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The Talking Stick Model Improves Mathematics Learning Outcomes for Fourth Grade Elementary School Students

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ABSTRAK

Masalahnya yang sering terjadi yaitu belajar matematika di sekolah dasar terkesan membosankan, sehingga berdampak pada hasil belajar yang rendah. Penelitian ini bertujuan untuk menganalisis penerapan model pembelajaran Talking Stick untuk meningkatkan hasil belajar matematika pada siswa kelas IV SD. Jenis penelitian ini yaitu penelitian kuantitatif. Penelitian ini menggunakan metode non-equivalent control group essay, dengan tipe pseudo-eksperimental. Subyek penelitian ini adalah siswa kelas IV SD yang berjumlah 27 siswa, terdiri dari 13 siswa laki-laki dan 14 siswa perempuan. Metode pengumpulan data yang digunakan dalam penelitian ini yaitu observasi, wawancara, dan tes dan lembar observasi. Instrumen yang digunakan dalam mengumpulkan data yaitu lembar observasi dan soal tes. Teknik yang digunakan untuk menganalisis data yaitu teknik analisis deskriptif kualitatif, kuantitatif, dan statistik inferensial. Hasil penelitian menunjukkan bahwa penerapan model pembelajaran Talking Stick yang memperhatikan jumlah anggota pada setiap kelompok dapat meningkatkan hasil belajar matematika siswa kelas IV SD. Pada tes awal terdapat 6 siswa (22%) yang mendapat nilai 76 dan pada hasil pretest sebelumnya penerapan pembelajaran Talking Stick terdapat 9 siswa (33%). Setelah itu pelaksanaan pembelajaran Talking Stick, terdapat 26 siswa dari keseluruhan siswa yang mendapat nilai diatas KKM. Hasil uji-t juga menunjukan terdapat perbedaan hasil belajar matematika setelah penerapan model pembelajaran Talking Stick. Disimpulkan bahwa model pembelajaran Talking Stick dapat digunakan dalam pembelajaran matematika. Implikasi penelitian ini yaitu penerapan model pembelajaran Talking Stick dapat meningkatkan hasil belajar siswa.

ABSTRACT

The problem that often occurs is that studying mathematics in elementary school seems boring, resulting in low learning outcomes. This research aims to analyze the application of the Talking Stick learning model to improve mathematics learning outcomes in fourth-grade elementary school students. This type of research is quantitative research. This research uses a non-equivalent control group essay method with a quasy-experimental type. The subjects of this research were 27 grade IV elementary school students, consisting of 13 male students and 14 female students. The data collection methods used in this research are observation, interviews, tests and observation sheets. The instruments used to collect data were observation sheets and test questions. The techniques used to analyze the data are qualitative descriptive analysis techniques and quantitative and inferential statistics. The research results show that applying the Talking Stick learning model, which pays attention to the number of members in each group, can improve the mathematics learning outcomes of fourth-grade elementary school students. In the initial test, six students (22%) got a score of 76; in the previous pretest results of the application of Talking Stick learning, there were nine students (33%). After the implementation of Talking Stick learning, 26 students out of the total got scores above the KKM. The t-test results also show differences in mathematics learning outcomes after implementing the Talking Stick learning model. It was concluded that the Talking Stick learning model can be used in mathematics learning.

1. INTRODUCTION

The main priority of a nation today is education. If the condition of a nation's human resources is low, then the nation will not progress one day (Grunt et al., 2020; Mohammad, 2018; Oh & Park, 2017). Efforts to improve the quality of human resources are through education. Education is developing human abilities and behaviour towards a better direction (Despeisse & Minshall, 2017; Didham & Ofei-Manu, 2020; Patterson & A.Niesa, 2018). Thus, the quality of human resources will increase with quality education. Primary education is the most critical point in education because it is in primary education that individuals begin to be formed and equipped with knowledge that will later be used for further education (Rahayu et al., 2021; Wasito et al., 2022; Yusrizal et al., 2019). The problem that often occurs in primary education in Indonesia is the learning process (Andarwulan et al., 2021; Nugraha et al., 2018; Wati et al., 2023). Elementary School (SD) teachers are the main factor determining the success of a learning process. One

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indicator that a learning process can be said to be successful can be seen from student learning outcomes (Kurniawati et al., 2017; Mawanto et al., 2020).

