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Journal of General Education and Humanities
Vol. 5, No. 2, April 2026, pp. 2419 – 2428, https://doi.org/
ISSN 2963-7147

The Effect of The Talking Stick Cooperative Learning Model on Science Learning Outcomes of Fifth-Grade Students

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Article Info

Article history:

Received 2026-02-17
Revised 2026-03-16
Accepted 2026-03-18

Keywords:

Cooperative learning model
IPAS
Learning outcomes
Talking Stick

ABSTRACT

This study aims to determine the effect of the Talking Stick cooperative learning model on students' learning outcomes in science subjects at SDN Tindaki. The background of this research is the relatively low learning outcomes of students in science subjects. Therefore, an appropriate learning model is needed to improve students' understanding and participation during the learning process. This research employed a quantitative, pre-experimental design with a one-group pretest–posttest method. The study subjects were 16 fifth-grade students from SDN Tindaki. Data were collected through learning outcome tests, and analysis was conducted using descriptive and inferential statistics, including a t-test after satisfying normality test requirements. The results showed that the average pretest score was 56.25, while the average posttest score increased to 81.56. The results of the hypothesis test showed that the calculated t-value (13.27) was greater than the t-table value (2.131) at the 0.05 significance level. This indicates that the cooperative learning model of the Talking Stick type significantly improves students' learning outcomes in science subjects for fifth-grade students at SDN Tindaki.

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1. INTRODUCTION

Science learning in elementary schools plays an important role in developing students' understanding of natural phenomena and their surrounding environment. Through science education, students are expected to develop curiosity, critical thinking skills, and awareness of environmental issues. Science learning is a combination of two subjects, namely Natural Sciences (IPA) and Social Sciences (IPS) [1]. The integration of these two subjects is intended to help students better understand their surroundings. Furthermore, integrating science and social studies within the science subject is expected to strengthen multicultural education and enhance understanding of the cultures and social conditions of Indonesian and global communities [2]. Science learning is designed to foster curiosity,

critical and creative thinking, and concern for the environment. It plays a crucial role for students because it helps them understand themselves, develop a love for nature, and preserve the environment [3]. Therefore, science is not just a compulsory subject but also contributes to shaping students' character and understanding of their surroundings.

Good learning outcomes are a sign of the success of a learning process because they demonstrate students' ability to understand the knowledge they have acquired. Student learning outcomes are an important indicator of students' understanding and absorption of learning material [4]. Therefore, to achieve optimal student learning outcomes, teachers need to be prepared and carefully plan their instruction. Furthermore, the learning model used also influences the success of the learning process. [5] In science instruction, teachers need to use appropriate instructional models to ensure an effective learning process and achieve the expected learning outcomes.

Based on observations conducted by researchers on October 7, 2025, in class V SDN Tindaki, it was found that the Learning Objective Achievement Criteria (KKTP) for the subject of Social Studies was 70. The Achievement of Learning Objectives (KKTP) for Social Studies was 70. The total number of students in class V (16) indicates that many students have not achieved the Social Studies learning objectives. The results of daily tests for class V students are low. In addition, observations conducted in class V SDN Tindaki indicate that during the Social Studies learning process, the teacher's lecture-based approach, in the form of lectures and questions, leaves students bored and less enthusiastic. Some students are less active or only listen to the teacher explain, without responding to the material. Ultimately, it can weaken the class's overall understanding and affect students' low learning outcomes, because the use of less varied learning models that do not involve students actively makes it less likely to capture students' attention in Social Studies, which should be more interactive. In addition to the use of less effective learning models, internal factors, such as student learning activities, also influence student learning outcomes [6].

Based on these issues, planning and learning models are needed that can capture students' inherent playfulness, thereby necessitating more interactive learning models. A variety of models are needed to implement these models, as this will make it easier for students to understand the lessons being taught [7]. To address these issues, the researcher chose the Talking Stick cooperative learning model. This model is expected to improve student learning outcomes in science. The Talking Stick cooperative learning model was chosen because it helps increase student engagement and participation in the learning process. In this model, each student has the opportunity to speak and share their opinions in turn, using a stick as a communication tool [8]. By improving the quality of the learning process, it is hoped that students' learning outcomes in the science subject will also improve.

2. METHOD

Research design is the procedure used to collect and analyze data in a study [9]. A research design guides a study, including everything the researcher will do, from collecting and processing data [10]. They said that the research design is like a map that guides researchers to their research objectives.

Based on the problem formulation and objectives of this study, the researcher used a quantitative research method. Quantitative research is a form of research that utilizes numerical data collection and analytical techniques to test hypotheses, draw conclusions, and understand the relationships between the variables studied [11].

