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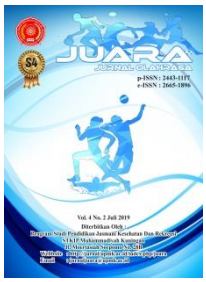

THE EFFECTIVENESS OF USING AUDIO VISUAL LEARNING MEDIA ON SPORTS PHYSIOLOGY LEARNING FOR PHYSICAL EDUCATION STUDENTS

Tedi Purbangkara [1*], Mariana Ditboya Hukubun [2], Yellia Tomasoa[3], Siswanto[4], Aria Kusuma Yuda Ryanto[5]

[1,4,5]Universitas Singaperbangsa Karawang, Indonesia

[2,3]Universitas Pattimura, Indonesia

*e-mail: tedi.purbangkara@fkip.unsika.ac.id

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Abstract

This study aims to determine the effectiveness of audio-visual learning media in improving students' understanding of sports physiology in Physical Education programs. The research employed a pre-experimental design with a one-group pretest-posttest approach, involving 35 students who were taught using audio-visual learning media. Data were collected through pretest and posttest assessments, as well as student response questionnaires. The results showed a significant increase in students' scores, with the average score rising from 60.86 in the pretest to 76.29 in the posttest, indicating an improvement of 15.43 points or approximately 25.4%. Additionally, questionnaire results revealed that most students responded positively to the use of audio-visual media, stating that it made the learning process more engaging, interactive, and easier to understand. This suggests that audio-visual learning media is effective in enhancing learning outcomes and student motivation in sports physiology courses. Although this study has limitations due to the absence of a control group, it provides valuable insights into the potential benefits of integrating technology-based media in physical education curricula.

✉ Alamat korespondensi:

E-mail : tedi.purbangkara@fkip.unsika.ac.id

INTRODUCTION

Information and communication technology development has significantly impacted the world of education, including physical education and sports. The use of modern learning media is increasingly in demand because of its ability to improve understanding of concepts visually and auditorily (Daud et al., 2019). One form of this use is the use of audiovisual media that can help the process of delivering material more interactively and engagingly (Tsai et al., 2021). Sports physiology, as a core course in the Physical Education study program, requires effective learning methods so students can easily understand complex concepts(Felici & Del Vecchio, 2020). Audiovisual media is a solution to overcoming difficulties in delivering abstract and theoretical physiology material. Therefore, evaluating how much this media can improve student learning outcomes is essential.

Conventional learning used in sports physiology lectures tends to be verbal and monotonous (Xiao et al., 2021). Lecture methods often do not explain body mechanisms during physical activity or physiological responses to exercise. As a result, many students have difficulty understanding dynamic concepts such as body metabolism or cardiovascular adaptation (Wang & Park, 2021). Audiovisual media can provide a clearer visual picture through simulation videos or animations of physiological processes. Thus, the hope of creating more meaningful learning can be achieved. This study aims to test whether using these media improves students' understanding (Xiao et al., 2021).

Exercise physiology studies the body's response and adaptation to acute and chronic physical activity. The material taught involves complex biological concepts such as the respiratory system, blood circulation, and energy metabolism. Students will find connecting theory with field practice difficult e without the right learning approach (Hasibuan et al., 2022). Audiovisual media is an aid that can represent realistically and easily understood physiological processes (Araújo et al., 2020). Visualization of muscle movement, heart rate, or blood flow can be shown in detail through video or digital animation. This is the basis for evaluating the effectiveness of the media in learning exercise physiology (Araújo et al., 2020).

Multimedia technology is now increasingly accessible to educators and students in higher education (Nagoyitsyn et al., 2020). The presence of projectors, laptops, and online learning platforms facilitates the integration of audiovisual media into the learning process. However, not all educational institutions use this media optimally, especially in sports science courses (Bird, 2018). Several factors, such as lack of training, infrastructure, or the assumption that this media is only complementary, are still obstacles. Audiovisual media has great potential to increase student participation and motivation to learn. Therefore, this study aims to identify the concrete benefits of using this media in the context of sports physiology learning (Tao et al., 2022).

