

APPLICATION OF MAKE A MATCH LEARNING MODEL TO IMPROVE MATHEMATICS LEARNING OUTCOMES IN CLASS VA OF STATE ELEMENTARY SCHOOL 1 PALEMBANG

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ABSTRACT

This study aims to improve students' mathematics learning outcomes through the application of the Make a Match learning model in class VA of SD Negeri 1 Palembang. The Make a Match model is a cooperative learning model that involves game elements in finding the right pair of cards, thus encouraging students to be more active, work together, and be directly involved in the learning process. The research method used is classroom action research (CAR) which is carried out in two cycles. Each cycle consists of planning, implementation, observation, and reflection. The subjects of this study were 28 students in class VA. Data were obtained through learning outcome tests and observations of student activities during the learning process. The results of the study showed an increase in student learning outcomes in each cycle after the implementation of the Make a Match model. This increase occurred because students were more motivated, enthusiastic, and active in participating in learning. Thus, the application of the Make a Match learning model can be an effective alternative to improve students' mathematics learning outcomes in elementary schools.

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1. INTRODUCTION

Education is an effort to prepare the next generation for life in society, nation, and country to be much more secure for the life to come (Wang & Chen, 2023). Education is a way to support humans to improve their skills, so that they are expected to be able to face the transition and development of technology currently. Based on the Republic of Indonesia Government Regulation No. 57 of 2021 concerning the National Education System, it is explained that education is a conscious and planned effort to create learning conditions and teaching and learning processes so that students can actively improve their competence to have spiritual strength, noble morals, and the skills needed by themselves, society, the nation and the state (Sumandya, 2022).

The quality of teaching affects learning outcomes, it can be interpreted that the greater the quality of teaching, the greater the learning outcomes will be obtained (Farhan et al., 2021; Sulisworo & Permprayoon, 2018). Learning should not just be a transfer of knowledge but should be able to share very useful skills for students so that students can improve their understanding, therefore efficiency and effectiveness are needed. Learning outcomes are the success of students after students have studied certain learning materials regarding cognitive, psychomotor, and affective aspects. Learning outcomes are used as feedback for teachers to reflect

on whether the learning materials presented can be accepted by students (Lesh & Doerr, 2003). Learning outcomes show learning achievements through changes in student behavior. Learning outcomes are abilities possessed by students based on the learning process that has taken place. Student learning outcomes are influenced by student skills and learning carried out by teachers. The quality of learning possessed by a teacher includes basic skills in the intellectual, attitude, and behavioral fields, therefore teachers must develop their abilities in the teaching process in the classroom so that student learning outcomes can increase in accordance with the expected learning objectives (Brandt & Columba, 2022).

The way teachers educate children in class causes effective learning. The learning process carried out by students will not run without the teacher who plays a role in shaping learning (Lo & Hew, 2020). The function of the teacher as a teacher is to create and design learning methods that fit the character of the students so that they can get a useful learning experience for them to achieve the goals that have been set. Determination of learning methods is related to the application of a learning model. The learning model applied must generate student skills, to create an exciting learning environment (Gustiningsi et al., 2022; Nemeth et al., 2019). One of the teacher's skills in giving lessons is the ability to determine the learning model. Determining the learning model is related to the teacher's efforts to present the right lesson to students to optimize the learning objectives. Therefore, what teachers must master is understanding the place of the learning model as one of the key factors in the success of a learning activity.

Based on the results of my observations during PPL 1 and PPL 2 which were carried out in class VA of SD Negeri 1 Palembang, I found several problems in mathematics learning, including, in the school the mathematics learning processes the teacher still uses the old method, namely assignments and lectures which cause a lack of learning effectiveness that is beneficial for students. Students only listen, take notes, and there are even some students who express that they find it difficult to understand and comprehend mathematical formulas, resulting in low learning outcomes for students in class VA in mathematics learning (Litkowski et al., 2020).

Many students think that mathematics is the most difficult subject and the most feared subject, even mathematics tends to be avoided or shunned by students (Maulyda et al., 2021). Many students also feel that learning mathematics is very boring, because there are many formulas and full of calculations, so that students feel uninterested in learning mathematics which then results in low mathematics grades. Although learning mathematics is one way to obtain a way of thinking and mathematics is useful for dealing with human life, the advancement of science and technology. Mathematics is very useful in life, because mathematics is a science that contains formulas, symbols, and concepts that are useful for us (Caetano & Zaro, 2018; Kim & Albert, 2015).

