Improving Fraction Concept Understanding Through the Jigsaw Cooperative Learning Model in 4th Grade Students

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ABSTRACT
This study aims to improve students' learning outcomes on the topic of fractions through the implementation of the cooperative learning model, Jigsaw type. This Classroom Action Research (CAR) was conducted in a 4th-grade elementary class consisting of 16 students. The study was carried out in two cycles, each consisting of the stages of planning, implementation, observation, and reflection. Data were collected through learning outcome tests, observations, and field notes. The results showed an improvement in students' learning outcomes. In cycle I, 9 students (56.25%) achieved learning mastery with an average class score of 72. In cycle II, the number of students who achieved mastery increased to 13 students (81.25%) with an average class score of 85. This improvement indicates that the Jigsaw type cooperative learning model is effective in enhancing students' learning outcomes on the topic of fractions. This study recommends the application of the cooperative learning model as an alternative teaching strategy to improve students' learning outcomes, especially on topics that require a deep understanding of concepts, such as fractions.

INTRODUCTION

Education is one of the key aspects in shaping an intelligent and competitive generation. In elementary school mathematics, the topic of fractions is fundamental as it plays a crucial role in mastering concepts that will be built upon in higher levels of education. However, in reality, students' understanding of fractions often becomes a significant obstacle in the learning process (Amo-Asante & Bonyah, 2023). This is due to the abstract nature of fractions, which requires logical thinking and good visualization skills.

SD Negeri 47 Koto Tuo faces a similar challenge. Based on initial observations and the results of students' daily test scores on the topic of fractions, only 7 out of 16 students (43.75%) achieved the minimum mastery score of 75. The low learning outcomes indicate the need for improvements in the learning process. Contributing

factors to this low performance include the lack of engaging and relevant learning media, as well as the teacher-centered teaching methods (Widiawati & Hidayat, 2023).

To address these issues, this study uses the Jigsaw cooperative learning model as a teaching strategy (Assbrina et al., 2024). This model was chosen because it allows students to actively learn, collaborate, and understand concepts through group discussions (Sihite, 2023). It is hoped that this model will improve students' understanding of fractions and their learning outcomes (Hanifah et al., 2024).

This study aims to improve students' learning outcomes on the topic of fractions in the 4th grade of SD Negeri 47 Koto Tuo through the implementation of the Jigsaw cooperative learning model. Additionally, this study also aims to identify the effectiveness of the model in helping students achieve learning mastery.

RESEARCH METHODE

This study employed a Classroom Action Research (CAR) methodology aimed at improving students' learning outcomes on fraction material in Class IV of SD Negeri 47 Koto Tuo. The research was conducted in two cycles, with each cycle consisting of four stages: planning, action, observation, and reflection.

The subjects of this study were 16 students in Class IV of SD Negeri 47 Koto Tuo, consisting of 9 male and 7 female students. The study was carried out in the second semester of the academic year 2024/2025.

Data Collection Techniques

The data were collected using multiple techniques, including:

1. Learning Outcome Tests: Used to measure students' mastery of the fraction material at the end of each cycle.
2. Observation Sheets: Used to monitor the implementation of the cooperative learning model (Jigsaw) and student participation during the learning process.
3. Field Notes: Used to record important events or obstacles encountered during the learning process.

The data were analyzed using both quantitative and qualitative approaches. Quantitative analysis was used to calculate the percentage of students who achieved the minimum passing score (≥ 75) and the class average score. Qualitative analysis was used to describe student engagement and the effectiveness of the Jigsaw learning model.

The success of this research was determined based on the following criteria:

1. At least 80% of students achieved the minimum passing score (≥ 75).
2. Improved student engagement and active participation during the learning process were observed consistently across cycles.

The research focused on addressing the challenges in teaching fractions and evaluating the effectiveness of the Jigsaw cooperative learning model in fostering better learning outcomes among students.

RESULT AND DISCUSSION

Results

The results of this study showed a significant improvement in students' learning outcomes on fraction material through the implementation of the Jigsaw cooperative learning model in two cycles. The following are the details of the results for each cycle:

1. **Cycle I**:

   In Cycle I, students were given a pre-test and a post-test to measure their understanding of fractions. The pre-test results showed that only 7 out of 16 students (43.75%) achieved the minimum passing score of 75. After the implementation of the Jigsaw model in Cycle I, 9 students (56.25%) achieved the passing score, with an average class score of 72.

2. **Cycle II**:

   Following the reflection and improvements made after Cycle I, Cycle II was implemented. At the end of Cycle II, the number of students who achieved the passing score increased to 13 students (81.25%), and the average class score improved to 85. The improvement in student performance was evident in both the post-test results and the increased participation during class activities.