Learning outcomes are changes or new abilities obtained by students after carrying out learning actions (Ratnasari et al., 2021; Rulyansah & Sholihati, 2018). The success of achieving student learning outcomes can be seen through the grades obtained by students. The student learning outcome scores are below the established Minimum Completeness Criteria (KKM) standards. In that case, student learning outcomes are low. It shows that the learning process cannot be successful, and vice versa (Abdul Karim et al., 2020; Maulidya & Nugraheni, 2021). One of the subjects that students are expected to have good learning outcomes is mathematics. Mathematics is one of the subjects taught in elementary school. Elementary mathematics subjects relate to logic regarding interconnected concepts (Fauzia, 2018; Hakim & Ramlah, 2019; Yanuarto & Setyaningsih, 2017). Apart from that, in learning mathematics so that students do not get bored, mathematics learning activities can also be carried out using games so that learning mathematics becomes fun (Handayani & Rochmahwati, 2020; Mawardini & Ningsih, 2022). Learning activities designed to be fun are expected to increase student motivation in learning mathematics so that students get grades above standard.

However, the current problem is that many students still need help learning mathematics. Previous research findings also stated that students had difficulty learning mathematics, with low student learning outcomes (Muslihatun et al., 2019; Nawafilah & Masruroh, 2020; Ulhusna et al., 2020). Other research also states that low learning outcomes can be influenced by many factors, one of which is teachers' teaching methods (Balqis, 2019; Budianti, 2021). Elementary students will usually be more interested in things that use games (Muslihatun et al., 2019; Nawafilah & Masruroh, 2020; Ulhusna et al., 2020; Utama & Stevanus, 2023). Suppose teachers use the lecture method more often. In that case, students will usually feel bored and need help to absorb the material the teacher teaches optimally (Afifah & Hartatik, 2019; Nawafilah & Masruroh, 2020). Based on the results of pre-research observations carried out in class IV of SD Negeri 5 Ngraji, a problem was also found, namely the students' mathematics learning outcomes. Based on the pre-test results on multiplication and division of numbers, many students still got low scores. 9 students got KKM scores, and 18 got scores below KKM.

The results of interviews conducted with fourth-grade teachers at SD Negeri 5 Ngraji also showed the current problem, namely the students' low mathematics learning outcomes. Based on the interview results, the average daily test score for students in multiplication and division of numbers is 71.44. Students can be said to have completed it by six students out of 27 students. Hence, the percentage of student learning completeness is 22%. In addition, when compared with other subjects, mathematics ranks at the bottom in terms of average scores. The results of data analysis show that mathematics is ranked lowest in terms of average scores. It can occur due to many factors, including the media used in learning or inadequate use of media (Afifah & Hartatik, 2019; Hakim & Windayana, 2016; Maswar, 2019; Nawafilah & Masruroh, 2020). The results of observations found another problem, namely in learning facilities. Several books were found to be damaged, which could disrupt students' learning concentration during the learning process.

Based on these problems, an alternative that teachers can use to improve student learning outcomes is to try using new models in mathematics learning. Previous research findings also state that choosing a suitable model will influence learning outcomes and students' ability to understand learning material (Dewi et al., 2021; Maloring et al., 2020; Ngilamele et al., 2019; Suwela, 2021). One learning model that can be used is the Talking Stick learning model (Dianawati, 2019; Meganingtyas et al., 2019). Talking Stick is a cooperative learning model (Dewi et al., 2017; Fajrin, 2018). The cooperative learning model is a model that gives assignments to more intelligent students in small groups whose results will be presented to other groups in the class (Witari et al., 2018; Yunita & Tristiantari, 2018). This Talking Stick can improve students' mathematics learning outcomes because it is based on existing facts that one of the characteristics of elementary school students is that they still enjoy playing (Baid et al., 2022; Masana, 2022; At, 2022) Apart from that, using the Talking Stick model, teachers can find a between students who understand the material and those who do not (Dewi et al., 2017; Witari et al., 2018). Apart from that, teachers can explain to students who are still having difficulties so that students understand that student learning outcomes can improve.

