



Effectiveness of Counting Tree Media in Enhancing First-Grade Students' Addition Skills at Madrasah Ibtidaiyah

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ABSTRACT

Mathematics learning in the lower class of Madrasah Ibtidaiyah requires the use of real media so that students can understand the concept of abstract calculation operations, especially in the material of summing numbers 1 to 10. A lack of understanding of concepts and student learning outcomes shows the need for innovation in learning media that is in accordance with student development. One of the concrete media that can be used is the Counting Tree media. This medium allows students to learn by manipulating objects directly. This study aims to determine the effectiveness of the Counting Tree media in improving the ability of summation counting operations of grade I students of MI Al-Azhar Menganti Gresik. This study uses a Classroom Action Research (PTK) design with a mix-methods approach. The research subjects consisted of 25 students in grade I. The research was carried out in two cycles which included the stages of planning, implementation of actions, observation, and reflection. Data collection techniques include observation of teacher and student activities, learning outcome tests, and student response questionnaires. The results of the study showed an increase in teacher and student activity with the category of very good. The completeness of student learning outcomes increased from 64% in the first cycle to 94% in the second cycle. The reason is that the Counting Tree media is effective in improving the ability of addition calculation operations and creating more meaningful mathematics learning for low-grade students.

INTRODUCTION

Mathematics learning is an important component in the basic education curriculum, especially at the lower grade level of Madrasah Ibtidaiyah (MI). Mathematics acts as a means to form logical, systematic, and critical thinking skills from an early age. In grade 1 students, mathematics learning is focused on the introduction of basic concepts, such as the operation of counting the sum of numbers 1-10. Mastering these basic concepts can be used as a first step for students in developing numeracy skills and mathematical understanding at the next level.

Based on the results of initial observations conducted in grade 1 of MI Al-Azhar in 2025-2026, it shows that students' ability to understand the concept of summation of numbers is still relatively low. Of the 25 students, who were able to understand the concept of summation was still low, there were 60% with the less category. This is because students tend to memorize the results of the calculation without understanding the process of summing conceptually. In addition, student involvement in mathematics learning is still low, characterized by a passive attitude, easy to lose concentration, and quickly bored during activities. This condition affects students' mathematics learning outcomes which are relatively low.

The main problem is found in the use of learning methods that are still dominated by lectures and the provision of written exercises without the support of learning media that is in accordance with the characteristics of children's development. Math learning that focuses on oral explanations tends to make it difficult for students to understand abstract concepts such as addition calculation operations (Ismiyana et al., 2024). Learning in grade 1 should use a contextual approach that adapts the subject matter to the real conditions of students in daily life, such as the use of concrete objects to understand abstract concepts (Susanto & Wulandari, 2024). Therefore, learning mathematics in the material of addition calculation operations requires an approach and learning media that can help students understand abstract concepts with real student experience. This is intended to make the learning process more effective and meaningful.

A number of studies show that the use of concrete media is able to improve the understanding of mathematics concepts and learning outcomes in low-grade students (Safira & Rudianto, 2025). As a research conducted at SDN Dukuh Kupang, it shows that the application of concrete object media can significantly increase the learning completeness of grade 1 students (Asadulloh et al., 2024). Concrete learning media can also stimulate students' attention and interest and help them understand abstract concepts through real experience with objects (Munisah et al., 2024). Research (Kurniasari & Maisaroh, 2025; Novia, 2022) emphasizing that concrete learning media is able to increase





learning outcomes and active involvement of students in mathematics learning. Learning will be meaningful if students are directly involved in the process (Insiyyah et al., 2025).

The use of concrete learning media in mathematics learning is an effective solution in helping students understand abstract concepts (Fithriyah, 2024). The use of learning media can also improve the quality of learning, because of the innovation that makes the learning process more interesting (Septiani et al., 2025). Concrete media provides a clearer visual picture, as well as providing space for students to actively explore through hands-on activities.

One of the concrete media that is relevant to mathematics learning with the material of summing numbers 1-10 is the Counting Tree media. That is a media that visualizes numbers and calculation operations in the form of a tree with number elements that can be compiled directly by students (Qondias et al., 2025). The Counting Tree Media is designed to help students connect abstract concepts of summation, develop cognitive abilities, and provide students with a different learning experience (Suwarjana et al., 2024). In addition, this media can create a more interesting and enjoyable learning atmosphere for students (Sari, 2021).