Based on the researcher's discussion with the homeroom teacher and students of class VA SD Negeri 1 Palembang, students and teachers want a creative, innovative, non-monotonous learning model and there are elements of games so that students do not feel that learning mathematics is a difficult and boring lesson. Therefore, the researcher concluded that the learning model that is suitable for students of class VA SD Negeri 1 Palembang is the cooperative learning model of *the make a match type* where the learning model has elements of games so that students do not feel bored and can increase student learning motivation. Mastery of a material can be achieved through mathematics learning activities that can be seen from the values that will be obtained after being evaluated. The selection of a learning model must be based on various reasons to achieve the objectives of a learning, including student competencies, student learning conditions, facilities and infrastructure, allocation of lesson time, and learning materials.

According to (Salsabila et al., 2024) Cooperative learning is part of a broader paradigm shift in the teaching profession. Cooperative learning involves and invites students to work together in small groups so that they can support each other's learning. One model of cooperative learning is to find a partner (*make a match*).

A match learning model is a critical thinking learning model and improves children's skills to help them maximize efficient and effective learning outcomes. The *make a match learning model* emphasizes student collaboration with other students and allows students to develop through game-based learning. This *make a match learning model* was first introduced in 1994 by Loma Curran and is one of the cooperative learning models (Ardiansyah, 2022). The *make a match type of cooperative* is a learning model that can increase student learning outcomes. According to (Khuzaini & Nasrulloh, 2023), the steps for learning to make a match include:

1. The teacher delivers material or gives students assignments to study the material at home.
2. Students are divided into two groups, for example group A and group B. Both groups are asked to face each other.
3. The teacher distributes question cards to group A and answer cards to group B.
4. The teacher tells the students that they must find/match the cards they hold with the cards of other groups. The teacher also needs to convey the maximum time limit that he gives them.

5. The teacher asks all group A to find their partners in group B. If they have found their respective partners, the teacher asks them to report themselves to him. The teacher records them on the paper that has been prepared.
6. If time is up, they should be informed that time is up. Students who have not found a partner are asked to gather separately.
7. The teacher calls one pair to present. Other pairs and students who do not get a pair pay attention and give feedback on whether the pair is a good match or not.
8. Finally, the teacher provides confirmation about the correctness and suitability of the questions and answers from the pair giving the presentation.
9. The teacher calls the next pair, and so on until all pairs have made their presentations.

The cooperative learning model of *the make a match technique* motivates students to be more active because the learning model includes elements of play and students are involved in learning activities. This *makes a match model* can create an active classroom environment to hone students' courage and eliminate students' boredom during learning (Suswandari, 2019).

From the results of the study conducted by Laili Mutia Qodra, on the title of the Application of the *Make A Match Model* to Improve Learning Outcomes of Class II Elementary School Students, it is stated Based on the results of the study and discussion, it can be concluded that the *Make a Match type cooperative learning model* can improve the learning outcomes of Class II Elementary School Students at SD Negeri 07 Palembang. Students can actively participate and be enthusiastic about learning in following learning activities through the *Make a Match type cooperative learning model* which is implemented through a game of finding card pairs. The results of the study showed that learning outcomes using the *Make a Match type cooperative learning model* in the Indonesian Language Subject increased. This can be seen before the action was taken, the average score of students was only 61.83 with a percentage of completion of only 60%. In cycle I, the average score of students was 68.47 with a percentage of completion reaching 73%. In cycle II, the average score of students was 76.30 and the percentage of completion reached 83%. The *Make a Match learning model* can improve students' understanding and can create an active and enjoyable learning atmosphere (Davidson & Major, 2014).

The relevant research used by researchers as a consideration for conducting research on the application of the *Make a Match learning model* is the same. However, the research conducted by the researcher is different from the relevant research. The research conducted by the researcher has a uniqueness, namely in carrying out the research, it applies the *Make a Match type cooperative learning model* to the Indonesian language subject for grade II in elementary schools.