Other research also reveals that mathematics is one of the subjects that students do not like, so teachers must present mathematics learning well so that students' learning motivation increases (Kencanawati et al., 2020; Laily et al., 2020; Maghfiroh & Hardini, 2021). Previous research findings state that teachers must pay attention to learning models when teaching mathematics subjects to students (Hayati et al., 2018; Prasedari et al., 2019). Other findings also revealed that after implementing the Talking Stick model, the percentage of student learning completion increased (Dewi et al., 2017; Kusumayani et al., 2019; Lisdayanti et al., 2014). The importance of student understanding in learning is because it impacts achieving complete learning for students. The advantage of the Talking Stick learning model is that it is very

suitable for elementary school students because, apart from training students to speak, it can also create a fun class atmosphere and make students active. There has yet to be a study regarding applying the Talking Stick learning model to improve mathematics learning outcomes for fourth-grade elementary school students. Based on this, this research aims to analyze the application of the Talking Stick learning model to improve mathematics learning outcomes for fourth-grade students at SD Negeri 5 Ngraji.

2. METHOD

This type of research is quantitative research. This research uses a non-equivalent control group essay method, with a pseudo-experimental type, to analyze the increase in the ability to understand information using the Talking Stick cooperative learning model. This research was conducted in class IV of SD Negeri 5 Ngraji, in Ngraji, Purwodadi Grobogan. The subjects of this research were 27 grade IV students at SD Negeri 5 Ngraji Purwodadi Grobogan, consisting of 13 male students and 14 female students. The object of this research is the mathematics learning results of fourth-grade students at SD Negeri 5 Ngraji Purwodadi Grobogan. The data collection methods used in this research are observation, interviews, tests, and observation sheets. The test in this research is a test to measure students' mathematics learning outcomes. Individual students carry out tests and are given at the end of each lesson. The instruments used to collect data were observation sheets and test questions. The observation sheet used in this research is used to observe the implementation of the Talking Stick learning model. The observation sheet uses the Guttman scale, which is in the form of a checklist with a yes or no option. Next to it, there is a description column that describes the process being observed. Learning evaluation test questions are used to obtain data on student learning outcomes. The instrument grid is presented in Table 1.

Table 1. Mathematical Story Question Grid Material

No	Element	Competence	Question Indicator	Question
1	Number	Students can carry out multiplication and division operations of whole numbers up to 100 using concrete objects, pictures and mathematical symbols	Students can complete division calculation operations based on whole numbers based on the statements made	1. There are 150 apples. If 30 apples are put in each carton, how many boxes are needed? 2. Mother bought 50 kg of apples. 1 kg of apples contains 10 pieces. The apples will be put in 20 plastic bags with the same amount of content. Many apples per plastic bag are... fruit 3. Shinta bought a pack of 50 pens. Then he will distribute the pens to 15 friends. If a pack of pens contains 12 pens, then the number of pens Shinta's friends will get is... 4. Umam bought 36 bracelets which he will share with his 12 friends. How many bracelets will Umam's friends get? 5. Dika bought 200 marbles. The marbles will be placed in 10 plastic bags with the same amount of content. How many marbles are in each plastic bag?

The techniques used to analyze the data are qualitative descriptive analysis techniques and quantitative and inferential statistics. The data obtained based on the results of observations were analyzed descriptively and qualitatively. The observation data is then described to describe the obstacles in implementing the Talking Stick learning model and the efforts made to improve the completeness of student learning outcomes. Data from learning outcomes tests after implementing the Talking Stick learning model were analyzed using quantitative descriptive analysis techniques. The test results were compared, namely, the scores before implementing Talking Stick learning, with the test scores after implementing Talking Stick learning. Data obtained from the results of tests carried out at the end of learning are then analyzed individually and classically using learning outcome formulas. Inferential statistics are used to test the effectiveness of the Talking Stick learning model. The indicator for the success of the process in this research is at least 75% of teacher and student activity. Meanwhile, the indicator of product success is the principle of complete learning or completeness of learning. This learning can be successful if, in working on the

evaluation test questions, the number of students who get a score of 76 (which is determined as KKM) can reach a minimum of 75% of the total number of students.

3. RESULT AND DISCUSSION

Result

Data on student learning outcomes before using the Talking Stick model, namely 6 students who completed before using the Talking Stick learning model and there were still 21 students who had not completed, so it can be concluded that the percentage of student learning completion was 22%. The results of the data analysis are presented in Figure 1.

