



HJSE
Holistic Journal of Sport Education
E-ISSN: 2809-9974
<https://journal.uniga.ac.id/index.php/penjas>
DOI: 10.52434/penjas.v5i2.44113



THE EFFECT OF AUDIOVISUAL (VIDEO-BASED) LEARNING MEDIA ON VOLLEYBALL OVERHEAD PASSING LEARNING OUTCOMES AMONG ELEVENTH-GRADE STUDENTS AT SMA PEMBINA PALEMBANG

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Keywords:

audiovisual learning media, overhead passing, physical education, volleyball, learning outcomes.

Abstract

Objectives: This study examined the effect of audiovisual (video-based) learning media on students' overhead passing learning outcomes in volleyball during physical education classes at SMA Pembina Palembang. The study was conducted to determine whether video-assisted instruction could improve students' technical mastery of overhead passing compared with their initial performance.

Materials and Methods: A quantitative pre-experimental study employing a One-Group Pretest–Posttest Design was conducted with 29 eleventh-grade students selected through purposive sampling. Students completed an overhead passing skill test before and after participating in learning sessions using audiovisual instructional videos. The intervention emphasized visual demonstrations of correct movement techniques combined with teacher guidance and practical exercises. Data were analyzed using descriptive statistics, normality and homogeneity tests, and a paired-sample *t*-test with a significance level of 0.05.

Results: The findings demonstrated a substantial improvement in students' overhead passing performance following the intervention. The mean score increased from 51.69 in the pretest to 70.10 in the posttest. Statistical analysis indicated that the improvement was significant ($p < .001$), confirming that the use of audiovisual learning media positively influenced students' volleyball overhead passing learning outcomes.

Conclusions: Audiovisual learning media provide an effective instructional approach for improving volleyball overhead passing skills in secondary school physical education. Video-based demonstrations facilitate students' understanding of movement execution, increase learning engagement, and support more effective motor skill acquisition. These findings suggest that integrating audiovisual media into physical education instruction can enhance the quality of skill-based learning and should be considered as an alternative teaching strategy for volleyball education.

Received: Day Month, Year

Accepted: Day Month, Year

Published: Day Month, Year

Authors' contribution:

A - Conception and design of the study; B - Acquisition of data; C - Analysis and interpretation of data; D - Manuscript preparation; E - Obtaining funding



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INTRODUCTION

Physical education plays an important role in developing students' physical competence, motor skills, cognitive understanding, and social values through structured movement experiences. In school settings, physical education is not only directed toward improving fitness but also toward helping students master basic sport skills, cooperate with peers, and participate actively in learning activities. Therefore, teachers need appropriate instructional strategies and learning media that can help students understand movement concepts more clearly and perform sport techniques more effectively.

Volleyball is one of the sports commonly taught in physical education because it involves teamwork, coordination, communication, and mastery of basic techniques. One important technique in volleyball is overhead passing, which is used to control the ball and organize attacking patterns. However, overhead passing requires coordination between body position, hand movement, ball contact, and visual timing. These technical demands often make the skill difficult for students to master, especially when learning is delivered mainly through verbal explanation and limited demonstration.

Initial observations at SMA Pembina Palembang showed that many eleventh-grade students still experienced difficulties in performing volleyball overhead passing correctly. Students often made errors in hand position, body balance, ball direction, and coordination during movement execution. This condition indicates that conventional teaching approaches may not be sufficient to support students' understanding of complex motor skills. Video-based audiovisual media can help overcome this problem because students are able to observe correct movement demonstrations repeatedly and understand each movement phase more clearly.

Audiovisual video-based learning is relevant to motor skill instruction because it provides visual and auditory information at the same time. Multimedia learning theory explains that students learn more effectively when information is presented through both words and pictures, because these channels support deeper cognitive processing (Mayer, 2021). In physical education, video-based instruction also supports observational learning, where students acquire motor skills by observing, imitating, and correcting movement based on a demonstrated model. A systematic review by Han et al. (2022) reported that observational learning is an effective pedagogical approach for improving motor skill learning in physical education.