Learning exercise physiology is not only practical for academic exams but also becomes a foundation for students to become prospective professional teachers or coaches (Hasibuan et al., 2022). Understanding how the body works is essential in designing a safe and effective exercise program. Without mastering the concept of physiology, they will have difficulty making scientific-based decisions when working in the field (Astuti et al., 2023). Audiovisual learning media is expected to be a means to convey this information more efficiently. In addition, this media can improve memory and understanding of concepts through attractive visual representations. Thus, using this media can be one of the relevant learning strategies for the future of physical education (Martín-Rodríguez et al., 2024).

The preliminary study results showed that most students found understanding the

abstract concept of sports physiology challenging (III et al., 2021). They complained that lecture methods and textbooks were not helpful enough to imagine the physiological processes in the body. Meanwhile, some lecturers have used demonstration videos or animations to deliver materials. Students who received learning with audiovisual media appeared more active and enthusiastic during class sessions. This shows the potential for increased learning outcomes if this media is used consistently and in a planned manner. Therefore, more systematic research is needed to test its effectiveness empirically (Shi & Zhao, 2022).

Previous studies have shown that audiovisual learning media can improve learning outcomes in various disciplines. For example, this media is used in medicine to display simulations of operations or body organ functions (Griban et al., 2020). A similar approach can be applied in sports physiology learning to visualize the body's reactions during exercise. Animated videos or live recordings of physiology laboratory tests can be examples of relevant applications. Using this media is expected to strengthen students' understanding of complex concepts. Therefore, it is essential to test its application in physical education (D'Agostino et al., 2021).

In addition, the use of audiovisual media also has the potential to increase student involvement in the learning process. The classroom atmosphere becomes more lively and interactive with dynamic visual displays and informative sound (Suherman et al., 2024). Students are more easily interested and motivated to follow the material until the end of the learning session. Interaction between lecturers and students also increases because of the discussion topics that arise after watching the learning video. This shows that audiovisual media is not just a tool but also an instrument to improve the quality of learning. Therefore, research is needed to measure its impact objectively (Spittle, 2013).

The ideal learning condition is when students can integrate theory with real practice (Siedentop, 2016). However, in sports physiology learning, many concepts cannot be observed directly in a classroom environment. For example, the mechanism of oxygen transport in the blood or energy changes in muscle cells cannot be seen with the naked eye. Audiovisual media is here to overcome these limitations by presenting realistic and detailed visualizations. Through animation or simulation, students can see how the process occurs microscopically. That way, their understanding of physiology can be more complete and in-depth (Ketelhut et al., 2021).

To prepare competent prospective physical education teachers, learning must be designed in such a way as to improve the quality of graduates. One effort can be made to introduce and integrate relevant learning technology. The use of audiovisual media in sports physiology learning is an initial step that can be developed further for academic purposes and to improve their practical abilities as educators. If students understand the concept of physiology well, it will be easier for them to apply it when teaching later. This is a strong basis for conducting this research (Oberste et al., 2020).

In the digital era like today, students are more familiar with visual media such as videos, films, and animated presentations than reading long texts. Therefore, a learning approach that uses audiovisual media is considered more appropriate to the learning styles of the millennial and Z generations. Educational videos, podcasts, or interactive animations can bridge the gap between traditional learning methods and current student learning preferences (Karpov et al., 2021). In addition, this media also provides flexibility in the learning process, both face-to-face and online. With the pandemic that has changed learning patterns, audiovisual press has become increasingly relevant to be developed (Liu et al., 2022). Therefore, it is essential to know how much this media effectively improveshow much this media

effectively improves sports physiology learning outcomes.

Based on initial observations in the field, most lecturers still rely on lecture methods and PowerPoint slides without adequate audiovisual elements. Although PowerPoint is used, the content is still simple text and less interesting diagrams for students. As a result, students' interest in learning and motivation is low, especially for complex materials such as sports physiology. Integration of audiovisual media is expected to be a solution to this problem. Adding sound, animation, and video elements makes the classroom atmosphere more dynamic and interactive. This study aims to prove whether this change really has a positive impact on student learning outcomes (Hudimova et al., 2021).

Exercise physiology is a discipline that is closely related to data and phenomena that are dynamic and changing—for example, the heart's response to high-intensity exercise or changes in blood lactate levels. Without adequate visualization, students will have difficulty understanding these changes. Audiovisual media can display graphs, tables, and simulations to explain these changes in real-time. This will help students build a stronger conceptual understanding. Therefore, using this media is worthy of further research in the context of learning exercise physiology (Wilhite et al., 2023).

