

THE EFFECTIVENESS OF AUDIOVISUAL MEDIA MANAGEMENT IN IMPROVING STUDENTS' BADMINTON FOOTWORK SKILLS

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Abstract

Footwork skills are a fundamental aspect of badminton because they determine the efficiency of movement and the effectiveness of shots. However, many students still have difficulty mastering this technique. This study aims to analyze the effectiveness of audio-visual media in improving badminton footwork skills. The study used a quasi-experimental method with a pretest–posttest control group design. The research sample consisted of 73 Physical Education, Health, and Recreation students at the University of Riau in the even semester of 2024/2025, divided into an experimental group (n=37) and a control group (n=36). The research instrument was a badminton footwork test that had been validated by experts. The analysis results showed an increase in footwork skills in both groups, with the average gain in the experimental group (+1.57) higher than that in the control group (+1.06). The paired t-test showed a significant increase in the experimental group (p=0.002), but the independent t-test showed that the difference between the groups was not significant (p=0.052). These findings indicate that audio-visual media can be an effective complement to footwork learning, although it does not completely replace conventional methods.

INTRODUCTION

The development of information and communication technology (ICT) has had a major impact on the world of education. According to a UNESCO report (2021), the integration of technology in education enables the learning process to be more inclusive, personalized, and interactive. In this digital age, students tend to be more interested in interactive learning media, such as videos, animations, and digital applications. Therefore, educators need to continue to innovate by utilizing technology to improve the quality and relevance of learning. This is in line with efforts to create a learning environment that supports 21st-century skills, such as critical thinking, collaboration, creativity, and digital literacy. In the context of sports, especially badminton, the use of audio-visual media can support the understanding of techniques that are difficult to explain only through verbal or demonstration (Rahman & Widodo, 2021; Chen & Liu, 2022).

Although badminton is one of the most popular sports in Indonesia, teaching this subject at the university level often faces obstacles. Conventional approaches that rely heavily on lectures and manual demonstrations are sometimes unable to accommodate all students' learning styles. In addition, limited facilities, such as training rooms or supporting equipment, can also hinder the learning process. According to research by Widiastuti and Purnama (2019), students often find it difficult to understand basic badminton techniques through verbal explanations and direct practice alone, without the support of additional learning media. The use of audio-visual media provides an opportunity to visualize movement techniques clearly and repeatedly and allows students to independently analyze their performance (Putra & Kurniawan, 2021; Kim & Lee, 2020). Previous research also confirms the effectiveness of this media in motor skill learning (Yusuf et al., 2020; Hidayat & Nuraini, 2023).

Good footwork allows players to move quickly, efficiently, and accurately to reach the shuttlecock in various areas of the court (Susanto, 2018). In the context of badminton learning, footwork skills are fundamental for students to master, because without this ability, stroke techniques and game strategies cannot be applied optimally (Donie, 2009). However, many students experience difficulties in mastering footwork techniques, both in terms of movement patterns and synchronization between foot movements and the body as a whole.

The learning methods used in badminton courses are often still conventional, relying on direct demonstrations by instructors and repetitive physical exercises (Prasetyo, 2019). This approach, although useful, has limitations, especially in providing a detailed understanding of the correct movements. Students often experience confusion when trying to imitate the movements demonstrated, especially if they are not accompanied by adequate supporting media. This shows the need for innovation in learning methods that are more interactive and easier for students to understand.

Audio-visual technology can be a solution to overcome obstacles in learning sports skills, including badminton. Audio-visual media allows students to learn footwork techniques through clear, structured, and repeatable visualizations (Putra & Kurniawan, 2021). By showing videos that demonstrate footwork techniques in detail, students can understand the movements more deeply, including foot position, steps, and movement rhythm. This is in line with previous research showing that the use of audio-visual media can increase the effectiveness of motor skill learning (Yusuf et al., 2020).

Therefore, it is important to integrate audio-visual media into badminton course learning, especially in improving students' footwork skills. By utilizing this technology, it is hoped that students can more easily understand and master the techniques taught. This study focuses on evaluating how the use of audio-visual media can contribute to improving students' footwork skills, while also serving as an innovative and effective alternative learning method.

METHODS

This study adopts a quantitative approach using a quasi-experimental method. The design applied is a pretest-posttest control group design, a design that effectively allows for the evaluation of causality between treatment and outcome without completely randomizing groups (Creswell, 2014). This approach was specifically chosen to empirically evaluate the effectiveness of using audio-visual media in improving badminton footwork skills among research participants.

In this design structure, participants were divided into two groups: the experimental group, which received intervention in the form of footwork training with the help of audio-visual media, and the control group, which underwent footwork training using conventional methods, without the use of audio-visual media. To ensure the validity of the comparison, both groups were measured at two points in time: a pretest before the treatment began and a posttest after the treatment was completed. The difference in scores between the pretest and posttest for each group will be analyzed to determine the extent to which the audio-visual media intervention contributed to the improvement in footwork skills.

