

## Application of the Make a Match Type Cooperative Learning Model Assisted by Mind Mapping to Improve Student Science Learning Outcomes

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### Abstrak

*The aim of this research is to determine the effect of the make a match type cooperative learning model assisted by mind mapping in improving science learning outcomes for fourth grade students at SDN Tonda. In their learning, fourth grade students at SDN Tonda Dalamtaking science lessons tends to be passive as well bored in carrying out learning activities so that the learning outcomes obtained tend to be low compared to other subjects as evidenced by learning outcomes that are less than the KKM. This research is Classroom Action Research (PTK) with the research subjects being all fourth grade students at SDN Tonda who are divided into control classes and experimental classes. The control class was taught using the make a match type cooperative learning method, while the experimental class was taught using the make a match type cooperative learning model assisted by mind mapping to improve student learning outcomes. This research was conducted in two cycles, cycle I completeness of student learning outcomes 53,34% and cycle II increased to 93,33%. This proves that make a match type cooperative learning assisted by mind mapping is a learning method that can improve the learning outcomes of class IV students at SDN Tonda.*

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## 1. INTRODUCTION

Science is a science that presents theories with carrying out observations, experimentation, inferences, formulating theories that are interconnected between one method and another other. IPA itself is defined as a collection of knowledge arranged in a guided manner. IPA is related to how to find out about nature systematically, so it's not just mastery of a collection of knowledge in the form of facts, concepts or principles only but it is a process of discovery (Depdiknas, 2006).

Science learning in elementary school aims to ensure that students have organized knowledge, ideas and concepts about the natural environment, which are obtained from experience through a series of scientific processes such as investigation, preparation and presentation of ideas (Fathurrahmaniah & Lutfin, 2024). Science learning is designed according to children's cognitive development stages, as stated by Paolo and Marten in Mufida et al, (2018) who state that "Natural Science for children is defined as activities (1) observing what happens; (2) try to understand what is observed; (3) use new knowledge to predict what will happen; (4) testing predictions under conditions to see whether they are correct."

Science lessons are one of the subjects that have a fairly broad and complex range of material, so it is hoped that teachers will have broad abilities in presenting material in science subjects and must be well prepared. If the teacher is not able to present the material well and interestingly, it can result in students becoming bored and fed up (Mulyantini & Parmiti, 2017). Science learning in SD/MI must emphasize providing direct learning experiences through use and development of process skills and scientific attitudes. Based on the results of observations of class teachers, it is known that teachers still use teacher-centered learning methods(*teacher centered*)so that the learning process which is expected to make learning fun and exciting is not felt by students. Learning that is oriented towards mastering memorization and theory can cause students' activities and

abilities to be hampered. Apart from that, learning through discovery which is oriented towards the environment and everyday life has not been taught thoroughly by teachers, resulting in science learning activities not developing. Based on the results of interviews conducted with science subject teachers in class IV of SDN Tonda, Bima Regency, information was obtained that students who took science lessons tended to be passive and bored in carrying out learning activities so that the learning outcomes they obtained tended to be poor as evidenced by the low UAS scores of class students. IV SDN Tonda Bima Regency is classified as low so it has not yet achieved completeness in learning. The Minimum Completeness Criteria (KKM) score for science subjects at SDN Tonda is 70.

Based on the results of observations of fourth grade students at SDN Tonda, it appears that the number of students who did not complete science learning with a KKM  $<70$  was still relatively high, this was due to the lack of methods used which resulted in students' understanding of learning not increasing. There were only 6 students with complete criteria with a percentage of 20%, while there were 24 students with incomplete criteria with a percentage of 80%. To improve student learning outcomes, teachers are required to be able to achieve learning goals optimally by using appropriate learning methods so that the learning concepts presented can be conveyed well and precisely. Therefore, one of the efforts made to improve the quality of teaching is by implementing a make a match type cooperative learning model assisted by mind mapping. The make a match learning model is a learning method that uses cards containing questions and other cards containing answers (Sari, 2017) which was developed by Loma Curran in 1994 with the advantage that students will look for partners regarding a concept or topic in pleasant situation. Mind mapping is a method used to summarize a theme or main idea in creative learning so that it can improve students' ability to remember easily and longer (long-term memory). The mind mapping learning model can make students happier in taking lessons, students always try to be disciplined and punctual in every activity, enthusiastic about expressing opinions and asking the teacher about material they don't understand (Rahayu, 2015). By implementing this learning model, it is hoped that it can create a pleasant classroom atmosphere so that effective and efficient learning can be achieved so that it can help students increase their understanding in science learning and improve their learning outcomes.

