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(Research/ Review) Article

Audio-Visual Learning Technology Improves Basketball Dribbling Skills In Third Grade Elementary School Students

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Abstract: Physical education in elementary schools plays a crucial role in developing students' basic motor skills, including dribbling in basketball. However, conventional teaching methods often hinder the achievement of optimal learning outcomes. This study aims to analyse the effect of implementing audiovisual learning technology on students' learning outcomes in basic basketball dribbling skills among third-grade elementary students. The research employed a quantitative approach with a quasi-experimental design involving two groups: the experimental group (using audiovisual media) and the control group (using conventional methods), each consisting of 24 students. The instruments used included a basketball dribbling skill test and a learning activity observation sheet. Data analysis using paired sample t-test and independent sample t-test was conducted. The analysis revealed a significant difference in learning outcomes between students taught with audiovisual media and those taught with conventional methods ($p < 0.05$). The experimental group showed a significantly higher improvement in learning outcomes. These findings affirm that audiovisual technology can provide a more interactive and effective learning experience, particularly in motor skill development. This study recommends the integration of audiovisual media into physical education strategies to better meet the contextual needs of digital-native learners, highlighting the innovative use of audiovisual technology as a more effective tool in motor skill education compared to conventional teaching methods.

Keywords: Audiovisual Dribbling; Basketball Dribbling; Elementary School; Learning Outcomes; Physical Education

1. Introduction

Physical education in elementary schools plays a crucial role in developing fundamental motor skills (Riyanto & Syamsudin, 2021; Colvin et al., 2023). According to Luthan (1988, as cited in Putra et al., 2023), motor skills refer to an individual's ability related to the execution of specific skills that are relatively stable and continue to develop beyond childhood. These include skills in major ball games such as basketball. One of the basic techniques that must be mastered in basketball is dribbling, which requires coordination, balance, and an understanding of movement both visually and kinesthetically. However, based on field observations, many elementary school students still struggle to master dribbling techniques due to the limited learning media used by teachers, which are generally conventional and lack interactivity.

Previous studies have revealed that the use of technology in physical education learning can enhance students' participation and understanding. For instance, research by Silaban et al. (2025) showed that the application of audiovisual media in physical education learning effectively improves the quality of instruction and student academic achievement. Similarly, a study by Dwijayanti and Sari (2025) in a SINTA 4 accredited journal found that this video learning product is suitable for use in elementary schools in terms of both the media format and the material presented. Another study by Sutrisno et al. (2023) stated that the development of audiovisual-based learning media for pencak silat material in elementary school PJOK lessons was considered good and feasible for use as a learning aid.

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According to Hayati (2017, as cited in Wijayanti & Mawardi, 2022), audiovisual learning media are tools that help students learn by using both sight and hearing, enabling them to acquire the knowledge, skills, or attitudes needed to achieve learning objectives. Meanwhile, Asyhar (2011, as cited in Hilman et al., 2019) explained that audiovisual media combine the senses of hearing and sight simultaneously in one learning activity. However, most of these studies have been limited to cognitive subjects or have not specifically examined the impact of audiovisual media on basketball dribbling skills at the elementary school level. Furthermore, there has been little research testing the effectiveness of audiovisual technology implementation in basic motor learning in public schools located in semi-urban areas such as Gondangrejo. This is where the research gap lies, which this study seeks to address.

Therefore, this study presents a novelty in the form of the structured application of audiovisual learning media in teaching basketball dribbling to third-grade elementary school students an area that has not been extensively studied empirically in Indonesia, particularly in primary education settings in Karanganyar. This research is also important as it offers practical solutions to the issue of PJOK learning, which tends to be monotonous and insufficiently contextualized for the learning styles of digital native students.