Based on this description, classroom action research is needed to examine the effectiveness of the use of Counting Tree media in improving the ability of counting operations in 1st grade students of MI Al-Azhar Menganti Gresik. This research is expected to provide empirical evidence that is not only related to improving the ability to sum numbers 1-10, but also to the creation of more meaningful learning, increasing student activity, and growing learning motivation in mathematics learning.

LITERATURE REVIEW

Mathematics learning at the lower grade level of Madrasah Ibtidaiyah (MI) has different characteristics from learning in high grades. Grade I students are in the early stages of cognitive development, so mathematics learning needs to be designed concretely, contextually, and meaningfully. According to Jean Piaget's theory of cognitive development, children aged 6–7 years are at a concrete operational stage, which is a stage in which students are not yet able to understand abstract concepts optimally without the help of real objects or visual representation (Imanulhaq & Ichsan, 2022). Learning media has a strategic role as a means of conveying learning messages so that the material delivered can be optimally accepted by students. Erni said that learning media functions to stimulate students' thoughts, attention, and interests so that the learning process becomes more effective and efficient (Erni Mariana et al., 2024). In the context of learning mathematics in the lower grades, concrete media is very important because it can bridge the gap between abstract concepts and students' real experiences. The use of concrete media helps simplify abstract concepts into forms that can be observed and manipulated by students, so that learning becomes more meaningful and interesting for elementary school-age students.

Various empirical studies support the effectiveness of concrete media in mathematics learning in primary school. Various empirical studies have proven the effectiveness of concrete media in mathematics learning at the elementary school level. Research (Ayu Sidabutar et al., 2025) It shows that concrete media based on educational games is able to improve learning outcomes and student involvement in flat building materials. These findings are reinforced by (Misyykah & Panggabean, 2022) who reported the positive influence of the use of concrete media on student learning outcomes in multiplication materials. In addition to helping the understanding of number concepts, concrete media also encourages active student participation through manipulative, exploratory, and interactive activities (Insiyyah et al., 2025). This is in line with the results of a bibliographic study which concludes that concrete media not only strengthens conceptual understanding, but also increases students' learning motivation, critical thinking skills, and creativity in mathematics learning. Thus, the application of concrete media is in line with the principle of meaningful learning which emphasizes the active role of students in building their own knowledge.

Counting Tree Media is a type of concrete learning media developed to help visualize the concept of numbers and basic calculation operations in an interesting and easy to understand by low-grade students. This media presents the concept of summation in visual form in the form of a tree equipped with numbers or counting objects that can be held and manipulated directly by students. (Qondias et al) explained that the Counting Tree media or number tree plays a role in developing children's numerical intelligence from an early age because it helps students connect the concept of numbers with the number of objects in real life. Furthermore, (Suwarjana et al., 2024) revealed that the use of counting tree media can improve children's numeracy skills, because this media provides a direct learning experience through compiling, calculating, and observing the relationship between numbers.

Learning outcomes are a benchmark of learning success that shows a change in students' abilities after participating in learning activities. According to (Lestari, n.d.) Learning outcomes include cognitive, affective, and psychomotor aspects, but in mathematics learning in elementary school, the emphasis is generally more directed to cognitive aspects. The achievement of optimal learning outcomes is inseparable from the level of student activity during the learning process. High learning activities reflect the physical and mental involvement of students in participating in learning. The application of concrete media in numbers 1-10 can increase students' learning activities, which in turn has a positive impact on improving mathematics learning outcomes. The findings confirm that mathematics learning that involves student activity through the use of concrete media is more effective than passive and teacher-centered learning.



Based on the literature review that has been described, it can be concluded that concrete learning media has proven to be effective in improving the activities and learning outcomes of mathematics students in lower grades. However, research that specifically examines the effectiveness of Counting Tree Media on the material of counting operations for summing numbers 1-10 in the Madrasah Ibtidaiyah environment is still limited, especially those that use the Classroom Action Research (PTK) approach with a comprehensive analysis of teacher activities, student activities, learning outcomes, and student responses. Therefore, this study has the urgency to fill the research gap by empirically examining the effectiveness of the use of Counting Tree Media in improving the ability of summation calculation operations of grade I students of MI Al-Azhar Menganti Gresik, both in terms of process and learning outcomes.

