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## IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE (AI) METHODS IN PE & SPORTS

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### **Abstract :**

*Artificial intelligence (AI) is gradually influencing every aspect of daily life, including education. AI can also provide personalized support to learners through predicting academic continuity or dropout rates. Although AI research is still in its early stages, we need to observe how it evolves and utilizes its potential over time. By using AI in physical education (PE), we can enhance its potential applications in sports and bring about changes in the nature of PE, its visualization, and its delivery. Based on the concept of AI and related research areas, this study explores its principles and applications in PE, and presents a focused, in-depth analysis of areas in PE technology where AI can be applied – personalized PE classes, knowledge delivery, learner assessment, and learner counseling methods. Our findings highlight the expertise required for future PE teachers in the application of AI.*

**Keywords :** Artificial intelligence, technology, applications in sports, difficulty control

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### **Preface :**

Artificial intelligence (AI) has emerged as a revolutionary technology in the field of education, transforming teaching and learning processes. Capabilities such as personalized learning, automated assessment, and data analysis, enabled by AI, are making education more effective and inclusive. This technology offers new opportunities for both teachers and students, such as customized learning materials and time savings. However, it also presents challenges such as data privacy, disparities in technological access, and ethical issues. This study analyzes the impact, implications, challenges, and possibilities of AI in education. Its aim is to understand how AI can improve the learning process and what obstacles need to be overcome. This study is based on a review of previous research and utilizes a descriptive methodology. Numerous studies indicate that AI can bring about positive changes in education, but its effective implementation requires policy frameworks, training, and resources. This technology can be a significant step towards making education more inclusive and innovative, provided that ethical and technical challenges are addressed. Physical education (PE) is a crucial school subject for holistic human development. The use of technology, including artificial intelligence (AI), in modern education theoretically enriches



educational content, changes perceptions of education, and transforms traditional educational models. AI also has the potential to improve the practicality of education for learners, reshape physical education, and promote sustainable development.

### **AI and Physical Education Classes :**

Globally, the current school system is a product of the industrialization era and was designed to provide all citizens with the right to education. Before the advent of the school system, education was only accessible to privileged classes. The school system made a significant contribution to the achievement of democracy by providing all citizens with the benefits of education. However, in the process of creating an education system for all citizens, a crucial form of education was lost: individualized education. In developing the mass education system that we call school, a standardized school structure was established, in which one teacher is responsible for educating many students. This structure places the curriculum and assessment in the hands of the education provider rather than the learner. For effective learning, it is essential to properly diagnose each learner's interests and aptitudes, as well as their academic history, level, and learning pace. However, classes in schools are conducted according to a predetermined curriculum, and assessment is based solely on outcomes. This has been a structural and systemic problem since the inception of the school system. Attempts have been made to compensate for this by modifying classroom structures in various ways, but the isolation of students within the classroom environment remains an unresolved issue. Adapting physical education classes means providing instructional support to students to offer them the most suitable physical education experience, taking into account their physical condition, physical activity achievement level, psychological characteristics, and home environment. Therefore, it can be assumed that all students can achieve their goals through customized physical education classes. Addressing this problem of mass education is crucial for the future.

### **Personalizing Physical Education Using AI Technology :**

Adaptive learning and customized education, which take into account both learners and learning styles, have emerged as major areas of interest in applying AI research in educational contexts, suggesting that the use of AI in education aims to meet learners' needs and provide them with their preferred learning opportunities. Customized physical education (PE), which considers learners' diverse physical, mental, and social characteristics, can be divided into differentiated, personalized, and individualized physical education. Differentiated physical education involves classes composed of small groups, where learners' learning pace and prior knowledge levels are considered when selecting teaching methods, although the educational content and learning objectives remain the same for all learners. Personalized classes provide learners with individual lessons, where learning is tailored to their level and needs. In individualized lessons, the educational goals, content, and teaching methods vary for each learner. For customized physical education classes that incorporate and apply artificial intelligence (AI), improvements and developments should be made not only in the school system but also in the school's environmental aspects, such as sports equipment and gymnasiums. The focus of such changes should be on the "learning process."



