



# Enhancing Science Learning in Fourth Grade: Reciprocal Learning Impact

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**Abstract.** This quantitative study evaluates how the Reciprocal Learning model affects science learning outcomes in elementary school students in the fourth grade. The study used a quasi-experimental design with the goal of addressing student disengagement through the use of creative teaching techniques. Class IV students were divided into experimental and control groups, with data analyzed using various statistical tests. Results indicate a significant positive effect of the Reciprocal Learning model on science learning outcomes. This highlights the importance of implementing such strategies to improve student engagement and academic performance in elementary science education, providing valuable insights for educators and policymakers.

**Keywords:** reciprocal learning, learning outcomes, elementary school

## 1 Introduction

In the current era of globalization, education is very important in the progress of a nation. Likewise with this nation, where the government pays great attention to the field of education, especially basic education to shape the character of students[1]. Law No. 20 of 200 concerning the national education system, it is explained that National Education functions to develop capabilities and form dignified national character and civilization in the framework of educating the nation's life, aiming at developing the potential of students to become human beings who believe and fear God Almighty. One and develop into an accountable and democratic citizen[2].

According to the above description of the purpose of national education, in addition to organizing, motivating, and assisting students in conducting methodical research on nature to show that science is both a process of discovery and the mastery of a body of knowledge expressed in the form of facts, concepts, or principles, teachers play a crucial role in helping students succeed in the mission of education and learning in schools[3]. Students should use science education as a means of learning about the environment and themselves, as well as opportunities to apply what they learn in the classroom to their daily lives[4]. Furthermore, instructing science, particularly in elementary schools, can be interpreted as teaching about the concept of nature or education that touches on aspects of nature and events in the surrounding environment by linking it to students' daily lives, so that science learning is more meaningful and easy to understand[5]. Through science learning, students are trained and exposed to the natural environment and its contents, with the hope that students will be able to manage and be able to adapt to their environment, adapt well and be able to solve any social problems they face when they are in a community environment which is a challenge to life and be able to make a decision to solve the problem[6].

Science subjects in elementary schools are one of the learning programs that aim to make students understand/master science concepts and their interrelationships, and be able to use the scientific method to solve the problems they face, so that they are more aware of the greatness and power of their creators. Reciprocal Learning is a form of active learning[7]. This learning involves between the teacher and students based on the segments of the text read and this can be done in large or small groups without any restrictions[8]. This lesson introduces communication techniques between various groups to improve understanding, answer questions, and select important issues when reading a text, then discuss them. Group discussions will be based on four reciprocal learning strategies, namely predicting, asking, understanding, and summarizing[9]. This strategy is used to develop understanding and mastery of the meaning of the text read. Reciprocal Learning uses group goals to gain group rewards[10].

If a group scores higher than the required minimum, they are awarded awards[11]. The group's ability to build caring, supportive, and cooperative interpersonal relationships with one another[12]. Every group's individual learning is essential to the group's success[13]. This duty centers on the actions of group members who support one another's educational endeavors[14]. Individual accountability also prepares each group to complete assignments and assessments on their own, without the assistance of other groups[15]. Reciprocal learning employs a scoring system that incorporates a developmental score based on prior students' accomplishments, ensuring all students have an equal chance at success[16]. Trianto says that "reciprocal learning teaching is a constructivist approach based on the principles of making/posing questions[17]." According to Palinscar and Brown (in Doolittle. 2006: 3) that reciprocal learning refers to an instructional activity that occurs in the form of dialogue between the teacher and students regarding reading texts[18]. According to Afandini and Mahmudah (2012: 163) explain that reciprocal learning is a learning model through teaching friends. In this model students act as teachers who are referred to as "student teachers" replacing the role of teachers to teach their friends[19].

## 2 Research Methods

The type of research used in this research is experimental research, because researchers will examine the impact of a treatment on research results. The method used by researchers is the test method. This method is used by researchers to determine the level of students' abilities related to the material provided. Posttest is a test given to students in the experimental class and control class. This posttest data was obtained from a multiple choice test of 35 items.

## 3 Results and Discussion

This study aims to determine the effect of the Reciprocal Learning learning model on science learning outcomes. The researcher used two classes, namely class IV A as the experimental class and IV B as the control class. This research was conducted in 4 meetings in the experimental class and 4 meetings in the control class with 2 hours each in each meeting. Based on the data obtained from the results of hypothesis testing with  $T_{count} = 8.44$  and  $T_{table} = 2.00$ , then  $T_{count} > T_{table}$  then  $H_0$  is rejected[20].

Accordingly, it can be said that fourth grade elementary school kids' scientific learning results are influenced by the Reciprocal Learning learning model[21]. The researcher first tested

the instrument with 30 students in class IV of elementary school prior to conducting the research. 35 multiple-choice questions that satisfy valid and reliable criteria can be used in research, according to the test results. Style is the subject being taught; at the first meeting, the experimental class and the control class both discussed the material characteristics of the force. The reciprocal learning model was employed by the researchers for the learning activities, but students continued to have many questions about the new model that was being used in the classroom[22]. The second meeting was given material on various styles, at the third meeting material was given on measuring instruments and force units. In the last meeting, the researchers gave multiple choice questions to find out the learning outcomes of fourth grade elementary school students. The teacher's first reciprocal learning activity divides students into several groups, each group consisting of 5 people. Then distribute group discussion sheets to each group. Then the teacher asked each group to summarize the material in the book[23]. Next, the teacher asks each group to discuss and answer the questions on the discussion sheet. The next step is the teacher appoints groups in turn to present the results of their discussions in front of the class. Then there was question and answer between students. The teacher becomes the facilitator and guide who does the scaffolding. The teacher gives conclusions and gives reinforcing questions in the form of questions[24].

Students in the experimental and control classes participate in the learning process more actively and enthusiastically thanks to the learning model that is employed. large amounts of student-to-student interaction. Every student talks with one another and shares thoughts with other groups [25]. Students become more receptive to learning in order to improve student learning outcomes, and the learning environment becomes more enjoyable so that students are not easily bored. After the researcher gave material and treatment to the experimental and control groups, then at the last meeting the researcher gave multiple choice questions to students to find out the results of learning science. The experimental class learning outcomes obtained an average = 78.1667 and the control class obtained an average = 48.666. So it shows that there is an influence of the reciprocal learning model on science learning outcomes. This is in accordance with the calculation of the t test, the results obtained are  $T_{count} = 8.44$  and  $T_{table} = 2.00$ , then  $T_{count} > T_{table}$ , then  $H_0$  is rejected. So it can be concluded that there is an influence of the Reciprocal Learning learning model on the science learning outcomes of class IV students in elementary schools.

## 5 Conclusion

Reciprocal Learning is a learning model designed to improve reading comprehension and provide benefits so that learning objectives are achieved. Through direct learning and this learning model must pay attention to three things, namely students learn to remember, think, and motivate themselves. Shown to encourage students to build learning skills, students are grouped in pairs or groups of 4-5 students in one group. Based on the results of the research that has been done, regarding science learning outcomes using the Reciprocal Learning model for class IV Elementary Schools, it shows that the analysis of the average comparative test at the final stage using the t test obtained  $T_{count} = 8.44$  and  $T_{table} = 2.00$  at the significant level  $\alpha = 5\%$ .  $T_{count} > T_{table}$ , then  $H_0$  is rejected, so it can be concluded that there is an influence of the Reciprocal Learning learning model on the science learning outcomes of fourth grade elementary school students.

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