisfactory. This achievement is certainly due to the learning conditions which are still conventional and doesn’t touch the whole realm of the dimension of the students, namely how to learn it (learning to learn) (Trianto, 2007: 1).

Based on the experiences of researchers for teaching mathematics courses in SMP Negeri 1 Palopo especially Class VII-A, it was revealed that many students complain that math is hard to understand. One of the reasons put forward by them are math has a lot of formulas to be memorized and remembered that result in poor performance of their math learning. The average result of mathematics learning of the students in the first semester of the Academic Year 2015-2016 was 71.03 and the learning completeness rate was 70\% (KKM subjects of mathematics is 75.00), and the classical completeness was at least 85\%.

One of the learning innovations of of constructivist theory is cooperative learning model. One type of cooperative learning model that can increase student participation in the learning process and can ultimately improve students' mathematics learning outcomes is cooperative learning model type Think Pair Share (TPS). TPS is one of the structural cooperative learning models that consists of three stages, namely thinking, pairing and sharing.

Structured Scaffolding

Applebee and Langer (Qadry, 2013: 16) indicates that there are five steps in learning to apply the technique of scaffolding.
a. Intentionality (intentionality). In this step, teacher groups the activities which will be done by learners into more specific sections.

b. In accordance with the ZPD (appropriateness). In this step, the teacher focuses on assistance on aspects that can not be done by the student.

c. Structured (structure). In this step teachers perform modeling activities and asks the students as well as arrange the students' work in accordance with tasks distributed so that the completion of these tasks can bring to the natural order of thinking.

d. Collaboration (collaboration). In this step, the teacher responds to the task of students and expand the activities of them without rejecting what the students do.

e. Internalization (Internalization). In this step, the scaffolding is gradually withdrawn (fading) in accordance with the pattern of internalization of students and teachers solidifies knowledge that has been owned by the students so that they really master it well.

The present research will be conducted in accordance with the form of learning by applying structured scaffolding techniques where teachers perform modeling activities i.e. (a) recalling the prerequisites material through questions, so that students' thinking understand the given problem; (b) directing the students to observe and interpret the problem so that students are aware of what to do next; and (c) providing a messenger or instruction that allows students to determine the accuracy of a step that must be done in solving the problem.

1. Method

This research was a classroom action research with repeated workflow through several phases: planning, action, observations and reflection. The research was conducted in SMP Negeri 1 Palopo. The subjects were students of class VII-A SMP Negeri 1 Palopo in the second semester of the Academic Year 2015/2016. There were 35 students consisting of 18 boys and 17 girls.

The factors which would be investigated in this study are.
1. input factors, namely the initial observations in the which includes the results of students' mathematics learning, the activeness of students in the learning process, learning strategies used by teachers, models of learning which has been applied prior to this study, as well as other factors causing low quality of mathematics learning.
2. Process factor, namely looking at the activity of students in the learning process
3. Output factor, namely mathematics student learning outcomes obtained from the test and their responses to the learning process

Research Procedures
This classroom action research was conducted in two cycles consisting of four meetings in each cycle. The instrument used in this study are:
1. Learning Outcome Test
2. Observation Sheet
3. Students’ Response Questionnaire

Qualitative analysis was performed in this study to provide an overview of the barriers experienced by students so that they were given scaffolding and what kinds of scaffolding given to students. Student response data were analyzed qualitatively to give an idea of the things that make students happy or not happy and suggestions of students associated with the implementation of the learning model.

In addition, quantitative analysis was also performed in this study. Learning outcomes data were analyzed quantitatively by using descriptive statistics to describe the learning outcomes in the form of average value, the highest data, the lowest data, the
range of values, standard deviation, variance, frequency tables and percentages, as well as the categorization. Categorization of learning outcomes used categorization techniques, i.e. five-point scale based on the technique of categorization standards set by the Ministry of National Education (MONE, 2006, in Harum, 2012: 83), these categories are:

1. Scores 0-39 for "Very Low" category
2. Scores 40-59 for "Low" category
3. Scores 60-74 for "Medium" category
4. Scores 75-90 for "High" category
5. Scores 91-100 for "Very High" category

Furthermore, learning completeness was categorized using the following criteria:
- Mastery level 0% - 74% is categorized as not completed.
- Mastery level 75% - 100% is categorized completed.

