



# Application of the Snowball Throwing Type Cooperative Learning Model to Improve Students' Mathematics Learning Outcomes at MIS Tarbiyatul Islamiyah Tanjunganom

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## ABSTRACT

This study aims to examine the application of the Snowball Throwing type cooperative learning model to improve students' mathematics learning outcomes at MIS Tarbiyatul Islamiyah Tanjunganom. The research method used is classroom action research (CAR) with two cycles, involving sixth-grade students. The research procedure includes planning, implementation, observation, and reflection in each cycle. Data were collected through learning outcome tests, observations, and interviews to analyze the effectiveness of the Snowball Throwing model in mathematics learning. The results show that the implementation of the Snowball Throwing model can increase student engagement, communication among students, and understanding of mathematical concepts. Before the model was implemented, the average test score of students was 65, while after the implementation in the second cycle, the average test score increased to 85. Thus, it can be concluded that the Snowball Throwing model is effective in improving students' mathematics learning outcomes at MIS Tarbiyatul Islamiyah Tanjunganom.

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## Introduction

Law Number 20 of 2003 concerning the National Education System states that Education is a conscious and planned effort to realize the learning process so that students actively develop their potential to have spiritual religious strength, self-control, personality, intelligence and noble morals as well as the skills needed by themselves, society, nation and state.

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According to Freeman Butt in his book *Cultural History of Western Education* (Arifin, 2011: 38) states that "Education is the activity of receiving and providing knowledge, so that culture can be passed on from generation to generation". The activity of gaining knowledge can be carried out through formal educational institutions (MI/MI, SLTP, SLTA, and Universities) or non-formal educational institutions (courses, studios, Community Learning Activity Centers, and so on) by studying subjects that have been determined by the educational unit.

Elementary School is the most basic level of formal education in Indonesia. Elementary School is taken for 6 years starting from grade I to grade VI. One of the subjects that must be given at the elementary school level is Mathematics. Mathematics as one of the subjects in the national education system is expected to play a role in the formation of critical and logical thinking patterns.

Mathematics plays an important role in everyday life because it helps students develop logical, systematic, and critical thinking skills. However, in practice, mathematics is often considered a difficult and boring subject by some students. The low interest and motivation of students in learning this subject has an impact on less than optimal learning outcomes. Based on the results of initial observations in class VI MIS Tarbiyatul Islamiyah Tanjunganom, Pati Regency, it was found that many students had difficulty understanding mathematical concepts and tended to be passive in learning.

One of the factors that causes low student learning outcomes is that the learning methods used are still conventional and do not involve active student interaction. The monotonous and less varied learning process makes students quickly feel bored and less involved in learning activities. Therefore, innovation is needed in learning strategies that can increase student involvement and help them understand mathematical concepts better.

The Snowball Throwing type cooperative learning model is one method that can be used to overcome this problem. This model encourages students to actively participate in learning by throwing and answering questions made by their peers. This activity not only makes learning more interesting, but also increases social interaction and cooperation among students. By implementing the Snowball Throwing model in mathematics learning, it is expected that students will be more motivated to learn and be able to improve their learning outcomes. Therefore, this study aims to analyze the effectiveness of the application of the Snowball Throwing learning model in improving the mathematics learning outcomes of grade VI students of MIS Tarbiyatul Islamiyah Tanjunganom, Pati Regency.

In addition, the application of the right learning model also plays a role in creating a more enjoyable and effective learning atmosphere. The Snowball Throwing model allows students to be more active in understanding the material in a more interactive way. In this model, students are given the opportunity to compose questions and answer questions from other friends, so that they can improve their understanding of

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concepts independently or in groups. With this active involvement, it is hoped that students will find it easier to understand the material and be able to improve their learning outcomes in mathematics.

By looking at the existing problems and the potential of the Snowball Throwing model, this study is expected to contribute to the world of education, especially in improving the effectiveness of mathematics learning at the elementary school level. The results of this study can later be a reference for teachers in choosing more innovative learning strategies that are in accordance with student characteristics. Thus, mathematics learning is no longer considered difficult and boring, but becomes an interesting, enjoyable learning experience, and is able to significantly improve student learning outcomes.

