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The Team Accelerated Instruction Model Improves Mathematics Learning Outcomes

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ABSTRAK

Kegiatan belajar guru kurang kreatif dan inovatif terutama pada pembelajaran matematika. Guru juga sangat jarang memberikan tugas. Guru kurang menerapkan model inovatif dan guru kurang memotivasi siswa untuk belajar. hasil wawancara didapatkan bahwa rendahnya hasil belajar matematika pada siswa karena sulitnya mengembangkan pemahaman siswa ketika belajar. Tujuan penelitian ini yaitu menganalisis pengaruh model TAI terhadap hasil belajar matematika. Jenis penelitian ini yaitu eksperimen semu. Jumlah populasi yaitu 125. Jumlah sampel 82. Metode pengumpulan data yaitu tes. Instrument yang mengumpulkan data yaitu lembar soal. Teknik analisis data yaitu deskriptif dan statistic incerensial. Hasil penelitian yaitu hasil analisis uji t diperoleh nilai signifikansi (2-tailed) sebesar 0,000. Dengan demikian, dapat diinterpretasikan bahwa terdapat perbedaan yang signifikan hasil belajar Matematika yang mengikuti pembelajaran TAI dengan pembelajaran Konvensional. Maka, TAI dapat meningkatkan hasil belajar Matematika. Implikasi penelitian ini yaitu dengan penerapan TAI menyebabkan hasil belajar matematika siswa menjadi meningkat. Siswa semangat dan aktif selama kegiatan pebelajaran berlangsung.

ABSTRACT

Teacher learning activities are less creative and innovative, especially in learning mathematics. Teachers also very rarely give assignments. Teachers do not apply innovative models, and teachers do not motivate students to learn. The interviews showed that the low learning outcomes of mathematics in students were due to the difficulty of developing students' understanding when studying. The purpose of this study is to analyze the effect of the TAI model on mathematics learning outcomes. This type of research is quasi-experimental. The total population is 125. The number of samples is 82. The data collection method is a test. The instrument that collects data is the question sheet. The data analysis techniques are descriptive and inferential statistics. The study's t-test analysis results obtained a significance value (2-tailed) of 0.000. Thus, it can be interpreted that there is a significant difference in mathematics learning outcomes following TAI learning with conventional learning. So, TAI can improve mathematics learning outcomes. This research implies that the application of TAI causes students' mathematics learning outcomes to increase. Students are enthusiastic and active during the learning activities.

1. INTRODUCTION

The development of a nation and state requires quality education to improve human resources. Quality education can improve the quality of life and create someone who is superior and has the ability in certain scientific fields (de Wit & Altbach, 2020; Selvaraj et al., 2021; Stellmacher et al., 2020). In the industrial era 4.0, society requires a qualified and professional educator to improve human quality (Lase, 2019; Nursyifa, 2019; Trisiana et al., 2019). Quality education is synonymous with quality learning activities carried out by teachers when carrying out learning activities (Cedillo et al., 2019; Ivanov et al., 2019; Lase, 2019). Good lesson planning arranged by the teacher can improve the quality of learning and achieve the specified goals (Maharani & Kristin, 2017; Pattanang et al., 2021; Pranoto, 2021; Yasa, Ariawan, 2017). Mathematics is important in various disciplines (Ikbal et al., 2018; Prasedari et al., 2019). The development of science and technology in this era of globalization is also in dire need of a mathematical mindset. Mathematics content is a charge that must be given to students (Gularso et al., 2021; Yusri, 2018). Students studying mathematics are expected to understand

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concepts, facts, operations, and principles related to mathematics. Learning mathematics can also make students have reasoning and problem solving that can be used (Ananda, 2018; Hasanah et al., 2019; Sari et al., 2020). In addition, mathematics can also improve understanding of concepts and good communication in students. Learning outcomes are the final results after learning activities through measurement and assessment (Rimawati & Wibowo, 2018; Susanti, 2019). This learning result is useful for measuring students' success in participating in learning activities (Nofrialdi et al., 2018; Prasedari et al., 2019). The teacher must design a good mathematics lesson.