METHODS

This research uses a design Classroom Action Research (PTK) with the *mix-methods*, which is a combination of quantitative and qualitative approaches. The quantitative approach is used to determine the improvement of students' basic calculation operation skills, while the qualitative approach is used to describe the learning process and student activities (Sidabutar et al., 2025). This research aims to improve the ability of basic calculation operations and the quality of the Mathematics learning process for grade I students of MI Al-Azhar through the application of Counting Tree media.

The implementation of this research refers to model Kemmis dan McTaggart, which includes four stages, namely: (1) Planning (*planning*), namely the activity of designing actions that will be carried out to overcome learning problems; (2) Implementation of the action (*action*), namely the implementation of the plan that has been prepared in the learning process; (3) observation (*observation*), namely the activity of observing and recording the entire process and the impact of the actions taken; and (4) reflection (*reflction*), namely the activity of evaluating the results of the implementation of actions to determine improvements in the next cycle. The four stages take place continuously until optimal learning results are obtained (Melda Sari et al., 2024). Further can be seen in the flowchart below:

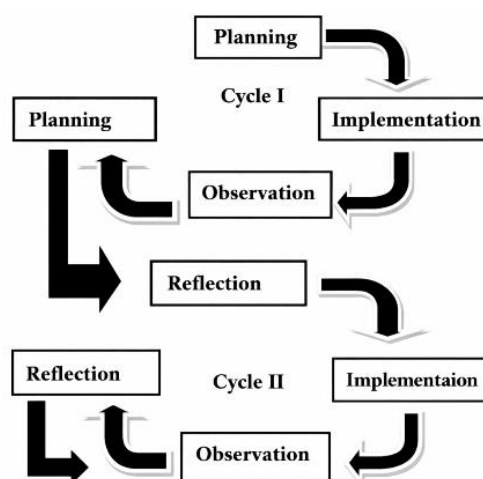


Figure 1. Kemmis & McTaggart Model PTK Procedure

This research was carried out at MI Al Azhar in the odd semester of the 2025-2026 academic year. The research time was adjusted to the mathematics learning schedule in grade 1 and was carried out over two research cycles. The subjects in this study are 25 students in the first grade of Intensive MI Al-Azhar, consisting of 12 male students and 13 female students. The selection of the subject of this study is based on the results of initial observations that show that students' basic calculation operations ability in addition materials is still not optimal, so the application of innovative learning media is needed to improve students' understanding and learning outcomes.

The object of this study includes the entire mathematics learning process as well as students' basic arithmetic operation abilities in summation materials through the application of Counting Tree **media**. The use of concrete media in mathematics learning is considered to be able to help students build a more real and meaningful understanding of concepts, especially in low-grade students who are still at the stage of concrete thinking.

The data collection techniques used in this study include observation, learning outcome tests, and student response questionnaires. The data analysis technique uses qualitative descriptive and quantitative descriptive, qualitative descriptive to describe the results of data acquisition in the form of narratives, for quantitative descriptive, namely the acquisition of data in the form of numbers obtained from the results of observation during learning. The observation sheet is used to see how the teaching process is carried out in the classroom. The observation sheet in question consists of the following: (1) The observation sheet for teachers is used to find out whether the steps taken by the teacher (researcher) during the learning process are in accordance with the learning steps that have been set, (2) The observation sheet for students who are actively involved in learning is used to observe the activities of each student who is active in



the implementation of learning. Learning outcome tests are administered at the end of each cycle to determine the level of student understanding and the achievement of learning completeness after the action is implemented. Meanwhile, the student response questionnaire was used to find out students' responses and attitudes towards the use of Counting Tree Media in mathematics learning of the basic calculation operation material of summation 1-10. The formula to obtain results from teacher and student activities is as follows:

$$P = \frac{f}{N} \times 100\%$$

Description:

P = Percentage of teacher or student activity

F = Number of events that appear

N = Total number of activities

The formula to obtain completeness from the learning outcomes is as follows:

$$NA = \frac{A}{B} \times 100$$

Description:

A = The number of scores obtained by students

B = Maximum score

OR = Value of Learning Completeness

To determine the improvement in learning outcomes at the end of each test cycle, by calculating the class average with an AKM of 75 using the following formula:

$$M = \frac{\sum x}{\sum n}$$

Description:

$\sum x$ = The number of grades students get

$\sum n$ = Number of students

M = Grade Average

Table 1. Learning Outcome Assessment Criteria

Yes	Percentage Success Rate	Criteria
1	85% - 100%	Excellent
2	75% - 84%	Good
3	60% - 74%	Not Good
4	≤ 59%	Not good