This study used a pre-experimental design with a one-group pretest-posttest approach. The researchers employed only one group, each given a treatment using the Talking Stick cooperative learning model. Before receiving treatment, the group was given a pretest to assess students' initial abilities. After receiving the treatment, a posttest was administered to assess learning outcomes.

Table 1. Research Design Table

Class	*Pretest*	Treatment	*Posttest*
V	O1	X	O2

Source: Sugiono 2022

O_1 : Initial test (Pretest) given before treatment.
X : Treatment in the form of implementing the Talking Stick type cooperative learning model.
O_2 : Posttest given after treatment.

This research was conducted at Tindaki Elementary School, located on Jl. Trans Sulawesi, Tindaki Village, Parigi Selatan District, Parigi Moutong Regency, Central Sulawesi. The population is all objects or subjects of the research that have certain characteristics to be studied and for which conclusions can be drawn [12]. The population in this study consisted of all 16 fifth-grade students at SDN Tindaki. A sample in quantitative research is a portion of the population selected for analysis, to generalize the results to the entire population [13]. According to Arikunto in [14], if the population is less than 100 people, then all members of the population should be used as a sample (total sampling). However, if the population exceeds 100 people, sampling can be conducted at a rate of 10-25% of the total population, adjusted to the desired level of population homogeneity and accuracy. Because the population in this study is less than 100, namely 16 students, the entire population was used as a sample.

In this study, a non-probability sampling technique was used, namely one that does not provide an equal opportunity for each member of the population to be selected as a sample [15]. The sampling technique used in this study was saturated sampling. Saturated sampling is a sampling technique that involves all members of the population as research samples. The type of data in this study is quantitative, in the form of numbers or numeric data, not words or images, and can be analyzed statistically [16]. Quantitative data in this study were obtained from student learning test results in the subject of science, consisting of pretest and posttest scores.

In addition, data from observation instruments is used. There are two data sources in research: primary data and secondary data. Primary data are original data collected directly by researchers from primary sources, such as interviews, direct observation, experiments, or questionnaires. This data is usually more specific, up-to-date, and relevant to the research

needs. Conversely, secondary data is collected by others and is available in publications, reports, articles, books, or official archives [17]. In this study, primary data were collected through interviews and direct observations with fifth-grade teachers at SDN Tindaki. Secondary data were obtained from various sources, including school documents (e.g., student attendance lists) and journal references, as well as previous research on the Talking Stick type cooperative learning model and science learning outcomes. This study has two variables: the dependent variable (Y), student learning outcomes, and the independent variable (X), the talking stick type cooperative learning model. The measurement scale in this study was used to assess student learning outcomes in the knowledge domain after the implementation of the Talking Stick-type cooperative learning model through a Pretest and Posttest.

The data collection technique in this study is the first test. A test is an instrument or method used to assess an individual's understanding, knowledge, or skills in a particular field [18]. In this study, test-based data collection techniques were used to assess student learning outcomes in science before and after the implementation of the Talking Stick cooperative learning model. The test was administered in two stages: pretest and posttest. The second is observation. Observation is one of the data collection techniques carried out directly in the field to obtain factual and contextual information [19]. In this study, observation techniques were used to collect data on the implementation of the Talking Stick cooperative learning model and student activities during the learning process. Finally, documentation is a data collection technique involving documents, archives, or other written materials related to the research phenomenon [20]. Documentation techniques are used to obtain supporting research data, such as student names, previous learning outcomes, and photos of learning activities, to strengthen observation results with concrete evidence of research implementation.

The data analysis technique used is descriptive analysis, which is a fundamental component in scientific research that provides an initial description of the data to support further analysis [21]. In this study, the data will be presented in percentages. The learning outcome data obtained are presented in the form of an average (mean), the highest and lowest values (range), and the standard deviation, both in the Pretest and Posttest results. In addition, the observation results are also analyzed descriptively by calculating the percentage of each assessment category. Next is the Prerequisite Analysis Test. As an initial step in hypothesis analysis, the researcher conducted a prerequisite test to assess the normality of the data obtained by testing for normality, aiming to determine whether the student learning outcome data, both before (Pretest) and after treatment (Posttest), are normally distributed. After the data are found to be normally distributed, a paired t-test is performed. However, if the data is not normally distributed, a non-parametric statistical test is used.

3. RESULTS AND DISCUSSION

3.1 Results

This research was conducted at Tindaki State Elementary School, a public elementary school located in South Parigi District, Parigi Moutong Regency, Central Sulawesi Province. The research procedure was as follows: In the preparation stage, the

researcher conducted initial observations in grade V at Tindaki State Elementary School to determine the initial conditions of the science learning process and identify problems students faced in learning. The researcher then prepared the learning tools to be used during the research, including teaching modules and pretest and posttest instruments. In addition, the researcher also conducted a validity test on the research instruments to ensure the appropriateness of the questions to be used. After all the tools were ready, the researcher obtained the research permit from the school.

