https://www.jurnal-umbuton.ac.id/index.php/wawasan
https://doi.org/10.35326/juwara.v4i1.7816

JURNAL WAWASAN SARJANA
LEMBAGA JURNAL DAN PUBLIKASI
UNIVERSITAS MUHAMMADIYAH BUTON

E-ISSN: 2986-514X
P-ISSN: 2988-599X

Vol. 4 No.2
Year 2025

Implementation of the Cooperative Learning Model Type TSTS Assisted by Concrete Media to Improve Mathematics Learning Outcomes

Krisnawati[1*], Nur Haizah Aopmonaim[2], Waode Ekadayanti[2]

[1]Fakultas Keguruan dan Ilmu Pendidikan, Universitas Muhammadiyah Buton, Indonesia
[2]Fakultas Keguruan dan IlmuPendidikan, Universitas Sulawesi Tenggara, Indonesia

ABSTRACT

This study was conducted to improve the learning outcomes of second-grade students in mathematics at SD IT Rumah Anak Soleh Buton. The research applied classroom action research carried out in two cycles. Each cycle consisted of the stages of planning, implementation, observation, and reflection. The learning process was designed by applying the Cooperative Learning Model type Two Stay Two Stray, assisted by concrete media, to make mathematical concepts more accessible and meaningful for students. Data collection techniques included observation sheets, test instruments, and documentation, which were analyzed descriptively to capture both the process and the results of student learning. The findings of the study revealed that student learning outcomes improved across the cycles. Initially, many students had difficulty achieving the expected mastery in addition and subtraction, but after the implementation of the model, a significant improvement was observed. The cooperative approach encouraged active participation, peer learning, and better conceptual understanding. The use of concrete media also helped students relate abstract mathematical ideas to real-life contexts, thus strengthening their comprehension and motivation. Based on these results, it can be concluded that the Cooperative Learning Model type Two Stay Two Stray with concrete media is effective in improving mathematics learning outcomes among second-grade students.

Keywords: *Cooperative Learning, Two Stay Two Stray, Concrete Media, Learning Outcomes*

1. Introduction

Education is a process of learning and development aimed at improving knowledge, skills, and character. It covers many aspects, one of which is learning. In the learning process, several important elements must be considered, including skills, application, synthesis, and evaluation. Among the various subjects taught in schools, mathematics plays a crucial role. Mathematics is the study of structure, numbers, and the relationships among them. It involves reasoning, logic, and problem solving to understand and analyze natural and social phenomena. Since mathematics is often considered abstract, its teaching requires the use of appropriate learning models and

Korespondensi: Krisnawati, Email: krisnawati25@gmail.com

instructional media that match the subject matter. For this reason, the implementation of the Cooperative Learning Model type Two Stay Two Stray assisted by concrete media is necessary to enhance students' learning outcomes in mathematics.

According to Harahap (2024), the Two Stay Two Stray (TSTS) model is a flexible learning strategy that can be applied across various subjects and educational levels. This model allows students to work collaboratively in groups, where two members remain to explain their work while two others visit different groups to exchange information. Through this process, students actively share ideas, compare solutions, and gain new perspectives, which enriches their understanding. In mathematics learning, the TSTS model is particularly effective because it encourages students to engage in problem-solving collaboratively, fostering communication, cooperation, and critical thinking skills. However, to maximize the effectiveness of the TSTS model, the use of instructional media is essential. Integrating appropriate learning media helps make abstract mathematical concepts more concrete and easier to understand. In particular, the use of concrete media—such as manipulatives, visual aids, or real-life objects—enables students to visualize and explore mathematical ideas more clearly. This combination of collaborative learning and supportive media not only enhances students' conceptual understanding but also increases engagement, making the learning process more meaningful and effective.

Learning outcomes are defined as changes in behavior that encompass cognitive, affective, and psychomotor domains. These changes occur within specific contexts as a result of continuous and repeated learning experiences. The achievement of learning outcomes is not instantaneous but rather a gradual process that can be observed as students engage in teaching and learning activities. Evaluation plays an important role in assessing these outcomes, as it provides educators with a clear picture of students' progress and level of mastery. Tests are among the most common instruments used to measure learning outcomes, allowing teachers to determine whether the learning objectives have been successfully achieved. The success or failure of learners in achieving the expected outcomes is influenced by a variety of factors. Some of these are internal factors, which originate from within the students themselves, such as motivation, interest, and physical or psychological conditions. Others are external factors, which come from outside the students, including the learning environment, instructional strategies, available media, and support from teachers or parents. Both internal and external factors interact dynamically, shaping the extent to which students are able to reach their full potential in the learning process (Sana & Bachri, 2022).

