Teams-Assisted Individualization: Teachers' Efforts to Improve Students' Mathematics Learning Outcomes Through Collaborative Learning Models

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ABSTRACT

Students share knowledge in groups during cooperative learning, which is a learner-centered learning process. The cooperative learning paradigm aids students in acquiring knowledge and abilities in the classroom. A learning adaptation strategy called Teams-Assisted Individualization (TAI) includes a justification that can explain how individual differences in students' skills or accomplishments have a meaningful impact on learning. The TAI cooperative learning paradigm has been the subject of numerous published studies, however, this study will concentrate on studies focusing on the topic of elementary school mathematics. The goal of this study is to describe how TAI cooperative learning is used to enhance student math learning outcomes in second-grade elementary school students as well as to assess how the TAI cooperative learning model is used to enhance student math learning outcomes. In one of the public elementary schools in South Tangerang City, Banten, Indonesia. The TAI cooperative learning model has been demonstrated to be able to improve second-grade students' mathematics learning outcomes. The study's final findings revealed an improvement in students' math scores from pre-cycle to cycle 2, with a maximum of 37 students, or 90.2% of 41 students, attaining a score representing a complete learning achievement. The four students who had not achieved mastery learning were offered enrichment and reteaching in accordance with their individual needs.

KEYWORDS: the Team Assisted Individualization Type Cooperative Learning Model, academic content and skills, achievements

INTRODUCTION

In cooperative learning settings, students are encouraged to collaborate on the same activity and are obliged to do so in order to successfully accomplish the assignment. Learning activities become more cooperative when groups of kids have the same objectives (Arends, 2013). According to Hossain et al. (2018), cooperative learning approaches have a significant impact on students' mathematical achievement. Students share knowledge in groups during cooperative learning, a process that is learner-centered (Rohmah et al., 2022). Students can acquire academic knowledge and abilities by using the cooperative learning paradigm (Hermawan et al., 2020; Sudin et al., 2021). The goal of cooperative learning is to give students the space and framework they need to reflect on and work on the subject matter they will be studying (Busahdiar et al., 2022). In order to identify the material to be studied, cooperative learning is a strategy that places an emphasis on student action and participation (Rosfiani et al., 2021).

The use of cooperative learning techniques in the classroom can be difficult, especially when there are many students present (Garca-almeida & Cabrera-nuez, 2018). As a result, it is important to identify success factors and the ways in which students construct knowledge when using cooperative learning.

In essence, Teams-Assisted Individualization (TAI) offers a justification for modifying learning that is able to convey the significance of individual differences associated with students' aptitudes or accomplishments. TAI is a component of group learning. The TAI learning style places students in diverse small groups of four to five. Additionally, the teacher offers each student who requires it individual support. Without assistance from other members, a separate test is given to each member. The teacher must focus on each student while they take this individualized test. Students' abilities to work independently (without using cheating methods) are also taken into account while determining their scores (Priansa, 2017: 351).

Groups that are able to correctly answer more questions and successfully finish their homework are rewarded. Students who achieve an average score higher than the required minimum on the final test receive additional points (extra points) from the teacher. The teacher can explain questions that are typically regarded as difficult by students since in the TAI learning model, students are required to verify each other's work and complete assignments based on a certain set of questions. Individual accountability, equal opportunity for achievement, and motivational dynamics are the key components that teachers must stress in this TAI learning approach (Priansa, 2017: 351).

stages of the TAI Type Cooperative Learning Model's implementation. a) The teacher assigns homework for each student to complete; b) the teacher gives each student a quiz to determine their baseline or initial grade; c) the teacher divides the class into various groups. Each group has 4-5 students with a range of skills, including kids with high, medium, and low talents. If at all feasible, group members represent a variety of races, cultures, nationalities, and gender identities. The teacher assists students in summarizing, directing, and providing confirmation to the learning material that has been studied; f) The teacher gives quizzes to students individually; g) The teacher awards groups based on the acquisition of an increase in individual learning outcomes from basic scores to quiz scores (Priansa, 2017: 356). In group discussions, each group member checks the answers of a groupmate.

The Teams-Assisted Individualization (TAI) cooperative learning approach has been the topic of numerous published studies, but this study will concentrate on studies that specifically address primary school mathematics. Therefore, the goal of this study is to describe how TAI cooperative learning is used to enhance student mathematics learning outcomes in second-grade elementary school students as well as to assess this model's effects on student mathematics learning outcomes.