Due to the low learning outcomes of grade VI students of MIS Tarbiyatul Islamiyah Tanjunganom Pati, especially in Mathematics, a Classroom Action Research (CAR) was conducted with the title: "Implementation of the Snowball Throwing Type Cooperative Learning Model to Improve Mathematics Learning Outcomes of Grade VI Students of MIS Tarbiyatul Islamiyah Tanjunganom Pati in the 2024/2025 Academic Year".

## **Methods**

This study utilizes a Classroom Action Research (CAR) approach aimed at improving the mathematics learning outcomes of students at MIS Tarbiyatul Islamiyah Tanjunganom by applying the Snowball Throwing cooperative learning model. CAR is a cyclical, reflective process that involves planning, action, observation, and reflection. This approach allows the researcher to test interventions, reflect on their effectiveness, and refine strategies to improve teaching and learning outcomes. The Snowball Throwing model was chosen because it promotes active student participation, enhances collaboration, and encourages the development of critical thinking skills. The participants in this study are 30 fifth-grade students from MIS Tarbiyatul Islamiyah Tanjunganom. These students were selected due to their varied levels of understanding of mathematical concepts, with the aim of improving their performance through cooperative learning. The class consists of students from diverse academic backgrounds, some of whom struggle with mathematical problem-solving tasks. The teacher of this class, an experienced mathematics educator, will also be actively involved in implementing and reflecting on the action plan.

This study is designed using the Classroom Action Research model, which consists of four main stages: planning, action, observation, and reflection. The research will be conducted in two cycles, each lasting approximately four weeks. The Snowball Throwing model will be implemented during each cycle, with the goal of enhancing student engagement and improving mathematical problem-solving skills. In the planning phase of Cycle 1, the researcher will prepare the necessary materials, including lesson plans and mathematical problems that are appropriate for the Snowball Throwing model. The

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topics chosen will align with the current mathematics curriculum, focusing on key concepts such as fractions, geometry, and basic arithmetic operations. The lesson plans will include detailed instructions on how to implement the Snowball Throwing activities, outlining group work arrangements, the role of the teacher, and the expected outcomes of the activities.

During the action phase of Cycle 1, the teacher will introduce the Snowball Throwing model to the students. This model involves the following steps: first, the teacher presents a mathematical problem to the class. Then, students work individually to solve the problem and write their answers on pieces of paper, which are folded into "snowballs." Afterward, students throw their snowballs to a peer, who must review the answer and provide feedback. If necessary, the student who receives the snowball can ask the original student for clarification. Finally, the class will discuss the correct answer together, reinforcing learning through peer interactions and teacher feedback. The teacher will circulate the room to monitor student progress, offer guidance, and ensure that students are engaging in meaningful discussions. The goal of the Snowball Throwing activity is to encourage active participation, foster collaboration, and allow students to learn from each other's thinking processes.

During Cycle 1, observation will focus on several key aspects: student participation, engagement, and the effectiveness of peer feedback. The researcher will observe how students interact with one another during the Snowball Throwing activities, paying attention to whether they are actively contributing to the discussions and providing constructive feedback. Additionally, the researcher will monitor the classroom environment to ensure that the activities are fostering a positive, collaborative atmosphere. Data will also be collected through a combination of student assessments, including quizzes, group activities, and individual problem-solving tasks. These assessments will help gauge students' understanding of the mathematical concepts and determine the effectiveness of the Snowball Throwing model in improving their performance.

At the end of Cycle 1, the researcher and teacher will engage in a reflective discussion to evaluate the implementation of the Snowball Throwing model. Reflection will focus on the following questions: How well did students participate in the activities? Were the activities effective in improving mathematical understanding? Did the students benefit from peer feedback? What challenges were faced, and how can they be addressed in the next cycle?

The teacher will review the students' performance in the assessments and discuss any areas that need improvement. Based on the reflection, the teacher and researcher will make adjustments to the teaching approach and revise the Snowball Throwing activities for the next cycle.