Previous studies have highlighted the importance of cooperative learning models in improving student outcomes, particularly in mathematics. Johnson and Johnson (2019) demonstrated that cooperative learning encourages collaboration and significantly enhances students' cognitive achievement. Similarly, Slavin (2020) emphasized that cooperative structures foster positive interdependence and individual accountability, which are critical for academic success. Research by Gillies (2021) also showed that students engaged in cooperative learning display better problem-solving skills and higher motivation compared to those in traditional settings. In the Indonesian context, Putra (2022) found that applying the Two Stay Two Stray (TSTS) model improved both conceptual understanding and student participation in elementary mathematics

classes. These findings suggest that cooperative learning can effectively address the challenges posed by the abstract nature of mathematics by making the learning process more interactive and meaningful.

Other scholars have examined the role of learning media in enhancing the effectiveness of cooperative models. According to Arends (2018), the integration of concrete media strengthens students' ability to connect abstract mathematical concepts with real-world applications. Harahap (2024) further argued that TSTS combined with suitable media provides students with opportunities to share and refine knowledge collaboratively, leading to improved outcomes. A study by Widianita (2023) revealed that concrete media not only supports conceptual mastery but also stimulates active engagement during group discussions. Meanwhile, research by Hernandez and Brown (2021) underscored that when cooperative models are reinforced with visual or tangible media, students experience deeper comprehension and increased retention. Collectively, these studies reinforce the argument that combining cooperative learning, particularly TSTS, with concrete media can significantly enhance mathematics learning outcomes across diverse educational contexts.

One of the main problems in mathematics learning at the elementary level is that students often perceive mathematics as abstract and difficult to understand. This condition creates a gap between the expected learning objectives and the actual outcomes achieved in the classroom. Teachers frequently face challenges in designing learning models that not only deliver content but also encourage active participation and deeper comprehension. As a result, students' motivation tends to decline, and their ability to apply mathematical concepts in problem-solving remains limited. The impact of this situation is that mathematics learning outcomes are often below the expected standards, which in turn affects students' confidence and long-term academic performance. To address these challenges, innovative learning approaches are needed that can make mathematics more engaging and meaningful. The Cooperative Learning Model type Two Stay Two Stray assisted by concrete media offers a potential solution, as it combines collaborative interaction with tangible learning tools to bridge abstract concepts. This strategy helps students share knowledge, discuss problems collectively, and relate mathematics to real-life contexts. The choice of this research title is particularly interesting because it does not only focus on improving academic achievement but also responds to the urgent need for interactive, student-centered learning in elementary schools. By integrating cooperative structures and concrete media, this study provides both theoretical contributions and practical solutions for enhancing mathematics education.

2. Methods

This study employed classroom action research conducted during the even semester of the academic year 2024 to 2025 at SD IT Rumah Anak Soleh Buton. The aim of the research was to improve mathematics learning outcomes through the application of the Cooperative Learning Model type Two Stay Two Stray assisted by concrete media. The subjects of the research were all second grade students consisting of fourteen participants, which allowed for a detailed observation of the learning process and the improvement of student outcomes. The research procedure followed the design of classroom action research which consisted of four main stages, namely planning, implementation, observation,

and reflection. The research was carried out in two cycles, with each cycle consisting of two meetings. In the planning stage, the teacher prepared lesson plans, concrete media, and research instruments. In the implementation stage, the teacher applied the Two Stay Two Stray model according to the prepared scenario. Observation was conducted to monitor student activities and teacher performance, while reflection was carried out to evaluate results and determine improvements for the next cycle.

