

THE EFFECT OF THE SCRAMBLE METHOD BASED ON QUESTION CARDS ON STUDENTS' LEARNING OUTCOMES ON THE MATERIAL OF PLANTS AS A SOURCE OF LIFE ON EARTH IN GRADE IV OF INPRES TOUNWAWAN ELEMENTARY SCHOOL

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ABSTRACT

This research was initiated because student learning outcomes were not yet optimal in science and science lessons on Plants, the Source of Life on Earth, one of the important materials in science and science subjects in elementary schools. This material contains basic concepts about the role of plants in ecosystems and human life. However, students often have difficulty understanding this material because of the limited interactive learning methods. The question card-based scramble method is proposed as a learning approach to improve student learning outcomes. This method involves using question cards containing queries or information that students need to rearrange according to the correct concept. This research aimed to determine the effect of the question card-based scramble method on the materials of Plants, Sources of Life on Earth, and class IV at SD Inpres Tounwawan. This research uses a pre-experimental quantitative approach with a one-group pretest-posttest design. In this design, one group of subjects is given a pretest to determine the condition before treatment, followed by a posttest to measure changes after the treatment is given. Based on the data that has been collected from the results of data analysis on student test results in the pretest, it is still relatively low because they have not met the minimum completion criteria score, namely 65. Of the total 20 students, only 1 student meets the minimum completeness criteria. Based on the posttest results of class IV students, all of them have passed the minimum completion criteria score and reached 83%. Based on the T-test table above, the sig value can be explained. (2-tailed) $0.000 < 0.05$, then there is an influence of the scramble method on learning outcomes for science material.

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Introduction

Education is a key element in developing and improving the quality of human resources. Education as a fundamental process not only functions in transferring knowledge but also helps shape individual character (Yudhistira et al., 2020). Through education, a person not only understands various disciplines, but also internalizes moral/ethical values, ethics, and social skills needed to contribute positively to society (Aprijal et al., 2020). Education is a process that involves interaction and collaboration between educators and students to achieve the learning objectives that have been designed. In this process, educators act as facilitators who provide direction, motivation, and support, while students are active in exploring, understanding, and applying knowledge (Riana & Gulo, 2022). This interaction is not only one-way but also dialogic, allowing for the exchange of ideas and constructive feedback. With an

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approach that involves effective communication and relevant teaching strategies, education becomes a vehicle for developing cognitive, affective, and psychomotor abilities. Therefore, efforts to improve the quality of education must be the primary preference in its implementation (Nugraha & Raihan, 2024).

The improvement of education quality is a continuous process that must be carried out to enhance the intelligence of the younger generation and support various aspects to achieve educational goals more effectively and efficiently (Oktavia et al., 2019). The ultimate goal of this quality improvement is to achieve educational targets, which are realized through the comprehensive development of students' abilities. In this context, the teaching and learning process plays a crucial role in determining the success of achieving these goals (Suparlan, 2020). Learning can be defined as an interactive process of mutual influence between teachers and students, which can take various forms, including face-to-face interactions in the classroom, the utilization of learning resources, and exploration of the surrounding environment. In face-to-face interactions, teachers provide direct guidance, explain concepts, and motivate students to actively participate (Charles Charles et al., 2023). The use of learning resources, such as books, digital media, and technology, enables students to broaden their knowledge and deepen their understanding independently or collaboratively. Additionally, the surrounding environment serves as a living laboratory rich in real-life experiences, allowing students to learn from natural phenomena, cultural aspects, or social situations around them (Anjani et al., 2020). A teacher must not only be proficient in explaining material to students in a clear and easily understandable manner but also be capable of creating an enjoyable learning atmosphere. By combining subject mastery, creativity, and a friendly approach, teachers can make students feel comfortable and motivated to learn. However, in practice, the learning process in schools often faces various challenges, particularly those related to students' learning activities (Uno & Nurdin, 2013).

