



Improving Learning Outcomes on Kinetic through the Cooperative learning Model of STAD type Assisted by Audio Visual Media at Elementary School

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ABSTRAK

Penelitian ini dilatar belakangi oleh rendahnya hasil belajar peserta didik pada materi energi gerak di kelas IV SDN 12 Babana Kabupaten Bulukumba. Salah satu faktor penyebabnya adalah penggunaan metode ceramah yang membuat peserta didik pasif dan kurang termotivasi. Oleh karena itu, penelitian ini bertujuan untuk meningkatkan hasil belajar energi gerak melalui penerapan model pembelajaran kooperatif tipe *Student Teams Achievement Divisions* (STAD) berbantuan media audio visual. Penelitian ini menggunakan pendekatan kuantitatif dengan jenis penelitian eksperimen dan desain Quasi Experimental Design. Populasi penelitian adalah seluruh peserta didik kelas IV SDN 12 Babana, dengan teknik pengambilan sampel menggunakan probability sampling. Teknik pengumpulan data dilakukan melalui tes hasil belajar dan observasi keterlibatan peserta didik. Analisis data menggunakan statistik deskriptif dan inferensial, meliputi uji normalitas, uji homogenitas, dan uji hipotesis dengan independent sample T-test. Hasil penelitian menunjukkan bahwa model pembelajaran kooperatif tipe STAD berbantuan media audio visual efektif meningkatkan hasil belajar peserta didik. Hal ini dibuktikan dengan meningkatnya keterlibatan siswa selama proses pembelajaran serta perbedaan hasil belajar yang signifikan sebelum dan sesudah perlakuan. Dengan demikian, dapat disimpulkan bahwa penerapan model pembelajaran kooperatif tipe STAD berbantuan media audio visual berpengaruh positif dan signifikan terhadap peningkatan hasil belajar energi gerak pada peserta didik kelas IV SDN 12 Babana Kabupaten Bulukumba.

Kata Kunci: Audio Visual, Energi Gerak, Hasil Belajar, Kooperatif, STAD

ABSTRACT

This study was motivated by the low learning outcomes of fourth-grade students at SDN 12 Babana, Bulukumba Regency, in the topic of motion energy. The main cause identified was the use of conventional lecture methods, which made students passive and less motivated to learn. Therefore, this research aimed to improve students' learning outcomes on motion energy through the application of the Student Teams Achievement Divisions (STAD) cooperative learning model assisted by audio-visual media. This research employed a quantitative approach with an experimental method using a Quasi-Experimental Design. The population consisted of all fourth-grade students at SDN 12 Babana, with samples selected through probability sampling. Data were collected through learning outcome tests and classroom observations. The data analysis employed descriptive and inferential statistics, including normality tests, homogeneity tests, and hypothesis testing using the independent sample T-test. The results showed that the STAD cooperative learning model assisted by audio-visual media was effective in enhancing students' learning outcomes. This effectiveness was evident in the increased student engagement during the learning process and the significant improvement in test scores after the treatment compared to before. In conclusion, the implementation of the STAD cooperative learning model assisted by audio-visual media had a positive and significant effect on improving motion energy learning outcomes among fourth-grade students at SDN 12 Babana, Bulukumba Regency.

Keywords: Audio-Visual Media, Cooperative Learning, Learning Outcomes, Motion Energy, STAD

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1. INTRODUCTION

The Indonesian *Merdeka Curriculum* emphasizes student-centered, interactive, and engaging learning experiences. However, in practice, many classrooms remain dominated by lecture-based methods that are teacher-centered and passive. This condition negatively affects students' achievement, particularly in science subjects. In the topic of motion (kinetic) energy, for instance, students struggle to grasp abstract concepts due to the lack of meaningful and hands-on learning experiences. A preliminary survey at SDN 12 Babana, Bulukumba Regency, revealed that only 10 out of 22 fourth-grade students reached the minimum mastery criterion (70), while the rest scored below the standard. This indicates a critical issue in the selection of appropriate instructional models to suit the nature of the content.

Recent studies have consistently shown that the Student Teams Achievement Divisions (STAD) cooperative learning model can improve student engagement and learning outcomes. Evianti, Mulyani, and Marlina (2023) reported that STAD combined with audiovisual media significantly improved thematic learning outcomes of fifth-grade elementary school students, both cognitively and psychomotorically. Similarly, Maulidya, Halidjah, and Kartono (2023) found that cooperative learning supported by audiovisual media had a very strong impact on cognitive learning outcomes in science. In another classroom action research, Pendem (2024) demonstrated that STAD integrated with audiovisual media sustainably improved student achievement in elementary madrasahs. At the secondary level, Permatasari et al. (2024) showed that STAD supported by video learning enhanced both achievement and enthusiasm in seventh-grade science classes. Furthermore, Sufanti and Santosa (2024) emphasized that STAD strategies assisted by multimedia such as PowerPoint or teaching aids were effective in mathematics, with the effectiveness varying according to students' learning styles.