But the reality is learning mathematics and tend to get bored when studying math (Nenotaek et al., 2019; Turgut & Turgut, 2018). Another finding states that students have difficulty learning mathematics (Ananda, 2018; Dwipayana et al., 2018; Machaba, 2018; Paroqi et al., 2021). Difficulties in learning mathematics are found in difficulties in remembering, understanding, and applying mathematical concepts. The lack of learning media that can facilitate learning also affects students' ability to capture information. Moreover, abstract material will be difficult for elementary school students to understand. Whereas mathematical concepts are very important to understand and to train and strengthen memory so that students can remember a material longer, mathematics is also necessary for solving various problems in everyday life. The results at SD Cluster IX, Kintamani sub-district, also found several obstacles, namely first, in learning activities, teachers were less creative and innovative, especially in learning mathematics. Second, the teacher rarely gives assignments, so students are not actively learning. Third, teachers do not apply innovative models, and teachers do not motivate students to learn. The interviews showed that the low learning outcomes of mathematics in students were due to the difficulty of developing students' understanding when studying. Students have not been able to relate to the material. In group learning, students are not actively involved and remain silent.

The solution can be applied using the Team Accelerated Instruction (TAI) model. The learning model is one of the learning activities carried out systematically (Hurriyah, 2017; Ngilamele et al., 2019). TAI has the characteristic that individuals learn independently about the material (Ariani, 2017; Jaziroh, 2019). After students learn independently, they are discussed in one group, and then an assessment is carried out with the group. It causes all group members to have responsibility for all the answers that have been discussed together (Ariani, 2017; Isa et al., 2017). The assessment carried out by the teacher in this model is based on learning outcomes. Activities prioritize heterogeneous abilities. Learning in groups is expected to help students with less ability to learn. Individual learning is applied with a combination of objectives to help each other and strive for team success (Cahyaningsih, 2019; Ujianti, 2019). Innovative models can help seriously and passionately (Sujana et al., 2018; Witari et al., 2017). TAI cooperative type makes it easier for students and increases motivation (Ariani, 2017; Isa et al., 2017; Jaziroh, 2019).

Previous research findings stated that the Team Assisted Individualization (TAI) learning model based on the Tri Hita Karana value positively affected students' reading skills learning outcomes (Iswari et al., 2021). Student achievement can be improved by applying the steps of the Team Assisted Individualization (TAI) Cooperative learning model with Peer Tutors (Mertayasa, 2021). There is no study on TAI on mathematics learning outcomes. The advantage of the TAI model is that it is designed to provide satisfaction. Another advantage is that it can minimize teacher involvement in learning and strengthen team collaboration. This cooperative learning can build student conditions to form a positive attitude. This study aimed to analyze the TAI model's effect on the mathematics learning outcomes of Gugus IX, Kecamatan Kintamani. It is hoped that TAI can help students learn mathematics.

2. METHOD

This type of research is a quasi-experimental design of Non-Equivalent Post-test Only Control Group Design. The location of the implementation of this research is in SD Gugus IX, Kecamatan Kintamani, Kabupaten Bangli, namely SD 1 Songan, SD 5 Songan, SD 6 Songan, SD 8 Songan and SD 9 Songan. The total population is fourth-grade students at SD N 1 Songan (16 students), SD 5 Songan (33 students), SD 6 Songan (39 students), SD 8 Songan (12 students), and SD 9 Songan (25 students), so that the total namely 125 students. The number of samples in this study was 82 with random sampling. The instrument is a sheet of learning outcomes. The data analysis techniques are descriptive and inferential statistics. A descriptive statistical analysis was conducted to determine students' mathematics learning outcomes. Inferential statistics are used to determine differences in students' mathematics learning outcomes. In this study, the data analysis technique used to test the research hypothesis is the T-test.

3. RESULT AND DISCUSSION

Result

The data described in this study are data on the results of learning Mathematics for Cluster IX, Kintamani District, Bagli Regency as a treatment of the effect of the TAI model on the experimental group and the effect of conventional learning on the control group. The post-test results on 16 students who studied under the

influence of TAI obtained the highest score of 29 and 18. The mode of the experimental group was 24.25, and the median was 24.07. The polygon curve of learning outcomes data is presented in Figure 1.

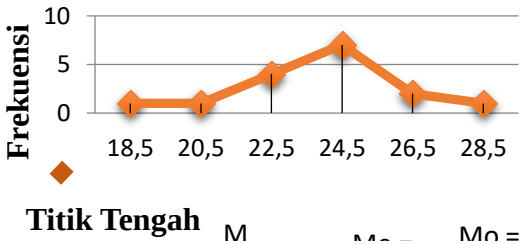

Figure 1. Polygon Curve of Learning Outcomes Data

This shows the experimental group's mean is 23.88 (very high). From the post-test results on 25 students who studied conventionally, the highest score was 24, and the lowest was 13. The mode of the control class was 15.5. The mean of the control class is 17.02. The control group's student scores tended to be low. The mean mathematics learning outcomes of control group students was 17.02 (medium). The normality test results are the experimental group is 0.546, while the control group is 0.178, so the distribution is normal. The homogeneity test was significant at 0.312, so it was homogeneous. Based on the results of the t-test analysis, the results obtained are 0.000. It shows a significance value of less than 0.05 ($p < 0.05$), so there are differences in Mathematics learning outcomes of the TAI and Conventional learning groups. The results of the t-test are in Table 1.

