

Application Of Reciprocal Teaching On Material Of Circle

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Abstract

The wave of modern society today has changed very rapidly. The flow of information and technology is a strength and power that can determine the dynamics of contemporary life. Development in all fields of education is an effort to educate the nation's life improve the quality of Indonesian human resources and create a just and independent society. However, based on the results of the World Competitiveness Yearbook survey, it was explained that education in Indonesia in 2020 was ranked 40th out of 63 countries surveyed. This situation should be material for thought and introspection for the Indonesian people. Especially in the teaching and learning process that has occurred so far, it still shows the lack of teachers in providing opportunities for students to explore their knowledge, to express their knowledge through creation and creativity. The lack of student experience, in this case, causes students to tend to experience difficulties when faced with new problems To overcome these problems, researchers conducted research using Reciprocal Teaching. The researcher aimed to describe the application of Reciprocal Teaching to the circle material in class VIII SMP Muallimin Wonodadi Blitar. The subjects of this study were students of class VIII semester 2 of Muallimin Middle School Wonodadi Blitar, with a total of 32 students. The object of this research is the whole process of learning mathematics using Reciprocal Teaching. The research instruments are worksheets, observation sheets, and tests. The research steps using Reciprocal Teaching include (1) Grouping students and group discussions, (2) Making questions (Question Generating), (3) Presenting the results of group work. (4) Clarifying the problem (Clarifying). (5) Provide practice questions that contain development questions (Predicting). (6) Summarizing the material studied (Summarizing). After analyzing the data, the researcher concluded that this study obtained classical learning outcomes reaching 87.5%, the average teacher observations reaching 85.83%, and the average student observations reaching 82.5%. So that research with the application of Reciprocal Teaching for circle material, in class VIII SMP Muallimin Wonodadi Blitar is said to be successful.

Keywords: *Reciprocal Teaching, Circle, Mathematics*

1. Introduction

Development in all fields of education is an effort to educate the nation's life and improve the quality of Indonesian human resources and create a just and independent society. Education is one of the most important needs of human life to maintain life and develop oneself so it must have a clear direction/goal.

Amid growing demands for education, several sources state that the quality of education in Indonesia is currently quite alarming. According to the PERC (*Political and Economic Risk Consultant*) survey, which is a Hong Kong consulting agency, it was found that the quality of education in Indonesia is ranked 12th out of 12 countries in Asia, Indonesia's position is below

Vietnam. Data reported by The World Economic Forum Sweden (2000), shows that Indonesia has low competitiveness, which is only ranked 37th out of 57 countries surveyed in the world. So Indonesia is only predicated as a follower, not as a technology leader from 53 countries in the world. In addition, based on the results of the 2007 *World Competitiveness Year Book survey*, it was explained that education in Indonesia was ranked 54th out of 55 countries surveyed, and in 2020, which is ranked 40 out of 63 countries. Based on the results of 2015 TIMSS data, in the field of Mathematics, Indonesia is ranked 45th out of 50 countries, and in the field of Science, Indonesia is ranked 45th out of 48 countries. This situation should be material for thought and introspection for the Indonesian people, especially the government and educational institutions to make improvements. Improvements will achieve maximum

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results if carried out simultaneously and include all elements of education.

Mathematics is one of the materials in the Education Unit Level Curriculum (KTSP) in Indonesia. Mathematics is taught starting from the lowest level of education to the highest level of education. This is related to the large role of mathematics as the basis of other sciences, as well as its application in everyday life. Mathematics as a branch of science that can lead humans to think logically, analytically, systematically, critically, and creatively is one of the fundamental lessons taught from elementary school to university (BNSP, 2006).

Mathematics is a discipline that deals with abstract ideas and concepts which are hierarchically arranged and the reasoning are deductive. "Patterns of human behavior that are structured into a model as learning principles are applied in mathematics", (Hudoyo, 1988:3).

Mathematics learning is a method, strategy, or method implemented to study mathematics subject matter aimed at achieving educational goals. To make it easier to understand mathematics, it is necessary to choose an appropriate and appropriate learning model, in the right and appropriate sense with condition participant educate nor with the material.

The learning model using reciprocal teaching *is* a learning model that provides space for students to develop their creative thinking skills and maximize the potential of each student.

The reciprocal Teaching model applies four independent understanding strategies, namely concluding teaching materials, compiling questions and solving them, re-explaining what is obtained or understood, and predicting what questions other students or teachers will ask. In general, this learning model is implemented so that learning objectives are achieved quickly through an independent learning process and students can take responsibility for their actions to answer the knowledge that has been obtained.

