

Implementation of Mind Map – Cooperative Learning Model to Improve Learning Outcomes in Objects and Its Properties Material of Fifth Grade Students at MI Islamiyah Purwojati Mojokerto

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ABSTRACT

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This study aims to improve student learning outcomes in science subjects of objects and their properties at MI Islamiyah Purwojati Mojokerto through the implementation of a mind map type-cooperative learning model. This research was conducted using Kurt Lewin's model consisting of 2 cycles with each cycle has 4 stages. The study was conducted at MI Islamiyah Purwojati Mojokerto with a sample of 29 Fifth Grade students. Data collection techniques through observation, interviews, tests, and documentation. The results are the implementation of mind map type-cooperative learning model can increase teacher activity from 71 points (enough) in the first cycle to 91 points (very good) in the second cycle, student activities from 72 points (enough) in the first cycle to 97 points (very good) in cycle II. Student learning outcomes increased from 13.8% (very less) in the pre-cycle, 51.8% (less) in the first cycle, and 82.8% (good) in the second cycle. Based on the results on teacher activities, student activities and learning outcomes, it can be concluded that there was a better increase in each cycle.

INTRODUCTION

Learning is the core of the overall educational process with the teacher as the main role holder. Learning is a process that contains a series of actions of teachers and students on the basis of reciprocal relationships that take place in educational situations to achieve certain goals (Jihad et al). The learning process which includes methods, strategies, media, as well as providers of learning support facilities and infrastructure must be prepared appropriately so that students are able to understand the lessons conveyed by the teacher well. Widyastuti (2007) said that there are still many children who have difficulty when trying to recall what has been obtained, studied, recorded, or previously remembered. Students also often have difficulty in concentrating when doing assignments, this is because their memories are not organized well, as the impact, some students also tend to get low learning outcomes.

Based on observations made at MI Islamiyah Purwojati Mojokerto through interviews and documentation, the scores of many students are still low, from 29 students there are only 4 students who are able to achieve the Minimum Completeness Criteria. The value of Minimum Completeness Criteria in Natural Sciences is 70, while the average score obtained by students is 43.6 (Ulfa, 2017). The causes of low student learning outcomes for science learning materials include the lack of supporting facilities such as learning methods that are delivered using only

lecture strategies so that students tend to be bored to participate in teaching and learning activities. In addition, the learning that has been carried out at MI Islamiyah Purwojati Mojokerto is also still using conventional learning. This is due to the limited technological facilities owned, the unavailability of computer-based learning media and the limitations of teachers in using computers.

Dian Puspita in her research said that the cooperative learning model of the mind mapping type on subject of energy, can increase the value of student learning outcomes in class X1 IPA SMA Negeri 6 Banjarmasin with a percentage value of 70.58% in the first cycle, increased to 88.23% in the second cycle, and increased to 97% in the third cycle. The same thing was also done by Surya Abadi who examined the application of the mind mapping learning model in PKN lessons. Classroom action research that has been carried out resulted in an increase in learning outcomes with a percentage of 70.55% in the first cycle and 80.60% in the second cycle. From the data of the two studies, it can be concluded that the mind mapping type-cooperative learning model can improve student learning outcomes. Therefore, the cooperative learning model of mind map type can be used by teachers as an effective, efficient and fun learning strategy. Mind maps prioritize the basic that every child is a unique and different's because they have different thoughts from one another. In making a mind map, several elements must be

carried out, including writing the main idea, making sub-topic branches, making keywords and connecting them to the main ideas.

Based on some problems description above, it is necessary to make efforts to improve the implementation of the teaching and learning process as a benchmark for learning outcomes. Therefore, in this study one of effort to improve the learning process through a mind map-cooperative model in Natural Science subjects, especially "materials and its properties". In general, this study aims to describe the implementation of a mind map type cooperative model in improving learning outcomes of learning in objects and its properties of fifth grade students of MI Islamiyah Purwojati Mojokerto and to describe the improvement in student learning outcomes in class 5 after using a mind map type-cooperative model as well.

METHODS

This type of research uses classroom action research which is carried out by researchers collaborating with teachers in the classroom as an effort to improve student learning outcomes in science subjects of material and its properties.

Research Cycle

Classroom action research is carried out in two cycles, each cycle is carried out following the implementation, action, observation, and reflective procedures. Through these two cycles, it can be observed that

there is an increase in student learning outcomes in science learning for fifth grade students at MI Islamiyah Purwojati Mojokerto. The research subjects were students of class V with a total of 29 students consisting of 11 males and 18 females. In collecting data, researchers used several techniques, namely observation, tests, interviews, and documentation.

