The Effect of Applying the Make A Match Type Cooperative Learning Model on Student Learning Outcomes in the Material of Relations & Functions

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Abstrak

Penelitian ini bertujuan untuk mengetahui hasil belajar siswa yang belajar matematika materi relasi dan fungsi menggunakan model pembelajaran kooperatif tipe *make a match* dan model pembelajaran yang biasa digunakan yaitu model pembelajaran konvensional. Penelitian ini merupakan penelitian eksperimen, yang dilakukan pada kelas VIII A (kelas eksperimen) dan kelas VIII C (kelas kontrol). Hasil posttest rata-rata hasil belajar kelas eksperimen $\bar{X}_e$ = 80,2 dan rata-rata hasil belajar kelas kontrol $\bar{X}_k$ = 50.29. Kesimpulan dengan menggunakan α = 0,05 dalam penelitian ini adalah rata-rata hasil belajar siswa yang belajar matematika materi relasi dan fungsi menggunakan model pembelajaran kooperatif tipe *make a match* lebih tinggi dari rata-rata hasil belajar siswa yang belajar menggunakan model pembelajaran konvensional.

Kata kunci: Model Pembelajaran, Make A Match, Hasil Belajar, Relasi, Fungsi

Abstract

This study aims to determine the learning outcomes of students who study mathematics on relations and functions using the cooperative learning model of the make a match type and the learning model that is commonly used, namely the conventional learning model. This research is experimental research, which was conducted in class VIII A (experimental class) and class VIII C (control class). The posttest results mean the learning outcomes of the experimental class $\bar{X}_e$ = 80.2 and the average learning outcomes of the control class $\bar{X}_k$ = 50.29. The conclusion using α = 0.05 in this study is that the average learning outcomes of students who study using the make a match type cooperative learning model are higher than the average learning outcomes of students who study using conventional learning models.

Keywords: Learning Model, Make A Match, Learning Outcomes, Relationships, Functions

INTRODUCTION

According to the 1945 Constitution's introduction, education is the most important and crucial in enhancing human resources. "To educate the life of the nation" is the stated goal of national education. In order to generate high-quality education, science, and technology development are necessary (Usman, 2014). Article 1 Paragraph 1 of Law No. 20 of the Republic of Indonesia (2003) on the National Education System states that education is "a conscious and planned effort to create a learning environment and learning process so that students actively develop their potential to have religious, spiritual strength, self-control, personality, intelligence, noble character, and the skills needed by himself, society, nation, and state."

The procedures of teaching and educating are goal-conscious. According to Anggraeni and Veryliana (2019), objectives are an effort to define the outcomes that students are expected to achieve after engaging in the learning experience. Anywhere is a potential location for learning, including school. Of course, numerous subjects are taught when learning at

school. Indeed, improvements in a nation are crucial for producing superior human resources (Tahir, 2017). Educators or teachers with the knowledge, skills, and instructional strategies necessary to guide students to complete the learning process are required to develop quality human beings beginning with the family, social environment, and educational institutions (Mangelep, 2017). One indicator of quality education is the acquisition of optimal student learning outcomes, both in cognitive, affective, and psychomotor forms (Pratiwi, 2017). The teaching and learning process includes activities carried out by teachers, from planning and implementing activities to evaluation and follow-up programs that take place in educative situations to achieve certain teaching goals (Faizah, 2017).

According to these variables, student learning results increase with student ability and instructor effectiveness. In attempts to fulfill the objectives of the Indonesian nation in realizing general welfare and educating the nation's life, education plays a very strategic role (Mangelep, 2017). The National Education System is outlined in Article 1 of Law of the Republic of Indonesia Number 20 of 2003, which states that education is "a conscious and planned effort to create a learning atmosphere and student learning process so that students actively develop their potential to have spiritual, religious strength, self-control, personality, intelligence, noble character, and skills needed by himself, society, nation, and state."