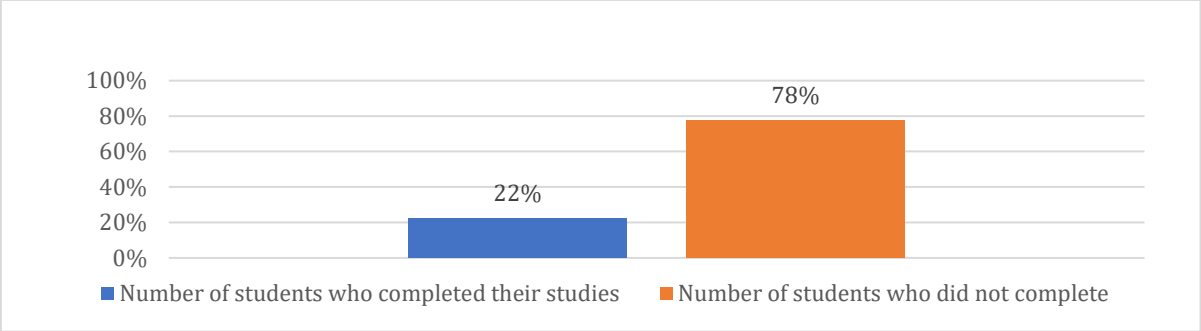

Figure 1. Student Mathematics Learning Results Before Using the Talking Stick Learning Model

Data on student learning outcomes before using the Talking Stick learning model, namely the students who completed before (pretest) using the Talking Stick learning model, were 9 students. There were still 18 students who had not yet completed it, so it can be concluded that the percentage of student learning completion was 33%. The results of the data analysis are presented in Figure 2.

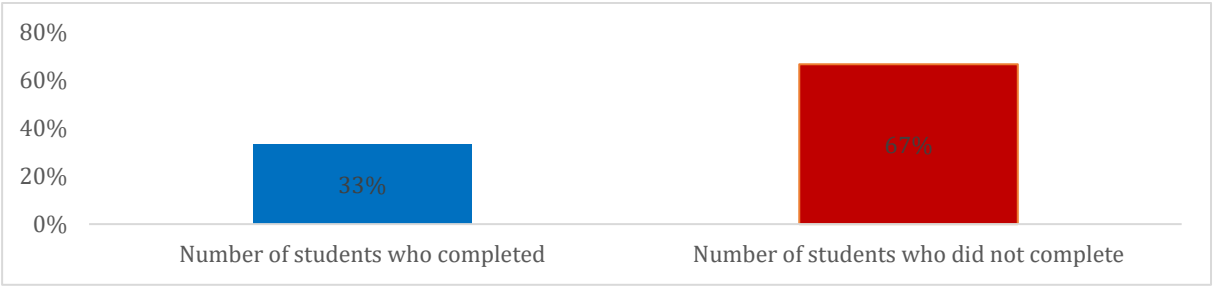

Figure 2. Student Mathematics Learning Results Before Using the Talking Stick Learning Model

Data on student learning outcomes after using the Talking Stick, namely 26 students who completed (post-test) using the talking stick method and there was still 1 student who was still incomplete, so it can be concluded that the percentage of student learning completeness was 96%. The results of the data analysis are presented in Figure 3.

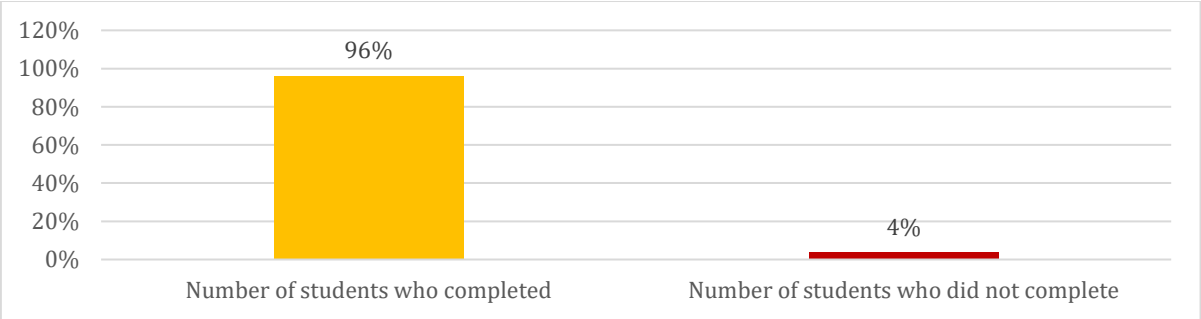

Figure 3. Post Test Results Using The Talking Stick Learning Model

Comparison of the percentage of student learning completeness starting from daily tests to post-tests in the implementation of Talking Stick learning, namely the percentage of student completeness in daily tests was 22%, before using the Talking Stick learning model 33%, after using the Talking Stick learning model 96%. A comparison of the average scores of students' mathematics learning outcomes is presented in Figure 4.