This research is expected to be useful for various parties, including as a gift for teachers, students, schools, and further researchers. The benefits of this research for teachers are that it can provide insight into knowledge about innovative learning models as a consideration when teaching other learning materials by implementing the *Make a Match learning model*. The benefits of this research are that it can foster students' interest in learning when participating in learning, especially Indonesian language subjects, making it easier for students to understand the learning materials. The benefits of this research for schools are that it can provide input and considerations to overcome problems in improving student learning outcomes and can improve and enhance the quality of education in schools.

2. RESEARCH METHODS

This study uses Classroom Action Research (CAR) conducted in two cycles. Each cycle will go through four stages, namely planning, implementation, observation and reflection (Bell & Aldridge, 2014). This study involves a researcher, 28 students who will be given the action and an observer, who will observe the activities of students and the learning process taking place. Each cycle will be implemented within a week, two meetings form one cycle, which involves adjustments to the learning schedule. Each meeting lasts for 2 x 35 minutes. The paradigm used is the cycle-based model by Suharsimi Arikunto (2013: 17), which includes the following four steps of activity for each cycle: (1) planning, (2) implementation of action, (3) observation, and (4) reflection. The following are the stages of the research process used:

Classroom Action Research in this study is collaborative, namely cooperation between researchers and class teachers. Researchers are directly involved in the research process from the beginning to the results of the research in the form of a report. At the initial meeting between the researcher and the class teacher, the class teacher has concluded that in the learning of mathematics in class VA SD N 1 Palembang, students are considered very less interested in following the lesson, in addition, the learning outcomes of students are still low. Here, researchers and class teachers have the intention to conduct collaborative research by applying the *make a match type cooperative learning model* to mathematics subjects.

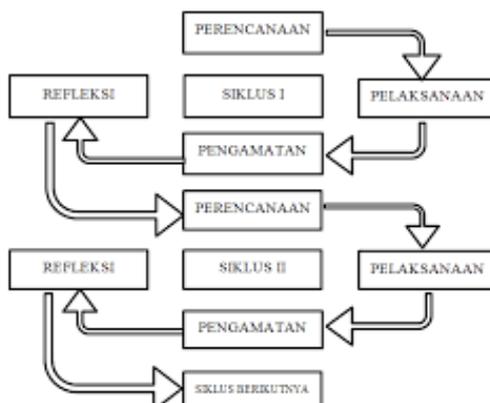


Figure 1. CAR Design (Bell & Aldridge, 2014)

- **Action Planning**

Action plans are made to test the stated hypothesis experimentally based on the difficulties identified at the pre-PTK stage. All requirements for carrying out the action, including:

- Conducting direct observations regarding the conditions of the learning environment in the classroom, as well as instructors and students.
- Reviewing the competencies and indicators of mathematics subjects on material about whole numbers up to 100,000.
- Create a Mathematics Teaching Module according to the established indicators and learning scenarios using the *make a match learning model* with whole number material up to 100,000.
- Prepare media and learning resources to support learning.
- Preparing evaluation tools in the form of written tests and student worksheets
- Prepare an observation sheet to assess the learning process that takes place through the *make a match learning model*.

- **Implementation of Action & Observation**

The implementation of mathematics learning is applied cyclically with 2 meetings in each cycle. Each cycle of implementation is planned in one learning implementation plan (RPP) which is divided into preliminary activities, this activity and closing activities. The indicators of teacher activities observed are

- Opening the lesson/ apperception,
- Giving motivation,
- Convey learning objectives,
- Presenting or delivering material,
- Organizing students into groups,
- Guiding groups with the *make a match model*,
- Evaluation/ quiz giving,
- Giving awards,
- Conducting feedback,
- Summarizing the material,
- Provide follow-up activities.

Meanwhile, the indicators for student activities are:

- Listening to the teacher's explanation,
- Forming study groups,
- Student interaction in groups,
- Doing exercises in groups,
- Seriousness in working on test questions.