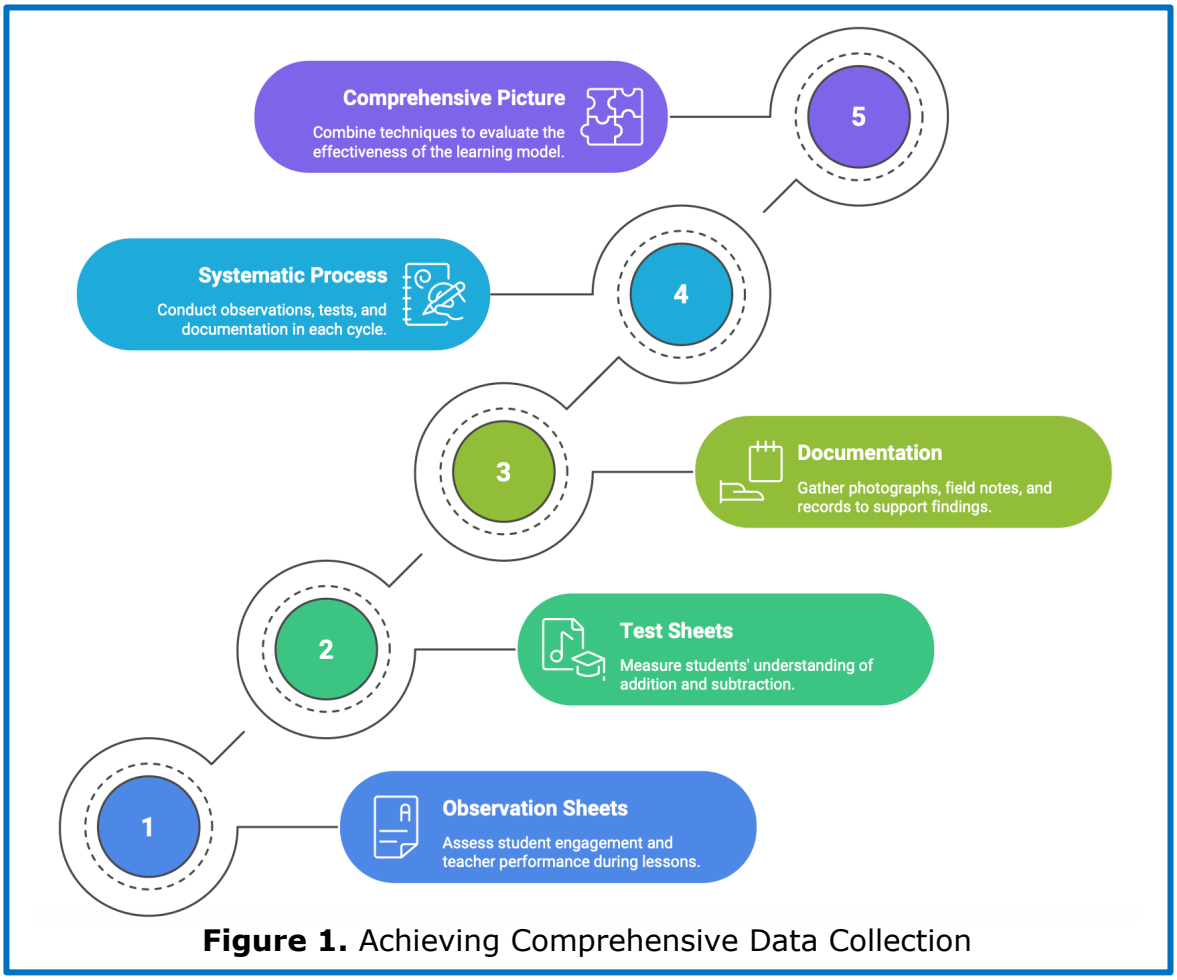

Figure 1. Achieving Comprehensive Data Collection

The data were collected using several instruments relevant to the objectives of the study. Observation sheets were used to assess student engagement and teacher performance during the lessons. Test sheets were administered to measure students' understanding of addition and subtraction after participating in learning activities with the Cooperative Learning Model type Two Stay Two Stray assisted by concrete media. Documentation in the form of photographs, field notes, and records of activities was also gathered to strengthen the findings of the study. The process of data collection was carried out systematically in each cycle. Observations were conducted throughout the learning process to examine interaction, participation, and student responses. Tests were administered at the end of each cycle to assess the improvement of learning outcomes, while documentation was collected continuously as supporting evidence. The combination of these three techniques provided a comprehensive picture of the effectiveness of the learning model applied in the classroom.