The contribution to this research is to help teachers apply the Teams Assisted Individualization cooperative learning model and to help teachers compile interesting, new, relevant, and intellectually challenging Mathematics learning topics that will challenge students' creative thinking.

METHOD

The four stages of this classroom action research project were planning, implementing, observing, and reflecting. Second graders and their teachers from a public elementary school in South Tangerang, Indonesia, took part in this study. The study featured a total of 41 pupils, including 19 boys and 22 girls. Tests and observations were used to gather data. In addition to how well pupils perform on the test, their ability to work independently is also taken into account when calculating their grades. While evaluations of the students' and teachers' performance in the Teams-Assisted Individualization (TAI) stage were made.

RESULT AND DISCUSSION

Pre-Cycle

Strengths and shortcomings are covered in reflection. Reflection on the pre-cycle reveals that student learning outcomes are subpar and fall short of the required minimum level of learning completion, which is a score of 80. The results of the pre-cycle show that out of 41 students, 25 students are incomplete, or 60.9% below the completeness score, while the other 16, or 39% got a completeness score. It is required to take action in order to enhance learning outcomes in cycle 1 in light of the findings of these reflections.
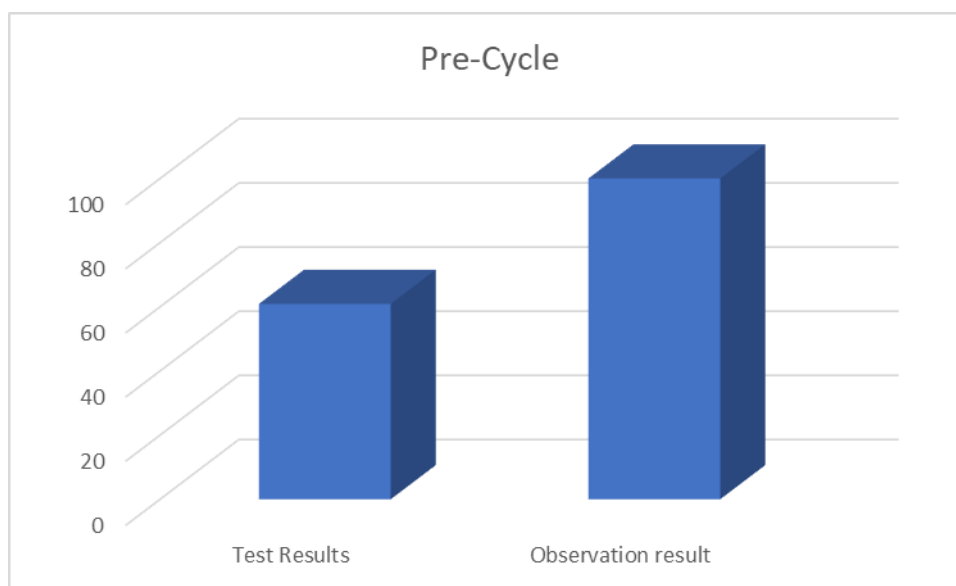
Figure 1. A graph of student learning outcomes and observations of the teacher's performance

Cycle 1

Data on student learning outcomes from cycle 1 revealed that 19 students had a mastery learning score of 46.3%, while the other 22 students had not completed or around 53.6%. The instructor feels that corrective action must be taken in order to enhance both teacher effectiveness and student learning outcomes.
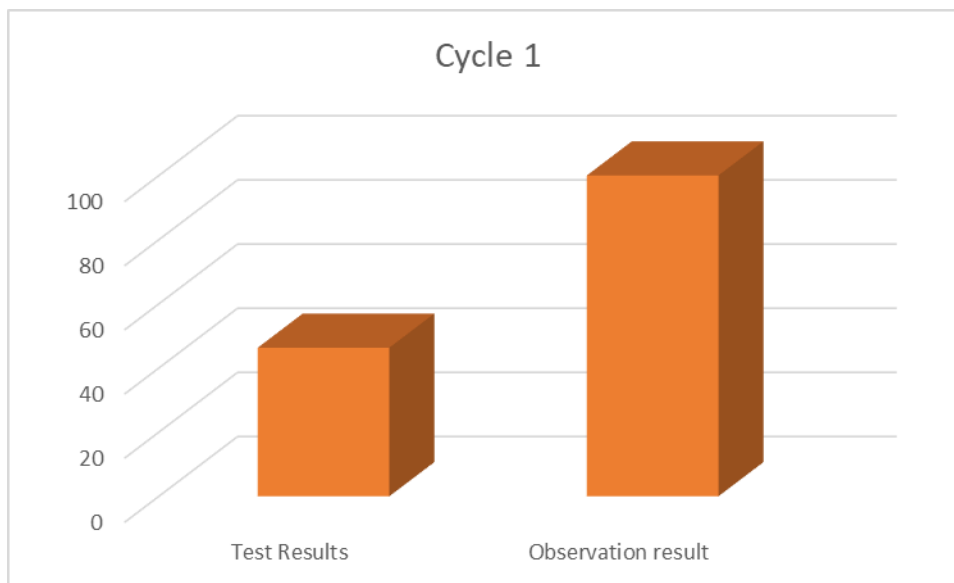

