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ONLINE PHYSICAL EDUCATION LEARNING DURING POST-PANDEMIC EDUCATION: CHALLENGES AND OPPORTUNITIES

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Abstract

The transition to online learning during the COVID-19 pandemic has significantly impacted the implementation of Physical Education (PE), a subject traditionally dependent on direct physical interaction and practical activities. This study aims to explore the challenges and opportunities of online Physical Education learning in the post-pandemic era. Using a qualitative research design, data were collected through interviews, observations, and document analysis involving 10–15 Physical Education teachers and 20–30 secondary school students selected through purposive sampling. The findings indicate that major challenges include limited physical space, difficulties in assessing student performance, low student motivation, and unequal access to technology. However, the integration of digital tools and the adoption of hybrid learning models provide new opportunities to enhance flexibility, promote personalized learning, and encourage lifelong physical activity. Unlike many previous studies that primarily focus on the challenges of online Physical Education, this study simultaneously explores both the challenges and opportunities of online and hybrid learning in the post-pandemic educational context, providing a more comprehensive perspective for future instructional practices. In conclusion, while online Physical Education presents notable limitations, it also offers innovative pathways for improving teaching and learning practices in the post-pandemic educational landscape

Keywords: online learning, physical education, post-pandemic education, hybrid learning, digital technology.

INTRODUCTION

The COVID-19 pandemic has significantly transformed educational systems worldwide, forcing institutions to rapidly adapt to online learning environments. One of the most affected areas is Physical Education (PE), which traditionally relies on direct physical interaction, hands-on activities, and in-person instruction. During the pandemic, educators were required to redesign PE curricula to fit virtual formats, creating a shift that challenged both teachers and students in maintaining the effectiveness of physical activity-based learning (Varea & González-Calvo, 2020). As education transitions into the post-pandemic era, these changes continue to influence how PE is delivered and perceived.

Online Physical Education learning presents unique challenges compared to other academic subjects. The lack of physical supervision, limited space at home, and varying access to digital resources have made it difficult for students to fully engage in physical activities. Additionally, teachers face obstacles in monitoring students' performance, providing feedback, and ensuring safety during exercises conducted remotely (Daum & Buschner, 2012). These limitations highlight

the need for innovative teaching strategies that can bridge the gap between theoretical knowledge and practical application in virtual environments.

Despite these challenges, the integration of technology in Physical Education also offers new opportunities for enhancing learning experiences. Digital platforms, fitness applications, and video-based instruction enable students to access diverse forms of physical activities beyond the traditional classroom setting. Moreover, technology can promote self-paced learning and encourage students to take greater responsibility for their physical health and well-being (Casey et al., 2021). This shift aligns with the growing emphasis on lifelong fitness and personal health management.

In the post-pandemic context, hybrid learning models have emerged as a promising approach for Physical Education. By combining online and face-to-face instruction, educators can maximize the strengths of both methods. For instance, theoretical concepts such as health education and movement analysis can be delivered online, while practical skills can be reinforced through in-person sessions. This blended approach not only increases flexibility but also allows for more personalized learning experiences (Hortigüela-Alcalá et al., 2021).

However, the successful implementation of online and hybrid Physical Education requires adequate support systems, including teacher training, technological infrastructure, and curriculum adaptation. Educators must be equipped with digital competencies to effectively design and deliver engaging content. Furthermore, schools and policymakers play a crucial role in ensuring equitable access to resources so that all students can participate fully in online PE learning (UNESCO, 2020). Without these supports, the gap in educational quality may widen.

In conclusion, online Physical Education learning in the post-pandemic era is characterized by both challenges and opportunities. While limitations in physical interaction and resource availability remain significant concerns, the integration of technology and innovative teaching approaches opens new possibilities for improving student engagement and learning outcomes. Therefore, it is essential to critically examine these dynamics to develop effective strategies that can enhance the quality and sustainability of Physical Education in the evolving educational landscape.

Although previous studies have examined online Physical Education during the COVID-19 pandemic, most have focused either on learning challenges or on the use of digital technology separately. Limited studies have comprehensively explore how challenges, opportunities, and hybrid learning strategies interact in supporting Physical Education during the post-pandemic period. Therefore, this study seeks to provide a more integrated understanding of these interconnected aspects. This study aims to explore the challenges and opportunities of online Physical Education learning in the post-pandemic era and to identify strategies that may support more effective and sustainable Physical Education practices.