The collected data were analyzed using both quantitative and qualitative approaches. Quantitative analysis was applied to process students' test results through the calculation of average scores, percentages of mastery, and progress across cycles. This analysis was intended to measure the extent to which the implementation of the Two Stay Two Stray model with concrete media improved students' academic performance. Qualitative analysis was applied to data obtained from student and teacher observations as well as documentation. The process included data reduction, data presentation, and conclusion drawing. This analysis provided insights into the dynamics of the learning process, student responses toward the use of concrete media, and the teacher's role in facilitating learning. By combining both quantitative and qualitative approaches, the study offered a comprehensive understanding of the effectiveness of the implemented model.

3. Findings and Discussion

3.1 Findings

The Cooperative Learning Model type Two Stay Two Stray assisted by concrete media has the potential to improve learning outcomes in mathematics based on students' abilities. This model encourages collaboration among students, allowing them to exchange ideas and strengthen their understanding of abstract mathematical concepts. The use of concrete media provides a tangible representation of problems, which helps students to better grasp the material and apply it to problem solving. As a result, the learning process becomes more engaging, interactive, and meaningful for students at the elementary level. The effectiveness of this model can be observed through the progress achieved in the first and second cycles of the study. The application of the Two Stay Two Stray strategy combined with concrete media showed significant improvement in students' learning performance compared to the initial condition. The details of students' progress in each cycle can be seen in Table 1, which illustrates the increase in both participation and mastery of the learning material. This indicates that the integration of cooperative learning and concrete media is effective in enhancing mathematics learning outcomes.

Table 1. Mathematics Learning Outcomes of Students in the Pre-Cycle, Cycle I, and Cycle II

Cycle	Total Score	Average Score	Mastery Percentage
Pre-Cycle	890	63.5	42%
Cycle I	947	67.64	64%
Cycle II	1090	77.85	85%

Table 1 presents the mathematics learning outcomes of students in the pre-cycle, the first cycle, and the second cycle. The results show a steady increase in both the average scores and the percentage of mastery. During the pre-cycle, students obtained an average score of 63.5 with only forty two percent of students achieving the minimum mastery level. This initial result illustrates that many students still struggled with mathematical concepts, which indicated the need for improvement in the learning process. In the first cycle, there was a notable improvement compared to the pre-cycle. The total score increased to 947, with an average score of 67.64 and a mastery percentage of sixty four percent. This progress suggests that the implementation of the Cooperative Learning Model type Two Stay Two Stray assisted by concrete media began to

have a positive impact on students' understanding. However, the results also revealed that more than one third of the students had not yet reached mastery, which highlighted the importance of refining the strategy and strengthening the use of media in the following cycle.

The second cycle demonstrated a significant enhancement in learning outcomes. The total score reached 1090, with an average score of 77.85 and a mastery percentage of eighty five percent. This substantial increase indicates that most students were able to grasp the mathematical concepts more effectively through the collaborative learning activities supported by concrete media. The cooperative structure allowed students to share knowledge with peers, while the use of tangible media helped bridge abstract ideas with practical understanding. Overall, the data confirm that the combination of the Two Stay Two Stray model and concrete media is effective in improving mathematics learning outcomes. The consistent progress across the cycles illustrates how active engagement, peer collaboration, and the integration of visual and concrete aids can support students in achieving higher levels of comprehension and mastery. These findings suggest that this model can serve as a reliable alternative strategy for mathematics learning in elementary schools.