Here are the criteria for the effectiveness of student activity (Nurdin, 2007):

\[
\begin{align*}
3.5 \leq \bar{x} & \leq 4 \quad \text{very effective} \\
2.5 \leq \bar{x} < 3.5 & \quad \text{effective} \\
1.5 \leq \bar{x} < 2.5 & \quad \text{not effective} \\
0 \leq \bar{x} < 1.5 & \quad \text{not very effective}
\end{align*}
\]

where \( \bar{x} \) is the average of the scores.

The criteria used to determine the student activity effective is that if the value of the score average is at least in the effective category. The criteria used to determine the student activity is effective is that if the value of the average is at least in the effective category.

Data obtained from the results of observations of teacher activity in the learning would be analyzed and described with reference / confirmed by determining the interval teacher activity (AG)categories to manage learning (modified from Nurdin, 2007: 156).

<table>
<thead>
<tr>
<th>Interval</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ≤ AG &lt; 1.6</td>
<td>Very low</td>
</tr>
<tr>
<td>1.6 ≤ AG &lt; 2.2</td>
<td>Low</td>
</tr>
<tr>
<td>2.2 ≤ AG &lt; 2.8</td>
<td>Enough</td>
</tr>
<tr>
<td>2.8 ≤ AG &lt; 3.4</td>
<td>High</td>
</tr>
<tr>
<td>3.4 ≤ AG ≤ 4</td>
<td>Very High</td>
</tr>
</tbody>
</table>

Students’ response data were analyzed by the following steps:

a. Counting the number of students who give a positive response to the aspects of the question.

b. Calculating the percentage of students who give a positive response to every aspect of the question.

c. Specifying the category for students with a positive response by matching the percentage with defined criteria.
Results and Discussion
Mathematics Learning Process

a. The Process prior to implementation of the Model

In the process of learning mathematics before the implementation of the model (pre-action), the researchers firstly examined the initial conditions of students who become the subject of research. It can be seen that in solving problems or tasks assigned by the teacher, students tend to just expect and rely on friends who are considered capable. In the process of learning in general, the students just passively absorb the lessons of the teacher and they also tend not to take advantage if they are given the opportunity to ask questions or give feedback.

Moreover, the researchers also give the test results to see the categories of student mastery of the material that has been taught. It is obtained that there are nine students who are in the medium category, many students are in the high category, and only two students were able to reach the very high category implying classical completeness is not achieved at the stage of pre-action.

b. The process of implementation

Learning is implemented based on lesson plan (RPP) that had been developed by researchers. To view the various implementations of real learning process, the following things are considered important in the learning process, based on the results of research findings and observations in the classroom:

1) In the first cycle, the teacher has run the implementation process of learning based on the phases and learning steps although there are still several things that need to be improved including the ability of motivating students and presenting the material briefly. Furthermore some of the findings of researchers and observers suggest that: (a) the student are less able to adjust to the learning model; (b) the student has low thinking stage; (c) students appear less seriously in discussing the answers of students’ worksheet (LKS) and tend to just follow one friend's opinion; and (d) the student was embarrassed to appear in presenting the group's work.

2) In the second cycle, the teacher has applied improvements in implementing the learning model. It is characterized from the observer ratings showed an increase in the average of teacher activity.

For the reflection of the implementation process in the first cycle and the second cycle learning, the researchers discussed with the observer about the issues that were performed well, as the basis for improvements in every subsequent in the meeting. In the first cycle and the second cycle, it can be said that the teacher has applied the learning well.