The teacher's contribution to the method's development determines one of a learning process's accomplishments (Tanjung et al., 2021). In this situation, the teacher's responsibility is to use creativity to create an efficient teaching and learning process, specifically one that develops approaches focusing on student engagement and activity in the classroom (Anggraeni & Veryliana, 2019). It is believed that using learning patterns created for students will foster the motivation of students to engage in active learning activities (Mangelep et al., 2013). The reality on the ground demonstrates that multi-directional or student-centered learning approaches must also be used in order to produce an efficient teaching and learning process (Mangelep, 2015). This is in addition to thinking in the instructor or one-way communication methods. The quality of education will suffer if this is not coordinated. The use of a teaching strategy approach, methods, and techniques in line with the approach to involving active student engagement in the learning process is required for student-strengthening learning process activities in the 2013 curriculum (Mangelep, 2020).

Mathematics is a basic science that plays a very important role in developing science and technology and advancing human thinking. Mathematics does not accept generalizations based on observation (inductive), but mathematics must be based on deductive proof (Sari, 2017). There needs to be knowledge that the content and methods of seeking truth in mathematics are different from natural science, let alone science in general (Hidayahtullah, 2019). The method of seeking truth used by mathematics is deductive science, while natural science is inductive (Muliawati & Sofyan, 2013; Domu et al., 2023).

In developing students' abilities, educators must be able to manage the learning process well. A good and quality learning process has the function and purpose of activating students in the classroom and increasing students' understanding of the lesson (Rajagukguk et al., 2021). Learning is said to be successful and of high quality if students are actively involved in the learning process in class and increase student understanding (Febriyanto et al., 2018). Fun learning is one factor that can support a lesson's success. When learning is done in fun, students will easily accept and understand the material being studied (Tiwow et al., 2022; Domu et al., 2023).

One of the materials taught in learning mathematics at school is relations and functions. In this material, there are many concepts and topics that students must know and understand. Students memorize and can know, explain, and describe topics or concepts in the material (Tiwow et al., 2022). Of course, learning is supported by the teacher's ability to vary learning activities to achieve learning objectives (Runtu et al., 2023).

In addition to the problems above, problems related to learning outcomes in learning are very important to discuss because they can determine the success of the learning carried out. The learning outcomes of class VIII students of SMP Negeri 2 Poigar regarding relations and functions are still relatively low compared to other materials, namely an average of 72. Students still need to gain an understanding of solving problems related to relations and

functions, so learning outcomes on relations and functions are low. The learning that is carried out also tends to be monotonous because there is no use of interesting learning models that build a pleasant classroom atmosphere. So learning activities in the class are passive, and students feel bored and do not pay proper attention to the teacher's explanation. Furthermore, most students need more interest in learning mathematics, assuming that mathematics is difficult and boring, thus affecting student learning outcomes.

Many factors cause students to think that mathematics is a difficult and boring subject, namely the students themselves, the teacher, the learning approach, the learning method, or the model used. From the factors that cause students' assumptions, it is necessary to do mathematics learning using a learning model that can attract students' attention to learning (Rompas et al., 2023). Using learning models that involve students also needs to be done so that in the learning process, students do not become lazy or feel bored, and bored, but can make students active (Kambey & Mangelep, 2019).

An interesting learning model that makes students enthusiastic about learning can help them understand the material well, is more active in class, and not only focus on the teacher's explanation, namely the Make Match Cooperative Learning Model. With the advantage of making the atmosphere active and fun, the material presented is interesting, it can affect learning outcomes, the atmosphere of joy increases, and cooperation between other students is achieved (Kurniasih & Berlin, 2015). According to Rusman, the make-a-match model is one method in cooperative learning. In the learning process with the make-a-match model, students can learn in a fun atmosphere and play while learning so students do not feel bored.

It is anticipated that the Make Match type learning model will encourage student interest in learning and motivate students to learn because it is a variety of a new learning model. The cooperative learning model of the Make-A-Match method, which involves students directly in the learning process, is said to increase their enthusiasm for learning, according to Deschuri (2016). By using the Make-A-Match method, instructors can create engaging learning environments, develop students' boldness, and prevent boredom while they are studying. According to Ernawati (2016), the Cooperative Learning Model emphasizes student cooperation in groups. This is based on students' thinking that expressing and understanding a concept is easier if they discuss the problem with their friends. The cooperative learning model consists of several types: Jigsaw, Think-Pair-Share, Numbered Heads Together, Group Investigation, and Make a Match.