Figure 2. A graph of student learning outcomes and observations of the teacher's performance Cycle 2

The results of the second cycle of reflection showed that the student learning outcomes were satisfactory and fulfilled the learning completeness criteria 80. The data on learning achievement revealed that 37 students finished, or roughly 90.2%, whereas the remaining four students did not finish, or roughly 9.8%. The instructor made the decision to halt the study project and implemented an enrichment and reteaching program for the four students.
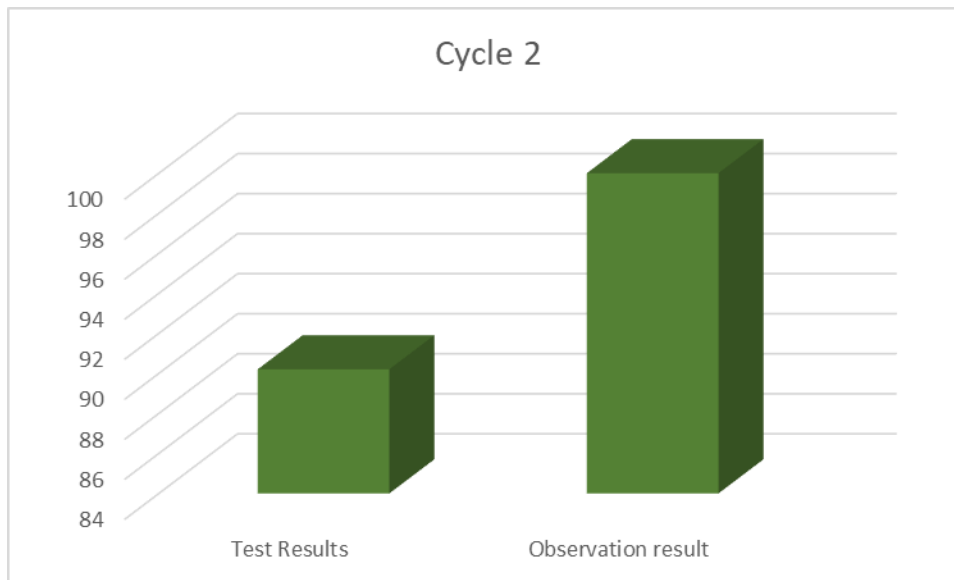
Figure 3. Graph of Teacher Performance Observations and Student Learning Outcomes

Figure 4 below presents comparison information on mathematics learning outcomes for grade II students in pre-cycle, cycle 1, and cycle 2 using the Teams-Assisted Individualization (TAI) cooperative learning method.
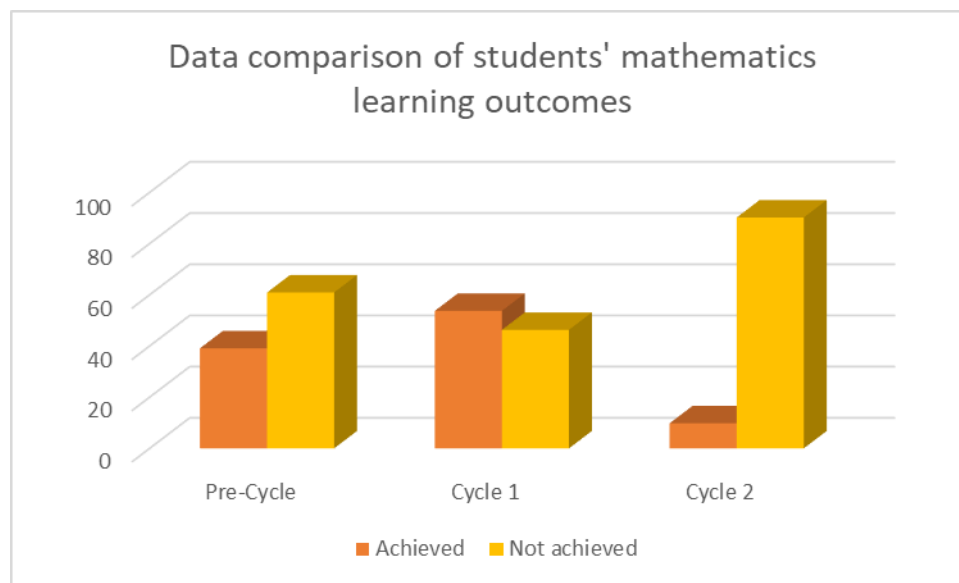