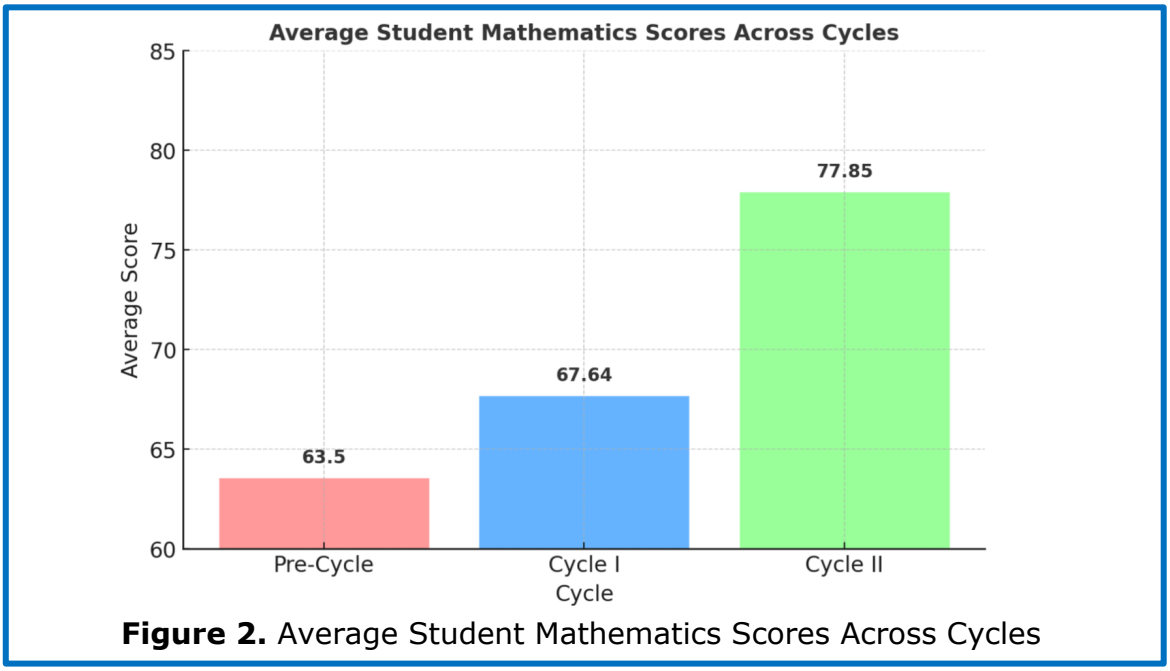

Figure 2. Average Student Mathematics Scores Across Cycles

The bar chart illustrates a clear upward trend in students' mathematics learning outcomes, progressing from the initial stage to the first cycle and further improving in the second cycle. At the beginning, students showed relatively low levels of mastery, indicating limited understanding of the material. However, after the implementation of the Cooperative Learning Model type Two Stay Two Stray (TSTS) supported by concrete media, there was a noticeable improvement in their performance. This progression suggests that the applied learning approach was effective in gradually enhancing students' understanding of mathematical concepts. The steady increase across cycles reflects how repeated exposure to the model helped students become more familiar with the learning process. As they engaged more actively in discussions and group activities, their ability to comprehend and apply concepts improved significantly.

The bar chart also highlights that the most significant improvement occurred during the second cycle. This stage indicates that students had begun to internalize both the learning model and the material being taught. Their growing familiarity with collaborative learning structures allowed them to participate more confidently and effectively in group interactions. At this point, students appeared more engaged and motivated to learn. They were more willing to express their ideas, ask questions, and contribute to discussions. This increased participation demonstrates that the learning environment had become more supportive and interactive, encouraging students to take an active role in their own learning.

Peer collaboration played a crucial role in this improvement. Through the TSTS model, students were able to exchange ideas, compare solutions, and learn from one another. These interactions not only enhanced their understanding of the subject matter but also developed their communication and teamwork skills. In addition, the use of concrete media significantly contributed to students' learning success. Abstract mathematical concepts became easier to understand when represented through tangible objects. By manipulating and observing these materials, students were able to connect theory with practice, leading to deeper comprehension.

The visual data further emphasizes that the combination of cooperative learning and concrete media creates a more effective learning experience. The structured interaction provided by the TSTS model, combined with the clarity offered by concrete tools, supported students in achieving better results over time. Overall, the bar chart reinforces the effectiveness of integrating cooperative learning strategies with concrete materials in improving students' mathematics achievement. This approach not only enhances academic performance but also fosters active participation, confidence, and collaborative skills, making it a valuable method for classroom implementation. From the description above, it can be seen that the comparison of student learning outcome percentages shows a consistent improvement across the three stages. In the pre-cycle, only a smaller portion of students had achieved mastery, while in the first cycle the percentage increased noticeably, and in the second cycle the majority of students successfully reached the expected level of mastery.

