

Application of Talking Stick Co-operative Model to Improve Students' Mathematics Learning Activity and Result in Primary School

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Received : 29 April - 2025

Accepted : 19 June - 2025

Published online : 23 June - 2025

Abstract

The objective of this research is to increase the engagement and academic achievement of fourth-grade students at SDN 2 Benda Karangampel, Indramayu in mathematics by implementing the Talking Stick cooperative learning approach. After consulting with teachers, it was identified that the inadequate utilization of educational resources and the limited diversity in teaching techniques are contributing factors to the students' poor performance. Consequently, this has resulted in a lack of student participation during lessons, as evidenced by only 9% of students achieving a score above the passing mark (65) in the Mid-Semester Assessment (PTS). This research project involves Classroom Action Research (PTK), conducted over three phases: planning, execution, observation, and reflection. The findings indicate that the introduction of the Talking Stick method enhanced the efficiency of the learning process. Evaluations of the teaching process improved from 71% (good category) in the first cycle to 86% (very good category) in the third cycle. Student engagement levels also rose from 61% (active category) in the initial cycle to 83% (very active category) in the final cycle. Moreover, student achievements increased from 54% (19 pupils) in the beginning to 86% (30 pupils) by the end, surpassing the 80% threshold for success. Consequently, the application of the Talking Stick cooperative learning model has been shown to be effective in boosting student participation and results in mathematics education. This innovative approach could offer a unique and enjoyable educational experience for students.

Keywords: Talking Stick, Cooperative Learning, Mathematics Learning Outcomes, Student Performance.

1. Introduction

Education is one aspect that plays an important role in a person's life, namely creating a better person through the formation of critical thinking skills and attitudes to help you live your daily life to the fullest (Setiawardani et al., 2021; Apriyanto et al., 2021; Robandi et al., 2025). In addition to the knowledge side, training also refers to attitudes and skills that can be obtained through formal and informal education (Setiasih et al., 2023; Syahid et al., 2025). The above education is essentially an effort to convey instructions for useful life values and instructions for completing activities in daily life that are transmitted through learning activities (Komalasari, 2019). The educational process is carried out at school so that students can gain knowledge and obtain good academic results according to their expertise (Fadillah et al., 2022).

Mathematics is one of the branches of science taught in elementary schools based on the 2013 curriculum, SD/MI mathematics is one of the subjects related to logic regarding a concept that is interconnected with one another (Ratmawati & Ihtiari, 2021; Oktaviana et al.,



2023). Mathematics learning is a process that brings planned learning experiences to students, with the hope that they acquire mathematical knowledge intelligently and skilfully. The success of mathematics teaching is strongly influenced by various factors integrated in the teaching system. The use of learning methods that are appropriate to the development and abilities of students is one of the key factors that determine the success of this teaching. By applying the right method, it is expected that students can understand the material well, achieve learning objectives, and experience an optimal teaching process (Ratmawati & Ihtari, 2021). But in reality, many students consider maths to be the most daunting subject. Understanding mathematics requires precision and detailed research (Rindani, 2022). As a result, it is crucial for students to be given extra attention. When teaching mathematics, educators need to engage students proactively to prevent boredom and maintain their interest in the subject (Muliandari, 2019; Setiasih et al., 2023). Teachers need to help students develop their critical thinking, logic, and creativity skills to a high standard.

According to the feedback from interviews with fourth grade teachers at SD Negeri 2 Benda Karangampel Indramayu, it was revealed that the students' performance in mathematics was poor due to various hindrances in the learning process. One major issue was the lack of proper learning materials, resulting in students struggling to comprehend the lessons taught by the teachers. Especially in mathematics subjects, teachers only teach in existing ways without any variations or innovative learning models. The Minimum Completeness Criteria (KKM) in mathematics is 65, but there are still many students who have not completed. Of the total of 35 students, 29 students with a percentage of 83% have not completed and 6 students with 17% have completed.

In order to address these challenges, this study suggests implementing a cooperative learning approach known as the Talking Stick model. This particular model was selected due to its alignment with the specific needs and attributes of primary school pupils, such as its emphasis on play, promotion of social interaction, and requirement for active involvement from all students. The Talking Stick method involves the use of a stick to regulate speaking opportunities in a classroom setting. Students holding the stick are encouraged to share their thoughts or respond to queries, while other classmates are expected to attentively listen. It is anticipated that this model will create a more enjoyable learning environment, enhance students' motivation to learn, and ultimately enhance the quality of mathematics education and outcomes.

2. Methods

This research employed the Classroom Action Research (PTK) method following a spiral model developed by Kemmis and McTaggart, which involved four main stages: planning, implementing actions, observing, and reflecting. The study took place in three cycles in a class at SDN 2 Benda Karangampel, Indramayu Regency, involving 35 students. Data was collected through observation and tests. Observations were made to monitor student engagement during lessons, while tests were conducted to assess student progress before and after each cycle. The instruments used were student activity observation sheets based on indicators from Paul B. Diedrich and multiple choice questions according to the learning material.