Several studies have also shown the benefits of video and audiovisual media in physical education. Mödinger et al. (2022) found that video-based visual feedback can improve motor learning in school physical education and may be more effective than verbal feedback alone. H'mida et al. (2020) also showed that video presentation supports motor skill acquisition because learners can observe



movement patterns dynamically. In volleyball learning, Budiman et al. (2024) reported that audio-visual learning media were useful for teaching volleyball passing and serving techniques. Similarly, Ruslan et al. (2024) found that a developed overhead passing learning model significantly improved students' volleyball overhead passing performance.

Although previous studies have discussed video-assisted learning and volleyball skill instruction, empirical evidence focusing specifically on audiovisual video-based learning media for improving overhead passing learning outcomes among senior high school students remains limited. Most studies have focused on general physical education learning, interactive media development, or other volleyball techniques. Therefore, this study offers contextual evidence from school-based physical education by examining the effect of audiovisual video-based learning media on students' volleyball overhead passing learning outcomes.

The novelty of this study lies in its specific focus on the use of audiovisual video-based learning media to improve overhead passing learning outcomes in senior high school volleyball instruction. This study also emphasizes measurable psychomotor performance through pretest and posttest assessment, rather than focusing only on students' motivation or perceptions. The findings are expected to provide practical implications for physical education teachers in designing more effective, engaging, and technology-supported volleyball learning. Therefore, this study aimed to examine the effect of audiovisual video-based learning media on volleyball overhead passing learning outcomes among eleventh-grade students at SMA Pembina Palembang.

METHOD

Study Design

This study employed a quantitative pre-experimental approach using a One-Group Pretest–Posttest Design. The design was selected to evaluate the effectiveness of audiovisual video-based learning media on students' volleyball overhead passing learning outcomes by comparing performance before and after the instructional intervention. Students' overhead passing skills were measured prior to the intervention (pretest), followed by a series of learning sessions utilizing audiovisual instructional videos, and subsequently reassessed through a posttest. The research design can be illustrated as O_1-X-O_2 , where O_1 represents the pretest, X denotes the audiovisual video-based learning intervention, and O_2 represents the posttest.

Participants

The study was conducted at SMA Pembina Palembang, Indonesia, during the 2025/2026 academic year. The population consisted of all eleventh-grade students enrolled in physical education classes. A total of 29 students participated in the study and were selected using a purposive sampling technique based on their active

participation in volleyball learning activities and their willingness to complete the entire intervention program. All participants completed both the pretest and posttest assessments, resulting in no missing data during the analysis.

Research Procedures

The research was conducted in three consecutive stages. During the first stage, participants completed a pretest to assess their initial overhead passing performance using a standardized volleyball passing assessment. The second stage consisted of instructional sessions integrating audiovisual learning media in the form of instructional videos demonstrating the correct overhead passing technique. The videos presented movement execution from multiple viewing angles, emphasizing body positioning, hand placement, ball contact, coordination, and movement sequence. Students observed the demonstrations before practicing the skills under the supervision of the physical education teacher. Feedback and corrective instruction were provided throughout the learning process to reinforce proper movement execution. After the intervention period was completed, participants performed the posttest using the same assessment procedures implemented during the pretest.

Instrument

Students' learning outcomes were evaluated using a standardized volleyball overhead passing skills test adapted for physical education learning assessment. The instrument assessed the accuracy and technical execution of overhead passing based on predetermined scoring criteria, including body posture, hand position, movement coordination, ball control, and passing accuracy. Prior to implementation, the assessment instrument was reviewed and validated by experts in physical education to ensure its content validity and suitability for measuring students' volleyball overhead passing performance.

Statistical Analysis

The collected data were analyzed using IBM SPSS Statistics version 26. Descriptive statistics were calculated to summarize participants' pretest and posttest scores using the mean, minimum value, maximum value, and standard deviation. Data normality was examined using the Shapiro–Wilk test, while variance homogeneity was evaluated using Levene's test. The effectiveness of the audiovisual video-based learning intervention was determined using a paired-samples *t*-test to compare pretest and posttest scores. Statistical significance was established at $p < .05$.