At Tounwawan Elementary School, one of the primary schools located in the 3T (Frontier, Remote, and Disadvantaged) areas, researchers found that the teaching of the IPAS (Integrated Science) subject tends to be monotonous and not sufficiently effective, as it remains teacher-centered or one-directional. This clearly indicates that students remain passive during learning, especially regarding the topic *Plants as a Source of Life on Earth*. As a result, they face learning difficulties due to these conditions. Observations reveal that educators lack a comprehensive understanding of innovative and varied teaching approaches. Consequently, the lack of effective interaction between students and teachers, combined with limited opportunities for students to develop creativity and critical thinking skills, makes the learning process monotonous, unchallenging, and less impactful on students' overall potential development (Donna et al., 2020). This aligns with the opinion of Rahmayanti et al., who state that students who tend to be passive and unmotivated to learn, either independently or in groups, experience a decline in concentration during the learning process (Rahmayanti et al., 2021). When students feel bored, they tend to lose focus on the given material. As a result, they struggle to understand or master key concepts. Students are unable to absorb lessons effectively due to low emotional and mental engagement. Therefore, a new learning approach is needed—one that not only enhances student motivation but also deepens their understanding of the subject matter, making the learning process more interactive and meaningful (Budianti et al., 2023). In this context, the *scramble* method using question cards is seen as an effective strategy, as it encourages active student participation, reinforces conceptual understanding, and makes learning more engaging and challenging (Suleman et al., 2021).

The scramble method using question cards is an innovative learning technique designed to enhance students' logical and critical thinking skills (Wahyudi et al., 2023). In this method,

information or questions are presented in the form of shuffled question cards, and students' task is to rearrange the cards to find the correct answers or solutions. This process not only requires a deep understanding of the material being taught but also involves analytical, synthetic, and problem-solving skills (Ariyanto, 2016). This method not only provides an enjoyable challenge but also increases students' active participation, critical thinking skills, and deeper comprehension of the concepts being taught (Zainudin, 2018).

This study aims to analyze the impact of using the scramble method with question cards in teaching the topic *Plants as a Source of Life on Earth*. This method is designed to encourage active student engagement by rearranging scrambled information, creating a more engaging and interactive learning experience. By using question cards containing various challenges and questions that must be solved either in groups or individually, students are expected to become more motivated and actively involved in the learning process. The scramble method is anticipated to have a positive impact, not only on improving students' academic performance but also on enhancing their critical thinking, collaboration, and creativity skills. Furthermore, this study has the potential to foster a more inclusive and collaborative classroom environment, where every student has an equal opportunity to actively participate in the learning process. Through this approach, students are not only motivated to understand the material but also encouraged to work together, share ideas, and appreciate differences. With a positive and supportive learning atmosphere, this study aligns with the holistic vision of elementary education, which aims to build character, develop critical thinking skills, and achieve optimal learning outcomes for every student.

Method

The approach used in this study is a quantitative approach, which is a systematic method for examining a particular population or sample through the use of research instruments as a data collection tool. This approach aims to provide a measurable and objective picture of the phenomenon being studied so that the results obtained can be analyzed statistically. With a quantitative approach, this study is also designed to test previously formulated hypotheses, to find the relationship or influence between relevant variables. This technique ensures the validity and reliability of the data so that the results of the study can be used as a basis for accurate decision-making (Sugiyono, 2016).

This study uses a pre-experimental research type with a one-group pretest-posttest design, which involves one group of subjects as the focus of the study. In this design, a pretest (initial test) is given to a group of subjects to measure the initial conditions before being given treatment or intervention. After the treatment is carried out, a posttest (final test) is given to measure the changes or effects that occur due to the treatment. This design allows researchers to compare the results before and after the intervention, thus providing an overview of the effect of the treatment on the variables studied. Although this design is simple, the results can still provide an initial indication of the effectiveness of the treatment given. (Arikunto, 2010) stated that this design involves giving a pre-test to a group of subjects before treatment, followed by a final test. This study involved all fourth-grade students of Inpres Tounwawan Elementary School, totaling 20 students, as research subjects. The researcher used the saturated sampling method or total sampling, where all members of the population were taken as samples. (Sugiyono, 2016) defines saturated sampling as a sampling technique that involves all members of the population without exception. Therefore, this study will cover all fourth-grade students of Inpres Tounwawan Elementary School, Southwest Maluku Regency, to ensure that the data obtained represents the population as a whole.

Research data processing will be carried out through descriptive statistical analysis and inferential analysis. Descriptive statistical materials include various techniques to describe and analyze data concisely, such as calculating the average (mean), median, mode, standard deviation, range, maximum and minimum values. These descriptive statistics provide an overview of the distribution of data and the existing central tendencies. On the other hand, inferential statistical analysis aims to draw conclusions or make predictions about the population based on existing samples. Inferential methods include normality tests to check data distribution, homogeneity tests to ensure equality of variance between groups, and hypothesis testing to test the truth of certain assumptions or claims. Data processing and analysis are carried out using SPSS 27 software, which allows for accurate and efficient calculation and interpretation of statistical results.

