Implementation of the RME Cooperative Learning Model with the Assistance of Teaching Aids to Improve Mathematics Learning Outcomes on the Circumference of Circles in Fifth Grade at SD Negeri 2 Sepanjang Gondanglegi Malang

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Abstract: *This study aims to determine student learning outcomes using the RME cooperative learning model with the aid of teaching aids. The implementation of the RME cooperative learning model with the aid of teaching aids is expected to improve mathematics learning outcomes. This study used classroom action research (CAR) through four steps: planning, implementation, observation, and reflection. Data collection techniques included student learning outcomes, teacher observations, and student observations. The subjects were 20 fifth-grade students at SD Negeri 2 Sepanjang. In this study, it is said to be successful if the learning outcomes of at least 75% of students obtain a score of ≥ 75. The results of the study show that the average learning completion of students in the Pre-cycle was 66.45 and those who achieved the KKM were 8 children or 40% and those who had not completed learning were 12 children or 60%. In cycle I, the average value was 85.8 and those who achieved the KKM were 15 children or 75% and those who had not completed learning were 5 children or 25%. In cycle II, the average value was 88.3 and those who achieved the KKM were 19 children or 95% and those who had not completed learning were 1 child or 5%. Thus, the application of the RME cooperative learning model assisted by teaching aids can improve mathematics learning outcomes on the circumference of a circle material in class V of SD Negeri 2 Sepanjang, Gondanglegi District, Malang Regency. Based on data at the pre-cycle stage, learning cycles I and II showed an increase in student learning outcomes.*

Keywords*: Improving; Student; Learning; Outcomes*

I.   INTRODUCTION

Education is a conscious and planned effort to create a learning atmosphere and process that allows students to actively develop their potential to possess spiritual and religious strength, self-control, personality, intelligence, noble morals, and the skills needed by themselves, society, the nation, and the state (National Education System Law No. 20 of 2003). Educational objectives are the end conditions or values to be achieved through an educational process. Each educational objective has two functions: describing the desired end conditions and providing direction and methods for all efforts or processes undertaken.

Student success in learning is every teacher's hope. This success can be measured by the optimal learning outcomes achieved by students in the learning process. Teachers play a variety of roles in helping students achieve optimal learning. Possible efforts include implementing appropriate methods, appropriate media, and appropriate learning models or strategies. Learning outcomes are the culmination of a learning process. Culmination is always accompanied by follow-up activities. Learning outcomes must demonstrate a new behavioral change in students that is permanent, functional, positive, and conscious. The overall behavioral aspect of learning objectives that can show a picture of learning outcomes includes cognitive, affective, and psychomotor aspects (Sri Anithah et al.). Student success in learning is the hope of every educator. This success can be seen from the maximum learning outcomes obtained by students from the learning process.

In this research, the study is directed at developing the Application of the RME Cooperative Learning Model Assisted by Teaching Aids to Improve Mathematics Learning Outcomes. Learning is a mental and emotional process or the process of thinking and feeling (Sri Anithah, et al.). A person is said to be learning when his thoughts and feelings are active. The activity of thoughts and feelings itself cannot be observed by others, but is felt by the person concerned, and continues with various activities that support optimal learning such as discussing and debating, practicing skills, asking questions, teaching each other, or leading learning for the whole class. Meanwhile, the cooperative learning model is learning that uses small groups so that students work together to maximize their own learning activities and also those of other members (Sri Anithah, et al.). Cooperative learning can make students learn actively, increase learning motivation, improve problem-solving abilities, develop critical thinking skills, help students acquire knowledge, skills, and behavior actively.

Mathematics is often considered a difficult subject, and student learning outcomes fall short of expectations. The learning outcomes of fifth-grade students at SD Negeri 2 Sepanjang are arguably still far from expectations. Efforts to improve learning outcomes have been made, but the results remain unsatisfactory. Fifth-grade learning outcomes are certainly influenced by outcomes in previous grades, including those in grade V. Student learning outcomes have not yet fully achieved the Minimum Competency (KKM). Research shows that the average learning completion score for students in the pre-cycle was 66.45, with 8 students (40%) achieving the KKM, while 12 students (60%) failed to achieve the KKM. This represents an unsatisfactory learning outcome.

Based on the above problems, the author found factors causing low learning outcomes, namely the lack of active student involvement in learning, conventional learning methods (lectures), minimal use of concrete learning media, and learning methods that are still monotonous. This research was conducted in class V of SD Negeri 2 Sepanjang with the address Jl. Imam Bonjol No. 19 Sepanjang Village, Gondanglegi District, Malang Regency. This research was conducted in the first semester of the 2024-2025 academic year in class V of SD Negeri 2 Sepanjang. The number of students was 20 children. The subject used as research material was the Mathematics subject for Class V about completing the circle circumference evaluation test. Of the 20 children at SD Negeri 2 Sepanjang, Gondanglegi District, it can be explained that most of the students are in lower to middle socioeconomic conditions. This can be seen from the position or location of the elementary school which is in a rural area. The condition of the school building is good but the school facilities and infrastructure are not standard. In terms of ability, the elementary school students can be categorized as average. This condition is what spurred the implementation of classroom action research by implementing the RME Cooperative Learning Model assisted by teaching aids.