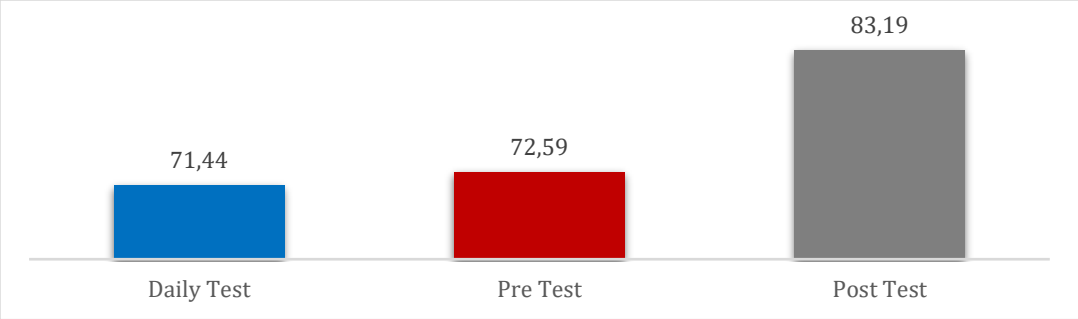

Figure 4. Comparison of the Average Values of Student Mathematics Learning Results

The results of the data analysis presented in Figure 4 show that the average daily test score for mathematics students is 71.44, pre-test 72.59, and post-test 83.19. Based on the diagram above, there has been an increase in the average value of student learning outcomes. The increase in scores was then tested to determine the significance of the influence of the Talking Stick learning model. The normality test results are presented in Table 2.

Table 2. One Sample Kolmogorov-Smirnov Normality Test

Statistics/Parameters		Daily	Pretest	Postest
N		27	27	27
Normal Parameters	Mean	71.4444	72.5926	83.1852
	Std. Deviation	5.17638	6.00807	5.41392
Most Extreme Differences	Absolute	0.133	0.132	0.109
	Positive	0.127	0.132	0.109
	Negative	-0.133	-0.079	-0.055
Kolmogorov-Smirnov with		0.692	0.688	0.569
Asymp. Sig. (2-tailed)		0.724	0.731	0.903

In the normality test analysis results, it is known that Asymp. Signature. (2-tailed) daily learning result value is 0.724, pretest learning result value is 0.731, and posttest learning result value is 0.903. This value indicates that the data comes from a normal distribution if it is more than 0.05. This means that the daily learning result scores, pretest learning result scores and posttest learning result scores can be stated to come from a normal distribution.

In the difference test, the average and standard deviation are presented. In the pair one difference test between the daily and pretest, it was found that the daily average was 71.44 and the pretest 72.59, pair-2 daily 71.4444 and posttest 83.1852. Pair 3 pretest 72.5926 and posttest 83.1852. The following is the average test data for different scores on mathematics learning outcomes. If the average difference in test values differs, then the Paired Samples Test is carried out. In the Pair 1 test results between daily and pretest, it is known that the calculated value is -0.712 with 26 degrees of freedom, a significance value of 0.483. Conclusions are drawn by looking at the significance value; namely, if the significance value is less than 0.05, then there is a difference in Pair 1 value between the daily and pretest; conversely, if the significance value is more than 0.05, then it means there is no difference in Pair 1 value between daily and pretest. The following is the complete Paired Samples Test testing table. The t-test results are presented in Table 3.

Table 3. Paired Sample Test

Pair	Description	t	df	Sig. (2-tailed)
Pair 1	daily - pretest	-0.712	26	0.483
Pair 2	daily - postest	-8.670	26	0.000
Pair 3	pretest - postest	-6.662	26	0.000

The results of the Pair 2 test between the pretest and posttest are known to have a calculated value of -8.670 with degrees of freedom of 26 and a significance value of 0.000. This means there is a difference in Pair 2 values between the daily and post-test values. The results of the Pair 3 test between the pretest and posttest are known to have a calculated value of -6.662 with degrees of freedom of 26 and a significance value of 0.000. This means there is a difference in Pair 3 scores between the pretest and posttest. It was concluded that there were differences in mathematics learning outcomes after implementing the Talking Stick learning model.