RESULTS

Teacher activities are one of the main elements that play a role in the success of the learning process. The optimal implementation of teacher activities can create a meaningful learning experience for students and support the achievement of planned learning goals. In this study, teachers' activities were observed during the implementation of mathematics learning using Calculation Tree Media on the material of counting operations for the sum of numbers 1-10. Observation of teacher activities is carried out by observers using observation sheets arranged based on the learning stages that have been determined as follows:

Table 2. Teacher Activities

Yes	Activities	Observed Aspects	Cycle I	Cycle II	Average
1.	Introduction	The teacher opened by saying greetings	4	4	4
		The teacher asked the class leader to lead the prayer	4	4	3,5
		The teacher ensures the readiness of students before starting the lesson	3	4	3,5
		Teachers conduct student attendance	4	4	4
		Teachers connect new material with student experiences	3	4	3,5
		The teacher explains the learning objectives to be taught	4	4	4
2.	Core activities	Teachers prepare Counting Tree media	4	4	4
		The teacher explained the concept of summation	4	4	4

		using the Counting Tree Media			
3.	Closing Activities	The teacher gave an example of the use of Counting Tree Media	3	3	3
		Teachers guide students directly	3	4	4
		Teacher asks questions and answers to students	3	4	3,5
		Teachers manage the classroom and condition students during learning	4	4	4
		Teachers reflect and reinforce the concept of addition	3	4	3,5
		Teacher and student summarize the material learned	3	4	3,5
		The teacher closes the lesson by reciting the Prayer and saying greetings	4	4	4
		Quantity	53	59	56
		Average	3,533333	3,933333	3,733333
		Prosentase	88%	98%	93%

Based on the observation results, teacher activity in Cycle I reached 88% with the "very good" category, and increased to 98% with the "very good" category in Cycle II. These results show that teachers' activities have exceeded the set success indicators, which are 85%. In the first cycle, teachers are still not fully optimal in guiding all students when using Counting Tree Media. After reflection and improvement in cycle II, teachers are able to manage learning more directed, provide clear instructions, and maximize the use of concrete media in accordance with the characteristics of grade I students of Intensive MI Al-Azhar Menganti Gresik.

The results of student activities carried out by peers in the first and second cycle of learning are as follows:

Table 3. Student Activities

No	Activities	Observed Aspects	Cycle I	Cycle II	Average
1.	Introduction	Students answer greetings and recite the Prayer	4	4	4
		Students respond to the reception given by the teacher by answering questions	4	4	4
		Students pay attention to the teacher's motivation about the importance of learning addition counting operations.	4	4	4
		Students listen to the learning objectives conveyed by the teacher	4	4	4
		Students observe the media of the Counting Tree	4	4	4
2.	Core activities	Students listen to and understand the concept of summation using the Counting Tree Media explained by the teacher	3	4	3,5
		Students understand the example of using Counting Tree Media explained by the teacher	4	4	4
		Students show enthusiasm when observing learning	4	4	4
		Students are given direct guidance by teachers	3	4	3,5
		Students and teachers conduct questions and answers related to summation materials	4	4	4
		Students work on evaluation questions given by teachers	4	4	4
		Students are able to explain the results of the work on the questions	3	3	3
		Students respond to reflection activities given by teachers	4	4	4
		Students and teachers conclude the learning material	3	4	3,5
		Students and teachers end the learning by reciting the Prayer and saying greetings	4	4	4
3.	Closing Activities	Quantity	56	59	54
		Average	3,733333	3,933333	3,857143
		Prosentase	93%	98%	90%

Based on the observation results, student activities also showed a significant increase. In Cycle I, student activity reached 93% with the "excellent" category, and increased to 98% with the "excellent" category in Cycle II. These achievements show that student activities have met and exceeded the success indicators by 85%. In the first cycle, some students still need guidance in using media and participating in learning. However, in Cycle II, students looked more



active, confident, and independent in manipulating the Counting Tree Media, asking questions, and solving problems summing numbers 1–10. This shows that concrete media-based learning is very suitable to be applied to the basic calculation operation material of summing in class I.