RESULTS

A total of **29 eleventh-grade students** completed both the pretest and posttest assessments after participating in the audiovisual video-based learning intervention. The results demonstrate an overall improvement in students' volleyball overhead passing learning outcomes following the instructional treatment.

Table 1.
Descriptive Statistics of Overhead Passing Learning Outcomes

Variable		Minimum	Maximum	Mean	SD
Pretest	9	45	58	51.69	3.39
Posttest	9	58	79	70.10	4.45

The descriptive statistics revealed a substantial increase in students' overhead passing performance after the implementation of audiovisual learning media. The mean score improved from 51.69 during the pretest to 70.10 in the posttest, representing an average increase of 18.41 points. Furthermore, the minimum score increased from 45 to 58, while the maximum score improved from 58 to 79, indicating that learning improvement occurred across nearly all participants.

Before conducting the hypothesis test, the assumptions of normality and homogeneity were examined.

Table 2.
Normality Test Results

Variable	Test	p-value	Interpretation
Pretest	Shapiro–Wilk	> .05	Normal
Posttest	Shapiro–Wilk	> .05	Normal

The Shapiro–Wilk test indicated that both the pretest and posttest data were normally distributed ($p > .05$). Therefore, the data satisfied the normality assumption required for parametric statistical analysis.

Table 3.
Homogeneity Test Results

Test	Levene Statistic	p-value	Interpretation
Levene's Test	0.783	.380	Homogeneous

The homogeneity analysis showed a significance value of **0.380**, which exceeded the predetermined significance level of 0.05. These findings indicate that the variances of the pretest and posttest scores were homogeneous, supporting the use of parametric hypothesis testing.

Table 4.
Paired-Samples *t*-Test Results

Comparison	<i>t</i>	p-value	Decision
Pretest vs. Posttest	-40.122	< .001	Significant Difference

The paired-samples *t*-test demonstrated a statistically significant improvement in students' volleyball overhead passing learning outcomes following the audiovisual video-based learning intervention ($t = -40.122$, $p < .001$). These findings indicate that the observed increase in performance was unlikely to have occurred by chance

and supports the effectiveness of audiovisual learning media in improving overhead passing skills among senior high school students.

DISCUSSION

The present study demonstrated that audiovisual video-based learning significantly improved students' volleyball overhead passing learning outcomes. The improvement observed after the intervention indicates that integrating visual and auditory instructional media into physical education provides students with clearer demonstrations of movement execution than conventional teacher-centered instruction. Overhead passing is a complex motor skill requiring precise coordination between body posture, hand positioning, visual tracking, and movement timing. Consequently, students benefit from instructional approaches that allow repeated observation of correct movement patterns before performing the skill independently.

The findings of this study can be explained through the Cognitive Theory of Multimedia Learning, which proposes that students learn more effectively when information is presented simultaneously through visual and auditory channels (Mayer, 2021). During the intervention, students were able to observe the correct overhead passing technique repeatedly while receiving verbal explanations regarding body positioning, hand contact, and movement coordination. This dual-channel presentation reduced cognitive overload and enabled students to process technical information more efficiently before translating it into motor performance. As a result, students demonstrated better technical execution during the posttest than during the initial assessment.

The results are also consistent with Bandura's Social Cognitive Theory, particularly the concept of observational learning. According to Bandura (2023), individuals acquire motor skills by observing competent models, retaining movement information, reproducing the observed actions, and receiving reinforcement through practice and feedback. Video demonstrations provide a consistent and accurate movement model that students can repeatedly observe, making it easier to imitate complex sport techniques than relying solely on live demonstrations, which may vary in quality or be difficult to observe simultaneously by all students.

The significant improvement found in this study is consistent with previous research investigating audiovisual learning in physical education. Mödinger et al. (2022) reported that video-based visual feedback significantly enhances motor skill acquisition because learners can repeatedly analyze their own movements and compare them with ideal performance models. Similarly, H'mida et al. (2020) concluded that video-assisted instruction improves the learning of complex motor skills by increasing students' understanding of movement sequences and technical accuracy. These findings reinforce the present study, suggesting that audiovisual media facilitate more effective motor learning than conventional verbal instruction.