Based on the above background and to improve the learning outcomes of class IV students at SDN Tonda done research regarding application of the make a match type cooperative learning model assisted by mind mapping to improve students' science learning outcomes.

## 2. RESEARCH METHOD

This research is classroom action research (PTK) which was carried out in 2 cycles and processes implementation starting with observations of fourth grade students at SDN Tonda to see their interests, activities and learning outcomes. This research was conducted in two cycles to determine the improvement in student learning outcomes through the stages of planning, implementation, observation and reflection. This stage takes place repeatedly until the desired research objectives are achieved with the independent variables of the make-a-matc type cooperative learning model assisted by mind mapping. And The dependent variable in this research is the learning outcomes of class IV students at SDN Tonda, Bima Regency. The subjects in the research were 30 class IV students at SDN Tonda who were divided into two classes with class A as the control class and class B as the experimental class. The independent variable in this research is the make a match type cooperative learning model assisted by mind mapping and the dependent variable in this research is student learning outcomes using the Nonequivalent Control Group Design.

Qualitative and quantitative data collection techniques. Qualitative data was obtained manually direct through observation and implementation results and quantitative data obtained from test results with the techniques used in data collection, namely test, non-test, observation and documentation. The research instrument used was a 10-item test in the form of multiple choice

questions, an observation sheet and an assessment sheet. The data obtained were analyzed by comparing the results of learning from cycle I and cycle II. The learning cycle that will be carried out is:

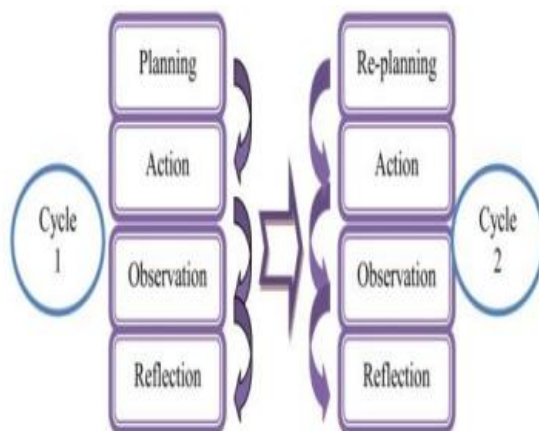


Figure 1. Research Flow

Based on the research flow above, the research stages were carried out in two cycles and according to Arikunto(2013) there are 4 steps in the research cycle, namely:

1. Planning Stage (planning)

At this stage, all research needs are well planned and prepared according to the RPP by implementing the make a match learning method for the control class and the make a match type cooperative learning method assisted by mind mapping for the control class. By preparing ter questions and observation sheets as well as group division to support learning activities so that the activities in question can run effectively.

2. Implementation (acting) stage

According to Pazaluddin and Ermalinda (2014) the implementation of actions is carried out after all plans have been properly prepared. The meetings in cycle I were held in one meeting with a time allocation of 3 lesson hours (3 x 40 minutes) with the material presented in accordance with the learning objectives, namely material on the forms of substances and their changes. Activities for implementing the make a match type cooperative model include the stages of conveying goals and motivation, organizing study groups, presenting information, guiding study groups (carrying out learning activities using the make a match method assisted by mind mapping media), evaluating and giving awards.

3. Observation (observing), and

The observation stage is needed to measure individual actions and processes in an observed event (Sudjana, 2013). The objectives of observation in the learning process are to determine the completeness of student learning outcomes, whether the teacher's activities are carried out in accordance with what has been stated in the assessment instrument or not.

4. Reflection

Reflection is an act of contemplating or thinking about something or an evaluation effort carried out by participants or collaborators related to a PTK being implemented. Kusumah and Dwitagama (2010). The learning process is evaluated and discussed with observers regarding emerging weaknesses.

In this research, cycle I and cycle II were carried out in accordance with the stages mentioned above, and cycle II corrective activities for weaknesses obtained in the learning carried out in cycle I.