A flexible school system is needed, meaning there should be a flexible teaching system that is adaptable to determining physical activities that match learners' achievement levels and learning pace, taking into account the differences in their cognitive and physical development levels. This will enable diverse teaching methods that reflect the needs and learning outcomes of individual learners. However, in group sports or project-based learning that require collaboration with other students, maintaining a class level is necessary. For learner-centered customized physical education classes, individual learners' physical condition, physical activity achievement level, and psychological characteristics should be objectively measured through empirical evaluation. Sensory AI can be used to objectively measure physical activity achievement levels based on an individual's physical condition, allowing for their identification through facial recognition and voice analysis, as well as the analysis of images and videos of their physical activity. This type of measured data can then be analyzed on machine learning and deep learning platforms using cognitive AI, providing learners with scientific evaluation and feedback. This method can also communicate with learners using the natural language capabilities of executive AI, enabling them to diagnose and improve their performance levels.

### **Artificial Intelligence and the Provision of Knowledge :**

Physical education teachers should study teaching materials and acquire the necessary tools to conduct physical education classes and impart knowledge of physical activities. Previously, when knowledge was limited, physical education teachers were a primary source of information. However, the application of artificial intelligence (AI) in education has provided personalized knowledge through the vast amount of information made available by deep learning. In the past, significant knowledge was held by only a select few; but now, most people have access to knowledge through the internet and have reached a level of knowledge reproduction beyond this access, made possible by deep learning. Deep learning involves a network of neurons and cells in artificial neural networks that connect and learn to establish a machine learning environment based on how the brain learns. Artificial intelligence's (AI) ability to accumulate and possess knowledge can also address the disparities in knowledge and information ownership that exist due to socio-economic factors. AI can be used to provide learning environments for those who cannot attend school for economic reasons, and its functions can enable continuous learning. It is essential to provide teachers with appropriate training in the use of artificial intelligence (AI) technologies so that they can utilize this technology more effectively. Furthermore, data privacy and ethical concerns are crucial, as it is necessary to ensure the secure and ethical use of students' personal information. In the future, artificial intelligence (AI) and advanced technologies such as blockchain, virtual reality, and augmented reality can make education even more impactful and inclusive. If used in a balanced and ethical manner, artificial intelligence (AI) can prove instrumental in making the education system more efficient and personalized.

### **Conclusion :**

Physical education is a crucial part of comprehensive human development. The use of technology in modern physical education can theoretically enrich educational content,



promote the perception of physical education, and bring about changes in traditional educational models, while also having practical effects, leading to the restructuring of physical education and promoting continuous development. The future of physical education will be bright due to the nature of the educational model, visualization, and repetition, as well as the application of AI in sports. A single physical education class contains diverse students with varying cognitive, physical, and emotional abilities. In such an environment, physical education teachers must be able to recognize students' individual differences and provide them with appropriate goals. According to Bandera's self-efficacy theory, experiences of achievement create strong personal beliefs, while experiences of failure weaken self-efficacy. Providing learners with achievable goals so that they can experience achievement is a crucial aspect to consider when planning physical education classes. However, there are many limitations in accurately identifying individual differences by providing appropriate levels of achievement and goals for all individual learners in physical education classes. Physical education classes using AI can overcome these difficulties through "difficulty control." Considering the diverse characteristics and individual differences of the learners participating in the class, the "difficulty control" function of AI provides achievable goals and task levels according to the learner's level. Currently, some students enjoy and actively participate in physical education classes, while others avoid or passively participate in classes for various reasons. It has been reported that the problem is that students do not assess their physical abilities and activity levels themselves, but rather through the perspectives and language of teachers and other students participating in the class. Physical education classes using AI will provide learners with diverse and customized experiences. By providing diverse sensory information, learners can gain direct experience, and by receiving objective information and feedback from AI, learners can objectively assess their physical abilities. Furthermore, learners can actively participate in physical activities to improve their physical capabilities without feeling self-conscious among other students.

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