Strategi Pembelajaran Timbal Balik (*Reciprocal Teaching*). ini dilakukan melalui penggalian pengetahuan dan pengalaman yang telah diperoleh sebelumnya dan dituangkan dalam bentuk presentasi. (Mosston & Ashworth, 2008) said that the defining characteristics of the Reciprocal style are social interactions, reciprocation, receiving and giving immediate feedback (guided by specific criteria provided by the teacher). the role of the teacher is to make all subject matter, criteria, and logistical decisions and to provide feedback to the observer. The role of the learners is to work in partnership relationships. One learner is the doer who performs the task, making the nine decisions of the Practice style, while the other

learner is the observer who offers immediate and ongoing feedback to the doer, using a criteria sheet designed by the teacher. At the end of the first practice, the doer and the observer switch roles.

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The teacher asks the group of students to be the teacher's *partner* to explain the material to be studied. The teacher *partner* explains or presents one of the material elements of a circle, its parts, and sizes. While the other groups of students as learners and assessors. Each group takes turns in presenting according to the material that has been distributed.

In the presentation, each group must provide a response and the presenter group must respond. Regardless of the response in the form of suggestions for improvement or questions question. With this activity, students' creativity can be seen from the quality of the material presented, the questions posed, or the quality of the responses given. In addition, every student is required to maximize their potential and creativity if they want to be active and get a satisfactory assessment.

In general, the core activities in the classroom are summarized through the following activities:

1. Grouping Students and Group Discussion
Students are grouped into several small groups. The grouping of students is based on the ability of each student. It is intended that the ability of each group formed is almost the same. After the group was formed, they were asked to discuss the student worksheet that had been received.
2. Creating Questions (*Question Generating*)
Students make questions about the material discussed and then present them in front of the class.
3. Presenting the Results of Group Work
The teacher asks one group to explain their findings in front of the class, while the other groups respond or ask questions about the findings presented.
4. Clarifying Problems (*Clarifying*)

Students are allowed to ask the teacher about material that is considered difficult. The teacher tries to answer by asking provocation questions. In addition, the teacher held a question and answer session related to the material being studied to determine the level of understanding of students' concepts.

5. Giving Practice Questions That Include Development Questions (*Predicting*)

Students get practice questions from the teacher to be done individually. This question contains a matter of development of the material to be discussed. This is so that students can predict what material will be discussed at the next meeting.

6. Summarizing the material studied (*Summarizing*)

Students are asked to conclude the material that has been discussed at the meeting.

2. Method

The research approach used in this research is a descriptive approach qualitative. Creswell (Manshur et al., 2013) describes, that qualitative research is an inquiry that investigates social and human problems with tradition.

The type of research used in this research is Classroom Action Research (CAR). This is done because researchers are involved and participate directly in the research process which includes planning, implementation, observation, and reflection. This research is designed to solve the problems faced by teachers in choosing the appropriate learning application.

Sanjaya (2016:11) explains "Classroom Action Research (CAR) is one of the efforts that teachers can make to improve the quality of teaching and teacher responsibilities, especially in learning management. In CAR the teacher acts as a researcher and at the same time a learning practitioner. While Kemmis (Wibawa, 2003) explained that " Action research is a form of collective self-reflective research conducted by participants in social situations to improve the reasoning and fairness of their educational and social practices, as well as their understanding of those practices and of the situations in which these practices are carried out ”.

Kemmis (Handini et al., 2016) states, 'A form of reflective and collective research conducted by researchers in social situations to improve their social practice reasoning that researchers collectively carry out in social situations to improve reasoning and fairness of educational and social practices. them, as well as their understanding of these practices and of the situations in which these practices are practiced.

Action research is a small-scale intervention on the action in the real world and a careful examination of the effect of the intervention (Cohen and Manton, in Riyanto 2010: 49). Meanwhile, Elliot (Riyanto, 2010: 49) action research is a study of social situations to improve the quality of the activities in it.

This research is a problem-solving activity that starts from planning (*planning*), implementing (*action*), collecting data (*observing*), analyzing data or information to decide the extent of the strengths or weaknesses of the action (*reflecting*). CAR is characterized by continuous improvement so that the researcher's satisfaction becomes a measure of the success (cessation) of these cycles.

Here the researcher tries to reflect on the existing learning, namely by conducting Classroom Action Research (CAR), by applying the *Reciprocal Teaching-learning strategy* that is deemed appropriate to the problems at hand, because often use *conventional* teaching methods or lectures so that students become bored, and the learning applied by the teacher is felt by students to be less attractive.

