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The Implementation of Technology in Physical Education Learning for Elementary School Students: Challenges and Opportunities

Elbadiansyah[1], Aulia Luqman Aziz[2], Zohaib Hassan Sain[3*], Uthman Shehu Lawal[4]
[1]IKIP PGRI Kalimantan Timur, Indonesia; [2]Universitas Brawijaya, Indonesia;
[3]Superior University, Pakistan; [4]Kaduna State University, Nigeria
zohaib3746@gmail.com

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Abstract

The implementation of technology in physical education learning at elementary schools is an innovative step to enhance the effectiveness and efficiency of the learning process. Technology offers broader accessibility, increases student engagement, and supports the development of digital skills. However, its implementation faces various challenges, such as technological disparities, resistance to change, limited resources, data security issues, and the potential for over-reliance on technology. With support from the government, schools, and communities, technology can be integrated in a balanced manner, serving as a supporting tool to achieve the goals of physical education without compromising its essence.

Keywords: Challenges; Opportunities; Physical Education; Technology Implementation

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INTRODUCTION

In this era of globalization, technological development has been advancing year by year, with society competing to create various innovations that can be utilized in all aspects of life, including education. The development of technological innovations has become a key driver of educational transformation worldwide. The latest technologies can provide more in-depth, interactive, and personalized learning experiences. The use of platforms such as online learning, mobile applications, and learning management systems has enabled broader and more flexible access to education (Saputra et al., 2024).

The use of digital technology in the educational environment not only involves changes in how teachers deliver materials to students but also enhances the overall learning experience. With the help of technology, teachers can present materials in a more interactive and engaging manner, thereby improving the effectiveness of learning (An'navi & Sukartono, 2023). In addition to encouraging more interactive learning methods, technology also enables educators to teach more innovatively by providing easy access to relevant educational resources such as materials, modules, journals, learning videos, and more. For elementary school-aged children, interactive learning methods are crucial, as this is the stage where children begin developing their sensorimotor skills. Therefore, activities that stimulate sensorimotor development should be introduced at this age.

One of the most essential activities that can be taught to elementary school students is improving physical fitness. This is because elementary school students are at an ideal age to receive basic fitness training and to instill healthy and active lifestyle habits. As children grow older, their physical activities increase, making it necessary to provide physical training to support their ability to carry out daily tasks. According to Agus et al. (2024), physical fitness is the ability of an individual's body to perform daily tasks and activities without experiencing significant fatigue, while still maintaining enough energy to handle additional tasks. Physical fitness is influenced by an individual's physical activity and sports exercises; the better and more consistent the physical activity and exercise, the higher the level of physical fitness (Sepriadi, 2017).

Improving physical fitness for elementary school students is implemented through Physical Education, Sports, and Health (PJOK). The objectives of PJOK learning activities are grouped into four categories: physical development, motor development, mental development, and social development. In addition to promoting physical growth, this

subject also strengthens positive character values in students, such as responsibility, discipline, teamwork, and a spirit of achievement. This is because outdoor learning activities encourage students to become athletic, honest, independent, and disciplined (Rahmawati et al., 2024). At the elementary school age, children are actively developing their motor skills, such as throwing, jumping, running, writing, and drawing. Physical Education is the most ideal subject to help children develop their motor skills (Ulfah et al., 2021).

Technology enables broader access to learning resources, encourages more interactive teaching methods, and provides opportunities for educators to adopt more innovative approaches. Advances in technology offer ease and positive benefits when used wisely. However, the implementation of technology in education is not without its challenges. These include difficulties in adapting to and accepting changes from long-established teaching methods. Understanding the opportunities and challenges of integrating technology into learning allows teachers to identify the necessary steps to maximize the potential of technology, ultimately improving the quality of education, particularly for elementary school students.

DISCUSSION

Technology in Physical Education Learning

According to Ricky (2020), elementary school students generally have not mastered the basic techniques required for physical education and sports activities. In fact, learning movement with proper techniques can significantly contribute to more complex advanced movement learning experiences. Therefore, more effective learning strategies are needed for students. One of the methods is through the implementation of technology in physical education learning, specifically digital technology. The use of applications, wearable devices, or specialized software can help enhance students' learning experiences.

One of the digital teaching materials suitable for elementary school students, according to Hasanah & Rodi'ah (2021), is the digital book creator. This application consists of text, images, and audio, which can be published in a digital format and read on computers or other devices such as smartphones or tablets. The book creator can enhance students' cognitive abilities such as speaking, writing, listening, and reading. Through the available features, teachers can add images, videos, and animations that can be customized

to fit the lesson content and students' learning styles. Additionally, teachers can include quizzes in the form of simple games to boost student motivation. This is because the presentation and organization of the material are tailored to students' preferences. Furthermore, beyond the classroom, teachers can provide access to the digital book creator to parents via smartphones, enabling students to learn anywhere.