Despite these promising findings, most of the existing research focuses on middle or high school contexts, and often in subjects such as mathematics or general science. There is still limited research specifically investigating the integration of STAD with audiovisual media in teaching the topic of motion energy at the elementary level. Moreover, previous studies have predominantly highlighted cognitive outcomes, while the dimension of student engagement during science learning activities has received less attention. Additionally, most research has been conducted in urban schools with relatively adequate resources, leaving a gap in understanding how this model functions in rural settings such as SDN 12 Babana.

Based on the analysis above, this study addresses the following research questions: (1) How is the implementation of the STAD cooperative learning model assisted by audiovisual media carried out in teaching motion energy in fourth-grade students of SDN 12 Babana? and (2) To what extent does the use of STAD with audiovisual media improve students' learning outcomes compared to conventional instruction? The objective of this study is to describe the implementation of STAD assisted by audiovisual media and to analyze its impact on students' learning outcomes. The novelty of this research lies in integrating the STAD cooperative learning model with audiovisual media in the context of elementary school science, particularly within a rural area. This study not only contributes to improving motion energy learning outcomes but also offers

practical instructional strategies for teachers to support the implementation of the *Merdeka Curriculum*.

2. METHODS R

This research employed a quantitative approach with an experimental type of study, specifically using a Quasi-Experimental Design. The design was chosen because it allows for testing the effect of an instructional model in a real classroom setting without requiring full randomization, which is often not feasible in educational contexts. The study focused on examining the impact of the Student Teams Achievement Divisions (STAD) cooperative learning model assisted by audiovisual media on students' learning outcomes in the topic of motion energy. The population of this study consisted of all fourth-grade students at SDN 12 Babana, Bulukumba Regency, during the 2024/2025 academic year. From this population, a sample was selected using a probability sampling technique, ensuring that each student had an equal chance of being included. The final sample involved one intact class of 22 students, who were directly engaged in the intervention and assessment activities.

Data were collected through two main instruments: tests and observations. The test instrument was used to measure students' cognitive learning outcomes in the topic of motion energy, administered both before and after the intervention. Meanwhile, classroom observations were conducted to document student engagement, participation, and the effectiveness of the teaching process during the implementation of STAD with audiovisual media. These instruments were validated by experts and piloted to ensure their reliability and accuracy.

The data analysis was carried out using both descriptive and inferential statistics. Descriptive statistics were applied to summarize students' performance and engagement during the learning process, providing a general overview of the results. Inferential analysis was then employed to test the research hypotheses, including normality and homogeneity tests as prerequisites, followed by an independent sample T-test to determine the significance of differences in student learning outcomes before and after the implementation of the model. This comprehensive approach ensured that the findings were both empirically sound and statistically valid.

3. RESULTS AND DISCUSSION

The findings of this study confirmed that the implementation of the STAD cooperative learning model assisted by audiovisual media had a significant effect on improving students' learning outcomes in the topic of motion energy. This result aligns with previous studies by Evianti et al. (2023) and Maulidya et al. (2023), who also reported significant gains when audiovisual support was integrated into cooperative learning. In line with Slavin's (1995) theoretical framework, the success of STAD lies in structured collaboration and accountability among group members, which was evident in the present study.

A closer look at the results across **learning cycles** provides further insights into the progression of student performance. In the **first cycle**, student engagement began to increase compared to the preliminary observation, yet some students still relied heavily on their peers and had difficulty presenting their ideas. The test results from this cycle showed an initial improvement, but not all students had reached the minimum mastery criterion. This indicates that while the cooperative structure encouraged participation, the novelty of the method still required adaptation.

By the **second cycle**, notable changes were observed. Students became more accustomed to group roles and the collaborative process of STAD. The use of audiovisual media, such as animated videos and visual demonstrations of motion energy, helped clarify abstract concepts, allowing students to actively connect theory with concrete examples. Test results in this cycle showed a significant increase in the number of students achieving scores above 70, and observation data revealed that almost all students were actively contributing to group discussions. The cycle also highlighted that student not only improved their test performance but also displayed greater enthusiasm and responsibility in peer collaboration.

The results across cycles demonstrate that improvement did not occur instantly but developed gradually as students adjusted to the cooperative learning structure and integrated audiovisual resources. These findings echo the conclusions of Pendem (2024) and Permatasari et al. (2024), who emphasized the importance of iterative learning processes in sustaining student achievement in cooperative classroom settings.

Thus, this study provides both empirical and practical evidence that combining STAD with audiovisual media is not only effective in raising cognitive achievement but also transformative in fostering active engagement, collaborative learning, and meaningful understanding of science concepts in elementary school contexts.

