

THE IMPACT OF QUESTION BOARDS-ASSISTED TALKING STICK LEARNING MODEL ON GRADE IV ELEMENTARY SCHOOL STUDENTS MATHEMATICS LEARNING OUTCOMES

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Abstract

Mathematics learning is the stage of transferring students' learning experiences in order to increase students' understanding so that they can gain competence related to the mathematics material being studied. The teacher's ability to design and carry out learning is a factor that can support success in learning procedure in order for pupils to become proficient in the subject. A cooperative learning model that uses talking sticks is one of the learning methods that can make the learning process more effective and efficient. The purpose of this study is to examine how fourth grade children at a Jakarta Public Elementary School learn mathematics using the talking stick learning model and a question board. Up to 60 fourth graders using the saturation sampling technique make up the population and sample in this study. The research method applied is quantitative in the form of experiments and the design chosen is a pseudo-experimental design. The instruments applied in this study consisted of talking sticks, question boards, and post-test sheets. The results of this study demonstrate a substantial relationship between grade IV students' mathematics learning outcomes and talking sticks as a learning approach supported by question boards in one of the Jakarta Public Elementary Schools.

Keywords : *talking stick, question board, mathematics, learning outcomes, primary school*

Abstrak

Pembelajaran matematika adalah tahapan transfer pengalaman belajar peserta didik guna meningkatkan pemahaman peserta didik sehingga bisa mendapatkan kompetensi terkait bahan matematika yang dipelajari. Kemampuan guru guna merancang serta menjalankan pembelajaran merupakan faktor yang dapat menunjang keberhasilan pada proses pembelajaran sehingga peserta didik mampu menguasai materi. Model pembelajaran bisa membantu proses belajar menjadi efisien serta efektif, salah satunya model pembelajaran kooperatif dengan *talking stick*. Tujuan dari penelitian ini adalah untuk menyelidiki apakah ada faktor yang mempengaruhi hasil belajar matematika siswa kelas IV di sebuah Sekolah Dasar Negeri Jakarta yang menggunakan model pembelajaran *talking stick* berbantuan papan pertanyaan. Populasi dan sampel pada studi ini yaitu semua siswa kelas IV sebanyak 60 siswa menerapkan teknik sampling jenuh. Metode penelitian yang diterapkan ialah kuantitatif berbentuk eksperimen dan desain yang dipilih ialah desain eksperimen semu. Instrumen yang diterapkan pada studi ini terdiri dari *talking stick*, papan pertanyaan, dan lembar *post-test*. Temuan studi ini memperlihatkan terdapat hal yang mempengaruhi bernilai signifikansi antara *talking stick* sebagai model pembelajaran berbantuan papan pertanyaan pada hasil belajar matematika siswa kelas IV di salah satu Sekolah Dasar Negeri Jakarta.

Kata kunci: *talking stick, papan pertanyaan, matematika, hasil belajar, sekolah dasar*

INTRODUCTION

One of the thematic learning is the teaching of mathematics in elementary schools. Mathematics learning is a stage of channeling learning experiences to foster understanding

so that students can get competencies in the content of the mathematics lessons they learn (Nurul Fadilla et al., 2021). The factor of learning success is the expertise of educators when designing and implementing learning (Wiryanto, 2020). In elementary school, mathematics learning requires the same systematic logical thinking as student growth. So that requires that the facilities provided by teachers must be adjusted to students in elementary schools. Learning media is a way to facilitate learning interaction (Arsyad & Fatmawati, 2018).

Talking stick is a medium that can be applied to learning activities. Sticks are needed in the learning model with talking sticks. Students after learning the material are required to answer the celebration from the teacher while holding a stick (Putu & Suhardiana, 2018). The learning model with this media is classified as a cooperative learning model. Students are taught to work together in their groups to achieve predetermined goals, this includes cooperative learning (Rahmawati & Sutiarso, 2019). According to Jamiah (2016), talking sticks as a learning model allow students to have the courage to express their opinions. The model uses a stick to give answers and communicate after students learn the content of the lesson. This learning model has the goal of creating a stimulating and active learning situation, making students more active, and making the teaching and learning stages more interesting (Bahak Udin By Arifin & Nur Laili, 2022).