- **Reflection**

Reflection is the stage where information/input obtained from observation is processed. The information received is interpreted, explanations are sought and then analyzed. External parties can also be involved in the process of reviewing this information, during observation. Involving collaborators to help researchers simply reflect and evaluate what happens in the classroom can be used to conduct PTK. At this reflection stage, all experiences, knowledge and learning theories obtained and related to the tasks in classroom action research.

The data source of this study is 28 students in class VA of SD Negeri 1 Palembang consisting of 13 male students and 15 female students. There are 2 types of data obtained, namely: 1) Quantitative data obtained from learning outcomes, in this study are student learning outcomes in the form of tests conducted after the end of the cycle, the data is learning outcome data in the form of numbers and obtained from the results of the teaching and learning process. 2) Qualitative data, namely the results of observations through observation sheets for each cycle which are sourced from student conditions and the way teachers teach using the *make a match learning model*.

The data in this study are quantitative data or learning outcomes and qualitative data of teacher teaching activities through observation sheets conducted in each learning process. Quantitative data analysis. Quantitative data analysis is in the form of observations of student learning outcomes conducted at the end of each action cycle by providing tests using written test questions.

1. Calculate the value of each student using the method $\text{Value} = \frac{\text{Skor yang diperoleh}}{\text{Skor Maksimal}} \times 100$ (Arikunto, 2005)
2. Calculating the average class value using the method $\bar{x} = \frac{\sum x}{N}$ (Arikunto, 2010)
3. Calculating student learning completion using the $\text{KB} = \frac{N}{n} \times 100\%$ method (Trianto, 2010: 241)

Qualitative data analysis

Qualitative data analysis is an analysis of the results of observations carried out in the learning process using observation sheets. The data obtained are data on teachers and student data in the learning process. The data is analyzed and concluded qualitatively. The processing of data on teacher and student activities from all indicators in one meeting is formulated as follows (Scanlon, 2018):

$$P = \frac{N}{n} \times 100 \%$$

Information:

P : Presentation

N : Number of scores obtained

n : Total score

Make a Match method can be said to be successful if there is an increase in learning outcomes, at least 80% of all students have obtained a score of ≥ 70 . This is based on the Minimum Completion Criteria Standard (KKM) in the learning process set at SD Negeri 1 Palembang for Mathematics subjects. The *Make a Match method* facilitates interactive and fun learning, allowing students to learn through matching information in pairs, which improves their understanding of concepts.

3. RESULTS AND DISCUSSION

The research began with a pre-cycle that aimed to find out the initial conditions of the students before the research was carried out. The initial results before the research were as follows:

Table 1: Pre-Cycle Learning Outcome Completion

No	Information	Frequency	Presentation
1	Completed	8	28, 58%
2	Not yet finished	20	71.42%
Amount		28	100%

Table 1 shows that only 8 students or 28.58% achieved learning completion. and those who have not achieved completion are 20 or 71.42% with a KKM value of 70. The description of the research data in cycle I can be seen in the table below.

Table 2: Learning Outcome Completion Cycle 1

No	Information	Frequency	Presentation
1	Completed	16	57.42%
2	Not yet finished	12	42.58%
Amount		28	100%

Table 2 shows that only 16 students or 52.42% achieved learning completion and 12 or 42.58% had not achieved completion and/or achieved a KKM score of 70. The description of the research data in cycle II can be seen in the table below.

Table 3: Learning Outcome Completion Cycle 2

No	Information	Frequency	Presentation
1	Completed	26	92.86%
2	Not yet finished	2	7.14%
Amount		28	100%

Table 3 shows that 26 students or 92.86% achieved learning completion and 2 or 7.14% had not achieved completion and achieved a KKM score of 70. The results of the research in each cycle can be presented in the table below.

Table 4: Comparison of Research Results from Cycle I and Cycle II

Aspects observed	Cycle		Category	Meaning
	1	2		
Observation of teacher activities	70.37	85.55	B	Good
Observation of student activities	62,625	79.25	B	Good
Learning outcomes	73.03	82.50	A	Very good

Based on table 4, it can be explained that the results of the implementation of the research in cycle I, namely the observation of teacher activities, got a score of 70.37 with a good category, observation of student activities reached an average score of 60.625 with a sufficient category, the average score of the learning outcome test was 73.03 and had achieved completion. However, the learning outcomes of cycle I classically were not complete because they had not yet reached 75% of the research indicators. Moreover, the minimum research indicator is 80% of the number of students achieving learning outcome completion. The learning outcomes in the Pre-Cycle, Cycle I and Cycle II can be seen in the picture below.