Based on these issues and the factors contributing to low learning outcomes, the author discussed with colleagues the need to improve the learning process by conducting Classroom Action Research (CAR). The improvements to the learning process will be implemented in an effort to improve learning outcomes by using visual aids on the circumference of a circle. Therefore, the researcher titled the paper "Implementation of the RME Cooperative Learning Model Assisted by Visual Aids to Improve Mathematics Learning Outcomes on the Circumference of a Circle in Grade V at SDN 2 Sepanjang Gondanglegi Malang."

In general, the research problem formulation in this classroom action research is as follows:
1. How can the implementation of the RME Cooperative Learning Model with the Assistance of Teaching Aids improve mathematics learning outcomes in the Circumference of a Circle topic?
2. Can the implementation of the RME Cooperative Learning Model with the Assistance of Teaching Aids improve mathematics learning outcomes in the Circumference of a Circle topic?

The purpose of this research is to determine the implementation of the RME Cooperative Learning Model with the Assistance of Teaching Aids to improve mathematics learning outcomes in the Circumference of a Circle topic in fifth grade students at SD Negeri 2 Sepanjang Gondanglegi.

II. METHOD

This Classroom Action Research (CAR) employs the Kemmis and McTaggart model, which consists of four main stages: planning, action, observation, and reflection. The research was conducted with 20 fifth-grade students of SD Negeri 2 Sepanjang. The instruments used in this study included observation sheets to record student and teacher activities, as well as evaluation questions designed to measure students' level of understanding. Data were collected through observation, learning outcome tests, and documentation. The research was carried out in two cycles.

In Cycle I, the first stage was planning. At this stage, problem identification was conducted based on observations of the teacher's usual Mathematics teaching and learning process. The observations revealed several obstacles encountered during the teacher's explanations, which resulted in students' limited understanding of the material. Based on these findings, a lesson plan was developed in accordance with the topic to be taught. The planning activities included formulating learning objectives, designing learning steps, selecting appropriate teaching aids and determining how they would be used, and preparing evaluation instruments aligned with the learning objectives. These evaluation instruments were administered to students individually one week prior to the implementation of Cycle I.

The second stage was the implementation of the action. During this stage, the teacher conducted the lesson using a cooperative learning model supported by appropriate teaching aids. The teacher presented the material and provided questions and assignments to help students develop their own understanding of the concept of the circumference of a circle. The third stage was observation. Observations were carried out by systematically recording events and activities that occurred during the learning process. The observation results served as important data for assessing the effectiveness of the implemented action and for determining necessary improvements. The final stage was reflection. Based on the results of the observations, an analysis of the first action was conducted, followed by reflection. The reflection results indicated that improvements were still needed in the teaching and learning process; therefore, the research proceeded to the second cycle.

III. RESULTS AND DISCUSSION

This learning process aims to create a creative, engaging, and enjoyable learning environment. The implementation of the RME cooperative learning model, supported by visual aids, can improve mathematics learning outcomes. The implementation of the RME cooperative learning model, supported by visual aids, makes it easier for students to learn and understand the learning material presented by the teacher. Therefore, the researcher conducted a classroom study based on three stages: pre-cycle, cycle 1, and cycle 2.

Tabel 1. Pre-cycle Table

NO	Value	Frequency	Percentage
1	95 - 100	0	0 %
2	85- 94	3	15 %
3	75 - 84	5	25 %
4	65 - 74	6	30 %
5	55 - 64	3	15 %
6	45 - 54	2	10 %
7	35 - 44	1	5 %
	Total	20	100 %

Pre-cycle

In the pre-cycle stage, the researcher conducted observations during the first week to determine the level of student learning outcomes. After the lesson, the teacher continued to use the lecture method and did not use

visual aids, resulting in many students still not understanding the mathematics lesson and still experiencing low mathematics learning outcomes. Therefore, the researcher will develop learning media or visual aids that can improve student learning outcomes on the circumference of a circle. The following are student learning scores in mathematics that were classified as low in the pre-cycle stage:

Based on research and data analysis, the results showed that the average student learning completion score in the pre-cycle was 66.45, with 8 students (40%) achieving the minimum completeness criteria (KKM) and 12 students (60%) not yet completing their learning.
Several findings during the pre-cycle implementation were as follows:
1. The teacher conducted teaching and learning activities, starting with guiding and directing students in learning both individually and in groups.
2. There was no explanation of the learning objectives to be achieved.
3. The lack of use of teaching aids resulted in students' lack of understanding of the material presented by the teacher.
4. During the learning process, students were still found to be inactive in group work to complete their assignments.

They were still busy playing alone, disturbing their friends, and lacked the courage to express their ideas in discussions. This was due to the unequal distribution of abilities in the groups.

