

ARTIFICIAL INTELLIGENCE USEFULNESS AND CHALLENGES STRATEGIC PLANNING, RESOURCE MANAGEMENT AND PERFORMANCE EVALUATION IN PHYSICAL PROGRAMMES

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Abstract

This paper examined the role of Artificial Intelligence (AI) in enhancing educational planning and Physical Education (PE) in Nigerian secondary schools, focusing on its potential to improve efficiency, personalization, and decision-making. The study adopts a descriptive and analytical approach, drawing on existing literature and empirical studies on AI applications in education and physical education. It synthesizes current trends, tools, and practices relevant to AI integration in school systems. The study reveals that Artificial Intelligence significantly improves data-driven planning by enabling the analysis of students' health, fitness, and academic performance. It supports personalized learning through adaptive systems tailored to individual needs and enhances resource management via intelligent scheduling of facilities and personnel. It also provides objective performance evaluation through real-time feedback and video analysis, thereby improving skill acquisition and reducing injury risks. However, challenges such as data privacy concerns, inadequate infrastructure, limited technical expertise, and overdependence on technology hinder its effective implementation. The findings suggest that policymakers and school administrators should invest in infrastructure, training, and data protection measures to maximize AI benefits in education. This paper contributes to the growing discourse on Artificial Intelligence in education by highlighting its specific relevance to Physical Education in the Nigerian context.

Keywords: Artificial intelligence, Secondary schools, Strategic planning, Physical education programmes

Introduction

Despite growing literature on the application of Artificial Intelligence in education, there remains limited empirical evidence on its integration into Physical Education programmes in Nigerian secondary schools. Most existing studies focus on general educational administration and largely draw from developed contexts, leaving a gap in understanding how Artificial Intelligence can be effectively implemented in resource-constrained environments. Furthermore, there is a lack of research examining the readiness of PE teachers and school administrators to adopt AI-driven tools for planning, scheduling, performance evaluation, and injury prevention. This study therefore seeks to address this gap by exploring the practical application and challenges of AI in Physical Education within Nigerian secondary schools.

Education drives social, economic, political, religious, and technological development of nations. The actualization of the goals of education warrants robust and efficient planning and management mechanisms (Osiesi, 2023). A nation cannot develop effectively if education is treated with neglect, as it remains the foundation of development and innovation. Gregory and Jegede (2021) submitted that educational planning and management form the foundation of successful schools, institutions, and organizations. Foundation plays a pivotal role in the development of a nations whoever fail to plan will eventually plan to fail, planning and management reveal quality of a good school. As educational institutions face increasing demands for efficiency and quality, the role of AI and technology has become crucial. The adoption of AI in educational planning and administration is transforming how institutions manage processes, engage with stakeholders, and deliver educational content (Ajuwon et al., 2024). The ministry of education overseer and control proper monitoring of academic program in every state in Nigeria.

Despite the importance of effective educational planning and management, secondary schools in Nigeria continue to face significant inefficiencies in administration, resource allocation, student performance tracking, and decision-making processes (Adelana & Akinyemi, 2021). The incessant transfer of teachers and poor funding are among the challenges faced by secondary school teachers (Ugolo&Onukwu, 2025). In most schools in Nigeria, manual methods, which can be referred to as traditional teaching and administrative methods, are still prevalent (Folasha, 2023). This also applies to the teaching and administration of physical education. PE and sports have always been pivotal in promoting health and fitness. However, with changing lifestyles, technological advancements, and new scientific insights, the landscape of these disciplines is undergoing a transformative shift (Yogesh, 2025). It encompasses and cover beyond the classroom setting. Physical education has long been recognized as an essential component of a well-rounded education, providing students with opportunities to develop physical skills, build confidence and self-esteem, and cultivate a lifelong appreciation for physical activity (Kirk, 2010).