Individual Test Assessment

Individual test scores are obtained from the results of tests in material of objects and its properties which consist of several questions. Assessment format according to the following formula.

$$\frac{\text{Obtained score}}{\text{Maximum score}} \times 100\% = \text{final score}$$

After the student scores were known, the researcher added up the scores obtained by the students and divided by the number of students to find out the average score. Sudjana stated that to calculate the class average, it was calculated using the following formula.

$$\frac{\sum x}{\sum N} = x$$

with

x = average value

$\sum x$ = total of value

$\sum N$ = total of students

Based on the teaching and learning explanation instructions, student is claimed to be successful if they has reached a minimum assignment level of 75. To calculate the presentation of learning mastery the following formula is used (Purwanto,

2012):

$$\frac{\Sigma \text{ student who reach completeness}}{\Sigma \text{ student}} \times 100\% = P$$

The learning outcomes that have been obtained are classified into the following criteria

Table 1. Success criteria (Baihaqi, 2008)

Successful grade	criteria
91% - 100%	Very good
75% - 90%	good
60% - 74%	enough
40% - 59%	less
≤ 40 %	Very less

RESULTS AND DISCUSSION

Data on the application of mind map type-cooperative learning model was obtained during teaching and learning activities by using teacher and student observation sheets. The stages in this study consist of pre-cycle, first cycle and second cycle. Pre-cycle is done to find out how far student understand the material and cycles I and II are carried out to obtain data on student learning outcomes.

Pre Cycle

Researchers collected initial data on student learning outcomes through interviews with school principals and fifth grade science subject teachers, Mrs. Mariya Ulfa, S.Pd.I. Data and documentation obtained stated that the problem is the low student learning outcomes in one of the science subjects, namely objects and its characteristics. This is indicated because students quickly feel bored, less enthusiastic and cannot concentrate when the teacher is

explaining the material. The researcher also interviewed several students about the ongoing learning process. Some students said that the learning method carried out by the teacher was only through lectures, then students were asked to work on and complete the worksheets and corrected them together. Teachers rarely innovate in learning, only through short questions and answers, quizzes, and lectures. The role of the media is also not used as it should be needed in science lessons, so that student learning outcomes on the subject matter are not optimal and have not reached the minimum completeness criteria.

Based on the data that has been obtained as a whole, both from interviews with teachers and students, the number of students who have completed learning material objects and their characteristics is 4 students of 29 students. Below is a recapitulation of student learning outcomes of MI Islamiyah Purwojati Mojokerto in the pre-cycle.

Table 2. Recapitulation of learning outcomes

Number of complete students	4 students
Number of uncomplete students	29 students
Number of maximum score's	100
The average value obtained	13,8 %

Based on the value of student learning outcomes in the pre-cycle, it can be concluded that student learning outcomes are still low, as evidenced by the results of the average pre-cycle value of students in natural science lessons is still 43.6. This value is still below the standard of completeness set

by MI Islamiyah Purwojati Mojokerto, which is 70 and when it is associated with the table of criteria, the average score of 43.6 is included in the bad category. From the total number of students, only 4 students completed and reached the completeness criteria and 25 students did not complete because their scores were below the criteria. The percentage calculation of learning outcomes are 13.8.

Application of mind map type-cooperative learning model

Science learning activities on material objects and its properties that are carried out through mind map type-cooperative learning model can improve student learning outcomes in each cycle. Based on observations in cycle I and cycle II, the following results were obtained

1. Teacher Activities in Teaching and Learning Activities in Cycle I and Cycle II

In the process of teaching and learning, the activities of teachers and students in each cycle have increased. The final score on teacher activity increased from 71 in the first cycle to 91 in the second cycle. The increase in teacher activity occurs because of an improvement in the learning process in each cycle. The teacher tries to fix any deficiencies in the first cycle and always actively involves students in learning. Likewise, in cycle II the teacher has started to get used to the classroom atmosphere and is not too nervous as in cycle I so that the learning process can be carried out

better than cycle I.

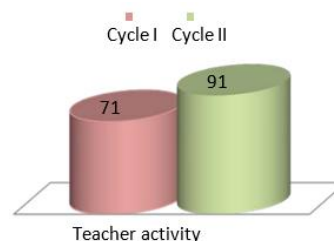


Figure 1. Diagram of teacher activity

2. Student Activities in Teaching and Learning Activities in Cycle I and Cycle II

In the process of teaching and learning, student activities in each cycle have increased. The final score on student activities increased from 72 in the first cycle to 97 in the second cycle.