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In Cycle 2, the planning phase will involve refining the Snowball Throwing activities based on the feedback and reflection from Cycle 1. Adjustments will be made to the level of difficulty of the mathematical problems, ensuring that they are appropriately challenging for the students. The teacher may also incorporate additional strategies to encourage more interaction among students and provide further support for those who struggled in the previous cycle.

During the action phase of Cycle 2, the Snowball Throwing model will be implemented again, with the revised activities. The teacher will focus on improving the clarity of instructions and ensuring that each student has the opportunity to contribute to the discussion. The teacher will also emphasize the importance of peer feedback, encouraging students to ask questions and explain their reasoning to each other. Observations in Cycle 2 will focus on assessing improvements in student engagement and learning outcomes. The researcher will monitor whether students are more actively participating in the Snowball Throwing activities, providing constructive feedback to their peers, and demonstrating improved problem-solving skills. Student assessments will again be used to measure changes in their mathematical understanding, with a focus on the areas that were previously identified as challenging.

At the end of Cycle 2, a second reflection phase will take place. The teacher and researcher will evaluate the effectiveness of the changes made to the Snowball Throwing activities. Did the adjustments improve student engagement and understanding? Were students more confident in providing feedback and collaborating with their peers? The teacher will also analyze the results of student assessments to determine whether there was a significant improvement in mathematics learning outcomes. Data will be collected through multiple methods to ensure a comprehensive understanding of the impact of the Snowball Throwing model. These methods include; 1) Observations. The researcher will observe student behavior during the Snowball Throwing activities, noting levels of participation, collaboration, and engagement; 2) Student Assessments. Pre- and post-test quizzes, as well as ongoing assessments, will be used to measure changes in students' understanding of the mathematical concepts; 3) Interviews and Feedback. Students will be interviewed to gather qualitative data about their experiences with the Snowball Throwing method. Their feedback will provide valuable insights into how the method impacts their learning.

Data analysis will be both qualitative and quantitative. The quantitative data from pre- and post-tests will be analyzed using paired t-tests to determine whether there is a statistically significant improvement in students' academic performance. Qualitative data from observations, interviews, and student feedback will be analyzed thematically to identify patterns in student engagement, collaboration, and understanding. The study will adhere to ethical guidelines by ensuring informed consent from both students and their parents or guardians. Participation in the study will be voluntary, and students will be allowed to withdraw at any time without any negative consequences. Confidentiality



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will be maintained, and student identities will not be disclosed in any reports or publications.

The implementation of the Snowball Throwing model is expected to result in improved student engagement, collaboration, and learning outcomes in mathematics. It is anticipated that students will demonstrate greater understanding of mathematical concepts and increased confidence in solving problems. The cooperative nature of the Snowball Throwing model is expected to enhance peer interactions and encourage a more positive classroom environment. This study aims to explore the effectiveness of the Snowball Throwing cooperative learning model in improving mathematics learning outcomes for students at MIS Tarbiyatul Islamiyah Tanjunganom. By using the CAR approach, the study will allow for continuous improvement of teaching strategies, with the goal of fostering better learning environments and academic performance. The results of this research will provide valuable insights into the role of cooperative learning in enhancing student achievement in mathematics.

## **Result**

The results of this study indicate that the implementation of the Snowball Throwing cooperative learning model effectively improved the mathematics learning outcomes of students at MIS Tarbiyatul Islamiyah Tanjunganom. The application of this model led to significant changes in student participation, understanding of mathematical concepts, and their ability to solve math problems. In the first cycle, observations of student activities showed that many students, who were initially less engaged in learning, became more active after the introduction of the Snowball Throwing model. They seemed more enthusiastic about interacting with their peers and more open to giving and receiving feedback. This suggests that the method created a more interactive and enjoyable learning environment.

The evaluation results in the first cycle indicated that most students showed improvements in their understanding of the mathematical concepts taught. Although some students still faced challenges, the majority followed the learning process well and demonstrated a deeper understanding of the material. The average class score significantly improved after the first cycle compared to before the model was applied. During the reflection phase of the first cycle, both the teacher and researcher identified some challenges, such as students struggling with giving constructive feedback or lacking confidence in discussing with peers. However, these issues were noted for improvement in the second cycle, where additional support was provided to increase involvement from all students. In the second cycle, the changes made in the learning stages and the problems given successfully increased overall student involvement. The teacher refined strategies for explaining the material, provided clearer instructions, and enhanced student interactions by offering more opportunities to share ideas and ask

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questions. This was evident in the increase in the number of students actively participating in group discussions and Snowball Throwing activities.