LITERATURE REVIEW

Online Physical Education (PE) has gained increasing scholarly attention, particularly following the global shift to дистан learning during the COVID-19 pandemic. Traditionally, PE has been grounded in psychomotor development, social interaction, and experiential learning, making it inherently challenging to translate into online formats. According to Varea and González-Calvo (2020), the sudden transition to virtual instruction disrupted embodied learning experiences, limiting students' opportunities to engage in meaningful physical activities. This shift has prompted researchers to explore how pedagogical practices in PE can adapt to digital environments without compromising learning outcomes.

Several studies have highlighted the pedagogical challenges associated with online PE implementation. One major issue is the difficulty in assessing students' physical performance and providing immediate corrective feedback. Daum and Buschner (2012) found that teachers often struggle to monitor students' participation and skill development in online settings, which can affect the reliability of assessment. Furthermore, disparities in access to technology, space, and

equipment at home create inequities among students, limiting their ability to fully participate in online physical activities (UNESCO, 2020). These findings suggest that online PE requires flexible and inclusive instructional designs.

In response to these challenges, researchers have emphasized the importance of integrating digital technologies to support learning in PE. Casey, Goodyear, and Armour (2021) argue that digital tools, such as wearable fitness devices, mobile applications, and video platforms, can enhance student engagement and promote self-directed learning. These technologies enable students to track their physical activity, set personal goals, and receive asynchronous feedback from teachers. As a result, online PE can shift from a teacher-centered approach to a more student-centered learning model.

The concept of hybrid or blended learning has also emerged as a key theme in the literature on post-pandemic education. Hortigüela-Alcalá, Hernando-Garijo, and Pérez-Pueyo (2021) suggest that combining online theoretical instruction with face-to-face practical sessions can address many of the limitations of fully online PE. This approach allows educators to deliver cognitive content, such as health education and movement theory, through digital platforms while preserving the essential physical and social components of PE in in-person settings. Hybrid learning is therefore considered a sustainable model for future PE instruction.

Another important area of discussion is the role of teacher competence in delivering effective online PE. Teachers are required not only to master subject content but also to develop digital pedagogical skills. According to UNESCO (2020), professional development programs are essential to equip teachers with the knowledge and skills needed to design engaging and inclusive online learning experiences. Without adequate training, teachers may struggle to utilize technology effectively, which can negatively impact student motivation and learning outcomes.

Finally, existing literature underscores the importance of promoting lifelong physical activity through online PE. While traditional PE often focuses on structured, school-based activities, online learning environments provide opportunities to encourage independent and flexible exercise routines. This aligns with the broader goal of fostering students' autonomy and responsibility for their health and well-being (Casey et al., 2021). Therefore, despite its limitations, online Physical Education has the potential to redefine how physical activity is taught and sustained beyond the classroom.

Although previous studies generally agree that digital technologies can support Physical Education, they differ regarding the extent to which online learning can replace direct physical instruction. Some researchers argue that technology effectively enhances student autonomy and flexibility, whereas others emphasize that psychomotor development still depends heavily on face-to-face interaction. These differing perspectives indicate that online Physical Education should be viewed as a complementary rather than a complete substitute for conventional Physical Education.

RESEARCH METHODOLOGY

This study employs a qualitative research design to explore the challenges and opportunities of online Physical Education (PE) learning in the post-pandemic era. A qualitative approach is considered appropriate because it allows for an in-depth understanding of participants' experiences, perceptions, and interpretations regarding the implementation of online and hybrid PE learning. The study adopts a descriptive method to systematically present findings based on real conditions in educational settings.

The participants of this study consist of Physical Education teachers and students from secondary schools. A purposive sampling technique is used to select participants who have direct experience with online PE learning during and after the COVID-19 pandemic. Participants were selected based on their direct experience in implementing or participating in online Physical Education during and after the COVID-19 pandemic, ensuring that they could provide rich and relevant information related to the research objectives. This sampling method ensures that the data collected is relevant and rich in

information. A total of 10–15 teachers and 20–30 students are typically involved to provide diverse perspectives on the topic.