The next stage is the research implementation stage. At this stage, the activity began with a pretest given to fifth-grade students to determine their initial abilities before receiving the treatment. The pretest was given in the form of 20 multiple-choice questions related to science and science material. After the pretest was conducted, the researcher then provided treatment in the form of learning using the Talking Stick model according to the developed teaching module. After the learning activities were completed, students were then given a posttest.

In the final stage of the research, the researcher corrected the students' pretest and posttest scores, then calculated each student's final score. The data obtained was then analyzed using SPSS to determine any improvement in student learning outcomes after implementing the Talking Stick learning model. The results of the instrument validity test are shown in the following table.

Table 2. Validity Test Results

Validity Test Results Table			
Question	r-count	r-table	Conclusion
P1	0.551	0.497	Valid
P2	0.702	0.497	Valid
P3	0.686	0.497	Valid
P4	0.730	0.497	Valid
P5	0.593	0.497	Valid
P6	0.760	0.497	Valid
P7	0.564	0.497	Valid
P8	0.564	0.497	Valid
P9	0.537	0.497	Valid
P10	0.645	0.497	Valid
P11	0.593	0.497	Valid
P12	0.514	0.497	Valid
P13	0.115	0.497	Invalid
P14	0.318	0.497	Invalid
P15	0.211	0.497	Invalid
P16	0.596	0.497	Valid
P17	0.380	0.497	Invalid
P18	0.572	0.497	Valid
P19	0.557	0.497	Valid
P20	0.627	0.497	Valid
P21	0.593	0.497	Valid
P22	0.610	0.497	Valid
P23	0.626	0.497	Valid
P24	0.877	0.497	Valid
P25	0.350	0.497	Invalid

Based on the table above, of the 25 questions tested, 20 obtained a calculated r-value ≥ r-table 0.497 and were declared valid, while 5 obtained a calculated r-value ≤ r-table 0.497 and were declared invalid. Questions declared invalid were then eliminated and removed, so that only 20 valid questions were used in the next analysis stage, namely, the reliability test of the test instrument. The reliability test was conducted using Cronbach's alpha. The results of the reliability test are shown in the following table.

Table 3. Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
0.919	20

The reliability test table shows the calculation results from the Cronbach's Alpha formula in SPSS 30, which yielded a value of 0.919. The decision criterion in the reliability test is that if the Cronbach's Alpha value is > 0.60, then the instrument is said to be reliable. Therefore, it can be concluded that the multiple-choice question instrument used in this study is declared reliable with a Cronbach's Alpha value of 0.919 > 0.60.

Based on the student test instrument results, descriptive statistics were obtained to provide an overview of the development of student learning outcomes before and after the implementation of the Talking Stick learning model. The descriptive statistics are shown in the following table.

Table 4. Descriptive Statistics Results

	N	Minimum	Maximum	Mean	Standard Deviation
Pretest	16	25	85	56.87	21,899
Posttest	16	70	100	85.62	8,341

Based on the data description in Table 4, there was an increase in the average learning outcomes of fifth-grade students at SDN Tindaki. The pretest score ranged from 25 to 85, with an average of 56.87. After treatment using the Talking Stick learning model, the average posttest score was 85.62, ranging from 70 to 100. This indicates that providing treatment through the Talking Stick learning model can improve student learning outcomes. This finding will be further strengthened by the results of the t-test in the next analysis.

The pretest and posttest data were tested for normality to determine whether the experimental class data were normally distributed. The normality test was conducted using the Shapiro-Wilk test in SPSS version 30, with the decision rule that if the p-value is > 0.05, the data are normally distributed. If the significance value is < 0.05, the data are not normally distributed. The results of the pretest and posttest normality tests for the experimental class are shown in the following table.

Table 5 Normality Test Results

Tests of Normality						
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistics	Df	Sig.	Statistics	Df	Sig.
Pretest	0.163	16	0.200	0.896	16	0.070
Posttest	0.200	16	0.087	0.955	16	0.576

Table 5 presents the results of the Shapiro-Wilk normality test for the experimental class. In the Pretest data, the significance value was 0.070 (0.05), and in the Posttest data, it was 0.576 (0.05). This shows that the Pretest and Posttest data are normally distributed.

Next, the hypothesis test in this study was conducted to determine whether there is an effect of the application of the Talking Stick learning model affects the learning outcomes of fifth-grade students at Tindaki State Elementary School. The hypothesis test used an independent paired-samples t-test because the data were normally distributed and came from the same group, namely the students' Pretest and Posttest scores. The decision-making criterion is that if the significance value is <0.05, then H0 is rejected and Ha in this study is accepted.