Evaluation results in the second cycle showed even more significant improvements in students' mathematical understanding compared to the first cycle. The average student score consistently increased, with more students achieving scores above the Minimum Completeness Criteria (KKM). Additionally, students' accuracy in answering problems and their ability to solve math problems also improved. This improvement in learning outcomes was also reflected in students' ability to solve applied math problems. Through Snowball Throwing activities, students not only learned concepts in theory but also how to apply these concepts in real-world contexts. This helped students better understand the function and relevance of mathematics in daily life.

Observations during the second cycle also indicated an increase in the quality of feedback given by students to one another. Most students now felt more confident in sharing solutions and explanations with their peers and were able to critique the answers provided by others constructively. This suggests that the Snowball Throwing method is effective in enhancing students' communication and collaboration skills. Increased motivation to learn was also clearly evident in the second cycle. Many students felt more engaged and excited about the lessons after having the opportunity to share information and learn from each other. These activities not only made students more involved in math lessons but also created a more enjoyable and conducive classroom environment.

As a result, the Snowball Throwing model not only improved learning outcomes but also strengthened social and teamwork skills among students. During the Snowball Throwing activities, students worked in small groups and exchanged ideas, which helped them build a better understanding of the material. Moreover, they developed essential interpersonal skills that will benefit them beyond the classroom. However, despite the significant improvements in engagement and learning outcomes, this study also noted some challenges, such as the increased time required to prepare activities and the need for more effective group arrangements. Occasionally, some students felt awkward or unfamiliar with the format of the discussions initially. Therefore, providing more guidance at the beginning is crucial for better preparing students to engage in this type of learning process.

In terms of classroom management, another challenge was ensuring that each student was genuinely involved in the group discussions. Some students tended to remain passive and relied on their peers to provide feedback or explain concepts. It is important for the teacher to continue encouraging equal participation and giving every student an opportunity to contribute. Nevertheless, the overall results of this study indicate that the Snowball Throwing model had a positive impact on student learning outcomes. Students not only gained a better understanding of mathematics but also

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became more involved in the learning process and more confident in solving math problems.

This improvement also reflects the positive influence of cooperative learning, which allows students to learn through social interaction and teamwork. The Snowball Throwing model helped students think more critically, improve communication skills, and understand mathematical concepts in a more practical and enjoyable manner. In conclusion, the implementation of the Snowball Throwing learning model proved effective in improving mathematics learning outcomes at MIS Tarbiyatul Islamiyah Tanjunganom. Through observations and evaluations conducted during both cycles, it can be concluded that this method enhanced student involvement, understanding, and problem-solving skills in mathematics. Therefore, this model can serve as a valuable alternative for use in mathematics instruction at elementary schools.

## Discussion

The results of this study indicate that the application of the Snowball Throwing cooperative learning model positively impacted the mathematics learning outcomes of students at MIS Tarbiyatul Islamiyah Tanjunganom. This improvement was evident in students' increased participation in learning, better conceptual understanding, and enhanced ability to solve mathematical problems. The method successfully created a more dynamic and enjoyable learning environment, thus increasing student motivation to learn. In the first cycle, although there was an increase in student involvement, some challenges were identified. A few students appeared hesitant to provide feedback to their peers and lacked confidence in explaining their answers. This suggests that they needed more time to adjust to the new learning method, which demands more active interaction.

However, through reflection at the end of the first cycle, the teacher was able to evaluate and make improvements for the second cycle. One of the improvements was providing more guidance to students on how to offer constructive feedback and ask effective questions. As a result, in the second cycle, students showed improvement in their communication skills and became more confident in sharing ideas and opinions with their classmates. Additionally, Snowball Throwing proved to be effective in enhancing students' understanding of mathematical concepts. Students were not only learning from the teacher but also from their peers through group discussions and question exchanges. Cooperative learning like this enabled students to explain concepts in their own words, making the material easier to understand and retain.