Figure 4. Data on the pre-cycle, cycle 1, and cycle 2 mathematics learning results for second-grade pupils

The findings of this study are also consistent with those of Hossain's (2018) study, which discovered that by collaborating in small groups, students were able to improve their interpersonal competency and attain academic success. All students, regardless of skill level, learning style, ethnic background, age, or gender, benefit from cooperative learning models including Learning Together,

STAD, TGT, TAI, CIRC, GI, Jigsaw, and Complex Instruction. Other findings from this study support earlier research's assertion that cooperative learning significantly affects students' levels of democratic views (Erbil, 2017). According to Hossain (2018), using cooperative learning is an excellent technique to raise students' math proficiency and communication abilities.

CONCLUSION

In one of the public primary schools in South Tangerang City, Banten, the Teams-Assisted Individualization (TAI) cooperative learning paradigm has been demonstrated to be able to improve second-grade students' mathematics learning outcomes. The study's final findings revealed an improvement in students' math scores from pre-cycle to cycle 2, with a maximum of 37 students, or 90.2% of 41 students, attaining a score representing a complete learning achievement. The four students who had not achieved mastery learning were offered enrichment and reteaching in accordance with their individual needs.

REFERENCES

Arends, R. I. (2013). *Learning to teach.* Edition 9. Book 2. p. 64. New York: The McGraw Hill Education.

Busahdiar., Rahmah, S., Rosfiani, O., Basith, A., Ayuhan., Ali, M., & Sudin, M. (2021). Think-Pair-Share (T-P-S): *Improving the achievement of students' learning and cooperation*. Paper presented at the ICOLLITE, pp. 114–119. https://doi.org/10.2991/978-2-494069-91-6_18

Erbil, D. G., & Kocabaş, A. (2018). Cooperative learning as a democratic learning method. *Journal of Research in Childhood Education* , *32* (1), 81–93. https://doi.org/10.1080/02568543.2017.1385548

García-almeida, D. J., & Cabrera-nuez, M. T. (2018). The influence of knowledge recipients' activities on knowledge construction in cooperative learning experiences. *Active Learning in Higher Education, 21*(1), 79-92. https://doi.org/10.1177/1469787418754569

Hermawan, C. M., Rosfiani, O., Suheti., & Susanti, S. F. (2020). STAD type cooperative learning model: An action in learning mathematics. *International Journal of Scientific & Technology Research*, *9*(4), 1871–1875.

Hossain, A., Rezal, M., & Ariffin, K. (2018). Integration of structured cooperative learning in mathematics classrooms. *International Journal of Psychology and Educational Studies*, *5* (1), 23-29.

Priansa, D. J. (2017). *Pengembangan strategi & model pembelajaran*. Bandung: Perpustakaan Nasional RI.

Rohmah, S., Rusyiah., Hermawan, C. M., Mutiara, D., Lubis, A. F., Shofiyah, S., & Rosfiani, O. (2022). *Knowledge sharing in groups to improve learning outcomes and social skills of elementary school students*. Paper presented at the ICOLLITE, pp. 524–530, 2022. https://doi.org/10.2991/978-2-494069-91-6_82

Rosfiani, O., Hermawan, C. M., Maisaroh, S., Romannada, L., Mawartika, N. F., & Ramadhan, A. I. (2021). *Collaboration on involvement in improving science learning outcomes through group*

investigation. Paper presented at the PVJ_ISComSET. doi:10.1088/1742-6596/1764/1/012096

Sudin, M., Hermawan, C. M., Rosfiani, O. (2020). *Improve mathematics pedagogical content knowledge and verbal communication skills through cooperative learning type Jigsaw*. Paper presented at the PVJ_ISComSET. doi:10.1088/1742-6596/1764/1/012094.