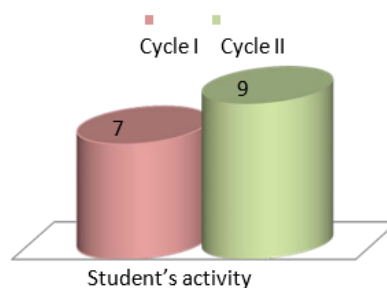


Figure 2. Diagram of Student Activity

In cycle II, students' scores increased and were more actively participating in learning. During the assignment, students work responsibly, are more confident, and are getting used to the learning model used by the teacher compared to the previous cycle.

Table 3. Observation results of teacher and students activity

No.	Aspects	Cycle I	Cycle II	Improvement
1.	Teacher activity	71	91	20
2.	Students activity	72	97	25

Improvement of student learning outcomes

Based on learning activities using a mind map type-cooperative model that has been implemented in 2 cycles, the results show that the mind map type cooperative learning model can improve student learning outcomes in each cycle, namely 51.8% in the first cycle and 82.8% in the second cycle.

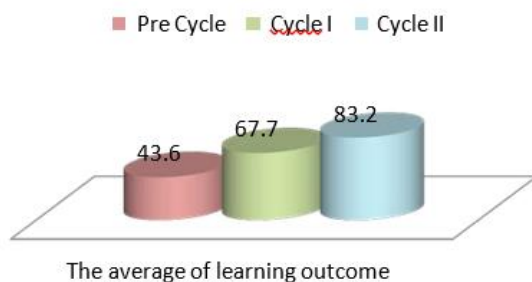


Figure 3. Diagram of Average Learning Outcomes

Each process of learning science in material objects and its properties has increased in each cycle. In the first cycle there was an increase of 24.1 with an average value of 67.7. The improvement in the first cycle from the pre-cycle was quite good even though it still did not reach the specified criteria. A quite drastic increase was seen in cycle II, where the value of student learning outcomes increased by 15.5 with a final score of 83.2. In cycle II, the average student has exceeded the specified criteria of 70%. In bar chart 4, it can also be seen that the percentage of student learning outcomes also increased in each cycle, namely with a percentage of 13.8% in the pre-cycle, 51.8% for the first cycle, and reaching 82.8% in the second cycle.

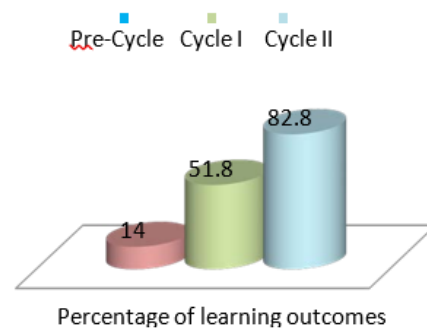


Figure 4. Percentage of learning outcomes completeness

Based on the results of the research that has been done, it can be said that mind map are able to encourage students to think more creatively in filling out mind map charts while making it easier for students to remember the material they have written. This is also supported by several studies conducted by Resi Ayu Hanisyah in her research on the Implementation of Mind Map as an Effort to Improve Writing Exposition Writing Skills for Class X of Vocational High School (SMK) PGRI Babakan Madang. In her research, Resi explained that the mind map type cooperative learning model is considered capable of treating the problem of low student learning outcomes because when students start making mind map, indirectly students will also remember easily the material that has been written in the mind map and will able to stimulate students to come up with other ideas (Hanisyah, 2011). Likewise, in research conducted by Rijal Darusman on the Application of Mind Mapping Models to Improve Mathematical Creative Thinking Skills for Junior High School Students, it is stated that the mind mapping learning method (mind map) is a learning method designed to develop students' knowledge by creatively arranging he main ideas of a concept into a

mind map that is easily understood by students (Darusman, 2014).

The cooperative learning model of mind map type is in accordance with teaching techniques according to the learning pyramid, where at the beginning of learning students first read the material that has been provided and then the teacher explains it using the lecture method. Students will remember a material as much as 10% through reading independently, 20% through listening to an explanation from the teacher and 30% when observing pictures. Students can understand material as much as 50% when students see, hear and are given examples of mind maps and as much as 70% if done through group discussions in working on mind maps (Wakhidah, 2016). Based on the results of the research and the explanation above, it can be concluded that the mind map type-cooperative learning model can be used as an alternative teacher reference to improve student learning outcomes.

CONCLUSION

The mind map type-cooperative learning model can improve the learning outcomes of fifth grade students at MI Islamiyah Purwojati Mojokerto on material objects and its properties in Natural Science subjects. The results of observation, student activities increased from score of 72 in the first cycle to 97 in the second cycle, while the results of the teacher's activity observations increased from 71 in the first cycle to 91 in the second cycle. The average score of students also increased from 67.7 in the first cycle to 83.2 in the second cycle.

The percentage of student learning completeness in the first cycle is 51.8% and in the second cycle is 82.8%.

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