The research stages began with planning, such as the preparation of lesson plans and evaluation tools, followed by the implementation of learning using the Talking Stick model, where students answer questions in turn using sticks. Observation was conducted by two observers to ensure objectivity. Reflection was conducted at the end of each cycle to assess the effectiveness of the action and determine improvements in the next cycle. Data were analysed

descriptively quantitatively using the percentage formula for learning activity and learning outcome completeness. Learning success was determined based on the increase in learning activity (at least active category) and classical learning completeness ($\geq 80\%$ of students reached the score).

3. Research and Discussion

The implementation of this class action research (PTK) was carried out for 2 weeks as many as 3 cycles, adjusted to the schedule that applies at school. This is so that learning can take place effectively, students can receive lessons well, and does not interfere with other subject schedules. Each cycle in this study discusses different material, but still in one subject matter, namely image pattern material and number patterns. In every PTK cycle, a sequence of action tasks includes four main steps: planning, executing, observing, and reflecting. The findings and analysis of this classroom intervention study are outlined below:

3.1. Research Results

a. Application of Talking Stick Co-operative Model

Observation tasks are conducted using the observation sheet given for guidance. Two individuals, specifically class IV and class V teachers, were appointed as observers. They carefully monitored the implementation of the Talking Stick cooperative learning model throughout the teaching process. The effectiveness of the model was evaluated based on the assessments provided by both observers in each phase. The data summarising the outcomes of using the Talking Stick cooperative learning model are presented in the table below:

Table 1. Recapitulation of the Results of the Application of the Talking Stick Co-operative Model Cycle I

No	Aspects Observed	Cycle I	Cycle II	Cycle III
1	Introduction Activity	10	12	11
2	Core Activity	16	18	22
3	Closing Activity	8	7	8
Total		34	37	41
Percentage		77%	84%	93%
Category		Good	Very good	Very good

b. Student Learning Activity Research

In the initial phase of learning, student activities were monitored using a pre-prepared observation sheet. Although the observations of student activities were satisfactory in this stage, the outcomes did not meet the anticipated standards. This is evident from the data presented in the subsequent table.

Table 2. Recapitulation of Observation Results of Student Learning Activities Cycle I

No	Aspects observed	Cycle I	Cycle II	Cycle III
1	Visual activities	62	74	81
2	Listening activities	64	76	88
3	Oral activities	66	66	66
4	Mental activities	64	64	64
5	Emotional activities	54	54	54
6	Writing activities	61	59	59
Total		372	394	413

Percentage	61%	74%	83%
Category	Moderately Active	Active	Very Active

c. Learning Results

The results of math learning in Stage I were satisfactory, however, the actual implementation did not yield the desired outcomes, as evidenced by the data in the table displaying math learning results.

Table 3. Recap of Cycle I Learning Outcomes

No	Category	Cycle I		Cycle II		Cycle III	
		Total	%	Total	%	Total	%
1	Completed	19	54%	26	74%	30	86%
2	Not Completed	16	46%	9	26%	5	14%

3.2. Discussion

a. Application of Talking Stick Co-operative Model

The Talking Stick cooperative learning method is thought to enhance student engagement in learning. To investigate the effectiveness of this model in promoting active participation among students, an action research study was conducted in which observation sheets were used to evaluate the impact of implementing the Talking Stick cooperative learning method on students' involvement in discussions and expression of opinions. According to Ali et al. (2024), the Talking Stick approach can inspire students to speak up, share their views, and participate more confidently in group conversations due to the stimulating factor of learning through challenges. After closely monitoring the implementation of the Talking Stick collaborative model in classroom settings by two observers, specifically teachers of class IV and V, across three cycles, it was evident that there was noticeable improvement with each successive cycle.

The application of the Talking Stick method in collaborative learning witnessed a noteworthy growth from the first cycle to the third cycle. During the initial cycle, the employment of this model was rated as good, achieving a 71% success rate. Teachers began to implement the basic steps of the model, but still faced obstacles in time management, giving instructions, and reinforcing students who got their turn to speak. Nevertheless, there were positive dynamics where each group showed care and co-operation, helping each other if one member had difficulty in answering questions. This reflects the beginning of a constructive cooperative learning climate.

In cycle II, the implementation increased to 83% and was in the excellent category. Teachers began to implement the strategy more effectively, such as arranging questions gradually from easy to difficult levels and organising the rhythm of the discussion more efficiently. Wordwall media was optimally utilised to increase students' participation and understanding of the material before the discussion session. Students seemed more accustomed to this method, and the spirit of gotong royong within the group was more visible as they worked together to help members who were having difficulty, especially when answering questions given using the stick.