In the past, many people perceived physical activities as solely physical exercise, and experts in the field were often referred to as "jumpologists" (physical educators). Some even claimed that there was nothing more to the field than just running and jumping. The current interpretation of Physical Education is centrally based on its conceptual meaning as a discipline of knowledge or subject-matter oriented, since all disciplines are concerned with certain aspects of human endeavor. Physical Education as a body of knowledge is viewed as an area of study concerned with human movement behavior (Human Kinetics). Movement is a fundamental characteristic of life, Physical Education is a discipline of human movement studies concerned with the study of man and his movement behavior patterns and the variety of applications of this knowledge in the service of man and society (Ojeme, 1990; Akindutire, 2014)

The term artificial intelligence was coined by John McCarthy when he held the first Dartmouth conference in 1956 (Cristianini, 2016). Later, in 1959 in Turkey, at a public conference at Ataturk University, Turkish mathematics professor Dr. Cahit Arf presented

his conference paper titled “Can a Machine Think?”. A current definition of artificial intelligence is “computing systems that can engage in human-like processes such as learning, adapting, synthesizing, self-correction and the use of data for complex processing tasks” (Popenici & Kerr, 2017). Moreover, the term is commonly used to refer to AI-associated technologies related to machine learning, natural language processing, computer vision, speech, and big data. The explosive growth of AI is increasingly transforming how people work, live, source information, interact, communicate, and are educated (Chiu et al., 2022).

The rise of Artificial Intelligence has made it easier for teachers and students to teach and learn many subjects. AI tools like ChatGPT, DeepAI, Google Scholar, Gemini, DeepSeek, and Claude can generate detailed text based on information created by people. These tools can be used in many school settings. Artificial Intelligence (AI) has emerged as a dynamic force capable of reshaping social interactions, particularly in education. AI refers to the development of computer systems capable of performing tasks that typically require human intelligence (Igbokwe, 2023). These tasks include learning, reasoning, problem solving, perception and natural language understanding (Adelana & Akinyemi, 2021). Ogunode (2023) defined AI as programs designed with human-like intelligence and structured in forms of computer, robot, or other machines to aid in provision of any kind of service or tasks to improve social economic and political development of the society. Artificial Intelligence technologies encompass various techniques and approaches, such as machine learning, deep learning, natural language processing, computer vision and robotics. Olatunde (2024) explained that these technologies enable computers to analyze vast amounts of data, recognize patterns, make predictions and automate complex processes. AI saves time and makes complex situation simpler and easier. Its memory can be copied and safe elsewhere. Fullan, et al., (2023) elucidated that Artificial Intelligence has applications across numerous fields, including health care, finance, transportation, customer service and in Physical education.

While AI offers numerous benefits, it also raises important ethical and privacy concerns. The extensive collection and analysis of personal data necessitate strict safeguards to protect individual rights and ensure responsible use. Moreover, the need for specialized knowledge to develop and implement AI systems presents a barrier for some institutions. Addressing these challenges is essential to harness AI's full potential in a manner that is ethical, equitable, and sustainable (Crawford & Calo, 2019). It is used across all the spheres of influence by the students, teachers and administrator. AI technologies such as machine learning, data analytics, and intelligent scheduling are being leveraged to design better programmes, monitor student progress, automate attendance, and forecast participation trends (Kumar & Bansal, 2023; Ogunleye et al., 2022).

Data-Driven Strategic Planning

Discovering individual needs, health status, fitness levels, and performance data through manual or traditional methods can often lead to a significant waste of time and resources. Such approaches may lack efficiency and accuracy, making it challenging to effectively

address each student's unique requirements. By leveraging modern data collection and analysis tools, schools can tailor timetables and curricula with greater precision to meet the specific needs of their students. This targeted approach allows educators to focus more attention on areas where students are struggling, thereby enhancing their overall development.

Artificial Intelligence (AI) has emerged as a transformative tool in the domain of physical education (PE), enabling educators and administrators to make more informed, evidence-based decisions (Unesco, 2023). By analyzing large volumes of student health, fitness, and performance data, AI facilitates a comprehensive understanding of individual and group student needs, leading to more targeted and effective PE programs (Doherty & O'Neill, 2019). These insights allow schools to tailor curricula that address specific deficiencies or disparities, ensuring equitable and personalized learning experiences (Dumont & Ready, 2023; Shireesha & Jeevan, 2024; Merino-Campos, 2025). For example, machine learning algorithms can detect students who are at risk of inactivity or declining health, prompting early interventions that promote increased engagement and healthier behaviors (Fletcher et al., 2021). Through the help of Artificial Intelligence, the administrator will know the work rate of each students, the exercise that could be given to them based on their health status and differences.

Data-driven strategy enables schools to look inward, assess their current programs critically, and develop new initiatives that are directly aligned with students' needs. As a result, educational institutions can create a more personalized learning environment, improve student outcomes, and ensure that resources are allocated effectively to support each student's growth and success.