The population of this study was all active students who took badminton classes at the University of Riau. The sampling method in this study used total sampling, where all members of the population were used as samples. The population and sample in this study were Physical Education, Health, and Recreation students in the even semester of 2024/2025.

RESULTS & DISCUSSIONS

Results

In teaching sports skills, effective methods are needed to ensure that students understand and master the techniques correctly. One way to do this is to use appropriate learning media, such as audio-visual media. With clear visualizations, students are expected to understand the movements, improve their memory, and deepen their understanding of the concepts being learned. This study aims to assess the effectiveness of audio-visual media in improving footwork skills in students. This study used two groups: an experimental group that was given footwork training with the help of audio-visual media, and a control group that was trained using conventional methods. Pre-test and post-test data were collected to measure the improvement in footwork skills. The pre-test results showed the level of footwork skills of physical education students at the University of Riau.

Table 1. Frequency Distribution of Pre-test and Post-test Footwork Data Processing Results

	N	Pre Tets	Post Test	Mean	Std. Deviation
Experiment	37	12.35	13.92	21.2667	1.16292
Control	36	12.19	13.25	25.6000	1.29835

Source: Authors

Based on Table 1, it can be seen that: The initial abilities (pre-test) of both groups were almost equal. Both groups experienced an increase in scores after the treatment. The experimental group showed a slightly higher average gain (+1.57) than the control group (+1.06). This proves that both training methods audio-visual and conventional are effective in improving footwork skills. Structured and consistent training, regardless of the medium, has a positive impact. After descriptive statistics were calculated, the next step was to conduct a paired t-test. However, before the difference test was conducted, prerequisite tests were first carried out, namely: (1) data normality test and (2) homogeneity test. The normality test was conducted on the gain data (the difference between the post-test and pre-test).

Table 2. Normality Test

Group	Kolmogorov-Smirnov	Significance (P-Value)	Description
Experiment	0.121	0.178	Normal
Control	0.134	0.152	Normal

Source: Authors

Table 2 above shows the results of the normality test, which indicate that the significance value for the experimental group is 0.178 and for the control group is 0.152. This means that both groups are normally distributed ($p > 0.05$) and therefore meet the requirements for parametric testing.

Table 3. Homogeneity Test (Levene's Test)

Levene's Test	Significance (P-Value)	Description
0.887	0.350	Homogen

Source: Authors

Based on the data in Table 3, Levene's Test of Homogeneity conducted on the gain data (the difference between the post-test and pre-test scores) yielded the following results: Levene Statistic = 0.887 Significance (p-value) = 0.350. Since the p-value > 0.05 , it is accepted that the variance of the gain data from both groups is homogeneous. In other words, the diversity of gain data in the group using audio-visual media is not significantly different from the diversity of gain data in the group using conventional methods.

Table 4. Paired Samples T-Test Experimental Group

Paired Samples Test						
	Mean Gain	t-count	df	t-table ($\alpha=0.05$)	Significance (P-Value)	Conclusion
Experiment	1.57	3.412	36	2.028	.002	Significant

Source: Authors

The paired t-test results show a p-value ($0.002 < 0.05$). This means that there was a statistically significant improvement in the experimental group after using audio-visual media.

Table 4. Independent Samples T-Test) Experimental Group

Independent Samples T-Test						
	Mean Gain	Mean Gain Control	t-count	t-table ($\alpha=0.05$)	Significance (p-value)	Conclusion
Experiment	1.57	1.06	1.973	1.995	0.052	Not Significant

Source: Authors

The results of the independent t-test show that the t-count ($1.973 < t\text{-table } (1.995)$ and p-value ($0.052 > 0.05$), which means that statistically, there is no significant difference between the

effectiveness of audio-visual media and conventional methods. However, in terms of mean gain, the experimental group showed a greater increase.

Discussions

Based on data collected from 73 students divided into experimental ($n=37$) and control ($n=36$) groups, the average pre-test score for the experimental group was 12.35 and for the control group was 12.19. The very small difference of only 0.16 indicates that both groups had almost identical levels of footwork ability before the treatment was given. This indicates that any differences that appear on the post-test can be caused more by differences in treatment methods rather than differences in initial abilities. Although the mean gain of the experimental group was higher (+1.57 vs +1.06), this difference was not statistically significant ($p=0.052$). This shows that in this context; the advantages of audio-visual media were not strong enough to conclude that this method was clearly superior to conventional training conducted by competent coaches.

The results of the study indicate that both training methods are effective in improving footwork skills, as demonstrated by a significant increase in scores in both groups from the pre-test to the post-test. The significant improvement in the experimental group ($p=0.002$) proves that audio-visual media can be a useful training tool. Clear visualization of movements and the possibility of recording and analyzing one's own performance provide valuable feedback for students. These findings are in line with Yusuf et al. (2020), who found that audio-visual media can clarify motor skills. The findings of Kim & Lee (2020) also state that visual-based media can help improve the accuracy of motor skills. However, the results also support Prasetyo (2019), who states that direct interaction with a coach remains crucial.