With the use of a board, talking sticks are a sort of cooperative learning strategy that gives students the chance to collaborate and learn in groups. According to (Hasrudin & Asrul, 2020), Talking Stick is classified as a cooperative learning model with a group format. In groups, students can discuss what they do not understand and seek solutions to problems posed by educators. Group formation, making students practice relating to their group members and expressing their opinions confidently (Anggi Seika Ayuni et al., 2017). A question board can be used in conjunction with the talking stick learning model.

The use of media in mathematics education can be an alternative solution for teachers to help students understand mathematical principles and concepts in their own right. Question boards are a learning medium that can be applied (Nafisah et al., 2023). The question board can be made of wood in the shape of a square or foam and consists of several envelopes containing math problems. This media is planning to bolster the learning prepare of the talking adhere show. This medium permits understudies to get questions

specifically from the envelope, so teachers don't ought to perused questions out loud. When a student receives a stick that is stopped, the student is obliged to choose an envelope from the question board and answer the questions in it.

The talking stick learning paradigm, which is intended to help fourth-grade students meet their learning objectives in mathematics, is supported by the questions on the board. The skills acquired by children after completing mathematics learning activities are included in learning outcomes (Susanto, 2014). Learning outcomes are students' learning outcomes while carrying out learning activities that bring transformation and shape human behavior (Sukendra et al., 2019). Mathematics is a science that deals with abstract objects, and mathematics relies more on logic than observation as a measure of truth (Wassahua Sarfa, 2016). Therefore, students need to think analytically, logically, systematic, critically, in order to understand mathematical principles. From the meaning that has been explained, Consequently, it may be said that mathematics learning outcomes are values or measures that determine student success, especially in mathematics subjects.

An additional strategy to enhance students' learning outcomes in mathematics is the use of the talking stick learning paradigm in conjunction with a question board. The study carried out by the researcher Wahyudi et al. (2020) It shows that learning mathematics students experience an increase in learning outcomes after applying talking sticks as a learning model. Throughout the teaching and learning stages of the talking stick, students show enthusiasm and motivation to participate in teaching and learning activities, especially in mathematics subjects with a significant influence on their learning outcomes. Talking sticks also have the advantage of focusing on the subject matter, fostering cooperation and responsibility, motivating students to be brave and improving their abilities, evaluating students' readiness, guiding students to express their own ideas, so that students think for themselves about what answers to a question and train students' skills and experiences.

The learning model is a number of learning methods and approaches that support each other so as to produce an optimal learning model. The steps in the learning model of talking sticks using a question board begin with the educator preparing the stick, the educator forms students into a number of groups, with 4 to 6 students, presenting the teaching of the subject matter that the educator will understand, then providing

opportunities for students to understand and read the content of the textbook. After understanding and reading the book,

the educator asks students to no longer open the book. The teacher takes control of the stick, and gives it to the students, and they are ordered to join in the singing. When the song ends, the stick will stop. The student who receives the stick should come forward to pick the envelope on the question board. When students are given questions, they are obliged to give answers to existing questions. Continue until a large number of students can give an answer. The talking stick learning demonstrate with the assistance of a board containing questions permits students to effectively take an interest within the learning handle, arouse students' interest in participating in teaching and learning stages, and support students to express their opinions. It is anticipated that this learning model will improve students' learning achievement in mathematics over the previous one. Because of this, the author is curious to find out more about the effects of the talking stick learning model—which uses question boards to enhance student understanding on students arithmetic learning outcomes in grade IV elementary school.

