



ROLE OF ARTIFICIAL INTELLIGENCE IN PHYSICAL EDUCATION AND SPORTS

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Artificial Intelligence (AI) is increasingly being integrated into physical education and sports to support teaching, training, performance analysis, fitness assessment, and athlete development. AI-based technologies can collect and analyse large amounts of information related to physical activity, movement patterns, fitness levels, training loads, and sports performance. AI-powered fitness applications, wearable devices, computer vision systems, motion-analysis tools, and intelligent coaching platforms can provide personalized feedback and support individualized training programmes. In physical education, AI can assist teachers in monitoring students' physical activities, assessing fitness performance, providing digital learning resources, and improving student engagement. In sports training, AI can help coaches analyse technical performance, identify movement patterns, monitor workload, and develop data-based training strategies. AI can also contribute to injury-risk monitoring, performance prediction, tactical analysis, and recovery management when used appropriately. The integration of AI may improve the efficiency, accuracy, and personalization of physical education and sports training. However, challenges such as high costs, limited technological infrastructure, lack of technical knowledge, data privacy, accuracy of automated assessments, and excessive dependence on technology require careful consideration. AI should therefore complement professional judgment, practical physical activity, and direct teacher or coach interaction rather than replace them. The effective and responsible use of AI can contribute to more personalized, measurable, innovative, and evidence-based physical education and sports training.



KEYWORDS: Artificial Intelligence, Physical Education, Sports, Sports Training, Machine Learning, Performance Analysis, Fitness Assessment, Wearable Technology, Computer Vision, Digital Coaching,

INTRODUCTION

Artificial Intelligence (AI) has become an important technological development in modern physical education and sports. The integration of AI into sports and educational activities is transforming traditional approaches to teaching, training, performance assessment, and fitness management. AI technologies can collect, process, and analyse large amounts of data related to physical activity, fitness, and athletic performance. In physical education, AI-based applications can help teachers assess students' fitness levels, monitor participation, provide personalized exercise programmes, and track individual progress. In sports,

AI is increasingly used for performance analysis, tactical planning, injury prevention, talent identification, and training optimization. Wearable devices, smart fitness applications, computer vision, and machine-learning systems can provide real-time information about movement, speed, heart rate, workload, and other performance indicators.

The application of AI can make physical education and sports training more individualized, scientific, measurable, and efficient. AI-powered video analysis can help identify technical errors and provide useful feedback to athletes and coaches. Predictive analytics can assist in understanding performance patterns and managing training loads, while intelligent systems can support injury prevention and rehabilitation. AI can also contribute to sports officiating, talent development, game analysis, and sports administration. However, its effective implementation requires appropriate infrastructure, technical knowledge, trained professionals, and responsible management of personal data. Issues such as privacy, data security, accessibility, cost, and excessive dependence on technology also need consideration. AI should therefore complement rather than replace the expertise of physical education teachers, coaches, trainers, and sports professionals. The combination of artificial intelligence and human expertise can create innovative opportunities for improving physical fitness, learning, athletic performance, and overall participation in physical education and sports.

AIMS AND OBJECTIVES:

Aim

The main aim of the study is to examine the role of Artificial Intelligence (AI) in physical education and sports and to understand how AI-based technologies can improve teaching, training, fitness assessment, performance analysis, injury prevention, and sports management.

Objectives

- ❖ To examine the concept and importance of Artificial Intelligence in physical education and sports.
- ❖ To identify the major AI technologies used in physical education and sports.
- ❖ To study the role of AI in improving sports performance.
- ❖ To examine the use of AI in physical fitness assessment and monitoring.
- ❖ To analyse the role of AI in personalized training programmes.
- ❖ To study the application of wearable AI devices in sports training.
- ❖ To examine the use of computer vision for analysing athletes' movements and techniques.
- ❖ To study the contribution of AI to injury prevention and rehabilitation.
- ❖ To examine the role of AI in talent identification and athlete development.
- ❖ To analyse the use of AI in sports strategy and decision-making.
- ❖ To study the role of AI-based applications in promoting physical activity among students.
- ❖ To examine the usefulness of AI for physical education teachers and sports coaches.
- ❖ To study the role of AI in monitoring training load and athlete performance.

