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IMPLEMENTATION OF TEACHER DEVELOPMENT TO IMPROVE MATHEMATICS LEARNING ACHIEVEMENT USING C3T METHOD AND PEER TUTORING AT SDN PURWOMARTANI

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Abstract

The impact of the perception that mathematics lessons are challenging and tedious is the low motivation of students to solve mathematics problems, which leads to low achievement of learning mastery. The activity focuses on implementing the C3T method and peer tutoring to improve the mastery of mathematics learning for 6th-grade students at SDN Purwomartani. The research method used is qualitative. The activity results show an improvement in the learning mastery of students from 9 students to 27 students, with 1 student receiving remedial action outside of class hours. There is a significant improvement in students' learning success. It indicates that the C3T method and peer tutoring can enhance students' learning achievements in mathematics at SDN Purwomartani. The C3T method emphasizes the active role of students, speed, and intelligence in learning, thereby increasing students' motivation and mastery. Peer tutoring also helps boost the confidence of peer tutors, in addition to providing additional support and guidance to students in overcoming learning difficulties.

Keywords: Learning Mastery; C3T Method; Peer-Tutoring Method

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A. introductionn

Learning is an interconnected cycle that involves a teacher as an educator, students as learners, and materials as the content to be taught. The success of the learning process reflects the extent to which learning objectives are achieved. Choosing a teaching strategy in the teaching experience must be appropriate to achieve a learning goal. The learning methods selected and implemented by the teacher are called learning strategies. Educators tailor these strategies to various situations, including student demographics, school conditions, environment, and specific learning objectives that have been set. The choice of these learning strategies significantly impacts students' understanding of the material and their learning achievements.

According to Rohman (Rosda, 202results2), teachers must carefully consider the implementation of chosen learning strategies in education within the school environment. The role of a teacher must be accurate, and they should be able to plan lessons effectively. To generate high-quality learning and students, teachers choose the appropriate teaching methods to implement good school teaching practices. This decision is based on various factors, including the nature of learning, student demographics, the type of subject matter, environmental situations and conditions, and the goals to be achieved.

One of the subjects found in the education system is mathematics. Students usually perceive learning mathematics as difficult and tedious. As a result, they are often less motivated to work on practice problems and may need help with mathematical calculations. Mathematics is an abstract subject, causing some students to find it challenging to comprehend and, consequently, not fully grasp the lessons. Therefore, appropriate teaching methods and techniques are necessary to achieve proficiency in learning mathematics, which is a part of the learning strategy.

The C3T method is one learning model that emphasizes that students should actively participate in their learning process inside and outside school. At the beginning of the teaching and learning process, the main goals of the curriculum and the learning outline are provided (Muliawan, 2016). The C3T (cerdas, cermat,

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cepat, and tepat) learning method originates from the quiz competition model, which stands for intelligent, careful, fast, and accurate. Prominent pedagogical factors include precision, intelligence, accuracy, and speed in answering teacher questions. As the name suggests, the C3T method is a modified teaching and learning activity method derived from the quiz competition method. This learning method prioritizes students' participation in independent learning activities. This method is independent of others in both internal and external environments.

Peer tutoring is a method of receiving information from peers or friends (Djamarah & Zain, 2010). According to Kyriacou (2011), peer tutoring is when a student assists or teaches another student. With the peer tutoring method, students feel free to become tutors and can develop their methods of explaining lesson materials to their friends who may not understand. Therefore, C3T is a method that prioritizes how students participate quickly, carefully, and actively in the learning process. This method expects to motivate students to work on practice problems and aims to keep those behind motivated to work on problems. Combining peer tutoring with the C3T method enables a more effective implementation, allowing all students to complete the exercises.

These advantages are expected to make students more active and capable of understanding mathematics learning through the C3T method and peer tutoring. Increased student engagement can be observed through motivation to solve problems, providing feedback to solve problems, and commenting on feedback from others. Learning outcomes can be measured based on students' final grades following the Minimum Competency Criteria (KKM), with a score of 70.

Based on the data obtained at SDN Purwomartani, located in the center of the Purwomartani Village. Its location is in the middle of the hamlet environment and various large residential areas. It has become a consequence of the uneven ability of students to attend school here, resulting in a low average class outcome. It requires a concerted effort due to the requirements of the 2013 curriculum, which necessitates students to have comprehensive competence in acquiring each core competency.

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A person's learning outcomes can indicate their success in learning, encompassing knowledge, relevant character, and behavior related to educational goals (Prayuda et al., 2014). According to Suhendri (2011), the ultimate goal of learning activities is to produce sustained and measurable changes in cognitive, affective, and psychomotor domains. By knowing students' learning outcomes, teachers can identify students' abilities, discover learning challenges, and plan enrichment. Furthermore, teachers guide and direct students who have yet to reach the minimum competency score (KKM) to improve their understanding of the explained material (Suyanto, n.d).