Next, there is learning using Augmented Reality (AR). The use of augmented reality in education has garnered significant attention from various studies. For instance, research by Carolina (2022) shows that augmented reality (AR) can enhance student motivation and engagement. The use of AR can help teachers provide clearer and more structured instructions, as well as monitor students' skill development more effectively. Additionally, AR can increase student involvement and provide a more contextual and realistic learning experience. This technology allows for immersive learning environments that can bring abstract concepts to life and deepen students' understanding.

Augmented Reality (AR) technology can support learning even with limited facilities and infrastructure available in schools. Students can collaboratively discuss what they observe through Augmented Reality (AR), fostering a more active and engaging learning environment. Research by Tumaloto et al. (2024) suggests that Augmented Reality (AR) can reduce boredom in the teaching and learning process, with students who are usually less interested in certain subjects becoming more enthusiastic when participating in AR-based lessons. This immersive technology can stimulate curiosity, making learning more interactive and enjoyable, thereby increasing student engagement and motivation.

Opportunities in Physical Education Learning

Research conducted by Subroto et al. (2023) shows that 82% of educators believe that technology has successfully increased student engagement in the learning process. Additionally, 76% of educators are confident that technology plays a role in improving students' digital literacy skills. Digital technology has contributed to enhancing the learning experience by providing broader access to educational resources, facilitating information retrieval, and enabling communication between students and teachers. According to Fatimah (2023), the following are opportunities that arise in physical education learning:

- Broader Accessibility: Technology allows elementary school students to access physical education learning materials anytime and anywhere, making it easier to learn without the constraints of time or location.

- Increased Student Engagement: Interactive media, such as educational apps or games, encourage students to be more active, enthusiastic, and involved in physical education learning, both individually and in groups.
- Efficiency and Productivity: Technology helps teachers plan, manage, and assess physical education lessons more efficiently, making the most of the available time and enhancing productivity.
- Development of Digital Skills: In addition to understanding physical education concepts, students also have the opportunity to enhance their technology literacy and digital skills, which are relevant for the modern era.
- Collaboration Between Students and Teachers: Technology facilitates communication between students and teachers, fostering more dynamic interactions through direct discussions, as well as sharing assignments and feedback digitally.

By effectively utilizing technology in physical education learning, elementary school students can not only develop their motor skills and physical abilities but also gain a more interactive, relevant, and time-appropriate learning experience. This creates a great opportunity to foster a generation that is healthier, more creative, and better prepared to face the challenges of the future.

Challenges in Physical Education Learning

Subroto et al. (2023) and Cahyono et al. (2023) explain that several challenges hinder the implementation of digital technology in education:

- Lack of Teacher Training in Technology Use: Many physical education teachers have not received adequate training to effectively utilize technology in the learning process, preventing the full potential of technology from being optimized.
- Cost and Infrastructure Constraints: Not all elementary schools have access to adequate technological infrastructure, such as digital devices, stable internet networks, or supporting applications, making it difficult to implement technology due to limited budgets.
- Resistance to Change: Some teachers and students may feel reluctant or struggle to adapt to the use of new technology, which hinders the implementation process.

- Limited Resources: Budget constraints for purchasing technology devices, teacher training, and device maintenance present significant barriers to technology implementation.
- Data Security and Privacy Issues: Improper use of technology can pose risks to student privacy, such as data misuse or exposure to inappropriate content.
- Dependency on Technology: Over-reliance on technology may reduce face-to-face interaction in physical education learning, which should emphasize physical activity and social skills development.

Although the implementation of technology in physical education learning for elementary school students faces various barriers, collaborative efforts between the government, schools, and the community can be key to overcoming these challenges. With the right strategies, technology can be integrated effectively, providing optimal benefits for students' physical, mental, and social development, without neglecting the core values of physical education.

CONCLUSION

The implementation of technology is crucial in education, including in Physical Education, Sports, and Health (PJOK). It is especially important for elementary school students, as this age is ideal for introducing basic fitness exercises and instilling healthy and fit lifestyle behaviors. At this stage, children begin developing their motor skills, and interactive learning methods are essential. Activities that stimulate their motor skills should be introduced. Interactive learning tools such as digital book creators and Augmented Reality (AR) can be used to provide more engaging lessons. This demonstrates that the integration of digital technology in education offers significant benefits, such as broader accessibility, increased student engagement, and improved efficiency. However, there are also challenges in implementing technology, such as the lack of training, cost and infrastructure limitations, and resource constraints.

Suggestions

To address the barriers in implementing technology in physical education learning at the elementary school level, strategic steps involving various parties are needed. The government can assist by providing equitable technology infrastructure, particularly in

remote areas, while schools should allocate budgets for acquiring devices and training teachers to better prepare them for digital transformation. In addition, strict data protection policies should be implemented to ensure the security and privacy of students. Technology must also be integrated in a balanced way as a supportive tool, ensuring that physical activities and social interactions remain the primary focus. With support from the community, parents, and other stakeholders, existing barriers can be minimized, allowing technology to have a positive impact on physical education learning.

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