### 3. RESEARCH RESULTS AND DISCUSSION

#### 3.1. Research result

Based on the result of observations that have been made, the learning outcomes of class IV students at SDN Tonda in science learning are quite low, this can be seen from the low scores obtained by students based on the KKM that has been set by the school, namely 70. There are 30 students in class IV at SDN Tonda who are divided into two classes. Class A is the control class and class B is the experimental class, based on the results of the evaluation carried out. The learning outcomes of class IV students at SDN Tonda pre-cycle are presented in table 1.

Table 1. Pre-Cycle Evaluation Values

No	Mark	Control Class		Experimental Class		Information
		The number of students	Percentage	The number of students	Percentage	
1	<70	11	73.33 %	13	86.67 %	Not Completed
2	71 - 80	2	13.33 %	1	6.67 %	Complete
3	81 - 90	1	6.67 %	1	6.67 %	Complete
4	91 - 100	1	6.67 %	0	0 %	Complete
Amount		15	100%	15	100%	

Based on the research results in cycle I, there was an increase in student learning outcomes based on the results of the analysis of science learning outcomes for class IV students at SDN Tonda which are presented in table 2:

Table 2. Analysis of Cycle I Science Learning Results

No	Mark	Control Class		Experimental Class		Information
		The number of students	Percentage	The number of students	Percentage	
1	<70	7	46.67 %	7	46.67 %	Not Completed
2	71 - 80	3	20 %	3	20 %	Complete
3	81 - 90	3	20 %	4	26.67 %	Complete
4	91 - 100	2	13.33 %	1	6.67 %	Complete
Amount		15	100%	15	100%	

After carrying out cycle II learning, the increase in student learning outcomes is increasingly significant. This shows that the learning method can increase student activity in learning so that it can improve student learning outcomes in accordance with the analysis of the science learning outcomes they obtained (table 3).

Table 3. Analysis of Cycle II Science Learning Results

No	Mark	Control Class		Experimental Class		Information
		The number of students	Percentage	The number of students	Percentage	
1	<70	2	13.33 %	1	6.67 %	Not Completed
2	71 - 80	6	40 %	2	13.33 %	Complete
3	81 - 90	4	26.67 %	7	46.67 %	Complete
4	91 - 100	3	20 %	5	33.33 %	Complete
Amount		15	100%	15	100%	

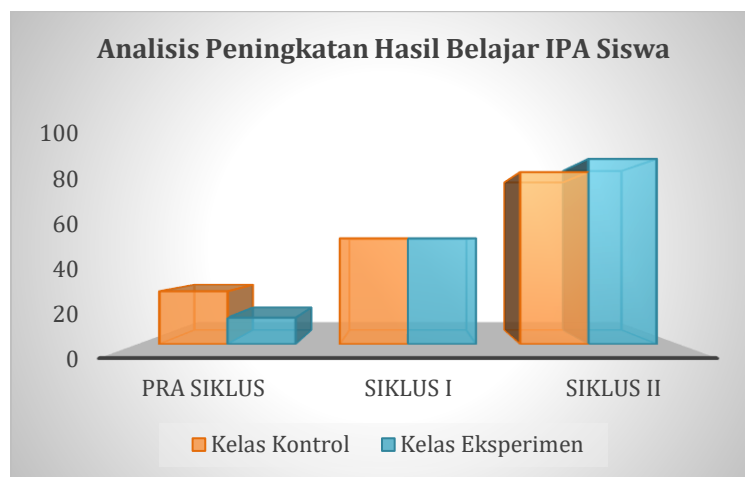


Figure 2. Analysis of Increasing Student Science Learning Outcomes

Figure 2 presents an analysis of improving learning outcomes for class IV students at SDN Tonda. Based on the graph above, it can be seen that student learning outcomes have increased by applying the make a match type cooperative learning method assisted by mind mapping. It can be seen that this learning model is very effective and can be used as a reference in improving student learning outcomes.

### 3.2. Discussion

In this research, there were 30 students in class IV at SDN Tonda who were divided into two classes. These two classes of students will be taught using new methods with the hope of increasing student activity which will ultimately improve their learning outcomes. In this case class A will be used as a control class with a total of 15 students with a completion percentage of 26.67% which will be taught using the make a match type cooperative learning model and class B as an experimental class with a total of 15 students with a complete percentage amounting to 13.33% which will be taught using a make a match type cooperative learning model assisted by mind mapping media. From the data above (table 1), it was found that the number of students who did not complete science learning with a KKM <70 was still relatively high, this was due to the use of conventional methods which resulted in students' conceptual understanding of learning not increasing. There were only 6 students with complete criteria with a percentage of 20%, while there were 24 students with incomplete criteria with a percentage of 80%. This is because during learning, students only listen to explanations from the teacher without being equipped with a sense of understanding so that students feel unfocused and tend to get bored when participating in learning activities. Some students are also recorded as happy to disturb other friends so that the student's focus is broken.