Cycle I
In Cycle I, before conducting the lesson using learning media, the researcher created a lesson plan, including preparing learning materials consisting of learning media modules, student worksheets, and evaluation sheets. After completing the planning stage, the teacher proceeded to the implementation and observation stages. During the implementation stage, the teacher taught based on the prepared learning modules. The researcher explained the learning material using teaching aids, and at the end of the lesson, students were given evaluation sheets. In this cycle, students were very enthusiastic about learning, but some students lacked focus. Then, in the reflection stage, the researcher provided an evaluation in the form of student worksheets to determine the level of success of using teaching aids in mathematics learning.

Table 2. Cycle I Table

NO	Value	Frequency	Percentage
1	95 - 100	0	0 %
2	85- 94	4	20 %
3	75 - 84	11	55 %
4	65 - 74	4	20 %
5	55 - 64	1	5 %
6	45 - 54	0	0 %
7	35 - 44	0	0 %
	Total	20	100 %

From the implementation of cycle 1, researchers conducted an evaluation of student worksheets to determine the level of knowledge of fifth grade students in Mathematics learning on the circumference of a circle. The results of the test showed an increase from the pre-cycle stage, the average student score increased to 85.8 and 15 children or 75% achieved the KKM and 5 children or 25% had not yet completed the learning. In the reflection stage, researchers and observing teachers discussed the implementation stages given to students. After the researcher and the observing teacher conducted a reflection, they then discussed the next cycle. The final results of the reflection and evaluation stages are guidelines for researchers to conclude the influence of student learning outcomes with the Implementation of the RME Cooperative Learning Model Assisted by Teaching Aids can improve the mathematics learning outcomes of class V. The shortcomings in cycle I will be corrected in cycle II.

Cycle II Stage

In Cycle II, the researchers conducted planning, implementation, observation, and reflection, similar to Cycle I, with improved preparation. The mathematics learning process in Cycle II demonstrated visible changes and improved student attitudes. Learning using the RME Cooperative Learning Model with the Assistance of Teaching Aids enabled students, who were initially passive, to become more enthusiastic and active, demonstrating positive changes in their learning attitudes. Observations of student activity indicated that students were able to understand the mathematics material well. This was due to the implementation of the RME Cooperative Learning Model with the Assistance of Teaching Aids to Improve Mathematics Learning Outcomes. Furthermore, during the learning process, student group discussions were active, and the classroom atmosphere appeared lively, with all students working enthusiastically on the worksheets.

Table 3. Cycle II table

NO	Value	Frequency	Percentage
1	95 - 100	3	15 %
2	85- 94	11	55 %
3	75 - 84	5	25 %
4	65 - 74	1	5 %
5	55 - 64	0	0 %
6	45 - 54	0	0 %
7	35 - 44	0	0 %
	Total	20	100 %

After the actions taken in Cycle II, based on data analysis and reflection, and the established minimum completion criteria, the results of the Cycle II test showed an improvement. In other words, the Minimum Competency Criteria (KKM) had been achieved, with an average score of 88.3. 19 students (95%) achieved the KKM, while 1 student (5%) failed to complete the learning. Therefore, the implementation of the RME cooperative learning model with the aid of teaching aids improved mathematics learning outcomes in the circumference of a circle topic.

Findings from the implementation of the actions in Cycle II included:
1. The teacher motivated learning and assisted students with learning difficulties.
2. The teacher explained the learning objectives to be achieved and explained the teaching aids to be used in the lesson.
3. Based on observations, students appeared active in group work and discussions.

Students were able to value and use time effectively, as evidenced by the timely completion of assigned tasks.

IV. CONCLUSION

Based on the discussion above, it can be concluded that the implementation of the RME Cooperative Learning Model with Teaching Aids can improve mathematics learning outcomes on the circumference of a circle in fifth grade at SD Negeri 2 Sepanjang, Gondanglegi District, Malang Regency. This study was considered successful if at least 75% of students obtained a score of 75 or higher. The results showed that the average learning completion rate for students in the pre-cycle was 66.45, with 8 students (40%) achieving the Minimum Competency Criteria (KKM) and 12 students (60%) not yet completing the learning. In the first cycle, the average score was 85.8, with 15 students (75%) achieving the Minimum Competency Criteria (KKM) and 5 students (25%) not yet completing the learning. In the second cycle, the average score was 88.3, with 19 students (95%) achieving the Minimum Competency Criteria (KKM). and 1 child or 5% had not yet completed their studies. Based on data from the pre-cycle stage, learning cycles I and II showed an increase in student learning outcomes.

Recommendations

Based on the research conclusions and discussion, the author offers the following recommendations:
1. When forming student groups, teachers should mix low-ability students with high-ability students. This can help lower-ability students accelerate their understanding.

2. Educators should thoroughly understand the circumference of a circle topic before teaching, ensuring optimal student engagement.
3. Time management during learning needs to be carefully considered to ensure it fits the allotted time.

To facilitate understanding, teachers need to use teaching aids or media appropriate to the material being studied.

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