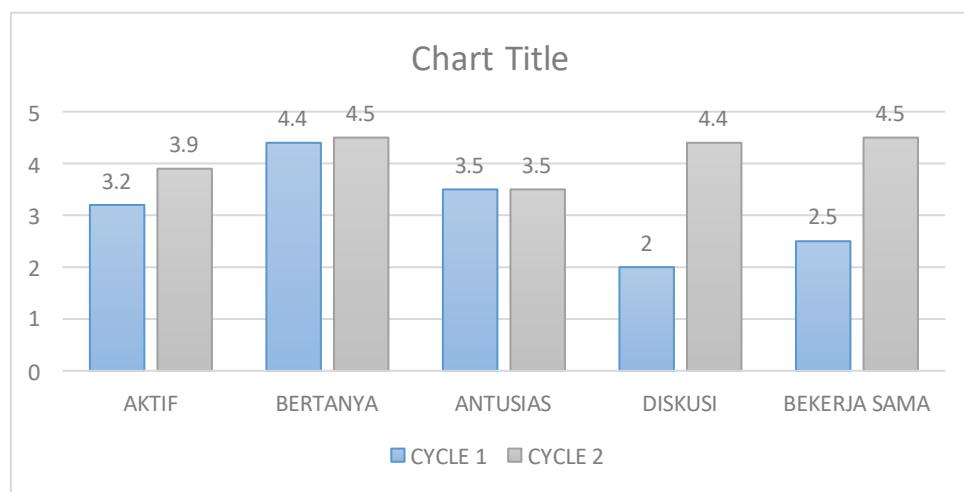


Figure 1. The result from cycle 1 and cycle 2

Discussion

This study examined the effectiveness of the STAD cooperative learning model assisted by audiovisual media in teaching motion energy to elementary students. The findings confirmed the research hypotheses: the intervention significantly improved student achievement and engagement compared to conventional teaching. Statistical analysis, including the independent sample T-test and a high effect size, shows that these gains were directly attributable to the instructional model.

The improvement in post-test scores demonstrates that STAD with audiovisual support successfully addressed students' difficulties in understanding abstract concepts. The cooperative structure promoted accountability and peer support, while audiovisual media clarified learning materials and increased motivation. Together, these elements created a learning environment aligned with the *Merdeka Curriculum*, which emphasizes inquiry, collaboration, and active participation.

Results across cycles further highlight this progression. In the first cycle, students showed modest improvements but were still adapting to group roles, with several not yet reaching the mastery criterion. By the second cycle, participation became more evenly distributed, discussions were more dynamic, and the majority of students surpassed the standard. The consistent rise in performance across cycles indicates that the combination of cooperative learning and audiovisual media not only improved cognitive outcomes but also fostered habits of collaboration and responsibility.

These findings are consistent with recent research (Evianti et al., 2023; Maulidya et al., 2023; Pendem, 2024; Permatasari et al., 2024), all of which demonstrate that STAD supported by multimedia enhances learning results. The novelty of this study lies in its rural elementary school setting, showing that such approaches can be effective even in resource-limited contexts. This provides practical insights for teachers who wish to adapt cooperative learning strategies in diverse classrooms.

Although promising, the study was limited to a single class of 22 students, which restricts generalizability. Future research should include larger and more varied samples to strengthen external validity. Beyond test scores, further studies could examine the effects on critical thinking, creativity, and long-term retention. Mixed-methods approaches are also recommended to capture students' and teachers' perspectives more deeply. Exploring the integration of STAD with interactive technologies, such as simulations or gamified platforms, would provide additional innovation for science education.

4. CONCLUSION

This study concludes that the implementation of the Student Teams Achievement Divisions (STAD) cooperative learning model assisted by audiovisual media proved effective in improving students' learning outcomes on the topic of motion energy in fourth-grade students at SDN 12 Babana, Bulukumba Regency. Prior to the intervention, many students struggled with the abstract concept of motion energy, resulting in low achievement and limited classroom engagement. After the application of STAD supported

by audiovisual media, students' learning outcomes improved significantly, as shown by the higher post-test scores compared to the pre-test and by the increase in the number of students who met the minimum mastery criterion. Statistical analysis using the independent sample T-test confirmed that the improvement was significant, with a large effect size, indicating the strength of the intervention. Beyond cognitive gains, the study also documented substantial growth in student participation. Learners became more active in group discussions, more confident in expressing their ideas, and more accountable to their peers. These results demonstrate that the integration of cooperative learning and audiovisual support creates a meaningful learning environment aligned with the principles of the Merdeka Curriculum, which values collaboration, inquiry, and active participation. This research not only addressed the formulated research questions but also contributed novelty by showing that such strategies can be effectively implemented in rural elementary schools with limited resources. Despite its promising results, this study had several limitations, particularly its small sample size and single-classroom focus. Future research should therefore expand to larger and more diverse samples across different schools and regions to increase generalizability. Further studies could also explore additional outcomes beyond cognitive achievement, such as critical thinking, creativity, scientific attitudes, and long-term retention of knowledge. Employing a mixed-methods approach is strongly recommended to complement quantitative findings with qualitative insights, providing a deeper understanding of students' and teachers' experiences. In addition, exploring the integration of STAD with more advanced educational technologies—such as digital simulations, augmented reality, or game-based learning platforms—could provide new pathways for innovation. Such efforts would not only strengthen the evidence for the effectiveness of STAD but also expand its potential application in fostering 21st-century skills in elementary science education.

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