The demands of the times also lead to the importance of learning innovation in higher education, including in the Physical Education study program. The government and educational institutions have begun to encourage the use of technology in the learning process as part of educational transformation. The use of audiovisual media is one form of implementation of this innovation. In addition, this is also in line with the vision of 21st-century education, which emphasizes technology-based learning and digital skills (Li & Wang, 2021). Improving the quality of sports physiology learning through audiovisual media can be the first step towards a better education. Therefore, this research is very relevant to do.

Although audiovisual media offers many benefits, its implementation among educators is still limited. Many lecturers are not yet accustomed to or do not have the skills to develop such media (Soares et al., 2023). In addition, the availability of audiovisual materials specific to sports physiology is also still limited. For this reason, support is needed from educational institutions in the form of training and provision of resources. This study can be a reference for developing broader audiovisual learning media in the future. In addition, the results can also be the basis for training lecturers in the use of modern learning media. Evaluation of the effectiveness of audiovisual learning media can be seen from the cognitive aspect and the affective and psychomotor aspects of students.

Cognitively, this media is expected to improve understanding of sports physiology. Effectively, this media can increase interest, motivation, and positive attitudes towards learning. Psychometrically, this media can help students understand the correct movements or techniques in physical exercise. Therefore, this study will measure its holistic impact on these aspects. The results will provide a comprehensive picture of the role of audiovisual media in learning sports physiology.

Physical Education students not only learn theory but must also be able to apply the knowledge in field practice (Hinkley et al., 2020). Understanding sports physiology is crucial in designing a training program that suits the individual's physical condition. With audiovisual media, students can see examples of applying physiological concepts in various types of exercise. For example, the difference in body response between aerobic and anaerobic exercise can be displayed visually. This will strengthen the relationship between theory and practice, making learning more meaningful. Therefore, this study will evaluate the effectiveness of this media in improving students' application skills.

Many studies have discussed using learning media in various disciplines, but not many have focused on sports physiology, especially in physical education (Umar et al., 2023). The need for research specific to this context is critical to fill the gap in the existing literature. In addition, variations in media content, methods of use, and student responses in the Indonesian context have also not been widely explored. This study is expected to provide new contributions to developing learning media in sports. The results can also be a reference for developing a more innovative and technology-based curriculum. Thus, this study has significant value both academically and practically.

Learning success depends on the material's content and the delivery method and methods used. Audiovisual learning media offers an alternative approach that can improve the overall quality of learning (Klochko & Fedorets, 2022). Video, animation, and voice narration can create a more effective multisensory learning experience. In addition, this media also allows for personalization of learning, for example, through interactive modules or on-demand videos. With these advantages, audiovisual media should be tested in sports physiology learning. This study will be the first step in empirically validating these claims.

Overall, the use of audiovisual learning media in sports physiology learning has a lot of potential to improve the quality of physical education. However, its effectiveness must be tested scientifically to ensure that this media provides significant benefits. Through this study, it is expected to obtain valid and reliable data on the influence of this media on student learning outcomes. In addition, the study's results will also provide practical recommendations for educators and policymakers in the field of education. Developing innovative and effective learning media will be the key to creating a superior generation of physical educators. Therefore, this study is very relevant and essential to do.

METHODS

The pre-experimental research method is one approach used to evaluate the effect of a treatment or intervention without using a strict control group or complete randomization. In the context of this study, the pre-experimental method was chosen considering the limitations of time, resources, and the number of subjects available. The study was conducted on only one sample group consisting of 35 Physical Education study program students studying sports physiology material. Before being given treatment in the form of learning using audiovisual media, participants were given an initial test (pretest) to measure their understanding of the sports physiology material. After that, audiovisual learning media was used during several meetings to deliver the material.

After the learning process is complete, participants are given a final test (posttest) to see the improvement in their learning outcomes. The pretest and posttest data are then analyzed to determine whether or not there are significant differences that indicate the effectiveness of using audiovisual media in learning sports physiology. Because this study did not use a control group and was not randomized, the results' generalization level is lower than in pure experiments. However, this method is still relevant to use on a small research scale, such as in a thesis or initial study, to produce findings that can be the basis for further research with a more rigorous design.