Researchers held CAR to improve these conditions. Motivating students to learn will affect the quality of the results. The quality of the results can be seen in the acquisition of scores so that at least it reaches the Minimum Completeness Criteria (KKM).

This classroom action research model is by the procedures or steps in Classroom Action Research (CAR) according to Lewin (Kemmis and Mc Taggar, 1992), namely, *Plan, Action, Observation, and Reflection*.

The research was carried out at Mualimin Junior High School Wonodadi Blitar and the students in this study were class VIII students, with a total of 32 students consisting of 13 boys and 29 girls. While the material used for research is the circle material, especially in Base Competence 4.1, namely calculating the circumference and area of a circle. In this study, the researcher collaborated with 2 colleagues who would act as observers during the research process.

This research was conducted through four stages, namely: a. The planning stage, b. the implementation stage, c. observation stage, and d. Reflection

a. Planning Stage

At this planning stage, the researcher arranges the equipment needed in the research, including Developing a lesson plan with a *Reciprocal Teaching strategy*. Prepare observation sheets for teacher and student activities and evaluate at the end of the cycle.

b. Implementation Stage

The implementation stage is the implementation of the plans that have been made. The implementation carried

out by the researcher is by the lesson plan that has been made.

c. Pen stage observation

This is the basis for reflection so that the observations must be able to tell the real situation. In observations, things that need to be noted by researchers are the process of action, the effects of the action, the environment, and the obstacles that arise.

d. Reflection Stage

Reflection is done to determine whether the action should be repeated or has been successful. Reflection here includes activities: analysis, synthesis, interpretation (interpretation), explaining, and concluding. The results of the reflection are used to achieve the research objectives. Based on the results of the reflection, a revision will be made to the plans that have been implemented.

In this study, researchers used some instruments that are Student Worksheets, test sheets, and observation sheets. Student Worksheets are done individually which were previously discussed with the group, The test is held at the end of the cycle, and in this study is a test subjective. The results of this test will be used as a reference for researchers to determine student learning outcomes about the material of straight-line equations after using learning strategies Reciprocal Teaching.

The observations made by researchers here are carried out directly. An observation sheet is a worksheet that serves to observe and measure the level of success or achievement of learning objectives in teaching and learning activities in the classroom. Here, the researcher is assisted by the two colleagues of the teacher to do the observations. The researcher uses 2 kinds of observations, that are the teacher's activity observation sheet that is used to assess the teacher's activities that have been carried out, and the student activity observation sheet that is used to assess all student activities.

The data analysis technique used in this research is the calculation of the results of observations, the percentage of individual learning completeness, and the percentage of class completeness. The first technique used is a test by determining individual learning completeness and class/classical completeness. The second technique is an observation by observing teaching and learning activities. Both with the following formula:

a. Test

1) Individual completeness (x)

$$(x) = \frac{\text{student's value}}{\text{maximum value obtained by the student}} \times 100\% \quad (1)$$

Note:

$x \geq 75$ = students finish studying

$x < 75$ = students have not finished study

A student is said to have achieved completeness if he reached a minimum level of mastery of 75 % or with a value of 75. Students whose level of mastery is less than 75 % or the value is less than 75, will be held individually repairs.

2) Classical completeness (y)

$$y = \frac{\text{the number of students who classically complete}}{\text{the number of student}} \times 100\% \quad (2)$$

Note:

$y \geq 75\%$ = classically complete.

$y < 75\%$ = classically uncomplete.

A class is said to have succeeded in achieving mastery learning if at least 75% of the number of students in a class has achieved individual mastery. A student is said to be classically complete if the student reaches a score of 75% (Depdikbud in Iswanti et al., 2019).

3) Observation

Teacher's observation sheet

$$Skor(G) = \frac{\text{total point}}{60} \times 100\% \quad (3)$$

Note:

If $G \geq 80\%$, it is said to have reached completeness.

If $G < 80\%$, it is said that it has not reached completeness.

Student observation sheet

$$Skor(S) = \frac{\text{total point}}{60} \times 100\% \quad (4)$$

Note:

If $S \geq 80\%$, it is said to have reached completeness.

If $S < 80\%$, it is said that it has not reached completeness.

With the number of descriptors each 16.

The average percentage of observations in one cycle is stated in the observation criteria **Table 1** as follows:

Table 1 Observation criteria

Percentage value	Criteria
$90\% \leq P_o \leq 100\%$	Very good
$80\% \leq P_o < 90\%$	Good
$70\% \leq P_o < 80\%$	Pretty good
$60\% \leq P_o < 70\%$	Not enough
$0\% \leq P_o < 60\%$	Very less

It is said to have succeeded in achieving mastery in learning if on the observation sheet the teacher and students each get a minimum score of 80%.