Result

Pretest Results

Before the treatment was carried out, students were given a pretest first. The pretest was carried out for 20 minutes. After the pretest results were obtained, the researcher then determined the achievement score for learning science with a range of 1-100. The Minimum Completion Criteria set for science learning at Inpres Tounwawan Elementary School is 65.

The initial test results obtained by grade IV students before implementing the card-based scramble method for the material Plants as a Source of Life on Earth are presented in Table 1.

Table 1. Students Pretest Results

No	Name	Pretest Score
1.	N.D	45
2.	N.K	55
3.	A.S	35
4.	A.L	55
5.	A.L	45
6.	B.S	35
7.	C.A	40
8.	D.L	50
9.	D.K	40
10.	E.S	60
11.	F.L	45
12.	F.S	40
13.	G.L	35
14.	I.S	50
15.	J.L	50
16.	J.G	35
17.	J.E	45
18.	M.Y	40
19.	Y.K	65
20.	Z.L	40
<i>Average</i>		<i>45.25%</i>

The results of the analysis showed that the students' scores on the pretest were still relatively low, with an average of 45.25% and only 1 out of a total of 20 students achieved the Minimum Completion Criteria (KKM) of 65. This pretest was conducted on the first day of the study to evaluate students' initial abilities related to the Material Plants as Sources of Life on Earth. This test does not affect students' final scores, because it aims solely to determine their level of understanding before learning begins

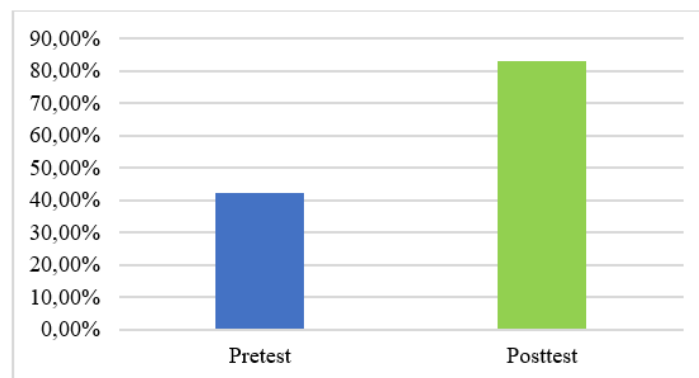
Posttest Results

The posttest results obtained by grade IV students after implementing learning using the card-based scramble method on the material Plants as the Source of Life on Earth are presented in Table 2.

Table 2. Students Posttest Results

No.	Name	Posttest Score
1.	N. D	90
2.	N. K	80
3.	A. S	85
4.	A. L	90
5.	A. L	90
6.	B. S	75
7.	C. A	80
8.	D. L	70
9.	D. K	75
10.	E. S	85
11.	F. L	85
12.	F. S	90
13.	G. L	80
14.	I. S	85
15.	J. L	80
16.	J. G	75
17.	J. E	85
18.	M. Y	85
19.	Y. K	95
20.	Z. L	80
<i>Average</i>		83%

Based on the table above, it can be seen that the final test results of the fourth-grade students have all passed the KKM score and reached 83%. This shows that the application of the card-based scramble method on the material of Plants as the Source of Life on Earth can improve the learning outcomes of fourth-grade students of Inpres Tounwawan Elementary School. The significant increase in learning outcomes shows that students are increasingly active in discussing, working together, and collaborating with their group members. In addition, they began to feel more confident in presenting the results of group work in front of the class and dared to ask questions to the teacher when they felt they did not understand the material being taught. This reflects the development of students' social and academic skills, who are increasingly motivated to participate in the learning process.



Picture 1. Comparison of Students' Pretest and Posttest Scores

Results of Research Data Analysis

Descriptive Statistical Test

The results of the descriptive statistical analysis obtained from the pretest (initial test) and posttest (final test) data conducted in class IV of SD Inpres Tounwawan are presented in detail in Table 3, which describes the comparison between the values before and after treatment to provide a deeper understanding of the changes that occurred in students.