CONCEPT OF ARTIFICIAL INTELLIGENCE IN PHYSICAL EDUCATION AND SPORTS

Artificial Intelligence (AI) refers to the ability of computer systems and digital technologies to perform tasks that normally require human intelligence, such as learning, analysing information, recognizing patterns, making decisions, and providing recommendations. In physical education and sports, AI represents the application of intelligent technologies to understand, monitor, and improve physical activity, fitness, training, and athletic performance. AI systems can process large quantities of information collected from athletes, students, coaches, wearable devices, cameras, and fitness applications. These

technologies can help in assessing physical fitness, analysing body movements, monitoring training loads, and identifying performance patterns. AI can also support physical education teachers by providing systematic information about students' participation, fitness development, and individual requirements. Thus, the concept of AI in physical education extends beyond simple technological assistance and involves the use of data-driven systems to support teaching, learning, assessment, and physical development.

In sports, AI is increasingly associated with personalized training, performance analysis, injury prevention, talent identification, and strategic decision-making. Machine-learning algorithms can analyse previous performance data and identify patterns that may assist coaches in planning training programmes. Computer-vision systems can examine athletes' movements and techniques, while wearable technologies can continuously collect information such as heart rate, speed, distance, and workload. AI-based applications can use these data to provide feedback and support individualized exercise programmes. AI can also contribute to rehabilitation by monitoring recovery and helping professionals track changes in physical performance. However, the concept of AI should be understood as a supportive technology rather than a replacement for teachers, coaches, trainers, or sports professionals. Human expertise remains important for interpreting individual needs, motivation, emotions, social interaction, and contextual factors. Therefore, the integration of AI with professional knowledge can provide a modern, systematic, personalized, and evidence-based approach to physical education and sports.

Evolution of Artificial Intelligence in Sports Training

The evolution of Artificial Intelligence (AI) in sports training has developed alongside advances in computing, data analysis, sensors, and digital technologies. Earlier sports training largely depended on coaches' observations, physical assessments, manual records, and athletes' experience. The introduction of computers made it possible to record and analyse performance data more systematically. As digital video technology developed, coaches began using recorded matches and training sessions to study movements, techniques, tactics, and mistakes. The development of statistical software and data analytics further improved the measurement of athletic performance. With the emergence of machine learning, sports organizations gained new methods for identifying patterns in large datasets and generating performance-related insights. Wearable sensors and smart devices subsequently enabled the collection of real-time information about heart rate, speed, distance, acceleration, workload, and other physical indicators. These developments gradually changed sports training from primarily observation-based methods toward more data-supported approaches.

Modern AI has expanded these applications through computer vision, predictive analytics, intelligent coaching systems, and personalized training platforms. AI-powered video systems can analyse body movements and technical skills, while machine-learning models can process historical and real-time data to identify performance trends. Wearable technologies can provide continuous information that assists coaches in monitoring training intensity and recovery. AI applications can also support individualized training by considering differences in athletes' physical condition, workload, performance history, and training responses. In addition, AI is being explored for injury-risk monitoring, rehabilitation, talent identification, tactical analysis, and sports decision-making. The evolution of AI has therefore created opportunities for faster analysis, personalized feedback, and more systematic training management. Nevertheless, effective use of these technologies requires qualified professionals, reliable data, suitable infrastructure, and attention to privacy and ethical considerations. AI is consequently evolving as a complementary tool that works with the knowledge and experience of coaches and sports scientists to support the continuing development of sports training.

AI-Based Fitness Assessment and Performance Monitoring

Artificial Intelligence (AI) has introduced new approaches to fitness assessment and performance monitoring in physical education and sports. Traditional fitness assessment generally depends on physical tests, manual measurements, observation, and periodic evaluation by teachers or coaches. AI-based systems can complement these methods by collecting and analysing data from wearable devices, mobile applications, cameras, fitness equipment, and digital assessment platforms. These technologies can monitor indicators such as heart rate, speed, distance, movement patterns, exercise intensity, repetitions, and training workload. AI algorithms can process these data to identify performance patterns and provide information about individual fitness levels. In physical education, AI can assist teachers in monitoring students' physical activity and progress over time. It can also support the development of individualized exercise programmes based on students' performance and physical requirements. Continuous digital monitoring can provide more frequent information than occasional manual assessments and can help identify changes in physical performance.