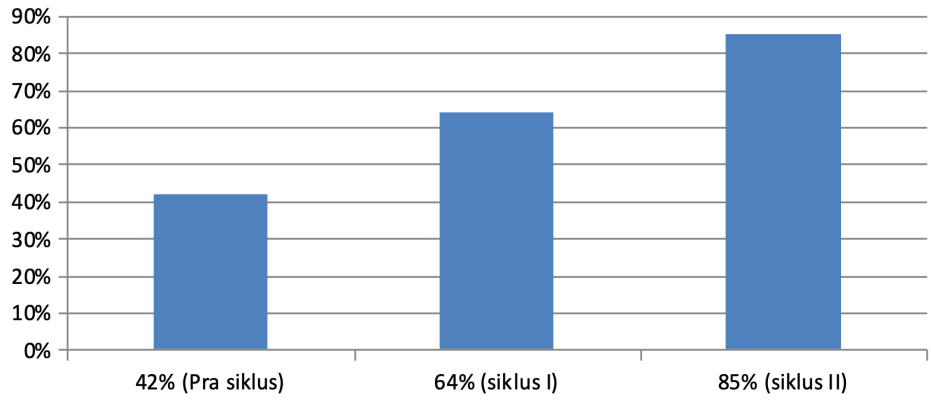

Figure 3. Diagram of Comparison of Student Learning Outcomes Percentages in the Pre-Cycle, Cycle I, and Cycle II

This progression demonstrates that the application of the Cooperative Learning Model type Two Stay Two Stray (TSTS), supported by concrete media,

was effective in gradually enhancing students' mathematics achievement. The steady improvement observed across learning cycles indicates that the model successfully created structured opportunities for active engagement. By involving students in group interactions and knowledge exchange, the learning process became more dynamic and student-centered, allowing them to construct understanding through shared experiences. The use of concrete media played a crucial role in supporting this process. Mathematical concepts, which are often abstract and difficult to grasp, became more accessible when presented through tangible learning aids. Students were able to visualize and manipulate representations of concepts, making it easier to connect theory with practice. This combination of cooperative learning and concrete media contributed to deeper comprehension and more meaningful learning outcomes.

The consistent increase in performance across cycles suggests that repeated implementation of the TSTS model reinforced students' conceptual understanding. As students engaged in similar learning patterns over time, they became more accustomed to discussing ideas, explaining reasoning, and evaluating different solutions. This repetition not only strengthened their cognitive skills but also helped them develop more effective learning strategies. In addition, the model significantly enhanced student participation and confidence. As students grew more familiar with collaborative activities, they became more willing to express their ideas, ask questions, and contribute to group discussions. This positive change in engagement reflects the creation of a supportive and interactive learning environment. Ultimately, the integration of cooperative learning strategies and concrete media not only improved academic achievement but also fostered self-confidence and active involvement in the learning process.

3.2 Discussion

The findings of this study demonstrate that the application of the Cooperative Learning Model type Two Stay Two Stray (TSTS), assisted by concrete media, was effective in improving students' learning outcomes in mathematics. The integration of cooperative strategies with tangible learning tools created a more interactive and student-centered learning environment. As a result, students were not only exposed to mathematical concepts but were also actively involved in constructing their understanding through discussion and collaboration. The steady improvement observed from the pre-cycle to the first and second cycles indicates that students became increasingly engaged in the learning process. This progression reflects how repeated exposure to the TSTS model helped students adapt to its structure and expectations. Over time, they showed greater participation in group activities, demonstrating increased enthusiasm and motivation to learn.

Through the TSTS model, students were given opportunities for active participation and peer collaboration. By sharing ideas, visiting other groups, and explaining their work, students developed communication and critical thinking skills. These interactions allowed them to compare different problem-solving approaches and gain new insights, which enriched their overall learning experience. Furthermore, the use of concrete media supported students in understanding abstract mathematical concepts more effectively. Visual and hands-on materials enabled students to explore and internalize ideas that might otherwise be difficult to grasp. This combination of collaborative learning and

concrete representation contributed to more meaningful learning, ultimately leading to improved academic performance and deeper conceptual understanding. The improvement in students' performance highlights the important role of concrete media in bridging abstract mathematical ideas with real-life experiences. Mathematics is often perceived by students as complex and difficult because many concepts are presented symbolically. However, when students are given the opportunity to interact with tangible objects, they can better visualize and understand these concepts. This connection between abstract theory and concrete experience makes learning more meaningful and accessible.