1. Students’ Mathematics Learning Outcomes

Based on the analysis of mathematics achievement test achieved by students after learning takes place, it can be described as follows:

a. The number of students who are in the medium category decrease from 9 students at the pre-action, to 4 students at the end of the first cycle, and remained one student at the end of the second cycle.

b. The number of students who are in the very high category increases from 2 students on pre-action to 4 students at the end of the first cycle and 8 students at the end of the second cycle.

c. The average score of the students' mathematics learning results increased from 77.13 in pre-action to 82.03 at the end of the first cycle and 85.47 in the end of the second cycle.
Furthermore, results of the analysis of the scores achieved by students after attending the learning through in the first cycle showed that of the 32 students, 28 students (87.5%) achieved a score of 75 or more, and only 4 students (12.5%) who obtained a score less than 75. The average value of the results of the test results of students' mathematics learning in the first cycle reaches 82.03, which means beyond the KKM ($N \geq 75$). The scores achieved by students after attending learning through cooperative learning model of TPS involving structured scaffolding on the second cycle showed that of the 32 students who became the subject of the study, 31 students (96.9%) achieved a score of 75 or more. The average value of the results of the test results of students' mathematics learning in cycle II reached 85.47, which means also exceeded KKM ($N \geq 75$). It shows that students’ comprehending after the learning increase. In fact, it can be seen that the first cycle of classical completeness has been reached.

In particular, the comparison of learning of four students who had been selected as the subject of observations of which two students were in the early stage who were in middle category and two students who were in the high category can be seen in Chart 1 below.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Siklus I</th>
<th>Siklus II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjek 1</td>
<td>80</td>
<td>82</td>
</tr>
<tr>
<td>Subjek 2</td>
<td>90</td>
<td>88</td>
</tr>
<tr>
<td>Subjek 3</td>
<td>95</td>
<td>92</td>
</tr>
</tbody>
</table>

**Picture 1. Comparison of Students' Learning Result Before Pre-Treatment, Cycle I and II**

2. Students' Activity

Observation of the students in the research activities carried out by an observer. Comparison of the average student activity (activity 1-8) from the first cycle to the second cycle can be seen in Chart 2 below.
Activity 1: paying attention to teacher’s explanation
Activity 2: reading/understanding and writing the thought toward the problem in the worksheet (LKS)
Activity 3: discussing each other in working on LKS
Activity 4: presenting the work
Activity 5: posing/answering question
Activity 6: solving all problems in worksheet
Activity 7: summarizing the lesson
Activity 8: doing activities not related to the learning

Having regard to the average of student activities, the student activity is at least in the effective category \((2.5 < AS < 3.5)\).

3. Teacher Activity Observation

The average of teacher activity value since the first meeting of the first cycle indicates that the ability of teachers to manage learning is in the very high category. Observer rated "appropriate" to most aspects observed in the activity of teachers managing the learning. Moreover, only a few aspects that are rated "quite appropriate". At the end of the second cycle, the observations show quantitatively that the teacher managed learning activities reaching the average value 3.93 which is in the very high category \((3.4 \leq AG \leq 4)\).

4. Students’ Response

The results of the questionnaire showed that in the implementation aspects of learning, 96.87% of students responded positively to aspects of how teachers motivate students to learn; 100% of students responded positively to the teacher explaining aspects of the subject matter; 100% of students responded positively to aspects of how teachers guide students in learning; and 93.75% of students responded positively to aspects of how teachers assess student learning outcomes.

Furthermore, in the aspect of the use of learning tools 90.63% of students responded positively to the explanation component learning steps; 100% of students responded positively to the use of components of LKS; 93.75% of students responded positively...
positively to the use of components of students’ books; and 93.75% of students responded positively to the implementation of the components of achievement test.

In the aspect of the use of models 84.37% of students responded positively to the components difficulty in writing the result of thought to the issue (stage thinking); 90.63% of students responded positively to the active components in discussions with teeman (stage sharing); 93.75% of students responded positively to the scaffolding components that teachers in problem solving; 84.37% of students responded positively to the components efforts in resolving problems in LKS; and 81.25% of students responded positively to the understanding of the components obtained after the end of learning. Overall, aspects (implementation of learning, the use of learning tools, and the use of the model) received a positive response from students with a percentage above 70%.

Conclusion

Based on the findings of the research and the discussion, it can be summarized as follows:

1. The process of implementation of cooperative learning model type TPS involving structured scaffolding, it was found that:
   a. The implementation of the learning model can increase the activity of students. It is characterized by an increase of the average score of student activity
   b. The response of students to the learning activity indicates that overall aspects (implementation of learning, the use of learning tools, and the use of the learning model) receive positive response from students with the percentage above 70%.

2. Application of the learning model type SMT involving structured scaffolding can improve learning outcomes.

References