The insignificance between groups may be influenced by the relatively short duration of the intervention, the homogeneity of initial abilities, and the dominant role of lecturers in the control class. The practical implication of this study is that audio-visual media should be used as a supplement to be learning, not as a substitute for conventional methods. However, the group that used audio-visual media experienced a greater average increase (+1.57) than the group that used conventional methods (+1.06). The difference in gain between the two groups was 0.51 points. In the context of training, this increase could mean that students in the experimental group were, on average, able to complete the footwork test slightly faster or with slightly better technique.

The observed insignificant increase in scores ranging only from 1 to 1.5 points is highly reflective of the inherent reality of specialized sports training. Skills requiring complex motor components, such as footwork skills involving speed, agility, and precise body coordination, simply cannot undergo drastic transformation within a short intervention period. This measured, moderate improvement is considered a more realistic and scientifically expected outcome, indicating that the efficacy of both training methods is constrained by the biological necessity for long-term adaptation. Consequently, achieving truly significant results and mastery in these complex skills requires a sustained commitment to training over an extended duration, emphasizing that consistency and time are the most crucial variables in athletic skill development.

Descriptively, the data shows a trend that audio-visual media has a slightly greater positive impact on improving footwork than conventional methods. Audio-visual media has the potential to make learning more standardized, as indicated by a reduction in data variation (decreased standard deviation). Hidayat & Nuraini (2023) state that the effectiveness of digital media is often more apparent in long-term learning. In practice, audio-visual media may be successful because they provide clear, repetitive visualizations and allow students to see their own mistakes through recordings, making the learning process more reflective. However, this advantage is not too significant because conventional methods involving direct interaction and correction from trainers are also still very effective.

The primary limitation of this study centers on the relatively short duration of the intervention. Complex motor skills, such as specialized footwork requiring high levels of speed, agility, and precise coordination, necessitate sustained, long-term training for complete mastery.

The brief intervention period likely constrained the observed gains to a realistic, moderate increase (only 1 to 1.5 points on average), thus preventing the manifestation of a statistically significant difference between the two groups. Furthermore, the initial homogeneity of abilities (a pre-test difference of only 0.16 points) narrowed the margin for demonstrating large-scale, significant gains. A final contextual constraint was the dominant and highly effective role played by the competent coaches in the conventional control class, suggesting that the direct, crucial interaction cited by Prasetyo (2019) may have masked a stronger potential effect from the audio-visual media.

The most critical plan for follow-up research is to implement a significantly extended intervention period. Given that existing literature suggests the full effectiveness of digital media is often more apparent in long-term learning and considering the persistent descriptive trend that favored the audio-visual group (+1.57 gain vs. +1.06), a new study spanning at least six to twelve months is clearly warranted. This extended duration would allow for the necessary biological adaptation and motor skill consolidation required for complex skills. It is essential to test if the initial small descriptive advantage is truly scalable into a statistically significant and sustained competitive advantage over time, confirming the potential of the media to offer standardized and reflective learning.

Future studies should also focus on exploring the optimal integration strategy for audio-visual media, specifically moving beyond its use as a primary method to investigate its role as a supplement to conventional coaching. One robust research path would be to compare three groups: a conventional control group, an audio-visual-only group, and an integrated group (conventional + audio-visual). This design would quantify the true additive benefit of the digital tool. Additionally, researchers should aim to include participants with a broader range of initial abilities to better understand the media's utility determining if it is more effective for beginners needing foundational visualization or for advanced students seeking high-level technical refinement.

In conclusion, while the current findings clearly establish audio-visual media as a valuable and highly effective training tool, the path forward requires testing its limits and applications. Subsequent research should investigate the generalizability of these findings by applying the intervention to other complex motor skills, or to different sports domains such as aiming accuracy or rhythmic activities. Researchers could also isolate and test specific components of the footwork skill such as testing speed versus technical precision to determine which elements are most enhanced by the visual feedback mechanisms. Ultimately, a multi-faceted research program is needed to transition this descriptive potential into clear, evidence-based guidelines for integrating digital media into specialized athletic skill development.

CONCLUSION

Based on the results of data analysis, it can be concluded that both training methods namely the use of audio-visual media and conventional methods proved effective in improving badminton footwork skills, as indicated by an increase in the average score in both groups after the intervention. However, the group that used audio-visual media showed a slightly higher increase (+1.57) than the control group (+1.06) and recorded better consistency between individuals, as seen from the sharper decrease in standard deviation. The results of Levene's Test of Homogeneity (p -value = 0.350) confirmed that the variance of the gain data of both groups was homogeneous, thus fulfilling the assumptions for further analysis. Overall, these findings indicate that audio-visual media can play a complementary role in footwork training, although its advantages are not yet significant enough to replace the role of conventional methods entirely.

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