Through the use of concrete media, students are able to manipulate objects, observe patterns, and explore relationships in a more hands-on manner. This process supports deeper comprehension, as students do not merely memorize procedures but actively construct their own understanding. As a result, mathematical concepts that were previously difficult become clearer and easier to grasp, leading to improved learning outcomes. In addition to enhancing understanding, the use of concrete media also increases students' motivation to learn. When lessons are interactive and engaging, students are more enthusiastic about participating in classroom activities. They become more willing to ask questions, express ideas, and contribute to discussions. This active involvement creates a positive learning atmosphere that supports both academic achievement and personal growth. Furthermore, the collaborative structure of the Two Stay Two Stray (TSTS) model fosters meaningful social interaction among students. Through group discussions and information exchange, students learn to share knowledge, listen to different perspectives, and respect others' opinions. These interactions not only support academic learning but also help develop important social skills.

The emphasis on teamwork within the TSTS model also contributes to the development of essential twenty-first century competencies. Students learn how to work cooperatively, communicate effectively, and solve problems collectively. These skills are crucial for preparing students to face future challenges, as they promote adaptability, critical thinking, and collaboration in various contexts. Overall, the increase in mastery levels across the learning cycles reflects the effectiveness of combining cooperative learning strategies with concrete media. This integrated approach not only improves students' conceptual understanding but also enhances their motivation, participation, and social skills. Therefore, it can be concluded that the use of the TSTS model supported by tangible learning aids is a powerful strategy for improving mathematics learning outcomes.

Another important aspect observed during the implementation was the improvement of students' confidence. Initially, many students hesitated to express their ideas or participate in discussions. However, with the gradual application of the TSTS model, they became more confident in sharing their thoughts and engaging with their peers. This change demonstrates that cooperative learning not only benefits academic achievement but also fosters social and emotional growth among students. These results are consistent with previous research. Johnson and Johnson (2019) revealed that cooperative learning fosters positive interdependence and individual accountability, leading to significant academic improvement. Slavin (2020) emphasized that structured group activities enhance both comprehension and motivation. Gillies (2021) found that cooperative learning encourages deeper engagement in problem

solving. Arends (2018) pointed out that concrete instructional media make abstract concepts more accessible, while Widianita (2023) highlighted that the integration of concrete materials increases participation and retention in mathematics classes. In line with these findings, the current study confirms that the combination of cooperative learning and concrete media is a promising strategy to address the challenges of mathematics learning in elementary schools. It not only improves learning outcomes but also supports the holistic development of students. Therefore, teachers are encouraged to adopt similar approaches in their classrooms, adapting cooperative strategies and instructional media to the needs of their students to ensure more effective and meaningful learning experiences.

4. Conclusion

The results of this study lead to the conclusion that the implementation of the Cooperative Learning Model type Two Stay Two Stray supported by concrete media was effective in improving mathematics learning outcomes among second grade students. The improvement observed from the initial stage to the first and second cycles shows that this approach not only enhanced students' cognitive understanding but also encouraged greater participation and engagement in the learning process. The combination of cooperative structures and concrete media successfully addressed the abstract nature of mathematics by making concepts easier to grasp and apply in practice. In addition, the findings highlight that this learning model does not only contribute to academic achievement but also supports the development of confidence, communication, and collaborative skills among students. The consistent progress throughout the cycles indicates that repeated application of this strategy creates a more interactive and meaningful classroom environment. Therefore, the Cooperative Learning Model type Two Stay Two Stray with concrete media can be considered a practical and effective alternative for mathematics instruction in elementary schools, offering both theoretical contributions and direct benefits for teaching practice.

References

Ajaja, R., & Nwanekezi, A. U. (2018). Concept Mapping and Cooperative Learning Strategies on Junior Secondary School Students' Performance in Social Studies. *International Journal of Education and Evaluation*, *4*(9), 83-95.

Arends, R. (2018). *Learning to teach*. McGraw-Hill Education.

Danlami, K. B., Zakariya, Y. F., Balarabe, B., Alotaibi, S. B., & Alrosaa, T. M. (2025). Improving students' performance in geometry: an empirical evidence of the effectiveness of brainstorming learning strategy. *Frontiers in Psychology*, *16*, 1577912.

Gillies, R. M. (2021). Promoting academic success and social competence in student learning through cooperative learning. *Theory Into Practice, 60*(1), 29–39. https://doi.org/10.1080/00405841.2020.1846206

Harahap, N. (2024). Implementation of the Two Stay Two Stray model in mathematics learning: Opportunities and challenges. *Jurnal Pendidikan Dasar Nusantara, 10*(2), 45–56.