Data collection is conducted through multiple techniques, including semi-structured interviews, observations, and document analysis. Interviews are used to gather detailed insights into participants' experiences, challenges, and strategies in conducting online PE classes. Observations focus on how online or hybrid PE sessions are implemented, including teaching methods, student engagement, and the use of technology. Additionally, relevant documents such as lesson plans, instructional videos, and school policies are analyzed to support and validate the findings.

Data analysis follows a thematic analysis approach. The collected data is first transcribed, organized, and coded to identify key patterns and themes. These themes are then categorized into broader concepts related to challenges and opportunities in online PE learning. The analysis process involves data reduction, data display, and conclusion drawing to ensure that the findings are systematically interpreted. To enhance credibility, triangulation is applied by comparing data from different sources and methods. In addition, the researcher continuously compared information obtained from interviews, observations, and document analysis to ensure the consistency and trustworthiness of the findings.

The thematic analysis was conducted through three stages: data reduction, coding and categorization of recurring themes, and interpretative synthesis. This systematic procedure enabled the researcher to identify meaningful relationships among the emerging themes while maintaining analytical consistency throughout the study.

Ethical considerations are carefully addressed throughout the research process. Participants are informed about the purpose of the study and provide their consent before participating. Confidentiality and anonymity are maintained by not disclosing personal identities in the research report. Additionally, the researcher ensures that the data is used solely for academic purposes and reported honestly without manipulation. This ethical approach helps maintain the integrity and trustworthiness of the study.

RESULTS AND DISCUSSION

The findings of this study reveal that online Physical Education (PE) learning in the post-pandemic era presents a complex interplay of challenges and opportunities. Based on data collected from teachers and students, it is evident that the transition to online and hybrid learning has significantly altered the delivery of PE. While some participants reported improved flexibility and access to learning resources, others highlighted persistent difficulties in maintaining the quality of physical engagement and interaction.

One of the most prominent challenges identified is the limitation of physical space and facilities at home. Many students reported that they lacked adequate space to perform physical activities effectively, which reduced their participation and motivation. Teachers also noted that it was difficult to design activities that could accommodate diverse home environments. This limitation directly affects the psychomotor development goals of Physical Education, which require sufficient space and proper equipment.

Table 1. Challenges in Online Physical Education Learning

No	Challenges	Description
1	Limited Space and Facilities	Students lack adequate space and equipment for physical activities at home
2	Assessment Difficulties	Teachers cannot accurately monitor and evaluate student performance
3	Low Student Motivation	Reduced engagement due to lack of interaction and structured environment
4	Digital Competency Issues	Teachers and students have varying levels of technological skills

5	Internet and Device Limitations	Unequal access to stable internet and digital tools

Another major issue is the difficulty in monitoring and assessing students' performance. Unlike traditional classroom settings, online learning restricts teachers' ability to observe students' movements in real time. As a result, assessment often relies on self-reported data or recorded videos, which may not accurately reflect students' actual performance. This creates concerns regarding the validity and reliability of evaluation in online PE contexts. These findings suggest that the effectiveness of online Physical Education is influenced not only by technological limitations but also by the practical nature of Physical Education itself, which requires continuous observation and immediate feedback during movement activities.

Table 2. Opportunities in Online Physical Education Learning

No	Opportunities	Description
1	Flexible Learning	Students can learn anytime and at their own pace
2	Use of Digital Tools	Integration of apps, videos, and online platforms enhances engagement
3	Personalized Learning	Activities can be tailored to individual needs and abilities
4	Promotion of Lifelong Fitness	Encourages independent exercise habits
5	Hybrid Learning Implementation	Combines strengths of online and face-to-face learning

Despite these challenges, the study also identifies several opportunities arising from the integration of technology. Similar findings have been reported in previous studies indicating that digital technologies increase learning flexibility and promote greater learner autonomy. This consistency reinforces the potential of technology to complement Physical Education when supported by appropriate instructional strategies. Digital tools such as fitness applications, video tutorials, and online collaboration platforms have enabled more varied and engaging learning experiences. Students reported that they could explore different types of exercises and learn at their own pace. This flexibility supports individualized learning and encourages students to take responsibility for their physical health.