Table 1. Hypothesis Test Results

Statistic	F	Sig	T	Df	Sig(2-tailed)	Mean Difference	Std.Error Difference	Lower	Upper
Hasil Belajar Equal Variances Assumed	1.048	.312	-7.652	39	.000	-6.91500	.90366	-8.74283	-5.08717
Equal Variances not Assumed			-7.895	35.317	.000	-6.91500	.87591	-8.69263	-5.13737

Discussion

The thing that became the planning of this research is understanding the learning syntax used more deeply. The results showed several findings. First, there are differences in mathematics learning outcomes between the TAI and conventional groups. The TAI model improves the learning atmosphere. In its application, the teacher forms a heterogeneous group. Before distributing the task, give short material to study on their own, then discuss it with their group friends. It will help create a pleasant learning atmosphere for students (Hurriyah, 2017; Yunita & Tristiantari, 2019). In addition, the teacher also creates a perception in students that success depends on the group's success. Of course, this will help create a more active learning atmosphere (Cahyaningsih, 2019; Ujianti, 2019). The TAI model also involves students directly in making decisions about problems, which will certainly improve the learning atmosphere to be more conducive and good. Other students cannot be silent because it will reduce group points. It allows students to explore their knowledge and argue in finding a new concept. This learning process is certainly student-centered so that learning activities become fun (Leonard & Nwanekezi, 2018; Nugraha et al., 2016; Subiyantari et al., 2019).

Second, the TAI model improves learning outcomes. TAI combines individual learning with groups to help overcome students' learning difficulties (Isa et al., 2017; Ujianti, 2019). This learning model is specifically designed for elementary school mathematics learning (Ariani, 2017; Isa et al., 2017). In its application, students are required to learn on their own first so that it can stimulate students to learn actively (Febriyanti & Jayanta, 2018; Hengki et al., 2017; Turgut & Turgut, 2018). So that the effect on learning outcomes increases. It affects the teacher who has a duty as a facilitator for students with difficulty learning. TAI can help increase motivation to learn. In learning, the teacher's task is to condition students to study in groups and do the given tasks to significantly increase students' learning motivation (Sujana et al., 2018; Witari et al., 2017). The teacher gives a score and then rewards the group that completes the task, such as mentioning the group of students with the fastest, best, and OK group and giving prizes to the group with the highest score. It will certainly increase

motivation (Hasanah et al., 2019; Lagur et al., 2018; Sujana et al., 2018). Collaboration in groups can raise enthusiasm; of course, it will affect student learning motivation (Dadri & Putra, 2017; Kua et al., 2019).

This finding is reinforced by previous findings, which state that the TAI model can improve learning outcomes (Isa et al., 2017; Ujianti, 2019). The TAI model can also improve student achievement (Mertayasa, 2021). TAI can make it easier for students and increase motivation when participating in learning activities (Ariani, 2017; Isa et al., 2017; Jaziroh, 2019). TAI makes self-study (Ariani, 2017; Jaziroh, 2019). From the discussion of the TAI model, it has a positive effect on learning. The advantages of this learning model have made several researchers research to prove the effectiveness of the TAI model. Team Assisted Individualization (TAI) can motivate students to discuss learning so that student learning outcomes can be better than before being treated using the Team Assisted Individualization (TAI) type cooperative learning model. The attitude of students who tend to be apathetic can be reduced because before learning begins, students tend to feel lazy. After all, the learning process in class only listens to what is said by the teacher and answers all questions given by the teacher. It can increase student learning outcomes by actively involving students in the learning process with the Team Assisted Individualization (TAI) model. This research implies that the application of TAI causes students' mathematics learning outcomes to increase. Students are enthusiastic and active during the learning activities.

4. CONCLUSION

The data analysis showed differences in mathematics learning outcomes between the TAI and conventional groups. The application of the team-assisted individualization model improves student learning outcomes, so this model is suitable to be applied in learning. It is recommended for teachers to use the team-assisted individualization model to make it easier for students to learn.

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