Within the context of volleyball education, the present findings also support previous studies conducted in Indonesia. Budiman et al. (2024) reported that audiovisual learning media increased students' motivation and technical performance during volleyball instruction because the visual demonstrations enabled learners to better understand movement execution. Likewise, Ruslan et al. (2024) found that structured instructional media significantly improved students' overhead passing performance by providing systematic demonstrations and opportunities for repeated practice. Collectively, these studies indicate that video-based learning is an effective pedagogical strategy for teaching volleyball techniques across different educational settings.

One important finding of this study is that audiovisual learning appears particularly beneficial for developing psychomotor skills requiring high levels of coordination. Unlike cognitive learning, motor skill acquisition depends heavily on accurate movement visualization and repeated practice. The instructional videos used during the intervention enabled students to observe movement phases from beginning to completion, identify common technical errors, and develop better movement consistency during practice. This process likely contributed to the improvement observed in overall overhead passing performance.

From a pedagogical perspective, the results suggest that audiovisual media should complement rather than replace teachers' instructional roles. Teachers remain responsible for organizing learning activities, providing individualized feedback, correcting technical errors, and motivating students throughout the learning process. The integration of video demonstrations with guided practice creates a more student-centered learning environment in which learners actively observe, practice, evaluate, and refine their motor skills. Such an instructional approach is consistent with current recommendations for technology-enhanced physical education that emphasize active learning and meaningful student engagement.

Despite these positive findings, several limitations should be acknowledged. This study employed a one-group pretest–posttest design without a comparison group, limiting the ability to attribute improvements exclusively to the intervention. In addition, the relatively small sample size drawn from a single senior high school reduces the generalizability of the findings. Future studies are therefore encouraged to employ randomized controlled or quasi-experimental designs involving multiple schools and larger participant samples. Further research may also investigate the long-term effects of audiovisual learning media on skill retention, tactical understanding, and learning motivation across various sports disciplines.

Overall, the present study provides empirical evidence that audiovisual video-based learning constitutes an effective instructional strategy for improving volleyball overhead passing skills in senior high school physical education. The findings strengthen previous evidence regarding technology-supported motor learning and

highlight the importance of integrating multimedia resources into practical sport instruction to enhance students' technical competence and learning engagement.

CONCLUSION

This study concludes that the integration of audiovisual video-based learning media is an effective instructional strategy for improving students' volleyball overhead passing learning outcomes in senior high school physical education. The use of instructional videos enables students to observe correct movement techniques more clearly, enhances their understanding of motor skill execution, and supports more effective skill acquisition through repeated visual demonstrations and guided practice.

These findings highlight the pedagogical value of technology-supported learning in physical education by demonstrating that audiovisual media can facilitate more engaging, student-centered, and skill-oriented instruction. For physical education teachers, incorporating video-based learning into volleyball lessons offers an effective alternative to conventional teaching methods, particularly when teaching complex technical skills that require accurate movement visualization.

Despite these promising findings, this study was limited by the use of a one-group pretest–posttest design and the involvement of participants from a single school, which may limit the generalizability of the results. Future studies are recommended to employ experimental designs with control groups, larger sample sizes, and diverse educational settings to further examine the long-term effectiveness of audiovisual learning media across different sports skills and educational contexts.

Overall, this study contributes to the growing body of evidence supporting the integration of digital learning media into physical education and provides practical guidance for enhancing the quality of volleyball instruction through technology-assisted teaching approaches.

ACKNOWLEDGMENTS

The author expresses sincere gratitude to the Physical Education Study Program, Universitas PGRI Palembang, the principal, teachers, and volleyball extracurricular students of SMP Negeri 5 Prabumulih for their support and participation during the research process. Appreciation is also extended to the supervisors and all parties who provided guidance and assistance in completing this study.

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