Hasibuan, M. F. (2024). Efforts to Improve Student Learning Outcomes Through The Two Stay-Two Stray (TS-TS) Type Cooperative Learning Model In Class

VI Mathematics Subjects At SDN 108384 Lubuk Pakam. *Journal of Classroom Action Research*, *3*(1), 37-45.

Hernandez, M., & Brown, T. (2021). Cooperative learning and the use of visual media in improving mathematical comprehension. *Journal of Educational Research and Practice, 11*(3), 210–222.

Johnson, D. W., & Johnson, R. T. (2019). Cooperative learning: The foundation for active learning. *Active Learning in Higher Education, 20*(1), 4–18. https://doi.org/10.1177/1469787418824615

Killen, R. (2016). *Effective teaching strategies: Lessons from research and practice*. Cengage Learning.

Lee, J. (2021). Teachers as role models in developing students' social and academic competencies. *Journal of Education and Learning, 10*(3), 45–54.

Lie, A. (2022). Cooperative learning in the Indonesian classroom. *Indonesian Journal of Education, 6*(2), 67–79.

Mawarni, S. (2023). The effectiveness of cooperative learning in improving mathematics achievement. *Jurnal Pendidikan Matematika, 12*(1), 23–35.

Nurlinda, E., Azis, Z., & Nasution, M. D. (2024). Students' Mathematical Reasoning Ability and Self-Efficacy Viewed from the Application of Problem Based Learning and Contextual Teaching and Learning Models Assisted. *JMEA: Journal of Mathematics Education and Application*, *3*(2), 54-61.

Patel, R. (2022). Classroom management and cooperative learning: Building social interaction in schools. *International Journal of Educational Psychology, 11*(2), 89–102.

Piaget, J. (2019). *The psychology of intelligence*. Routledge.

Putra, A. (2022). The application of the Two Stay Two Stray model in elementary school mathematics learning. *Jurnal Pendidikan Matematika Indonesia, 7*(1), 55–63.

Sana, & Bachri, B. S. (2022). Faktor-faktor yang memengaruhi hasil belajar siswa sekolah dasar. *Jurnal Ilmu Pendidikan, 8*(2), 134–142.

Sepriyani, E. M., & Ahda, Y. (2023). The Effect of the Two Stay Two Stray Cooperative Learning Model (TSTS) Assisted by STEM-Based Interactive Media on Critical Thinking and Student Learning Outcomes on Sensory System Material. *Jurnal Penelitian Pendidikan IPA*, *9*(12), 12073-12081.

Slavin, R. E. (2020). *Cooperative learning: Theory, research, and practice* (2nd ed.). Allyn & Bacon.

Slavin, R. E. (2020). *Educational psychology: Theory and practice*. Pearson Education.

Sunandar, D. (2023). Enhancing Mathematics Education Through Collaborative Learning: A Study of Two Stay Two Stray (Ts-Ts) and Think-Pair-Share (TPS) Models within Realistic Mathematics Education. *International Journal of Enterprise Modelling*, *17*(3), 130-138.

Syabna, L., & Suriani, A. (2025). Transformation of teacher roles in character education. *Jurnal Pendidikan Karakter, 13*(1), 77–90.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Webb, N. M. (2017). Peer interaction and learning in small groups. *International Journal of Educational Research, 86*, 16–26.

Widianita, R. (2023). Concrete media in cooperative learning for mathematics classrooms. *Jurnal Penelitian Pendidikan Dasar, 11*(2), 101–112.

Yusnan, M. (2025). *Media Pembelajaran Interaktif (Konsep dan Analisis di Sekolah Dasar)*. CV. Eureka Media Aksara.

Yusri, N. S., & Sulaiman, N. A. (2024). Willingness to Communicate Among Pre-University ESL Learners: Teachers' Perceptions and Teaching Strategies. *International Journal of Academic Research in Business and Social Sciences*, *14*(8).

Yusuf, Q., Jusoh, Z., & Yusuf, Y. Q. (2019). Cooperative Learning Strategies to Enhance Writing Skills among Second Language Learners. *International Journal of Instruction*, *12*(1), 1399-1412.

Zuo, S., Huang, Q., & Qi, C. (2024). The relationship between cognitive activation and mathematics achievement: mediating roles of self-efficacy and mathematics anxiety. *Current Psychology*, *43*(39), 30794-30805.