Personalized Physical Education

Artificial intelligence can minister to the need of student individually. AI systems designs a unique program for each student interest and goals. In PE, AI can be applied in various areas such as customized lessons, providing information, student evaluation, and student counseling methods (Lee & Lee, 2021). Through AI applications, users' physical activity data, such as step count and calorie expenditure, can be collected instantly and feedback can be provided (Vairavasundaram et al., 2022). Instantly the data collected can be worked on and result delivered immediately. AI-powered applications analyze this data to provide individualized feedback and recommendations, allowing educators to monitor student progress continuously (Chen et al., 2021).

Individual monitoring is essential and accessible with the aid of Artificial Intelligence. It is possible to monitor and improve the health status of individuals with personalized interventions and instant feedback provided by AI applications (Mikava, 2024). Artificial intelligence is meant for everybody whether old, young, able or physically challenged. AI systems support inclusive PE environments by accommodating students with diverse abilities and needs, promoting equity and participation (Sharma et al., 2020). AI systems can support inclusive physical education environments in many ways. They help accommodate students with different abilities and needs, making sure everyone has a chance to participate. By doing so, AI promotes fairness and encourages

more students to get involved in PE activities. This creates a more welcoming and equal environment for all learners.

Resource Management and Scheduling

Artificial Intelligence (AI) is transforming the ways in which educational institutions optimize classroom resources and scheduling, resulting in enhanced learning experiences and improved operational efficiency (Anieka et al 2024). AI is changing the way schools and colleges manage their classrooms and schedules. It helps organize resources and plan lessons more effectively. By using AI, schools can create better learning environments for students and ensure that everything runs smoothly. This technology also helps staff save time and work more efficiently, making the overall operation of the school better. It makes education easier and more effective for both students and teachers. AI systems can predict peak usage times for classrooms and laboratories, allowing administrators to schedule classes in a manner that minimizes conflicts and maximizes space utilization (Anieka et al 2024). AI can help make school work easier by handling tasks like planning class schedules, managing school facilities, and sharing equipment. Smart systems can automatically create the best timetable, making sure classrooms, teachers, and students are all organized well. This saves time for staff and helps use school resources better, especially in schools with fewer buildings and equipment.

Using AI to plan and organize physical education classes helps make the best use of sports facilities, equipment, and teachers. This means that classes can be scheduled more efficiently, so students have access to the right equipment and space when they need it (Chukwuemeka & Caroline, 2025). It also helps ensure that teachers' time is used wisely, allowing them to focus more on teaching and supporting students. As a result, students get better sports experiences, learn more, and enjoy their PE classes more (Casey et al., 2023). AI algorithms can automate and streamline the planning of PE activities by analyzing data such as class sizes, available spaces, equipment needs, and individual student requirements (Zhang et al., 2020).

Advanced scheduling systems utilize machine learning techniques to predict peak usage times and allocate resources efficiently, minimizing conflicts and ensuring equitable access for all students (Li & Wang, 2021). For example, AI can dynamically assign students to suitable activities based on their fitness levels and goals while considering constraints like equipment availability and instructor schedules (Kim & Park, 2022).

In a secondary school in Nigeria, if the school administrator uses a smart scheduling system to organize activities and resources. For example, during sports hours, the system looks at past data to see when the school's football field are usually busy. It then suggests the best times for students to use these facilities so there are no clashes. The system also helps assign students to different sports classes based on their interests. For instance, some students may want to join soccer, while others athletics. The system considers how many trainers are available, the number of students, and the equipment needed. This way, students get fair access to sports facilities, and activities run smoothly without conflicts. It saves time for teachers and makes sure every student can participate in their preferred activities.

Performance Evaluation and Feedback

In the old way of checking performance, people would watch and judge what someone is doing. This can sometimes be unfair because different people might see things differently or make mistakes. AI systems, on the other hand, use clear rules to judge performance. During an interhouse sport competition, AI can be used to record and analyze athletes' performance. It can track how well athletes perform in different events, such as running, jumping, or throwing. The AI system can analyze their movements, speed, and technique to see where they are excelling or need improvement. AI in this way makes it easier to accurately record performances and support athletes to perform at their best in the competition. They give the same standard every time, so the results are fair and consistent. This way, everyone is judged more equally, and the process becomes more reliable. For example, systems utilizing pose estimation models like Open Pose or DeepLabCut can quantify joint angles, limb alignments, and movement speed, providing objective scores (Cao et al., 2019).