3. Results and Discussion

The research data was obtained from the results of tests and observations of teacher and student activities on the application of reciprocal teaching-learning strategies.

a. Planning Stage

Researchers prepare learning tools, namely syllabus, lesson plans, teaching materials, worksheets, formative tests, scoring guidelines for every meeting.

b. Stages of Activities and Implementation

This research was conducted in three meetings. Here researcher acts as a teacher, and the observer is a colleague. From the results of the final test of the first cycle, 4 students had not finished from 32 students. This means that there are 28 students whose scores are above the KKM and classical completeness can be determined in the first cycle, which is 87,5%. Meanwhile, the results of the observation of teacher activities reached an average value of 85,83 % with a good predicate and activity reached an average value of 82.5 % with a good predicate.

c. Reflection

In teaching and learning activities, the results of reflections at meetings I and II can be concluded that the average score of student worksheets that are done individually has increased but there is still weaknesses inaccuracy when working on questions, when calculating and writing numbers students are less thorough, resulting in wrong results.

During the implementation, it was found that there were still vacant groups because they lacked confidence in expressing their opinions, asking questions, or giving suggestions to the presenting group.

d. Observation

Teacher and student observations during one cycle can be seen in the following **Table 2**:

Tabel 2 Observation result

Meeting-	Observation to-		
	1	2	Average
Teacher Activities	8.33 %	3.33 %	5.83 %
Student Activities	1.67 %	3.33 %	8 2.5 %
Predicate Good is successful	good enough	Good	good

The results of observations of teacher and student activities have reached the "Good" criteria. Based on observations during one cycle, the application of the *Reciprocal teaching*-learning model on the Circle material in class VIII SMP Muallimin Wonodadi Blitar has finished.

The results of this study indicate that the researcher has succeeded in conducting classroom action research with the title “ Application of Reciprocal Teaching in Circle Materials to Improve Learning Outcomes of Class VIII Students at Muallimin Middle School Wonodadi” for approximately one month and a half. The research was conducted in three meetings, This can be seen from the increasing student understanding of the material presented by the teacher.

4. Conclusion and Suggestion

Based on the results of the analysis and discussion, what has been reviewed in the previous chapter is classroom action research conducted on class VIII students of SMP Muallimin Wonodadi on the Circle material through Reciprocal Teaching strategies, the following conclusions can be drawn. Description of the implementation of the Reciprocal Teaching strategy in the circle material for class VIII SMP Muallimin Wonodadi, as follows: (1) Grouping Students and Group Discussion, students are grouped into several small groups. The grouping of students is based on the ability of each student. It is intended that the ability of each group formed is almost the same. After the group was formed they were asked to discuss the LKS that had been received previously. (2) Making Questions (Question Generating), students make questions about the material discussed and then present them in front of the class. (3) Presenting the results of group work. The teacher asks one group to explain their findings in front of the class, while the other groups respond or ask questions about the findings presented. (4) Clarifying the Problem (Clarifying). Students are allowed to ask the teacher about material that is considered difficult.

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students with the application of the learning model Reciprocal Teaching on the circle material in class VIII Muallimin Middle School Wonodadi increased. This is indicated by the increase in the average value of the final learning test which has increased by 20.5 % from 60.22 % at the beginning of the learning which is shown in the pre-test percentage to 80.72 % at the end of the learning test percentage. Meanwhile, the percentage of students who finished studying based on the final test of the first cycle was 87.5% and had reached the classical completeness requirement of 75 %.

From the results of research that has been carried out by researchers in class VIII SMP Muallimin Wonodadi, there are several suggestions that researchers can convey for improvement in further research, including the following: (1) Carefully planning for each learning activity will determine the success of the learning.

Reflection, material reinforcement, and drawing firm conclusions can mature students' understanding which can further improve student achievement. (2) In applying the Reciprocal Teaching-learning model to improve students' creative thinking skills, it should be supported by the ability to motivate students to enjoy learning activities and try to stimulate students to explore their abilities. (3) The effectiveness of learning with the application of Reciprocal Teaching-learning to improve students' creative thinking skills should be supported by the teacher's ability to condition and regulate the course of learning activities. (4) The accuracy of the selection of learning models is needed so that students more easily understand the material. It is not justified to choose a learning model that slows students in understanding the material

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