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IMPLEMENTATION OF COOPERATIVE LEARNING WITH TALKING CHIPS TECHNIQUE ON SOLIDS MATERIAL

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Abstract

Mathematics is one of important lesson for our life, so teachers have to use correct way to teach mathematics. To make mathematics become meaningful and students centered so teachers can use Cooperative Learning and Talking Chips technique. The researcher conducted a research which aimed to know students' activity, students' activities during learning activities. This research is a descriptive research. It had been done in SMP Negeri 3 Sidoarjo. This research had been done for three times based on the lesson plan from researcher. Analysis data shows that students' activities categorized as active. The students' achievement is about 93,94% for complete students and 6,06% for incomplete students

Key words: Cooperative Learning, Talking Chips Technique

INTRODUCTION

Education has an important role in our life. The progression level of education usually linked with prosperity level in society. One way that could be used to improve education quality is create innovation in learning. This innovation could be as technique or method in learning so that students can learn easier especially in learning mathematics. Teachers is the main information dealer to students (Suprijono,2010) so that according to Slameto (2010) teachers should have teaching principals and implement these principles effectively. Effective teaching can lead students to effective learning. As one of an important lesson, mathematics will be more interesting and meaningful if teachers put students as a subject, so giving students a chance to build their own understanding.

Cooperative learning can be used to create students-centered learning because it insists students to participate actively during the lesson. Students will be divided into several groups in cooperative learning. However, there are concerns that the implementation of cooperative learning will create chaos during the lesson. So that teacher should concern about the students' equality of opportunity to participate in groups. One of learning technique that can be used by teachers to give same participation opportunity for students is Talking Chips Technique. This technique will make students actively participate during the lesson and can solve domination problem by some certain students which usually appear in Cooperative Learning. During the lesson teacher will give worksheet to each group and each student will be given some chips with same number. Students should use the chips to ask and answer questions in the worksheet, in other words the number of chips is their opportunity to participate in the lesson. This research focused on the implementation of cooperative learning using talking chips technique in solid material.

Based on the research background, this research is aimed to answer some questions they are:

1. How is the students' activity during the implementation of cooperative learning by using talking chips technique in solid material?
2. How is the students' result study during the implementation of cooperative learning

by using talking chips technique in solid material?

The result goals for this research are describing: (1) the students' activity during the implementation of cooperative learning by using talking chips technique in solid material (2) the students' result study during the implementation of cooperative learning by using talking chips technique in solid material

This research is expected to give some benefit for teachers and other researcher such as:

1. Could be an inspiration for mathematics teachers to implement cooperative learning by using talking chips technique
2. Could be a suggestion for other researcher who want to conduct same research

Cooperative learning

Cooperative learning came from English word cooperate which has meaning "to work with someone else in order to achieve something that you both want" (Manser, 1995). Based on Suyatno (2009) cooperative learning is a leaning activities in group to cooperate help each other solving problems. According to the Johnson and Johnson model, cooperative learning is instruction that involves students working in teams to accomplish a common goal (Kagan, 2005) under condition that include the following statements:

1. Positive interdependence. Team members re obliged to rely on one another to achieve the goal. If any team members fail to do their part, everyone suffers consequences
2. Individual accountability. All students in a group are held accountable for doing their share of the work and for mastery of all material to be learned
3. Face-to-face interaction. Although some of the group work may be parcelled out and done individually, some must be done interactively, with group members providing one another with feedback, challenging reasoning and conclusions, and perhaps most importantly, teaching and encouraging one another.
4. Appropriate use of collaborative skills. Students are encouraged and helped to develop and practice trust-building, leadership, decision-making, communication, and conflict management skills
5. Group processing. Team members set group goals, periodically assess what they are doing well as a team, and identify changes they will make to function more effectively in the future.

There are six phase in cooperative learning, they are: (Ibrahim, 2000)

Phase 1 : Present goal and set

Teachers present the learning goal and prepare students so that they are ready to study

Phase 2 : Present information

Teachers present the information that related to the learning material through verbal or demonstration

Phase 3 : Organize students into learning teams

Teachers divide students into several groups

Phase 4 : Assist team work and study

Teachers assist the learning teams so that they can reach the goal

Phase 5 : Test on the material

Teachers give final test to evaluate students' ability about the material

Phase 6 : Provide recognition

Teachers give reward to students

Talking Chips Technique

Talking chips technique is a learning technique which uses chips or other small things as a learning media (Lie, 2008). Common problem that usually found when teachers ask students

to study in a group is not all students in the group can get the same opportunity to participate. Spencer Kagan created a learning technique that can solve the problem it calls talking chips technique. The goal of this technique is to promote equal participation and develop discourse ability. Each member of the group gets different chips with the same number that they must use whenever they want to speak and could include:

1. Answer a question
2. Ask a question
3. Express a doubt
4. Give an idea
5. Respond to an idea
6. Summarize

Students place one of these chips on their desk before speaking. The goal is for all students to use their chips, avoiding the risk that only some members of the group participate in the task.

RESEARCH METHOD

Participants

The participants of this research were students in second grade of junior high school in Siodarjo. The class of the students randomly selected from six classes in this school and researcher selected class VIII-1 SMP Negeri 3 Sidoarjo.

Procedure

There are three main steps in the research procedure, they are : (1) Preparation, There are four steps in preparation category such as : (a) Making teaching management observation sheet and students activity observation sheet (b) Making teaching instruments (c) Determining the school to do research. (2) Implementation, There are three steps such as : (a) Observing the teacher's teaching management during learning activity (b) Observing the students' activities during learning activities (c) Giving mathematics final test about the volume of solids figures. (3) Data Analysis

Instruments

Students' activities observation sheet were used to observe all actions that did by the students during learning activities such as giving attention to teacher explanation, searching for relevant information, writing, etc. Final test were given to students to know students' ability about given material that was volume of solids figures. Students would be categorized into two categories for the result of the final test. Complete if students got score ≥ 75 and incomplete if students got less than 75.