Discussion

The data analysis results show differences in mathematics learning outcomes after implementing the Talking Stick learning model. Apart from that, the results obtained were an increase in students' mathematics scores after implementing the Talking Stick learning model. The Talking Stick learning model can be used in mathematics learning. Various factors cause this. First, the Talking Stick learning model is suitable because it can improve students' mathematics learning outcomes. Talking Stick is a learning model carried out with the help of a stick (Dianawati, 2019; Puspitawangi et al., 2017). In learning activities, students holding sticks are required to answer questions given by the teacher after students have studied the primary material (Dianawati, 2019; Meganingtyas et al., 2019; Puspitawangi et al., 2017). In the context of mathematics learning, this can help them express their understanding of mathematical concepts and understand classmates' perspectives. Apart from that, in learning activities, students can exchange ideas, discuss problem-solving strategies, and help each other understand mathematical concepts that may be difficult (Cardoso et al., 2017; Hasanah et al., 2019; Laily et al., 2020; Masana, 2022a).

Second, the Talking Stick learning model is suitable because it increases student activity in learning mathematics. The Talking Stick learning model is a learning model with the help of sticks that encourages students to dare to express their opinions (Dianawati, 2019; Fajrin, 2018; Meganingtyas et al., 2019; Puspitawangi et al., 2017). This can undoubtedly increase students' activeness in learning. Talking Stick is a learning model that contains game elements. This was done because there was a specific purpose. Learning activities carried out by playing certainly make students fully involved in learning so that they do not cause boredom (Muslihatun et al., 2019; Nawafilah & Masruroh, 2020; Setiawan, 2020). Talking Sticks can also help manage learning time and maintain student focus (Dianawati, 2019; Puspitawangi et al., 2017). By providing structure in speaking, students may participate more and pay greater attention to the math material.

Third, the Talking Stick learning model is suitable because it creates a pleasant learning atmosphere. Talking Sticks can increase student involvement in mathematics learning (Baid et al., 2022; Masana, 2022b). Allowing each student to speak and convey their opinions, in turn, can create a classroom environment that supports active participation (Baid et al., 2022; Dianawati, 2019; Fajrin, 2018; Meganingtyas et al., 2019; Puspitawangi et al., 2017). In Talking Stick learning, students who cannot answer will be given an educational punishment. This aims to create motivation in students so that they study harder. This certainly creates a pleasant learning atmosphere. The Talking Stick learning model is very suitable for elementary school students because it can train students to speak and create a pleasant classroom atmosphere. Learning activities while playing create a warmer, more enjoyable and less stressful learning atmosphere (Nawafilah & Masruroh, 2020; Pambudi, 2017).

Previous research findings also reveal the importance of implementing cooperative learning to make it easier for students to learn (Arthaningsih & Diputra, 2018; Jaziroh, 2019; Laily et al., 2020; Nurfitriyanti, 2017). Other research also reveals that talking sticks can help overcome fear or discomfort because each student gets a turn and feels safer to express opinions or questions (Baid et al., 2022; Masana, 2022b). Applying the Talking Stick learning model can improve the mathematics learning outcomes of class IV students at SD Negeri 5 Ngraji. The advantage of the Talking Stick learning model is that it facilitates student interaction with each other. Students can exchange ideas, share understanding, and help each other solve problems. Additionally, students can develop their social skills through interaction and sharing opinions. This includes listening well, providing feedback, and communicating effectively. The implication of this research is that the application of the Talking Stick learning model can help fourth grade elementary school students in learning mathematics so that it can improve student learning outcomes significantly. The limitation of this research is that the Talking Stick learning model applied only measures the mathematics learning outcomes of fourth grade elementary school students. Other research can measure the success of the Talking Stick learning model for other subjects. Teachers can choose the suitable learning model for mathematics subjects to achieve education goals optimally. It is recommended that teachers use the Talking Stick learning model so that students feel motivated to learn mathematics.

4. CONCLUSION

After implementing the Talking Stick learning model for fourth-grade elementary and fourth-grade students, the data analysis results show differences in mathematics learning outcomes. It can be concluded that applying the Talking Stick learning model can improve the mathematics learning outcomes of class IV students. The Talking Stick learning model pays attention to many members in each group, making it easier for students to understand the learning material and impacting student learning outcomes. . The implication of this research is that the application of the Talking Stick learning model can help fourth grade elementary school students in learning mathematics so that it can improve student learning outcomes significantly. Other research can measure the success of the Talking Stick learning model for other subjects. Teachers can choose the suitable learning model for mathematics subjects to achieve education goals optimally. It is recommended that teachers use the Talking Stick learning model so that students feel motivated to learn mathematics.

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