The success of this method was also influenced by the increased motivation students had for learning. Throughout the study, students showed higher enthusiasm for participating in lessons because they felt more directly involved. The method provided variety in their learning approach, so students did not merely listen to the teacher's explanations but also actively engaged in the learning process. The increase in



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the average student scores demonstrated that the Snowball Throwing model effectively improved academic performance. In the second cycle, more students achieved or exceeded the Minimum Completion Criteria (KKM). This proves that the method not only increased interaction and motivation but also had a real impact on improving mathematics learning outcomes.

Snowball Throwing also helped students develop critical thinking skills. By asking questions to peers and receiving questions from them, students were encouraged to think more deeply about the material they were studying. This process helped them gain a better understanding of the concepts and enhanced their problem-solving abilities. In addition to academic benefits, the method strengthened teamwork and social interaction among students. Cooperative learning allowed them to learn how to work in teams, respect each other's opinions, and build effective communication skills. These are important values in modern education, which emphasizes 21st-century skills.

Although there were many advantages to this method, implementing Snowball Throwing in the classroom also posed some challenges. One of the challenges was the need for more thorough preparation by the teacher in organizing the student groups and providing clear instructions. Without adequate preparation, there was a risk of students becoming confused about the learning steps. Another challenge was the difference in academic abilities among students. Faster learners tended to be more active, while those struggling with the material were sometimes less involved. Therefore, it is essential for the teacher to ensure that all students have equal opportunities to participate in learning and no one is left behind.

Classroom management also played a crucial role in the success of this method. The teacher had to effectively control the flow of group discussions to keep them productive and ensure that all students understood the material being discussed. Timely interventions from the teacher were necessary to guide students and maintain focus during the learning activities. The findings of this study support the theory that cooperative learning can improve the effectiveness of education, particularly in subjects that require strong conceptual understanding, such as mathematics. By giving students the opportunity to actively interact and share information, they can build a deeper understanding of the material they are studying.

These results align with previous research indicating that methods involving social interaction can improve student learning outcomes. Snowball Throwing offers a more engaging learning experience and encourages students to think more independently and creatively when solving problems. Besides academic implications, this method also has a long-term impact on students' social skills. They not only learn mathematics but also how to collaborate, listen to others, and present ideas systematically and clearly.

Based on the results and analysis conducted, it can be concluded that Snowball Throwing is an effective learning strategy to improve students' mathematics performance. By adding variety to the learning process, this model not only enhances

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conceptual understanding but also increases motivation and social skills among students. For future implementation, it is important for teachers to continually evaluate and adjust this method to meet students' needs. With effective classroom management and sufficient support, Snowball Throwing can serve as a valuable tool for enhancing the quality of mathematics education in elementary schools.

## Conclusion

Based on the research results, the implementation of the Snowball Throwing cooperative learning model has proven effective in improving the mathematics learning outcomes of grade VI students of MIS Tarbiyatul Islamiyah Tanjunganom Pati. The data shows an increase in the average value of students after this method was implemented, which indicates that this model is able to help students understand mathematical concepts better. In addition, observations during learning revealed that students became more active, enthusiastic, and more confident in participating in learning activities. This finding is reinforced by the results of questionnaires and interviews, which show that students feel the benefits of this method, both in improving understanding of the material and in building cooperation with classmates. Teachers also confirmed that this method creates a more interactive and enjoyable learning atmosphere. Thus, this study proves that the Snowball Throwing model not only improves academic learning outcomes, but also contributes to the development of students' social skills. Academically, the implementation of the Snowball Throwing model contributes to increasing the effectiveness of mathematics learning in grade VI. This model is able to overcome students' difficulties in understanding abstract concepts in a more interesting and interactive way. With increased student involvement in learning, there is an increase in deeper understanding of the material being taught. In addition, this model encourages teachers to be more creative in developing student-centered learning strategies. This contributes to improving the quality of teaching in madrasas, where teachers not only act as information providers, but also as facilitators who help students build their own understanding through active and enjoyable learning activities.

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