In competitive sports, AI-based performance monitoring can provide coaches and athletes with detailed information for training planning and performance improvement. Computer vision can analyse body movements, posture, technique, and coordination during training or competition. Machine-learning systems can compare current performance data with previous records and identify patterns that may require attention. Wearable technologies can provide real-time information about workload, recovery, and physiological responses during exercise. AI-based analysis may also help coaches manage training intensity and recognize signs of excessive workload, supporting injury-prevention strategies. Performance monitoring can be applied to individual athletes as well as teams, allowing coaches to examine technical, physical, and tactical aspects of performance. However, AI-generated information needs to be interpreted by qualified teachers, coaches, trainers, or sports scientists because numerical data alone cannot fully explain an athlete's condition or performance. Therefore, AI-based fitness assessment and performance monitoring can serve as valuable supportive tools for systematic evaluation, personalized training, continuous feedback, and evidence-based decision-making in physical education and sports.

AI in Sports Performance Analysis and Technique Improvement

Artificial Intelligence (AI) has become an important tool for analysing sports performance and improving athletes' technical skills. Traditional performance analysis often depends on coaches' observations, manual recording, and repeated review of match or training footage. AI technologies can analyse large volumes of performance data and identify patterns that may not be easily recognized through ordinary observation. Computer vision systems can examine athletes' movements, body positions, speed, balance, coordination, and technique through video recordings. AI-based systems can also analyse factors such as running patterns, jumping movements, throwing actions, stroke mechanics, and body alignment. By comparing an athlete's current performance with previous performances or defined technical parameters, AI can provide detailed information about strengths and areas requiring improvement. Such analysis can help coaches and athletes develop a more systematic understanding of performance.

AI can also support technique improvement by providing timely and individualized feedback during training. Motion-tracking technologies can identify variations in movement and help detect technical inconsistencies. Machine-learning systems can process performance data over time and identify recurring patterns in an athlete's technique. Coaches can use this information to modify exercises, training intensity, and technical drills according to individual requirements. AI-based video analysis can also assist in studying opponents, understanding tactical movements, and evaluating team performance. In sports such as athletics, football, cricket, basketball, tennis, swimming, and gymnastics, AI-supported analysis can

contribute to more precise technical evaluation. However, AI-generated feedback should be interpreted alongside the professional judgement of coaches and sports scientists because performance is influenced by physical, psychological, environmental, and situational factors. Therefore, AI serves as a supportive technology that can make sports performance analysis more systematic, objective, continuous, and personalized while contributing to the gradual improvement of athletic technique.

AI in Sports Strategy, Decision-Making and Officiating

Artificial Intelligence (AI) is increasingly being applied to sports strategy and decision-making through the analysis of large amounts of performance, match, and player data. Traditional strategic decisions often depend on coaches' experience, observations, and statistical records, whereas AI can process information rapidly and identify patterns across multiple matches and training sessions. AI-based analytical systems can examine player movements, team formations, scoring patterns, opposition behaviour, possession, speed, and other performance indicators. This information can assist coaches in developing training plans, analysing opponents, selecting tactical approaches, and making informed decisions during competitions. Predictive and machine-learning models can also be used to identify patterns in previous performances and provide data-based insights for future planning. In team sports, AI can support the analysis of individual and collective performance, helping coaches understand how different tactical arrangements influence match situations. Thus, AI provides an additional analytical resource for strategic planning and performance management.

AI also has applications in sports officiating, where technology can support the accuracy and consistency of certain decisions. Computer vision, sensors, tracking systems, and automated video analysis can assist officials in reviewing events and identifying specific incidents during competitions. Technologies such as video assistant systems, electronic line detection, goal-line technology, and automated tracking can provide additional information when determining whether particular events have occurred. AI-supported systems can analyse multiple camera angles and large volumes of match data more rapidly than manual review alone. These technologies may reduce some forms of human error and provide officials with objective information for decision-making, although their exact use varies across sports and competitions. Human officials remain important for interpreting rules, managing match situations, and making decisions within the established regulations. Therefore, AI in sports strategy, decision-making, and officiating should be understood as a technological support system that combines data analysis with the experience and judgement of coaches and officials.