The Cooperative Learning Model with the Make Match type begins with forming three groups. If the class consists of 30 people, then each group consists of 10. The first group is the question-card-holder group, the second group is the answer-card-holder group, and the last group is the assessor group. Then set the group's position in the shape of the letter U, then strive for the first and second groups to line up facing each other. If each group is in a predetermined position, the teacher sounds a whistle to signal the first and second groups to move, looking for matching pairs of questions and answers. After the cards are matched, pairs of question-and-answer card holders are formed.

Group work exercises are conducted initially in the Make-A-Match type cooperative learning style (Nurmalia, 2018). It seeks to identify and comprehend the traits of each person and group. According to the above description, it is clear that: (1) the cooperative learning model of the Make-A-Match type seeks to foster an attitude of mutual respect, foster an attitude of responsibility, and increase self-confidence in solving a problem; (2) it is a learning model that requires students to be active in learning, skills- (3) Students are given the flexibility to express their thoughts in a democratic environment during Make A Match learning. The Make-A-Match learning model combines democratic principles where students are actively involved in learning activities, both from the beginning to the end of learning, with the freedom to choose the material to be studied according to the topic being discussed (Shoimin, 2014).

Based on the description above, the researcher was interested in applying the make-a-match type of cooperative learning model, so the researcher conducted a study with the title "The effect of applying the make a match type cooperative learning model on the mathematics learning outcomes of class VIII students on relations and functions at SMP Negeri 2 Poigar".

METHOD

The experimental class and the control class are the two classes involved in this experiment. Students from three classrooms in class VIII of SMP N 2 Poigar made up the population of this study. The experimental class and the control class were chosen at random by drawing lots to ascertain which samples came from which two identical or homogeneous classes. This study was done to find out how well students learned relations and functions in mathematics using the make-a-match cooperative learning paradigm, which is more effective than traditional learning models. The treatment variable and the response variable are the study's variables. The study's instrument was a test with a description item as the last question. A precondition test is used to select two classes that are similar or homogeneous to sample, and a learning achievement test is used to compare the effectiveness of the make-a-match cooperative learning model with the traditional learning model in terms of student learning outcomes. The t-test was employed in the data analysis method, which was followed by the f-test for homogeneity and the Liliefors test for normality.

RESULT AND DISCUSSION

This research was conducted at SMP Negeri 2 Poigar. Prerequisite test results from 3 selected classes 2 homogeneous or the same classes, namely class VIII A and VIII C. Then taken randomly by drawing lots. Class VIII A is the experimental class by applying the cooperative learning model of the make-a-match type, and class VIII C is the control class with the learning model that is commonly used. The number of students in the experimental class was 20, and the number of students in the control class was 24. The data from student learning outcomes in the post-test on relations and functions.

Analysis of the results of the post-test experimental class and control class data can be seen in the following table.

Table 1. Post-test Statistical Data for Experimental Class and Control Class

No	Statistic	Cooperative Learning Model Type Make a Match	Learning Model conventional
1	Minimum Score	50	30
2	Maximum Score	95	80
3	Average	80,2	50,29
4	Standard Deviation	14,12575	14,10051
5	Variances	199,5368	198,8243

Before testing the hypothesis using the t-test, a normality test was carried out for the experimental class and control class using Microsoft Office Excel; for the experimental class, it was obtained $l_{hitung} = 0,147 < l_{tabel} = 0,19$ accept H_0 thus the data is distributed normal and for the control class obtained $l_{hitung} = 0,1748 < l_{tabel} = 0,1766$, accept H_0 with normally distributed data. Then the homogeneity test using the f-test obtained $f_{hitung} = 1,00358 < f_{tabel} = 2,06075$ which was accepted by H_0 namely where the variances of the experimental class and the control class were the same (homogeneous). After the normality and homogeneity tests were carried out, the t-test was carried out using a significant level α = 0.05. With test statistics:

$$t = \frac{(\bar{x}_1 - \bar{x}_2)}{s\sqrt{\left(\frac{1}{n_1}\right) + \left(\frac{1}{n_2}\right)}}$$

$$S = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}}$$

Based on the hypothesis testing using the t-test, it is obtained that t_{hitung} = 6,9998 > t_{tabel} = 2,018 then H_0 is rejected, where $H_0 : \mu_1 \leq \mu_2$ and $H_1 : \mu_1 > \mu_2$. The average learning outcomes utilizing the cooperative learning model of the make-a-match type were therefore found to be superior to those using traditional learning models.