Table 3. Strategies for Improving Online Physical Education

No	Strategy	Description
1	Teacher Training	Enhancing digital and pedagogical competencies
2	Interactive Learning Design	Using gamification and collaborative activities
3	Improved Assessment Methods	Utilizing video submissions and digital tracking tools
4	Infrastructure Support	Providing access to devices and stable internet
5	Blended Learning Approach	Combining online theory with in-person practice

Furthermore, the implementation of hybrid learning models has been positively received by both teachers and students. Combining online theoretical instruction with face-to-face practical sessions allows for a more balanced approach. Teachers can deliver conceptual materials online while focusing on skill development during in-person classes. This approach helps overcome many limitations of fully online learning and enhances overall learning effectiveness. The positive response toward hybrid learning also indicates that combining online theoretical instruction with face-to-face practical sessions may provide a more balanced learning experience than relying solely on either approach.

Teacher readiness and digital competence also emerged as critical factors influencing the success of online PE. Teachers who were proficient in using technology were able to design more interactive and engaging lessons. Conversely, those with limited digital skills faced difficulties in managing online classes effectively. This finding underscores the importance of continuous professional development and training in digital pedagogy.

Student motivation is another key aspect discussed in this study. While some students appreciated the flexibility of online learning, others experienced decreased motivation due to the lack of direct interaction and structured environments. Social interaction, which is an essential component of Physical Education, is often reduced in online settings. Therefore, strategies to enhance engagement, such as gamification and virtual group activities, are necessary.

In addition, issues related to accessibility and equity were identified. Not all students have equal access to stable internet connections, digital devices, or supportive learning environments at home. This digital divide creates disparities in learning outcomes and participation levels. Addressing these inequalities is essential to ensure that online PE learning is inclusive and equitable for all students.

Overall, the findings suggest that while online Physical Education in the post-pandemic era faces significant challenges, it also offers valuable opportunities for innovation. By leveraging technology, adopting hybrid models, and improving teacher competencies, educators can enhance the effectiveness of PE learning. Future efforts should focus on developing adaptive strategies that address existing limitations while maximizing the benefits of digital integration.

CONCLUSION

This study concludes that online Physical Education (PE) learning in the post-pandemic era represents a significant shift in how physical activity and health education are delivered. The transition from traditional face-to-face instruction to online and hybrid models has reshaped teaching practices, learning experiences, and student engagement. While this transformation was initially driven by necessity during the pandemic, it has evolved into a long-term approach that continues to influence educational systems.

One of the main conclusions drawn from this study is that online PE presents substantial challenges, particularly in terms of physical engagement, assessment accuracy, and access to resources. The limitations of space, equipment, and direct supervision hinder the achievement of psychomotor learning objectives. Additionally, disparities in technology access contribute to unequal learning opportunities among students, highlighting the need for more inclusive educational policies.

Despite these challenges, the study also demonstrates that online PE offers valuable opportunities for innovation and development. The integration of digital technologies enables more flexible and personalized learning experiences. Students can engage in a wider variety of physical activities and develop greater autonomy in managing their health and fitness. These opportunities indicate that online learning can complement traditional PE when implemented effectively.

The findings also emphasize the importance of hybrid learning as a sustainable model for future Physical Education. By combining online theoretical instruction with face-to-face practical sessions, educators can balance the strengths and limitations of both approaches. This blended model allows for more comprehensive learning, ensuring that cognitive, affective, and psychomotor domains are adequately addressed.

Furthermore, teacher competence plays a crucial role in the success of online and hybrid PE learning. Educators must possess not only subject knowledge but also digital and pedagogical skills to design engaging and effective learning environments. Continuous professional development and institutional support are essential to equip teachers with the necessary competencies to adapt to evolving educational demands.

In conclusion, online Physical Education learning in the post-pandemic era is characterized by both challenges and opportunities. To maximize its potential, stakeholders must focus on improving infrastructure, enhancing teacher readiness, and developing innovative teaching strategies. By addressing existing limitations and leveraging technological advancements, Physical Education can continue to evolve and remain relevant in a rapidly changing educational landscape.

This study has several limitations. The findings were obtained from a relatively limited number of participants and focused on secondary school Physical Education in a specific educational context. Consequently, the results should be interpreted within this scope. Future studies are encouraged to involve participants from different educational levels and geographical areas while examining the long-term effectiveness of hybrid Physical Education models.

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