Table 3. Descriptive Statistical Test

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Pretest	20	30,00	35,00	65,00	45,2500	8,65645	74,934
Posttest	20	25,00	70,00	95,00	83,0000	6,36603	40,526
Valid N (listwise)	20						

In the descriptive statistics table, the results of pretest and posttest learning on 20 research samples obtained a range or difference of 30 in the pretest, 25 in the posttest, minimum and maximum scores in the pretest 35 and 65, minimum and maximum scores in the posttest 70 and 95. The average mean value is 42.25. In the pretest and 84 in the posttest. The standard deviation is 8.66, posttest 6.37. The variance/distribution of pretest data is 74.93 and the variance of the post-test is 40.53.

Normality Test

The normality test was conducted to determine the most appropriate type of statistics used in this study and to determine whether the distribution of learning outcome data obtained from the pretest and posttest followed a normal distribution pattern or not. This normality test was implemented using the Shapiro-Wilk test at a significance level of 0.05, which was chosen because the number of samples in this study was less than 100. Based on the results of this test, if the significance value obtained is greater than 0.05, then the data can be considered normally distributed, while if the significance value is less than 0.05, then the data is considered not normally distributed. The complete results of this normality test can be seen in Table 4, which presents the significance values for each data group.

Tabel 4. Uji Normalitas

	Statistic	Shapiro-Wilk	
		Df	Sig.
Pretest	,917	20	,086
Posttest	,950	20	,371

The results of the normality test conducted using the Shapiro-Wilk method showed a significance value of 0.086 for the pretest and 0.371 for the posttest. Since both of these values are greater than 0.05, it can be concluded that the data is normally distributed. If the data is normally distributed, then the next statistical analysis can use parametric tests, such as the t-test. Conversely, if the data is not normally distributed, then the next analysis will use non-parametric statistical tests, such as the sign test.

Homogeneity Test

The homogeneity test applied in this study uses the Levene Test, which is used to test the equality of variance between groups so that it can determine whether the assumption of equality of variance is met or not in the data used. The results of the homogeneity test in this study can be seen in Table 5, which presents complete information regarding the test of equality of variance between groups in this study.

Table 5. Levene's Test

		Levene Statistic	df1	df2	Sig.
Learning Outcomes	Based on Mean	1.391	1	38	.246
	Based on Median	1.347	1	38	.253
	Based on Media and With adjusted df	1.347	1	36.682	.253
	Based on trimmed mean	1.286	1	38	.264

Based on table 5 above, it can be seen that the significant value is $0.246 > 0.05$, which means that the data is homogeneous.

Hypothesis Testing

The hypothesis test conducted in this study used the Paired T-Test to test whether or not there was an effect of the card-based scramble method on the learning outcomes of science in grade IV students of SD Inpres Tounwawan. The purpose of this test was to compare student learning outcomes before and after the application of the method. In this test, the null hypothesis (H0) is accepted if the significance value (sig) obtained is > 0.05 , which means there is no significant effect between the method applied and student learning outcomes. Conversely, H0 is rejected if the sig value is < 0.05 , which indicates a significant effect. The results of the Paired T-test can be seen in Table 6.

Tabel 6. Hypothesis Testing

		Paired Differences							
		95% Confidence Interval of the Difference							
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pretest-Posttest	-37,75000	8,346	1,866	-41,656	-33,843	-20,226	19	,000

Based on the t-test table presented above, it can be explained that the significance value (sig.) for the two-way test (2-tailed) is 0.000, < 0.05 . This shows that there is a significant influence of the application of the scramble method on the learning outcomes of science material in students, which means that the method has a real impact on improving students' understanding of the material being taught.

Discussion

The main objective of this study was to explore the extent to which the use of the card-based scramble method can affect the learning outcomes of students in grade IV of Inpres Tounwawan Elementary School. The study began with a pretest (initial test) to measure the level of students' understanding before the application of the learning method. The results of the pretest showed relatively low values, indicating that most students had not fully understood the material on Plants as the Source of Life on Earth. These findings provide an initial overview of the need to improve students' understanding through more effective and interactive learning methods.

Assessment of student learning outcomes is very important for the learning process. One example of behavioral change is a shift from not knowing to knowing or from not understanding to understanding (Shoimin, 2014). The pretest was conducted to measure the level of student understanding before the start of learning, and the results showed that after the study was completed, only 1 fourth grade student showed better results than the others. Assessments that are carried out appropriately and systematically provide important information that can be used to improve the quality of the learning process, as well as assist teachers in designing more effective strategies to improve student understanding (Roestiyah, 2001).