The results of student activities increased, affecting student learning outcomes through multiple-choice questions given by teachers. Student learning outcomes can be seen in cycle I and cycle II in the table as follows:

Table 4. Posttest Results

NO	NAME	RESULTS OF CYCLE I SCORES	RESULTS OF CYCLE II SCORES
1.	Achmad Syafa`at	60	80
2.	Adiba Nailal Husna	65	100
3.	Adreena Shaeena Taufani	80	100
4.	Aishwarya Aina Risdianto	90	100
5.	Aqilla Safa Nur Husna	60	90
6.	Aqmar Afzalur Rahman	95	100
7.	Cherry Mikhayla Carissa Ramadhani	75	100
8.	Devanka Athaya Sitepu	65	100
9.	Dhevin Sinatria Azril Achmad	60	100
10.	Elvano Ravindra Adzkarillah	85	100
11.	Faizan Alby Ardirafan	90	100
12.	Gaitsha Naura Khadijah	90	100
13.	Hanifa Nur Aisyah	60	80
14.	Like Alia Sahra	80	80
15.	Meisie Aileen Nathania Putri	85	100
16.	Melati Rachmeida Setyabudi	60	100
17.	Mohammad Kenzo Alrianto	95	100
18.	Muhammad Agam Aditya Fahreza	70	100
19.	Muhammad Aqil Hafis	85	100
20.	Muhammad Azka Mahardika	85	100
21.	Muhammad Bagus Abrisam Pratama	90	100
22.	Muhammad Faiz Setiawan	60	65
23.	Muhammad Ranga Restu Aditya	70	90
24.	Nur Adiba Azzahra Effendi	85	85
25.	Sara Zofi Az Zaida Arifin	80	90
Quantity		1920	2360
Average		76,8	94,4
Completion Percentage		64%	96%

Based on the results of the analysis, the completeness of student learning in Cycle I reached 64% with the category "Not Good" and increased to 94% with the category "Very Good" in Cycle II. These achievements show that student learning outcomes have met and exceeded the set success indicators, which are 85%. In the first cycle, there are still 9 students who have not reached completion, with an average class score of 76.8, so learning improvements are needed in the next cycle. After improvements were made in Cycle II, student learning outcomes showed more optimal improvement. The average class score increased to 94.4, and there was only 1 student who had not reached the Minimum Completeness Criteria (KKM). Nevertheless, classically the indicators of the success of the research have been achieved. This improvement in learning outcomes shows that the use of Counting Tree Media is able to help students understand the concept of addition counting operations in a more concrete and meaningful way.

The results of student responses given by teachers to learning in Cycle I showed a percentage of 66% with the category of "not good", which indicates an increase but has not met the success indicators, so improvements are needed in Cycle II. In Cycle II, the percentage of student responses increased to 94% with the category of "very good" and had reached the research success indicator, so it was declared successful.

DISCUSSION

The use of Counting Tree media is considered to be in line with the characteristics of mathematics learning in the material of counting operations adding numbers 1-10 in class I. This media provides a concrete overview of abstract concepts, so that students can more easily understand the material through activities related to real experience. In addition, the success of learning is also inseparable from the role of teachers in designing strategies and implementing directed learning. Teachers not only prepare and deliver material, but also design effective teaching strategies, mastery of learning approaches, and the ability to use media according to the learning context (Syifaurrehman et al., 2025).

The results of observations on student activities show that the use of Counting Tree media is able to encourage



students to be active in learning. Students seemed more concentrated, dared to ask questions, and were enthusiastic about using the media to solve summation problems. So that the learning can provide a more meaningful learning experience to students.

The increase in teacher and student activities also has a positive influence on the achievement of students' mathematics learning outcomes. The learning outcome data shows an increase in each cycle. Based on the results of the reflection, it can be concluded that the use of Counting Tree media is effective in helping students understand the concept of summation and create a more interesting and meaningful learning atmosphere. Therefore, the learning actions in this study were declared successful and met the criteria for completeness in mathematics learning in the MI low grade.

CONCLUSION

From the results of the research by applying the Calculation Tree media to the learning of mathematics of summation materials in the MI lace class, it can be concluded that the media is able to improve student activities and learning outcomes. Increasing student activities has an impact on understanding concepts which is shown through an increase in the percentage of student learning outcomes in each cycle. Student learning completeness in Cycle I reached 64% with the "Poor" category and increased to 94% with the "Very Good" category in Cycle II. These achievements show that student learning outcomes have met and exceeded the set success indicators. Thus, the use of Calculation Tree media is declared effective and can be used as an interesting and meaningful alternative to mathematics learning for MI low-grade students.

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