Benefits of Artificial Intelligence in Physical Education and Sports

Artificial Intelligence (AI) provides several potential benefits to physical education and sports by making training, assessment, and performance monitoring more systematic and data-oriented. AI-based systems can collect and analyse information related to physical fitness, exercise, movement, and athletic performance. In physical education, AI can help teachers monitor students' participation, assess fitness levels, track individual progress, and support personalized exercise programmes. AI-powered applications can provide immediate feedback and encourage students to participate regularly in physical activities. Wearable devices and smart technologies can monitor indicators such as heart rate, speed, distance, activity duration, and exercise intensity. Such information can help teachers, coaches, and athletes understand changes in physical performance over time. AI can also reduce the time required for certain types of data processing and assist professionals in organizing and interpreting large amounts of performance information.

In sports, AI can contribute to performance analysis, personalized training, injury-risk monitoring, talent identification, tactical planning, and rehabilitation. Computer-vision systems can analyse athletes' movements and provide information about technique, posture, balance, and coordination. Machine-learning technologies can identify performance patterns and support evidence-based training decisions. AI can also help coaches analyse opponents and develop strategies using historical and real-time data. In rehabilitation, digital systems can monitor exercise performance and recovery progress under professional supervision. AI-supported officiating technologies can provide additional information for reviewing certain match situations. These applications may improve the efficiency, precision, and consistency of selected sports-related tasks. However, the benefits of AI depend on appropriate technology, reliable data, trained professionals, and responsible use. Human judgement remains essential because physical education and sports involve motivation, communication, teamwork, emotions, and individual differences that cannot be fully represented by numerical data. Thus, AI can complement professional expertise and contribute to more personalized, efficient, and scientifically informed physical education and sports practices.

Challenges and Limitations of AI Applications

The use of Artificial Intelligence (AI) in physical education and sports offers several opportunities, but its implementation also involves important challenges and limitations. One major challenge is the high cost of AI-based equipment, software, sensors, cameras, and wearable devices, which may make these technologies difficult to access for schools, colleges, and sports institutions with limited resources. Adequate digital infrastructure, internet connectivity, technical facilities, and regular maintenance are also required for effective implementation. Another limitation is the need for trained teachers, coaches, sports scientists, and technical professionals who can understand and correctly interpret AI-generated information. The quality of AI analysis depends heavily on the accuracy, quantity, and relevance of the data provided to the system. Incomplete, inaccurate, or biased data may produce unreliable results. Technical failures, software limitations, connectivity problems, and compatibility issues can also affect the effectiveness of AI applications.

Privacy and data security are additional concerns because AI systems may collect sensitive information about students and athletes, including physical activity, health-related indicators, movement patterns, and performance records. Appropriate measures are therefore required to protect personal information and prevent unauthorized access or misuse. Excessive dependence on technology may also reduce direct interaction between students, teachers, coaches, and athletes. AI cannot fully understand psychological factors, motivation, emotions, social relationships, or individual circumstances that influence physical activity and sports performance. There may also be differences in access to AI technologies between well-funded and less-resourced institutions, creating concerns about technological inequality. Furthermore, AI-generated recommendations require professional interpretation and should not automatically replace human judgement. Ethical issues related to transparency, accountability, consent, and responsible data use also need attention. Therefore, successful application of AI in physical education and sports requires appropriate infrastructure, trained professionals, reliable data, privacy protection, ethical guidelines, and a balanced combination of technological support and human expertise.

Ethical Issues, Data Privacy and Security

The use of Artificial Intelligence (AI) in physical education and sports raises important ethical issues concerning the collection, processing, storage, and use of personal data. AI-based applications and wearable devices may collect information such as heart rate, physical activity, movement patterns, fitness levels, training workload, and performance records. In educational institutions, the data may also relate to

students' participation and individual physical development. Therefore, informed consent, transparency, and responsible data management are important when implementing AI systems. Students and athletes should understand what information is being collected, why it is being collected, how it will be used, and who may have access to it. AI systems should also be designed to reduce unfair bias and should provide reliable information without discriminating against individuals or groups. Ethical concerns may arise when AI-generated assessments influence training opportunities, selection, or performance evaluation without sufficient human review. Maintaining human oversight is therefore essential when using AI for important decisions in physical education and sports.