AI-powered video analysis tools, teachers in Nigerian secondary schools can easily watch and check how students perform during activities like, running, or team sports. These tools help teachers see what students are doing well and where they can improve. It makes the process of checking students' skills faster and easier. This way, students get better advice and support to do better in sports and physical activities. Computer vision algorithms can track key body points, analyze motion trajectories, and assess technique consistency with high accuracy (Zhao et al., 2020). This helps to find mistakes in how students sit or move very fast.

One of the most significant advantages of AI-enabled video analysis is the ability to deliver instant feedback to students. Real-time visualizations and corrective suggestions help learners adjust their techniques promptly, accelerating skill acquisition (Li et al., 2021). Instant visual help and tips allow learners to fix their techniques quickly, helping them learn faster. This quick feedback is especially useful in stopping injuries by fixing unsafe positions and reducing repeated strain.

By constantly watching how someone moves, AI tools can find dangerous habits or signs of tiredness. When these issues are noticed, the AI can alert the person so they can take action early. This helps prevent injuries and makes sure they stay safe while practicing or exercising. Detecting improper landing mechanics in gymnastics or running form in athletics can help prevent injuries such as sprains or strains (Zhang et al., 2022).

Challenges of Artificial

Although Artificial Intelligence (AI) has the potential to improve planning, organization, and instructional delivery in secondary schools, particularly in Physical Education (PE) programmes, several challenges limit its effective and consistent use in Nigeria. These challenges reduce the extent to which schools can fully integrate AI into teaching, learning, and sports administration. There are some problems that make it hard for secondary schools in Ogun State to use AI all the time. These challenges stop schools from using AI as much as they want to in their daily work. Some of these challenges are data privacy, security concerns dependence on AI. This raises concerns about the

security of data and the potential for breaches. Data protection regulations require that institutions implement robust security measures to protect against unauthorized access and misuse. Compliance with these regulations necessitates comprehensive data management practices, including encryption, secure storage solutions, and strict access controls to prevent data breaches (Igbokwe, et. al., 2024). One concern is that relying too much on AI for learning can cause problems. This is because if students rely too much on AI for learning, it can stop them from developing important skills like thinking, problem-solving, and remembering things. This can be a big problem. In other words, students will be depending too much on machines which can hinder their learning and making full use of their potential (Awofiranye, 2024).

Another significant challenge infrastructural and financial limitations, including inadequate ICT facilities, unstable electricity supply, and limited access to modern digital tools required for AI integration in PE and other subjects. These constraints make it difficult to consistently implement AI-based systems for lesson planning, student monitoring, sports facility management and there is often a lack of AI literacy among teachers and school administrators, which affects their ability to effectively use AI tools in curriculum planning, PE instruction, and student performance evaluation. Without proper training, AI systems may be underutilized or misapplied, reducing their potential benefits in educational and sports settings.

Conclusion

Using Artificial Intelligence (AI) in planning and running physical education (PE) classes can be very helpful for schools. AI can help give students personalized lessons, make managing PE programs easier, and help teachers make better decisions based on data. As technology gets better, using AI in PE will help students stay healthier, be more active, and become well-rounded.

- i. Educational institutions should adopt AI-powered tools such as fitness trackers, motion analysis systems, and smart scheduling platforms to support effective Physical Education delivery, optimize the use of sports facilities, and improve student performance tracking.
- ii. PE teachers, sports administrators, and policymakers should develop AI literacy and digital competence to effectively integrate AI technologies into sports instruction, while also understanding their ethical implications, limitations, and potential biases.
- iii. AI applications in Physical Education should be designed to promote equity by ensuring that students with different fitness levels, abilities, and backgrounds receive personalized training programs and equal access to sports opportunities.
- iv. Continuous research should be conducted on the use of AI in Physical Education, particularly in areas such as motor skill acquisition, fitness assessment, injury prevention, and student engagement in sports activities.
- v. Clear institutional frameworks and policies should be developed to guide the responsible use of AI in Physical Education, ensuring data privacy, fairness, transparency, and effective use of technology in sports learning environments.

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