In cycle III, the implementation of the model reached 86% in the excellent category. A significant change in this cycle was the shift from material-based learning to practice-based learning, where students not only listened and answered questions, but also directly practised

making picture and number patterns in groups. Students' involvement is more evenly distributed, and the teacher can run all stages of the model smoothly, from giving instructions, group management, to evaluation. Learning activities become more lively and meaningful as students interact directly with the concepts learnt through concrete practice, which has an impact on increasing their overall understanding and skills. This improvement is in line with Adiko and Djafar (2022), which showed that the Talking Stick cooperative learning model has been shown to have a positive impact on students' academic achievements.

One way to overcome the problem of low learning outcomes is to apply the right learning model (Fauzia, 2018; Prihartati et al., 2024). A previous study found that student academic performance saw a positive change following the introduction of the Talking Stick educational approach (Hidayah, 2020).

b. Student Learning Activities

The results of observations of student activity observed by 2 observers, namely class IV and V teachers in cycle I, cycle II, and cycle III, there was an increase in each cycle. In Cycle I, the observation results showed that the Oral Activities indicator got the highest score, which indicated that students were relatively active in expressing opinions and discussing verbally. Meanwhile, the Emotional Activities indicator was the lowest, indicating that students' emotional responses such as interest, enthusiasm, and expression of feelings during learning still need to be improved. This finding is in line with the results of a study by Arifin and Laili (2022), where the use of the Talking Stick model significantly increased students' verbal activeness even though the emotional aspect was not optimal in the early stages of implementation.

Then experienced an increase in cycle II, namely with a percentage of 74% in the active category, the observation results showed a significant increase in the Listening Activities indicator which showed that students were increasingly able to listen to teacher explanations and group discussions actively. However, the Emotional Activities indicator still shows the lowest value, which shows that although the cognitive and listening aspects have improved, students' emotional involvement in learning still needs to be improved. This finding is in line with research by Ayuwanti (2017) which revealed that the improvement in the listening aspect was seen when students had begun to adapt to the Talking Stick method, although the development of emotional aspects required additional mentoring efforts from the teacher.

In cycle III, student learning activities continued to increase with a percentage of 83% and were in the very active category. These results indicate that the study has been a success based on the specified criteria. There has been a notable improvement in various student activities compared to the previous period. The indicator for Listening Activities stood out with an impressive average of 88%, demonstrating a heightened level of engagement from students when listening to both teachers and peers. This discovery aligns with Ayuwanti's (2017) research findings suggesting that employing the Talking Stick cooperative learning approach enhances student engagement in listening and effectively responding to information.

However, the indicator with the lowest achievement is still found in Emotional Activities, with a percentage of 54%, and has not increased from the previous cycle. This indicates that although student involvement in cognitive and social aspects has increased, emotional aspects such as confidence, enthusiasm, and comfort in participating in learning have not developed optimally. This condition is reinforced by the findings of Arifin and Lalili (2022), who stated that the development of emotional aspects in cooperative learning models requires a more personalised and sustainable approach so that students can be more comfortable and emotionally involved in the learning process.

The results of this study are in line with the results of research conducted by Elu and Tupen (2021), cooperative Talking Stick type can improve student learning activities and outcomes. According to Baid et al. (2022), Talking Stick learning will create a comfortable learning environment that makes students more active and increases students' effectiveness in solving problems presented by the teacher.

c. Learning outcomes

In the first cycle, the fourth grade students at UPTD SD Negeri 2 Benda had mathematics learning outcomes averaging 54%, with a classical passing rate of 80%, lower than the Minimum Completeness Criteria (KKM). The results are disappointing as students may not be accustomed to the Talking Stick cooperative learning model, having been more comfortable with traditional teaching methods in the past. According to research conducted by Haidet et al. (2004) changes in learning methods take time for students to adapt, especially if they are used to the previous method which is more passive. In addition, the less conducive classroom atmosphere, such as students who still often chat, play when the teacher explains, and the shyness and fear of asking questions, shows that students are still passive in teaching and learning activities (Nyborg et al., 2022).

In order to tackle these challenges, it is important to have a suitable plan in place for the successful implementation of the Talking Stick cooperative learning model, leading to enhanced student learning results. A possible approach to consider is introducing students to this model beforehand to ensure they are well-informed and eager to engage in the learning process (Setiawan et al., 2024). In addition, teachers need to create a conducive classroom atmosphere by setting clear and firm rules and motivating students to be more courageous in asking questions and expressing opinions (Sutiyono & Hidayati, 2024). A personal approach is also needed to understand the obstacles experienced by students who are still passive or shy to ask questions, so that they get the necessary support in increasing their involvement in the learning process (Rosheim, 2018). By applying these steps, it is expected that students can be more active in learning and their mathematics learning outcomes will improve in subsequent cycles.