Improvement in Students' Completion Rate (Tuntas) from Cycle I to Cycle II
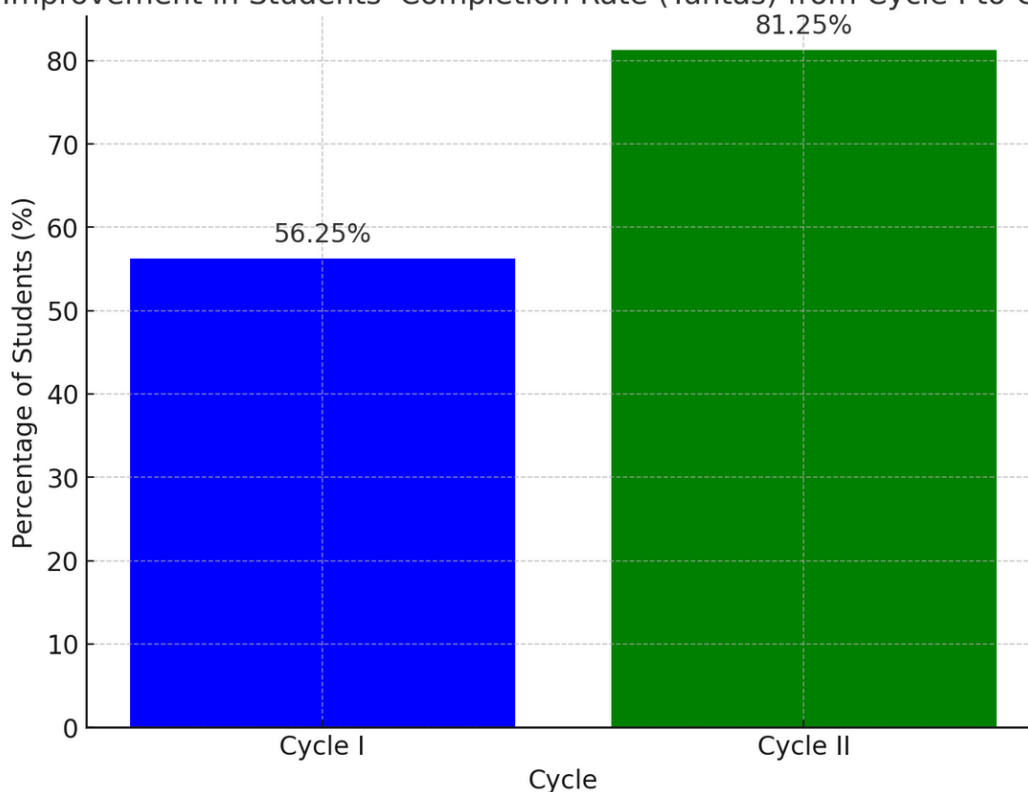
Discussion

The implementation of the Jigsaw cooperative learning model was effective in enhancing students' learning outcomes in fractions. The increase in the number of students who achieved the passing score and the improvement in the class average

score from Cycle I to Cycle II indicate that the model helped students better understand the concept of fractions.

The success of the Jigsaw model in this study can be attributed to several factors:

1. Active Student Participation: The Jigsaw model encourages students to work together in small groups, allowing them to actively engage in the learning process. This collaboration improved their ability to discuss and explain the concept of fractions to each other, reinforcing their own understanding.

2. Peer Teaching: Students were able to explain the material to their peers, which has been shown to improve learning outcomes. By teaching others, students reinforced their own knowledge and gained a deeper understanding of the topic.

3. Motivational Increase: The group-based structure of the Jigsaw model fostered a sense of responsibility among students to help their peers, which motivated them to be more involved in the learning process. This peer support system contributed to their improved performance.

4. Reflection and Adaptation: The reflection phase after Cycle I allowed the researcher to make adjustments to the teaching strategies, such as providing clearer instructions and more focused discussions on difficult concepts, which contributed to the improved results in Cycle II.

However, some challenges were still observed, including time management during group discussions and the initial reluctance of some students to participate actively. These issues were addressed through better planning and guidance during Cycle II.

In conclusion, the Jigsaw cooperative learning model proved to be an effective strategy for improving students' understanding and achievement in fractions. It encouraged active participation, peer collaboration, and mutual support, all of which contributed to enhanced learning outcomes.

CONCLUSION

The conclusion of this study is that the Jigsaw cooperative learning model effectively improves students' learning outcomes on the topic of fractions. The implementation of this model in a 4th-grade class showed significant improvement, with the number of students achieving mastery increasing from 56.25% in Cycle I to 81.25% in Cycle II. This demonstrates the effectiveness of the Jigsaw model in enhancing understanding, particularly for topics requiring deep conceptual knowledge. The study suggests using cooperative learning models as an alternative teaching strategy to improve students' academic performance.

REFERENCES

Amo-Asante, K., & Bonyah, E. (2023). Building students' conceptual understanding of

operations on fractions using manipulatives: A junior high school perspective. *Mediterranean Journal of Social & Behavioral Research*, 7(3), 151–159.

Assbrina, A. M., Misiawati, S. N., Fahrunnisa, S. A., & Sukmawati, W. (2024). Upaya Peningkatan Pemahaman Siswa terhadap Pembelajaran Matematika tentang Pecahan dengan menggunakan Metode Jigsaw pada Siswa Kelas V SDN Halim 01. *Jurnal Pendidikan Guru Sekolah Dasar*, 1(4), 9.

Hanifah, N., Ramadhan, M. G., & Ermawati, D. (2024). Peningkatan Kemampuan Pemahaman Konsep Matematis pada Siswa Kelas V Melalui Model Jigsaw Berbantuan Media Papan Multifungsi. *Cartesius: Jurnal Pendidikan Matematika*, 200–212.

Sihite, M. S. R. (2023). Implementation of Cooperative Model's Jigsaw to Improve Mathematic Ability of Students. *Conference Proceedings International Conference on Education Innovation and Social Science*, 119–126.

Widiawati, D. I., & Hidayat, M. T. (2023). Implementation of Mathematics Learning with Cooperative Learning Model in Elementary School. *International Conference on Learning and Advanced Education (ICOLAE 2022)*, 614–622.