FINDINGS AND DISCUSSION

Findings

The results of the study showed a significant increase in students' understanding of sports physiology material after being given learning using audiovisual media. Data obtained from the pretest and posttest showed that the average pretest score before treatment was 62.3, while the average posttest score after learning with audiovisual media increased to 78.5. This increase proves that the use of

audiovisual media provides a positive contribution to helping students understand complex and abstract physiological concepts.

The questionnaire results showed that most students responded positively to the application of audiovisual media in the learning process in terms of learning engagement and enthusiasm. Of the 35 respondents, 84% stated that learning became more interesting and interactive. In addition, 78% of students admitted that it was easier to understand the material because of the visualization of physiological processes through animated videos and simulations. This shows that in addition to influencing cognitive learning outcomes, audiovisual media can also increase students' motivation and interest in learning during lectures.

In terms of understanding technical and abstract concepts such as the body's metabolic mechanisms, cardiovascular adaptation, and neuromuscular responses to exercise, students showed improvements in answering application questions. They could explain physiological processes in more detail and accurately after seeing the visual representation presented through the media. These results prove that audiovisual media is effective as a learning aid to simplify concepts that are difficult to understand only through lecture methods or reading text alone.

Table 1. Research Findings: Effectiveness of Using Audio Visual Learning Media on Learning Sports Physiology for Physical Education Students

Component	Pre-Test	Post-Test	Change (%)
Average value	62.3	78.5	+26.0%
Number of Samples	35	35	-
Result Categories			
-Pre-Test	021.44		
Posttest		82.75	
Value Enhancement			
Total		13.4	

Table 2 Statistics and Effectiveness Value of Using Audio Visual Learning Media on Sports Physiology Learning for Physical Education Students

Statistik	Nilai
Pretest rate	60.86
Posttest rate	76.29
Average Increase	+15.43
Minimum Pretest Score	55
Pretest Maximum Value	65
Minimum Posttest Value	70
Posttest Maximum Score	81
Pretest rate	60.86

Discussion

The results of this study indicate that the use of audiovisual learning media positively influences students' understanding of sports physiology. The increase in scores from pretest to posttest proves that this media is effective in helping students understand complex concepts that are dynamic and abstract. Visualization through animated videos or simulations of physiological processes provides a clearer picture, making it easier for students to connect theory with biological mechanisms that occur in the body during physical activity.

The positive response from students to audiovisual media-based learning also shows that this method can increase engagement and motivation to learn. Sound, movement and visual narration make the classroom atmosphere more lively and interactive. This aligns with the current generation's learning style, which tends to be more responsive to visual and auditory stimuli than delivering material verbally alone. In addition, this media also helps lecturers in delivering material more efficiently and in a focused manner.

These findings support several previous studies stating that multimedia learning media can improve learning outcomes in scientific fields such as medicine and sports. Although this study has limitations in design (no control group and limited sample size), the results still provide practical implications for the world of education, especially in developing innovative learning strategies in Physical Education study programs. Audiovisual media can be an alternative or complement conventional learning methods to create a more meaningful and effective learning process.

CONCLUSION

Based on the results and discussion of the research that has been conducted, the use of audiovisual learning media has a positive and significant influence on student learning outcomes in the Sports Physiology course. The increase in the average value from the pretest (62.3) to the posttest (78.5) shows that this media is effective in helping students understand abstract and dynamic physiological concepts. In addition, student responses to learning with audiovisual media also tend to be positive, as seen from the level of involvement and enthusiasm that increases during the learning process.

Audiovisual media can simplify the delivery of complex materials through animated visualizations, simulation videos, and voice narration, making it easier for students to relate theories to biological mechanisms that occur in the body. This method also provides a more interactive and engaging classroom atmosphere to the current generation's learning style, which is more responsive to visual and auditory stimuli.

Although this study has limitations, such as the absence of a control group and a relatively small sample size, these findings still provide essential contributions to developing innovative learning strategies in physical education. Therefore, it is highly recommended that educators begin integrating audiovisual media into the learning process, especially for courses with technical and abstract concepts such as exercise physiology. Further research with a more rigorous experimental design and larger sample size is needed to strengthen the validity of these results.

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