One elementary school in Temanggung Regency reports that the 6th grade mathematics learning outcomes students are excellent, with many students receiving above-average grades. Despite the teachers using various engaging approaches to teach mathematics, some students still need help understanding the material. Therefore, the researcher hopes that the school pays attention to students who have yet to reach scores above the minimum competency level and frequently conducts programs to improve grades above the minimum competency level so students' learning outcomes can be achieved well and optimally.

A learning model that enhances learning outcomes, namely the peer tutoring model, will be used to manage this issue. The peer tutoring learning model is considered to improve learning outcomes. This model is implemented in the classroom to assist other students in understanding the material well and help students facing difficulties in understanding the material (Firmasari et al., 2013). Peer tutoring is conducted in the classroom among peers and is applied after the completion of the lesson, allowing the teacher to assess students' proficiency levels in the material. Students with high skills and abilities will assist those with lower skills and help them achieve grades above the minimum competency level.

According to the 2013 curriculum, the steps to be followed by peer tutors are as follows: (1) selecting a topic that can be learned independently by students; (2) choosing tutors who meet the criteria; (3) dividing students into groups; (4) categorizing students based on their intelligence and placing them in respective groups; (5) explaining the reasons for forming the groups; (6) each group paying

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attention and listening to the tutor's explanation (observation); (7) having problems in each group and then working on the answers (observation); (8) each group searching and reading books related to the unsolved problem (collecting information); (9) finding steps or answers from the book (processing information); (10) giving time for other groups to ask the tutor about anything they do not understand (processing information); (12) filling out observation forms, making conclusions, and clarifying.

According to Anggorowati (2011), peer tutoring aims to help students acquire problem-solving skills, leadership skills, responsibility to complete tasks, and the ability to build relationships with other students.

Teguh (2016) found that peer tutoring influences the learning outcomes of trigonometry material in high schools. Additionally, research by Lopez et al. (2016) found that high school students excel in studying the motion system. Middle and high schools widely use the peer tutoring model; many researchers have discovered this, unlike elementary schools, where researchers have found it less, especially in Mathematics learning. Furthermore, many researchers have observed the steps of the learning process and found that many schools still need to adapt to the features of the 2013 curriculum, which should have been implemented. Although some schools still need to implement the 2013 curriculum, there is an expectation that they will transition to it. Additionally, this research needs to pay more attention to the 4C learning characteristics, which are crucial for teachers to apply during the learning process. The researcher is interested in conducting a study on peer tutoring in mathematics for 6^{th} grade because there is limited prior research on mathematics, particularly in elementary schools.

This research is based on the 2013 curriculum, which modifies the 6M learning steps and establishes the 4C learning, especially C3, to enhance previous studies. This research will be beneficial for students in learning mathematics in the classroom. The author conducted this research using the peer tutoring model in the sixth grade at SDN Purwomartani. Thus, the researcher aims to conduct

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research titled "Teacher Development in Efforts to Improve Mathematics Learning Mastery with the C3T Method and Peer Tutoring".

B. Methods

This research is for all 6th grade students at SD Negeri Purwomartani. This research describes how the C3T method and peer tutoring can help 6th grade students at SD Negeri Purwomartani master the Basic Competency of Circles. This research is descriptive and conducted over 3 weeks. Each week, the learning activities are divided into three stages: material presentation for 2 hours, 1 hour for sample questions and exercises, and 2 hours for evaluation. During the first week, teachers conduct learning without using the C3T method and peer tutoring. In contrast, teachers perform learning activities in the second and third weeks using the C3T method and peer tutoring. The desired outcome of this research is to achieve learning mastery for students.

Implementing the C3T method and peer tutoring involves providing questions to students at a level similar to the previous exercises at SD Negeri Purwomartani. They allocate time for students to work on these questions and assign the highest ranking to those who can solve the questions correctly and quickly, followed by other students in the order of answer submission. If there is a need to correct the answers, students must make the corrections and submit them again in the following order. Students who have answered correctly will guide the others who need help to solve the questions. This way, students with lower abilities will receive guidance from classmates who can explain more understandably, indirectly improving learning mastery. Considering the time taken to complete the questions determines the grading. Students who complete the questions quickly will receive a score of 100, while those who finish at the end of the specified time will receive 75. However, if students fail to solve the questions correctly before time runs out, they are considered not to have achieved learning mastery. The C3T method and peer tutoring are implemented again in the following week.