METHODS

This study was conducted at one of Jakarta's state elementary schools. The method chosen by the researcher is a quantitative method in the form of an experiment. A pseudo-experimental design is applied as the design. A quasi-experimental design is a design that contains a control group but not enough control for any outside factors that influence how the experiment proceeds (Sari & Permata Azmi, 2018). A non-equivalent posttest-only control group design was used in the study.

The control group and experimental group were included in this researcher's study. The talking stick learning model helped by a question board was not given treatment, so it was classified as a control group. The talking stick learning model is different with the help of a question board that is given treatment, including the experimental group. Both groups received harmonious material to see the students' mathematics learning results.

Table 1. Research Design

Group	Treatment	Post-test
Experimental classes	X	O1
Control class	-	O2

Explanation:

X = Classes that are given treatment (using talking sticks as a learning model assisted by a question board)

O1 = Post-test group experiment

O2 = Post-test control group

The Talking Stick Learning Model variable (X) and the Mathematics Learning Outcome

(Y) are the two variables that make up the research variables. There are 60 students in this study sample overall, comprising the control group and the experimental group. The data collection technique chosen is an instrument in the form of a written test of mathematics problems. The test is in the form of an essay that is distributed after the experiment is carried out. Students' comprehension following the application of the talking stick learning technique in mathematics with the aid of question boards is measured by the objective test.

Table 2. Classification of Person Value and Item Reliability

Value Person & Item Reliability	Category
0,90 $r < 1,00$	Highest
0,70 $r < 0,90$	Tall
0,40 $r < 0,70$	Medium
0,20 $r < 0,40$	Low
$r \leq 0,20$	Very Low

Source: (Palimbong & T Allo, 2018)

The data analysis technique in the researcher's study is to apply SPSS 25 to test the analyzed and processed instruments to provide answers to research questions and hypothesis tests. This research conducts statistical analysis or mathematical calculations,

before testing analytical requirements or testing hypotheses. Therefore, the data taken must be in the form of numbers. Furthermore, the researcher tested the processed and analyzed instruments using SPSS 25 to answer research questions and test hypotheses. Homogeneity tests, hypothesis testing, normality tests, and effect size tests are some of the necessary tests.

Normality test is conducted as a requirement of data analysis techniques. The test tool applied to carry out the normality test in this study is Kolmogorov-Smirnov. With the use of the Levene test applied to both data groups, the homogeneity test was performed to determine how comparable the two sample groups were. The purpose of hypothesis testing is to test and prove whether a hypothesis is accepted or rejected. In analyzing this, one way is to apply a t-test.

Effect size is a secondary integrative analysis that examines the results of testing research hypotheses with statistical methods.

Table 3. Criterion Effect Size

Effect Size	Criterion
$d \geq 0,8$	Big
$0,5 \leq 0,8$	Medium
$d < 0.5$	Small

Source: (Handayani et al., 2018)

RESULTS AND DISCUSSION

Before the implementation of the research, it is necessary to have a validity test to find out how feasible the instrument is to be used in the research. The validity test results obtained amounted to 10 questions. Of the 10 questions, the results stated that all question items were valid, which if r calculated $> r$ table at a significant level of 0.05.

Furthermore, a reliability test is carried out to ensure that the instrument has a proper consistency value as a measuring tool. Cronbach Alpha is used in reliability tests to find out if the research instrument is said to be reliable if the result is 0.6 or more. The results of the reliability test were obtained with the help of SPSS version 25, the results obtained were 0.893 which can be concluded that the results are $0.893 > 0.60$. So the instrument has reliability results in the high category.

The normality and homogeneity test comes next, following the validity and reliability test. SPSS 25 is used in this study for the normalcy test. It can be considered regularly distributed if the significance value is greater than 0.05. Kolmogorov-Smirnov was used because the number of sample was > 50 . The experimental class's known mathematics learning outcomes are 0.200, whereas the control class's results are 0.182; both classes' results are greater than 0.05. Consequently, it can be said that the test has a normal distribution.