This study aims to determine the impact of using audiovisual learning technology on the learning outcomes of basic basketball dribbling techniques among third-grade students at SD Gondangrejo 1. The results are expected to serve as a reference for PJOK teachers in choosing more effective, technology-based teaching methods and to contribute to the growing body of scientific literature in the field of digital physical education. Academically, this research is also expected to contribute to the development of adaptive and innovative motor learning methods that align with 21st-century educational needs.

2. Proposed Method

Research Design

This study employs a quantitative approach with a quasi-experimental design, specifically the Nonequivalent Control Group Design. Quasi-experimental designs include two forms: the Time-Series Design and the Nonequivalent Control Group Design (Arif et al., 2023; Cuttler, 2020; Kelemen, 2020). The Nonequivalent Control Group Design involves two groups: an experimental group that receives instruction using audiovisual media, and a control group that uses traditional teaching methods. Both groups will take a pretest and posttest to assess students' learning outcomes in basketball dribbling skills. The quasi-experimental method is applied in the evaluation process to obtain information that approximates actual data. Various types of quantitative research methods, including this experiment, are commonly used when it is not feasible to control or manipulate relevant variables (Abdullah et al., 2022).

Research Population and Sample

The research population refers to the entire group of objects or individuals that share similar or relevant characteristics with the issue being studied (Candra Susanto et al., 2024). According to Swarjana (2022) and Sugiyono (2021), understanding the population in research activities is crucial because the sample taken must represent that population. The sample, as a part of the population, needs to be selected appropriately and aligned with the research approach used, whether qualitative or quantitative. The population in this study consists of all third-grade students at SD Negeri Gondangrejo 1, totaling 48 students. Sampling is a systematic approach applied by researchers to select a small portion of elements or individuals from a predetermined population to serve as data sources in observation or experimentation, in accordance with the research objectives (Delice, 2010, as cited in Firmansyah & Dede, 2022). Furthermore, according to Kumara (2022), purposive sampling is a technique for selecting research subjects based on specific criteria or characteristics determined by the researcher. In this study, the sample was selected using purposive sampling, involving the selection of two parallel classes (III A and III B) with a relatively balanced number of students and equivalent academic backgrounds. Class III A was designated as the experimental group (n = 24), and Class III B as the control group (n = 24).

Data Collection Techniques and Instruments

According to Ardiansyah et al. (2023), qualitative research collects data through interviews, observations, and focus group discussions to gain an in-depth understanding of respondents' perspectives and experiences. In contrast, quantitative research uses questionnaires, structured observations, and experiments to collect numerical data that is analyzed statistically.

The main instrument in this study is a practical test of basketball dribbling skills, developed based on the indicators of basic dribbling technique mastery from the elementary school physical education curriculum. This test has been validated by subject matter experts and physical education professionals and has been piloted on a similar sample. The results of the validation showed that the instrument has high validity ($r > 0.70$) and excellent reliability, with a reliability coefficient (Cronbach's Alpha) of 0.84. In addition, an observation sheet was also used to monitor learning activities and ensure the implementation of audiovisual media usage in the experimental group. Observations were conducted systematically during the four learning sessions.

Data Analysis Techniques

The data were analyzed using a paired sample t-test to observe differences in learning outcomes before and after the treatment within each group, as well as an independent sample t-test to compare the average learning outcomes between the experimental and control groups. All analyses were conducted using the latest version of SPSS software, with a significance level of $\alpha = 0.05$. The t-test formulas used were based on a parametric approach for normally distributed data (Sudjana, 2015).

Research Models and Symbolization

The research model illustrates the relationship between the independent and dependent variables as follows:

$X \rightarrow Y$

Symbol description:

X: Application of audiovisual learning technology

Y: Basketball dribbling skills learning outcomes

This model shows that the implementation of audiovisual media (X) is assumed to influence improving basketball dribbling learning outcomes (Y) in elementary school students.

3. Results and Discussion

Results

This research was conducted to determine the impact of using audiovisual learning media in improving the learning outcomes of basic basketball dribbling techniques for third-grade students at SD Negeri Gondangrejo 1. Data were obtained from the results of pretests and posttests in two groups: the experimental group (using audiovisual media) and the control group (using conventional methods).