H_0 : There is no significant influence of the application of the Talking Stick type cooperative learning model on student learning outcomes in the fifth-grade science subject at SDN Tindaki.

H_1 : There is a significant influence of the application of the Talking Stick type cooperative learning model on student learning outcomes in the fifth-grade science subject at SDN Tindaki.

The results of the independent paired-samples t-test are shown in the following table.

Table 6 Hypothesis Test Results

Paired Samples Test				
	T	Sig. (2-tailed)	Mean Difference	Conclusion
Equal variances assumed	-7,155	<0.001	-28,750	There is a Significant Increase

Based on Table 6, the significance value is between 0.001 and 0.05. This indicates a significant difference between students' pretest and posttest scores. These results indicate that H0 is rejected and Ha is accepted. Therefore, it can be concluded that the application of the Talking Stick learning model significantly improves student learning outcomes in the science subject in grade V at Tindaki State Elementary School.

3.2. Discussion

Student learning outcomes are one indicator of the success of the learning process. Achieving these learning outcomes is greatly influenced by the educator's readiness and ability to manage learning. Furthermore, the learning model used also plays a crucial role in supporting student success. The application of a variety of learning models can create a more engaging and enjoyable learning environment. This, in turn, can improve student learning outcomes. Therefore, selecting the right learning model is crucial for the quality of the

learning process [22]. In this study, the researcher sought to determine whether the Talking Stick type cooperative learning model improved learning outcomes and met the Criteria for Achieving Learning Objectives (KKTP) for science in class V of SDN Tindaki.

Based on research conducted in class V with a sample of 16 students using the Talking Stick type cooperative learning model, it was found that before treatment, the Pretest results showed an average Pretest score of 56.87, ranging from 25 to 85. This shows that students' initial abilities are still relatively low. After implementing the Talking Stick cooperative learning model, there was a significant increase in student learning outcomes improved significantly. The average Posttest score increased to 85.62, with a minimum score of 70 and a maximum of 100.

Based on the results of the normality test for the Pretest and Posttest data, the p-value is > 0.05, indicating that the data meet the normality assumption. Upon fulfilling this assumption, the analysis can proceed using a parametric hypothesis test, namely the independent paired-samples t-test. The t-test results indicate a significant difference between students' Pretest and Posttest scores. This is evidenced by the significance value < 0.05. so that H_0 is rejected and H_1 is accepted. Thus, it can be concluded that the Talking Stick cooperative learning model improves student learning outcomes.

This research is strengthened by previous research by [23], conducted in class IV of SD Negeri 9 Mamboro, which showed that the application of the Talking Stick model increased classical learning completion from 56.52% in the pre-action to 69.56% in cycle I and further increased to 87.37% in cycle II. In addition, research conducted by [24] at SD Negeri 104243 Lubuk Pakam also showed that the Talking Stick model affected student learning outcomes with normally distributed data (sig ≥ 0.05) and a correlation value of 0.644, indicating the model's influence on learning outcomes. Furthermore, research conducted by [25] in Bengkulu City also showed that the Talking Stick model had a significant influence on student learning outcomes, as indicated by a t-value greater than the t-table value. These results are consistent with this study, which also showed a significant difference in learning outcomes before and after treatment. The research conducted by [26] shows that Talking Stick is effective in increasing student activity, which has an impact on improving learning outcomes.

4. Conclusion

Based on the research and data analysis, it can be concluded that the application of the Talking Stick cooperative learning model significantly improves students' learning outcomes in science subjects for fifth-grade students at SDN Tindaki. The analysis shows that students' learning outcomes improved after implementing the Talking Stick learning model, suggesting that this model can foster a more active and engaging learning environment.

The findings of this study suggest that the Talking Stick cooperative learning model can be an effective alternative learning strategy to improve student participation and understanding of science concepts in elementary schools. By encouraging students to actively participate in learning activities, this model fosters a more interactive, student-centered learning process.

However, this study still has several limitations, including a limited number of research subjects and a pre-experimental research design. Therefore, future researchers are recommended to conduct further studies using larger samples and more varied research designs, such as quasi-experimental or experimental methods, to obtain more comprehensive results regarding the effectiveness of the Talking Stick learning model.

THANK-YOU NOTE

Praise be to Allah SWT, because of His blessings, the author can complete this final assignment as a requirement to obtain a Bachelor's degree (S1). With full respect, the author thanks Mrs. Dr. Zulnuraini S.Pd., M.Pd, as the first supervisor and Mrs. Asriani, S.Pd. M.Pd, as the second supervisor, for their guidance and support in the process of completing the author's final assignment. The Principal of SDN Tindaki, the teachers, and all fifth-grade students who have been willing to be sources of information in the author's research. The author's parents, family, and friends who always provide support and assistance to the author.

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