To find out the similarities of the two sample groups, it is necessary to conduct a homogeneity test by means of the Levene test. The data can be said to be homogeneous if the significance value > 0.05 obtained on the Based on Mean. The arithmetic learning results of understudies in this think about were $0.270 > 0.05$, so it was concluded that the information of this consider was homogeneous.

Table 4. Student Mathematics Learning Outcomes

Class	N	Lowest Rate	Highest Scores	Average
Control Classes	30	33	97	59,63
Experimental Classes	30	43	100	72,53

The experimental class's mathematics learning outcomes were derived from Table 4, whereby the best score was 100, the lowest score was 43, and the average score was 72.53. In contrast, the control class's average score in mathematics was 59.63, with the highest score of 97 and the lowest score of 33. This demonstrates that when compared to the control class, the experimental class has the highest value for mathematics learning outcomes.

Table 5. Test Independent Sample T-Test

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	T	df	Sig. (2-tailed)
Student Mathematics Learning Outcomes	Equal variances assumed	1.238	.270	-3.034	58	.004
	Equal variances not assumed			-3.034	56.718	.004

It can be inferred from Table 5 that there is a significant difference in the learning

outcomes of mathematics between the talking stick learning model and the question board for grade IV students. The student learning outcomes were obtained with a Sig (2-tailed) value of 0.004 (sig < 0.05). Review IV understudies who are categorized as medium benefit from the talking adhere learning demonstration assisted by an address board, according to the results of the computation within the effect measure test, which yielded a value of 0.78.

The ponder is in line with the researchers' discoveries Baid et al. (2022), emphasized that there was an increment in understudy learning results in social number juggling fabric after the usage of talking sticks as a learning show. Teaching and learning in this model can make students comfortable in their learning environment, result in students being more active, and foster an effective attitude of students to find a way out of a problem given by educators.

The investigation conducted by (Anggi Seika Ayuni et al., 2017) according to the results of the grouping of students who participate in teaching and learning activities, the question box media with the Talking Stick type is a cooperative learning model of greater value, different in the group of students who participate in teaching and learning activities instead of with this learning model. This shows how the support of the question box media in the use of the Talking Stick learning model can develop mathematics in learning outcomes. The difference in learning environments between the experimental and control groups is the cause of this condition.

The learning model presents opportunities for students to understand and dialogue in their study groups. When in a group, students can exchange ideas related to teaching materials that are not yet understood and students can help each other to find a solution to a problem. Students can understand how to socialize with their group friends and learn to dare to express their ideas. In addition, there is a game component that makes students not bored and joyful and makes students more enthusiastic and enthusiastic about participating in learning (Anggi Seika Ayuni et al., 2017).

According to (Surya & Khairunnisa, 2017) added that talking sticks can be used as a teaching tool to help students achieve better learning outcomes in their maths classes. In everyday mathematics subjects, teachers rarely use teaching aids. They often use

whiteboards and markers which seem to make students less active because they are less interesting. When students are asked to answer questions, there are a number of students who do not understand how to complete the answers to the questions presented. By using the talking stick learning paradigm, educators can help students grasp a concept better and enhance their learning outcomes by not only helping them communicate more effectively. Talking sticks education not only improves students communication abilities but also creates supportive environments and increases their engagement with the material.

CONCLUSION

From the discoveries of the ponder that has been carried out, the comes about of the theory test were acknowledged so that it can be concluded that there's a critical impact on the learning show of talking adhere helped by address sheets on the arithmetic learning results of review IV understudies. The talking adhere learning demonstrate helped by a address board can include understudies straightforwardly, so that understudies can be more. dynamic amid learning exercises. In expansion, learning utilizing talking sticks can make learning circumstances energizing and not repetitive which makes understudies feel more energized amid the learning prepare. Here are some suggestions conveyed by the researcher: (1) Teachers, use interesting and creative learning media in every learning, (2) The next researcher, the researcher hopes that the learning media that has been made can be further developed using technology.

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