Data Analysis Technique

The observations sheets about students' activities were analyzed then categorized based on the given categories in the observation sheets. Final test was used to determine students' ability and understanding about given material that was volume of solids figures, then calculated the percentage of each category (complete and incomplete) by using this formula

$$\frac{the\ number\ of\ complete\ students}{the\ number\ of\ all\ students} \times 100\%$$

RESULT AND DISCUSSION

This section presents the results of the descriptive statistics.

STUDENTS' ACTIVITIES DATA

Data about students' activities during the learning were collected by observing students. The observation focused on one group which had decided before. The group consist six students with heterogenic ability. The table shows recapitulation of students' activities during the cooperative learning using talking chips technique in three cycles.

No.	Students' activities	Number of activities in each cycle			Total frequency	(%)
		1	2	3		
1.	Giving attention to teacher's explanation	21	26	14	61	21,18
2.	Doing procedure of talking chips technique	3	7	5	15	5,21
3.	Reading (finding information)	8	6	4	18	6,25
4.	Writing (relevant with learning activities)	14	7	7	28	9,72
5.	Asking question / giving opinion	12	11	18	41	14,24
6.	Giving attention to others' opinion	22	24	26	72	25
7.	Presenting the result of group discussion	2	3	1	7	2,43
8.	Respond to an idea	9	8	17	34	11,81
9.	Doing irrelevant activities (joking around, walking, disturbing other, etc.)	4	4	4	12	4,16
Total frequency		96	96	96	288	100

As shown in the table, most activities did by students during the learning by using talking chips technique was no. 6 that is giving attention to others opinion (25%). It means students preferred to be silent and gave more attention to others. Students also give more attention in teacher's explanation (21,18%). The students' activities no. 5 and 8 (asking question/giving opinion and respond to an idea) which related to students' participation almost had the same ration (14,24% and 11,81%). It happened because talking chips technique gives same opportunity to students for asking question and responding to an idea.

STUDENTS' MATHEMATICS ABILITY

Data about students' mathematics ability collected from the final test given by teacher in the end of learning activities. Students categorized to be complete if they can get final test score ≥ 75.

Student	Score	Explanation	
		Complete	Incomplete
1	100	√	
2	100	√	
3	78	√	

Student	Score	Explanation	
		Complete	Incomplete
4	100	√	
5	78	√	
6	100	√	
7	100	√	
8	100	√	
9	75	√	
10	100	√	
11	100	√	
12	70		√
13	100	√	
14	85	√	
15	100	√	
16	100	√	
17	85	√	
18	100	√	
19	100	√	
20	100	√	
21	85	√	
22	100	√	
23	100	√	
24	100	√	
25	85	√	
26	78	√	
27	53		√
28	100	√	
29	100	√	
30	83	√	
31	100	√	
32	100	√	
33	95	√	
Total		**31**	**2**
(%)		**93,94**	**6,06**

According to the table can be seen that from 33 students (93,94%) who did the final test categorized as complete because they got score ≥ 75. Meanwhile two other students categorized as incomplete (6,06%). Two students who categorized as incomplete did some mistake in their final test, such as:

a. Lack understanding about the material that was about solid figures so that they used wrong formula to solve the problem
b. Students did not put the important information of the problem
c. Students did not understand the purpose of the given problem

Discussion

In traditional classroom, even in cooperative learning, when teacher implement group discussion during the learning activities there must be an inactive student. Participation in learning activities is fundamental for learning, so everybody should take part equally in group

work and should be guaranteed to have an equal opportunity to participate (Kagan,2005 ; Kimura, 2005). Talking Chips technique can solve inequality opportunity of students in group (Kagan, 2005 ; Lie,2008). The result shows that talking chips technique can improve students' participation, categorized as Active reached 74,65%. This improvement was also supported by cooperative learning which had been implemented in learning activities using talking chips technique. During Talking Chips technique was implemented in the classroom, all students did face to face interaction because they worked together and face to face in group. Besides, it also happened simultaneous interaction because in group, they cooperated and interacted between one student to other students. Next, it happened individual accountability because every student in group must be responsible to their task or role. The last, it also occurred equal participation because all students were given equal opportunity to speak (Syafryadin,2013). Based on the result of students' activities, the percentage of giving attention to teacher's and other students' explanation got huge percentage, reached 25% and 21,18% respectively. This can happened because students are not familiar with the talking chips technique. This unfamiliarity caused small problem, many students forgot to give their chips every time they want to ask question or respond to other students. Fortunately, this problem could be solved by giving students continuously guidance so that students could implement talking chips technique well. In the end of the study, teacher gave students a final test about the topic that has been discussed. This final test was for seeing whether the implementation of cooperative learning using talking chips technique was successful or not. The learning can be categorized as success if the number of completed students reached more than a half of the total number of students. Students categorized to be complete if they could get final test score ≥ 75 (adapted from the school's standard). The result of final test shows that only 2 students who categorized as uncompleted which was mean that students who were categorized as completed reached 93,94%.

CONCLUSION AND SUGGESTION

Activities students during the implementation of cooperative learning using talking chips technique classified as active. This is because the percentage of categories achieved except in giving attention to the teacher's explanation and behaves irrelevant reached more than 50% in the amount of 74.65%. If teachers want to apply the talking chips technique in the learning process, the teacher should master the technique first so that learning can proceed smoothly. Teacher should make an appropriate worksheet if they want to apply this technique so that the learning process will be effective.

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