This research collected data through observation, tests (pretest and post-test), and documentation. According to Slameto (2015), tests or exams are

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conducted to determine the extent of competence with specific procedures, which can produce consistent results under consistent conditions. Furthermore, Slameto (2015) notes that observation is a term used to describe recording events conducted sequentially and structured. Observation is employed to gather data that, in the context of 6th grade mathematics subjects, utilize the peer tutoring model to collect information about the learning process in the classroom.

Slameto (2015) stated that researchers can document events or incidents using pictures, writings, and films. In this research, documentation serves as evidence. Observation sheets for teachers and students are used to evaluate the teachers' performance in implementing peer tutoring learning. Student observation sheets also assess students' ability to collaborate and comprehend the material. Additionally, formative test sheets contain questions designed to measure mastery and achievement in mathematics learning outcomes based on success indicators.

C. Results and Discussion

The results of the research conducted by the researcher show the success of the C3T method and peer tutoring at SD Negeri Purwomartani. The researcher presents the results in the table below.

Table 1
Mathematics Subject Scores Acquisition in the First Week

Scores	Total Students	Completed	Not Completed	%Completion
100	1	9	19	32,14 %
95	2			
90	2			
85	0			
80	3			
75	0			
70	1			
65	1			
60	1			
55	3			
50	5			
45	1			
40	2			
35	1			
30	1			

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Scores	Total Students	Completed	Not Completed	%Completion
25	2			
20	1			
15	0			
10	1			
Total	**28**			

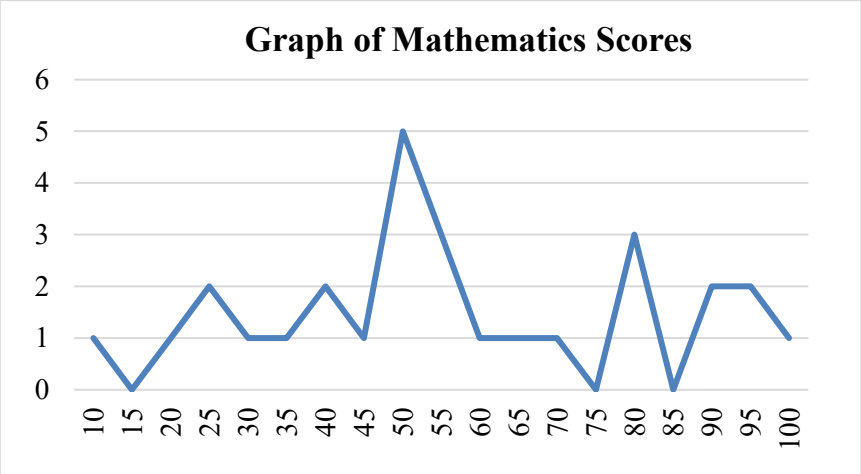

Figure 1. Graph of Mathematics Scores Acquisition in the First Week

In the first week of learning, the C3T method and peer tutoring were not used; instead, the learning took place conventionally. The learning achievement results of students in Table 1 above show that 5 students achieved the highest score of 50, and another 3 students achieved the highest score of 55. It indicates that the initial abilities of students in conventional learning are centred around the middle group.

9 students have completed the learning, while 19 other students have not completed the learning, with an achievement rate of 32.14%. The learning outcome curve found a normal distribution. It aligns with Benjamin S. Bloom's statement (1968-1971) that if teachers teach students the same learning with the same quality and time, and students' talents are normally distributed, the learning outcomes will be normally distributed. It indicates that talented students tend to perform well, while less talented students may not. However, if learning is conducted systematically, all students can master the material presented. Therefore, all students can find satisfaction in learning.

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Table 1 indicates that the level of student learning completeness still needs to be higher, only 32.14%. Teachers should strive to create a learning environment where students feel comfortable and happy, using teaching methods that encourage students to engage in learning activities. It is essential to fulfil the requirements of the K13 curriculum, which stipulates that 75% of students must achieve classical mastery.

To improve learning completeness, teachers need to choose an appropriate teaching method. According to Fathurrahman (2015), a method is used to achieve specific goals. In learning, a method is a way to present material to students to achieve specific objectives.

Implementing the C3T method is expected to enhance students' motivation in solving problems because this method incorporates enjoyable elements. Indarawati and Wawan (2009) define enjoyable learning as a relaxed, pressure-free, safe, and engaging process that can stimulate interest in learning. It actively involves students, captures their attention, arouses enthusiasm and happiness, and enhances student concentration.