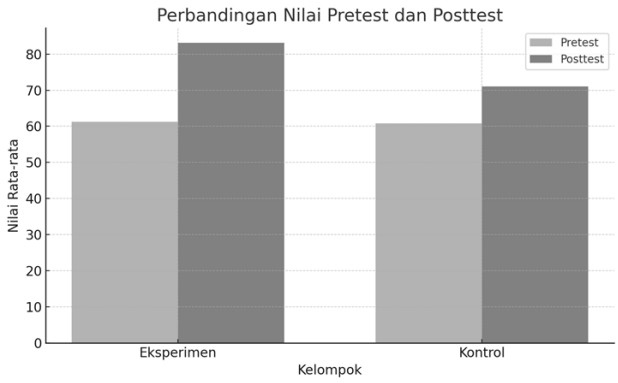

Figure 1 Comparison of Pretest and Posttest Scores.

Discussion

The average pretest score in the experimental group was 61.25 and increased to 83.12 in the posttest. Meanwhile, the control group experienced an increase from an average of 60.83 to 71.04. The paired sample t-test showed a significant difference between the pretest and posttest scores in both groups ($p < 0.05$). However, the independent sample t-test indicated that the improvement in learning outcomes in the experimental group was significantly greater than that in the control group ($p = 0.001$).

These results demonstrate that the use of audiovisual media can effectively enhance students' understanding and skills in basic basketball dribbling techniques compared to conventional teaching methods. The study findings indicate that the use of audiovisual media has a positive impact on student learning outcomes. This aligns with research conducted by Silaban et al. (2025), which stated that audiovisual media facilitates motor learning in a more concrete and interactive manner, making it easier for students to understand and imitate movements.

Moreover, the visualization of movements through audiovisual media allows students to observe dribbling techniques repeatedly and independently. This ability supports Bandura's (1977) social learning theory, which emphasizes the importance of observation in motor skill learning. Thus, students not only receive verbal instructions from the teacher but also gain visual representations that strengthen their conceptual and practical understanding.

Research by Dwijayanti and Sari (2025) also supports these findings. They found that physical education learning assisted by instructional videos improves learning effectiveness and minimizes errors in basic techniques among elementary school students. The effectiveness of audiovisual media is also reinforced by increased student affective engagement during the learning process, which contributes to more optimal learning outcomes.

Nevertheless, the success of using audiovisual media also depends on the teacher's readiness to manage technology and student involvement during the learning process. External factors such as technological facilities and a conducive learning environment are also important aspects influencing the implementation results of this media.

Overall, the findings of this study show that audiovisual media is not just a supplement in the learning process but also a strategic pedagogical instrument, especially in the context of motor skill learning at the elementary education level.

4. Conclusions

Based on the research conducted, it can be concluded that the use of audiovisual learning technology has a significant effect in improving basketball dribbling skills in third-grade elementary school students. This is evident from the difference in the average post-test scores, which are much higher in the experimental group compared to the control group. Audiovisual media has been proven to provide a more realistic and interactive learning experience, making it easier for students to understand and imitate dribbling techniques.

This study also shows that the utilization of technology in physical education learning is not only relevant for cognitive aspects but also effective in psychomotor learning. However, the results of this study cannot be generalized widely due to the limitation of the sample size, which only included one elementary school. Additionally, other variables such as the teacher's teaching style, school facilities, and student characteristics may influence learning outcomes and were not fully controlled in this study.

Therefore, it is recommended that physical education teachers consider using audiovisual media as part of their teaching strategies, especially in motor skills material. For future research, it is suggested to be conducted on a broader scale, both in terms of sample size, variation of other basic sports techniques, and exploration of more diverse digital learning media, such as augmented reality or mobile device-based interactive applications. Further studies are also expected to evaluate the long-term effectiveness of technology use on students' motor skill retention.

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