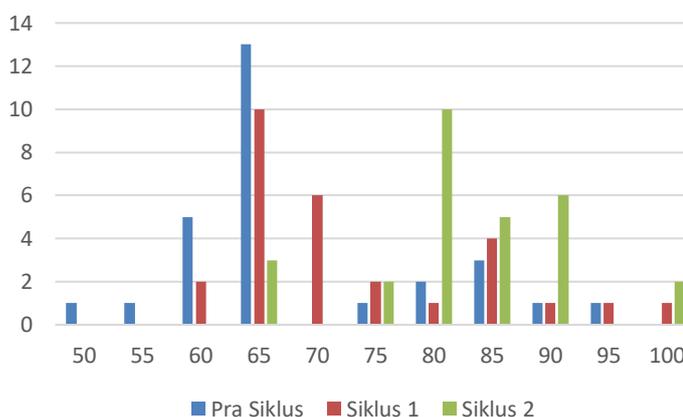


Figure 2: Pre-Cycle, Cycle I and Cycle II Learning Outcomes

From the picture above, it can be seen that in cycle I there are still 12 students whose scores have not reached the KKM. After making improvements in cycle I, it can be said that the activities in Cycle I have increased from the Pre-Cycle. In cycle I, the results of teacher activity observations were 70.37 with a good category and increased to 85.55 with a very good category. Observations of student activities in cycle I reached 62.625 with a sufficient category and increased in cycle II to 79.25 with a good category. The average value of learning outcomes in cycle I was 73.03 increasing to 82.50. From learning completeness from 73.03% to 82.50% and has completed the classical research indicator of 80%. In cycle II, there was an increase in learning outcomes which can be seen that the scores obtained by several students have exceeded the KKM score of 70, although there are still 3 students who have not reached the KKM, but it can be said that the implementation

of the Make a Match Learning Model has succeeded in improving the mathematics learning outcomes of class Va students. To be clearer about the comparison of research results in cycle I and cycle II, it can be seen in the picture below. The blue bar chart shows the results of cycle I research, and the orange bar chart shows the results of cycle II research.



Figure 3: Comparison of Research Results from Cycle I and Cycle II

Based on the results of the study conducted in class VA of SD Negeri 1 Palembang, it can be concluded that the implementation of the *Make a Match cooperative learning model* has succeeded in improving student learning outcomes. The purpose of implementing the Make a Match model is to train students' accuracy and understanding of the material being taught in more depth. Improved learning outcomes occurred after the teacher implemented the *Make a Match model*, where this model contains elements of the game in finding the right pair of cards, thus encouraging students to be more active in working together and not passive during learning. The implementation of the *Make a Match cooperative model* also makes learning more meaningful, enjoyable, and triggers student activity through thinking and discussion activities in solving problems.

4. CONCLUSION

Based on data collection and analysis, it can be concluded that the *make a match learning model* can improve students' learning outcomes in mathematics subjects on Whole Numbers Up to 100,000 in class V of SD Negeri 1 Palembang. This is indicated by the increased learning outcomes of students. By implementing the *make a match model*, teachers no longer use lecture methods alone but also games or learning while playing by finding answers from the cards held by students. Students are already seen to be active because in this make a match learning model, students are involved in the game of finding pairs of answers and questions so that they can understand the material explained by the teacher. Student completion increased from 73.03% in cycle I and in cycle II increased to 82.50%. Thus, the completion of learning outcomes of 80% of students has been achieved with a KKM score of 70.

The researcher provides several suggestions as follows: (1) Schools should conduct outreach to teachers to use various learning models, such as the *Make a Match cooperative model*, so that learning becomes more active and enjoyable, and helps students achieve learning goals optimally. (2) Teachers are advised to apply the *Make a Match cooperative model as a variation of learning methods to improve student learning outcomes*. (3) For further researchers, it is recommended to conduct a more in-depth study on the application of the *Make a Match cooperative model* and develop it further to improve student learning outcomes.

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