After completing the pretest, students were given treatment in the form of learning using the scramble method based on question cards. Learning is carried out following the steps that have been set out in the syntax of the scramble method. Students are actively involved in learning activities, which take place with the help of an infocus projector so that students can focus more on listening to the teacher's explanation. After the material has been delivered, the teacher divides students into four groups to facilitate collaborative learning. Each group is given the task of studying the material that has been taught and discussing the questions given in the form of question cards. To complete the discussion process, the teacher then distributes answer cards that must be analyzed and understood by each group. In this way, students can share their understanding and improve their critical thinking in understanding the material in depth.

The scramble method facilitates students in understanding the material about plants by using question cards distributed by the teacher. The question cards are designed to encourage students to think critically and try to solve the existing questions. In order to solve the questions well, students are expected to re-study the material that has been taught, so that they can connect the concepts that have been learned with the right answers (Astriani & Sudarma, 2019). The scramble method is a learning approach that involves distributing question cards and answer cards to students, where each question card is equipped with several alternative answers that are arranged to stimulate critical thinking. In applying this method, students are expected not only to find the correct answer but also to understand and find the right way to solve the question by referring to the available answers. This process challenges students to connect the concepts that have been learned in a more active, creative, and reflective way so that they can hone their logical thinking skills and improve their understanding of the material being taught. Thus, the scramble method not only focuses on achieving the right answer but also on developing students' cognitive skills in solving problems (Rakhmawati, 2022).

The scramble method is an active learning approach, designed to facilitate students in answering questions in a fun and challenging way. This method provides question cards that must be answered by students so that they can be directly involved in the learning process and more active in finding answers (Imami et al., 2018). Before starting this activity, the teacher first provides an explanation of the concepts related to the teaching material and provides relevant and appropriate information to help students understand the topic being discussed. After the explanation of the material, students are then given the opportunity to complete the

questions on the question cards, which will help them deepen their understanding. At the end of the lesson, the teacher evaluates the student's work objectively, provides constructive feedback, and assesses the extent to which students have understood the material taught. This evaluation process not only provides an overview of student achievement but also provides a sense of satisfaction for students for their efforts in completing assignments, which in turn increases their self-confidence and motivation to learn better (Dewi, 2016).

According to (Rismawati, 2019), the scramble method has the potential to improve student learning outcomes by encouraging them to think critically and innovatively, as well as creating an active, efficient, interactive, and enjoyable learning atmosphere. The scramble learning method has the advantage of helping students think critically and making them more thorough and careful in finding answers. This is reinforced by the results of the analysis which revealed a significant influence after the application of the scramble learning method, which succeeded in creating a pleasant learning atmosphere so that students can learn effectively while playing (Halawa & Laoli, 2023). This is in line with previous research which explains that the scramble learning method is an effective innovation and breakthrough that must be applied as a learning method in elementary schools, especially in science subjects (Kartikasari, 2023).

The scramble learning model begins with an explanation of the material that is in accordance with the learning topic to be studied. After that, students are divided into several groups, each consisting of five people. Each group is given a scrambled question card, and each group member works together to find the answer card that matches the question they receive. The teacher also gives students reflection cards to record how they found the answer. After that, students are given a certain amount of time to work on the questions, and they work within the specified time limit. The teacher then records the time and checks the student's work, and all worksheets must be collected after the time runs out. Assessment is based on how quickly students complete the questions and how many questions are answered correctly. As part of the evaluation, the teacher asks one member of each group to come to the front of the class and measure the extent of their understanding of the material Plants as the Source of Life on Earth. Members who advance will be given points if they can answer the questions correctly, and they themselves will get points as a reward for their efforts.

Conclusion

The results of the study conducted on students in Grade IV of SD Inpres Tounwawan showed that H_0 was accepted if $\text{sig} < 0.05$, which indicates that the use of the card-based scramble method has an influence/impact on student learning outcomes about the material Plants as a Source of Life on Earth. Factors that influence the success of the study so that the scramble method can be categorized as very good include:

- a. The teacher has been able to prepare a good learning plan (practical module).
- b. The teacher prepares a series of relevant questions so that they can help students understand the material being taught.
- c. The teacher clearly explains the learning objectives and provides information about the methods to be used.
- d. The teacher is able to organize students into groups and monitor the learning process.
- e. The teacher has evaluated the students' learning outcomes well and provided appropriate follow-up based on the results.

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