The fundamental principles of the C3T method are accuracy, intelligence, and precision in answering the teacher's questions. This method applies a competitive model within a quiz competition (Sari, et al., 2018). It operates and is implemented differently. In the C3T method, students must solve problems quickly and accurately to obtain high scores. If the initial answer is incorrect, students can rectify it and resubmit. Subsequently, the scores will be determined based on the time sequence of the resubmission.

Previous research has demonstrated the success of the C3T method. For example, in 2021, Nurwijani implemented the C3T (Cerdas, Cermat, Cepat, and Tepat) method in the science subject, successfully improving students' learning outcomes and increasing learning completeness. Additionally, studies by Sari (2017) and Partono (2020) indicate that the C3T method enhances students' motivation to learn.

Peer tutoring is a teaching method where students with a good understanding of the material assist their peers struggling to comprehend it.

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According to Hasmawati (2021), this method can generate student learning motivation and improve academic achievement. Suherman, as cited in Suriyati (2018:43), states that peer tutoring involves students helping each other in learning, and students can comprehend better because the relationships among students are usually closer than those between teachers and students. This method allows passive students to become more active, confident, responsible, and emotionally closer to their peers.

Because students can recall what they have learned while working on tasks assigned by peer tutors, this method can help them retain these tasks in their memory for longer.

Table 2
Mathematics Subject Scores Acquisition in the Second Week

Scores	Total Students	Completed	Not Completed	%Completion
100	3	23	5	82,14 %
95	4			
90	3			
85	2			
80	5			
75	2			
70	4			
65	1			
60	2			
55	0			
50	1			
45	0			
40	1			
35	0			
30	0			
25	0			
20	0			
15	0			
10	0			
Total	**28**			

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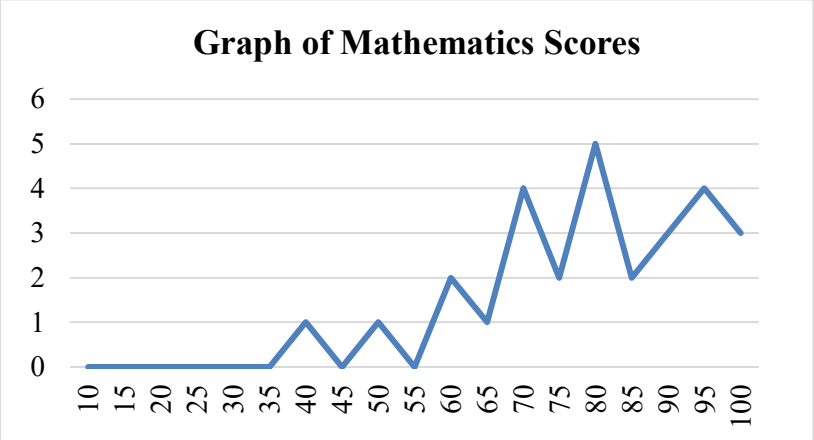

Figure 2. Graph of Mathematics Scores Acquisition in the Second Week

Table 2 shows the learning outcomes in the second week using a modified version of the C3T method and peer tutoring, indicating an improvement in students' learning outcomes. 23 students have completed the assignments, while 5 students still need to. The completion rate percentage increased from 32.14% to 82.14%. These results indicate that more students are motivated to complete tasks using this method than conventional methods. Endorphins and adrenaline hormones drive task completion, creating an exciting learning atmosphere where students compete for the best grades.

Consistent with Rusman (2011), enjoyable learning can prompt students to assist their peers in learning because relationships among students are usually closer than between teachers and students. This method transforms initially passive students into more active and joyful participants, and they can share this enthusiasm with students facing difficulties. They proudly become peer tutors to assist their friends struggling to complete their assignments within the available time. Meanwhile, those facing challenges feel motivated to complete their tasks with guidance from their peers. Therefore, more students are motivated to complete their assignments successfully.

D. Conclusion

Implementing the C3T method in learning has increased students' enthusiasm when solving mathematical problems. Students feel more confident and motivated when working on tasks and actively solve problems to achieve the highest score quickly. This method is also combined with peer tutoring, placing

students directly into the recovery phase after learning, allowing them to revisit the problem-solving level they have achieved.

The combined method of C3T and peer tutoring has advantages; students with good abilities will be more motivated to solve problems quickly and correctly. Additionally, when students successfully solve problems correctly, their self-confidence increases. As they become peer tutors, they feel responsible for guiding their friends who do not yet understand. A sense of togetherness and happiness emerges when students help their friends solve problems.

The combination of these two methods has a drawback because students who are unprepared and need help understanding the concept of the topic may become confused when working on problems, especially if they are in a hurry. They may become too anxious, leading to a loss of focus. Therefore, the role of the teacher in creating a comfortable environment for students is crucial.

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