In the second cycle, there was an enhancement in students' performance as opposed to the first cycle. This improvement is evident from the evaluation findings in cycle II, which reached a 74% rate with 80% meeting the classical standards, although still falling short of the Minimum Completeness Criteria (KKM). This rise indicated that students were becoming more comfortable with the implementation of the Talking Stick type cooperative learning model, leading to a more favourable learning environment. Nonetheless, despite the progress, the learning outcomes in cycle II were still below the required completeness level. Moving on to cycle III, students' learning outcomes witnessed further improvement compared to the preceding cycle. Evaluation results displayed a rise in scores to 86% with a classical completeness of 80%, surpassing the set standards. According to the findings of Setiawan et al. study (2022), the gradual introduction of the cooperative learning model enables students to adjust to the new approach, resulting in a notable enhancement in the effectiveness of learning.

The effectiveness of the learning completion measures in this research was attributed to various elements, such as students adapting to the collaborative learning approach known as the Talking Stick, a better classroom environment, and students feeling more comfortable asking questions and engaging in learning tasks. According to research by Pratiwi et al. (2018), students' adaptation to the cooperative learning model can increase interaction and involvement in the learning process, which in turn has an impact on improving learning outcomes.

The improvement in learning outcomes can be seen from the evaluations carried out in each cycle. In cycle I, only 1 student met learning completeness with a percentage of 54%. In the second stage, there was a notable rise with 26 students meeting the criteria at 74%, although they did not reach the expected level of completeness. Moving on to the third stage, the number of students achieving the required level increased to 30 students at 86%, surpassing the minimum standard of 80%. The study findings demonstrate a steady improvement in student performance in mathematics. Initially falling into the adequate category in the first stage, the completeness of learning progressed to the good level in the second stage and eventually reached a very high level in the third stage. This finding is in line with Mingolo's research (2024) which states that the implementation of collaborative activity-led learning methods can lead to a beneficial impact on the continuous enhancement of educational achievements. Therefore, the Talking Stick approach to learning was successful in notably enhancing pupils' understanding and performance in maths.

Although the mathematics learning outcomes of grade IV UPTD SD Negeri 2 Benda students showed a significant improvement in cycle III, there were still 3 students who had not achieved learning completeness. This shows that although the Talking Stick cooperative learning model has helped most students, there are several factors that cause a small number of students to still experience difficulties. One of the main factors is the difference in learning speed among students. In this context, the 3 incomplete students may still have difficulties in understanding the mathematics concepts taught, especially if they take longer to master the material. In addition, a lack of confidence and active participation in learning could also be a contributing factor to non-completion. Research conducted by Gagulu (2022) shows that success in the cooperative learning model is strongly influenced by students' active participation in group discussions and activities. If students are still shy or afraid to ask questions, they will have difficulty in understanding the material in depth, which ultimately impacts on their learning outcomes. Environmental factors, such as lack of support from family or a less conducive learning atmosphere at home, can also be a major cause. Research conducted by Duruka et al. (2020) emphasises the importance of social interaction in learning, where students who receive guidance and support from their surrounding environment tend to understand the material more easily.

Research conducted by Baid et al. (2020), the Talking Stick learning approach was implemented in two phases, leading to a notable enhancement in students' performance in mathematics. Initially, only 52.20% of students achieved the desired learning outcomes, but this figure jumped to 82.60% in the second cycle. This demonstrates a considerable 30.40% increase in successful learning outcomes, indicating the effectiveness of the Talking Stick model in boosting student performance.

4. Conclusion

Based on the results and discussion, it can be concluded that the application of Talking Stick type cooperative learning model in Mathematics subject for grade IV students at SDN 2 Benda Karangampel proved to be effective. This can be seen from the increase in the observation score of the application of the learning model by the teacher, which increased from 77% in cycle I, to 84% in cycle II, and reached 93% in cycle III, with a very good category. In addition, the Talking Stick model was also able to increase student learning activities. The percentage of student activeness increased from 61% in cycle I, to 74% in cycle II, and reached 83% in cycle III with a very active category. These activities include listening, speaking, writing, thinking, and emotional involvement during the learning process. In terms of learning

outcomes, student completeness also increased significantly. In cycle I, students who achieved scores above the KKM (≥ 65) were 19 students (54%). The completeness increased to 26 students (74%) in cycle II and reached 30 students (86%) in cycle III, thus exceeding the minimum classical success limit of 80%. Thus, the application of Talking Stick type cooperative learning model was proven to be able to improve the quality of learning process and outcomes and worthy of being used as an interactive and fun alternative learning strategy in elementary schools.

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