Based on the results of the evaluation of student learning outcomes in cycle I, it shows that there is an increase in learning outcomes from the learning methods applied (table 2), the table above shows student learning outcomes in the control class using the make a match type learning method, showing individual completeness reaching 53.33 % and incompleteness reached 46.67%, while individual completion in the experimental class which used the make a match type cooperative learning method assisted by mind mapping was 53.34% and incompleteness reached 46.67%. With the increase in learning outcomes obtained, students' attitudes and behavior during learning improve, students are more able to focus and can properly digest the material presented by the teacher, apart from that, students also appear to be more active in communicating and interactive in learning activities.

The results of the research and data analysis that have been carried out show that the increase in student learning outcomes is getting better, based on table 3, it shows that using the Make a Match type learning model assisted by Mind Mapping can further improve student learning outcomes when compared to learning using the Make a Match type learning model. just match. It can be seen that the percentage of students passing increased in the second cycle of student learning outcomes with the make a match type learning model assisted by mind mapping. This is proven by the decrease in incompleteness obtained by students, students who did not complete in the control class were 2 people with a percentage of 13, 33% and in the experimental class it decreased to 6.67%. The improvement obtained indicates that the learning model applied can be applied well. Learning using the make a match model assisted by mind mapping obtained data with the highest percentage of 93.33%, while student learning outcomes using the make a match learning model as a control class had a completion percentage of 86.67%.

In cycle II, it was seen that the learning preparations carried out were more mature. This is proven by the increasing activity and readiness of teachers, students, rooms, materials, teaching aids, learning media and others. Students look very focused and orderly during learning. Based on research conducted by Putu et al (2020) with the title science learning research with models *make a match* environment-based improves student learning outcomes which shows that there are differences in science learning outcomes between groups of students who are given model treatment *make a match* environment-based with groups of students who were not given model treatment *make a match* environment-based in class IV with the interpretation of the science learning results obtained analyzed using descriptive and inferential statistical analysis techniques. Based on the results of the t-test calculation,  $t$  is obtained  $t_{count} = 2.97$  and significant level (2-tailed) = 0.01.

Learning with the help of mind mapping media can better improve student learning outcomes. This is in line with research conducted by Variani and Agung (2020) showing that the average science learning outcomes of experimental group students is higher than the control group (experimental group = 19.68 > group control = 18.10). and thus, it is stated that there is a significant influence of the discovery learning model assisted by mind mapping media on the science learning outcomes of class V students at SD Gugus II, Buleleng District, Buleleng Regency for the 2019/2020 academic year. Further research was conducted by Meida et al (2017) with the research title the influence of the make a match type cooperative learning model assisted by mind maps on the science learning outcomes of fifth grade elementary school students. Comparison of the calculation results of the average science learning outcomes for the experimental group was 25.84, greater than the control class average of 18.59.

Based on the above, the application of the make a match type cooperative learning model with the help of mind mapping can improve student learning outcomes maximally when compared to the application of the make a match type learning model alone. This can be seen in Figure 2 where the increase in student learning outcomes in the pre-cycle was as large as 13, 34% Cycle I 53.34% and cycle II 93.33%, this shows that the level of activity and focus of class IV students at SDN Tonda increased along with the implementation of the make a match type cooperative learning method assisted by mind mapping so that it could improve students' science learning outcomes class IV at Tonda Elementary School.

#### 4. CONCLUSION

Based on the results of the research that has been carried out, it can be concluded that the learning model cooperative type make a match with the help of mind mapping can improve the learning outcomes of class IV students at SDN Tonda, Bima Regency. This is proven by the increase in student learning outcomes in cycle I and cycle II after implementing the make a match type cooperative learning model assisted by mind mapping. Based on the research results, student

learning outcomes increased from 20% (pre cycle) to 46.67% and in cycle II it was seen that student learning outcomes increased by 90%.

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