Based on the results of research at SMP Negeri 2 Poigar in the odd semester of the 2022/2023 academic year in class VIII A and VIII C, where the experimental class used the make-a-match type cooperative learning model in the material on relations and functions with an average student learning outcome of 80.2, the maximum score is 95, and the minimum score is 50. Then in the control class, using the learning model that is commonly used, namely the conventional learning model on relations and function material, with an average student learning outcome of 50.29, a maximum score of 80, and a minimum score of 30.

According to the test, it was discovered that the typical student learning outcomes using the cooperative learning model of the make-a-match type were higher than those utilizing the typical student learning outcomes using traditional learning models. The make-a-match type of cooperative learning methodology encourages pupils to learn actively and socially. To promote student activity and affect learning results, students search for pairs of already-existing cards while cooperating with one another.

In the make-a-match cooperative learning concept, students are turned into learning centers. Instead of controlling the learning process, teachers give their pupils the chance to explore and deepen their understanding of mathematics. Mathematics teachers can utilize the make-a-match cooperative learning paradigm to help students improve their ability to think, solve problems, reason, and communicate. The make-a-match learning model is a sort of cooperative learning that is offered to students in the form of cards. It encourages them to use creativity to identify partners for each concept that is presented on each card in order to find answers to statements or pairs of concepts.

The make-a-match learning model offers students the chance to actively construct their mathematical knowledge by giving them content concepts that can be easily reviewed and understood in study groups that call for cooperation, cohesion, and efficient time management so that students are motivated to learn and produce results. Good research. Making use of the make-a-match learning methodology, we can help pupils comprehend the concepts in Mathematics. The make-a-match learning approach can thus be used to create a pleasant environment.

Giving pupils praise and points also motivates them to engage in lessons that boost their confidence, which benefits their academic performance. This is consistent with Fitria's opinion (2017), which claims that learning outcomes serve as a baseline for teachers to assess how well their charges comprehend concepts.

Student learning outcomes can be determined by how well students retain the lessons taught during the learning process and how they apply those teachings in their daily lives. Learning outcomes, according to Cintia et al. (2018), are new knowledge that students hold after completing the learning process in accordance with predefined learning objectives, comprising facets of knowledge, attitudes, and skills. Learning outcomes are also the size of the score that is determined by evaluating various knowledge, attitude, and skill-related components.

In line with the opinion above, Yulianti & Muhammadi (2020) also argue that student learning experiences can shape students' abilities, which are referred to as learning outcomes. In the learning process, learning outcomes have an important role. Information obtained from the process of assessing learning outcomes can provide an overview to the teacher about student progress in achieving learning objectives through learning activities. Based on this information, the teacher can arrange further student activities for the whole class and individually. Learning outcomes embody all the efforts made during the teaching and learning process and are related to students' final grades. Evaluation is the result of the final learning process.

According to the journal's analytical findings, elementary schools successfully implement the make-a-match cooperative model for integrated thematic learning. Because the make-a-match type can transform learning that is less appealing to students' motivation and interest

into enjoyable learning that draws students' enthusiasm due to the game element in learning when the cooperative model is implemented. According to Yulianti and Muhammadi (2020), make-a-match cooperative learning can boost students' knowledge and physical activity in learning, create fun learning because of the game element, increase students' understanding of the material being studied, motivate students in learning, strengthen students' trust so that they can display their work in front of the class, and can strengthen a sense of self-discipline in students through the u This is also in line with Muhammadi and Bakar's (2019) assertion that stronger attitudes like discipline, communication, peace-loving, and social care can be used to demonstrate the effectiveness of a learning process in addition to activity and results.

CONCLUSION

According to the study's findings, students who studied relations and functions in mathematics using a cooperative learning model of the make-a-match type had greater average learning outcomes than those of students who used a traditional learning model. Therefore, the cooperative learning model of the make-a-match kind has a positive impact on learning outcomes in connection to functional material, making it a good choice for teaching and learning activities.

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