Data privacy and security are equally important because digital sports systems can store large quantities of personal and performance-related information. Unauthorized access, data leakage, inappropriate sharing, or misuse of information can negatively affect students and athletes. Institutions should establish appropriate policies for data collection, storage, access control, retention, and deletion. Strong passwords, secure databases, encryption, access restrictions, and regular security assessments can help protect digital information. Data should be collected only for legitimate and clearly communicated purposes, and access should be limited to authorized personnel. Special care is required when dealing with students and young athletes because they may require additional protection and appropriate consent procedures. AI systems should also be transparent enough for teachers, coaches, athletes, and administrators to understand how important recommendations are generated. Regular monitoring and professional supervision can help identify errors, bias, or inappropriate use. Thus, ethical principles, privacy protection, data security, informed consent, transparency, accountability, and human oversight should form an essential part of responsible AI implementation in physical education and sports.

Future Scope of Artificial Intelligence in Physical Education and Sports

The future scope of Artificial Intelligence (AI) in physical education and sports is extensive due to the continuous development of digital technologies, wearable devices, computer vision, machine learning, and data analytics. AI is expected to support more personalized approaches to fitness assessment, exercise planning, sports training, and performance monitoring. Intelligent systems may analyse individual physical characteristics, training history, performance data, and activity patterns to provide customized training recommendations. In physical education, AI-based platforms can assist teachers in monitoring students' fitness development, participation, and progress. Virtual training environments and intelligent coaching systems may provide interactive learning experiences and real-time feedback. Advanced wearable technologies may continuously monitor physical activity and physiological indicators, enabling athletes and coaches to understand training responses more effectively. AI may also contribute to the early identification of performance changes and support more systematic approaches to injury prevention and rehabilitation.

Future developments may further expand the use of AI in talent identification, tactical analysis, sports officiating, rehabilitation, and athlete management. Advanced computer-vision systems may provide more detailed analysis of body movements and technical skills, while predictive models may assist coaches in understanding training and performance trends. AI could also support the integration of virtual reality, augmented reality, robotics, and intelligent simulation systems into sports education and training. In sports administration, AI may improve scheduling, performance databases, facility management, and other organizational activities. However, future development should be accompanied by strong attention to data privacy, cybersecurity, ethical standards, accessibility, and human oversight. Institutions will need trained professionals who can use AI technologies effectively and critically interpret their outputs. AI should continue to complement rather than replace teachers, coaches, trainers, and sports scientists. With

responsible implementation, appropriate infrastructure, and continuous technological development, AI has the potential to contribute significantly to personalized learning, scientific training, improved performance monitoring, and the modernization of physical education and sports.

DISCUSSION:

Artificial Intelligence (AI) is increasingly influencing physical education and sports by introducing data-driven approaches to teaching, training, assessment, and performance analysis. The discussion indicates that AI-based technologies can support physical education teachers and sports professionals in monitoring fitness, analysing movements, tracking training workloads, and providing individualized feedback. Wearable devices, computer vision, machine-learning applications, and digital fitness platforms can generate detailed information about physical activity and athletic performance. These technologies can help identify performance patterns and support the development of personalized training programmes. AI can also assist in analysing technical skills and tactical behaviour, allowing coaches to use performance information more systematically. In physical education, AI applications may help teachers monitor student participation and fitness development while providing opportunities for individualized exercise guidance. These developments demonstrate the potential of AI to complement traditional methods and introduce more measurable approaches to physical education and sports training.

At the same time, the discussion highlights that the successful use of AI depends on several practical, ethical, and professional factors. The cost of advanced equipment, availability of digital infrastructure, technical skills, and quality of data can influence the effectiveness of AI applications. Privacy and security are particularly important because AI systems may collect personal, physical, and performance-related information from students and athletes. AI-generated recommendations also require careful interpretation because physical performance is influenced by psychological, social, environmental, and individual factors that cannot always be represented through numerical data. Excessive dependence on automated systems may reduce the importance of human observation and professional judgement. Therefore, AI should be integrated with the knowledge and experience of teachers, coaches, trainers, and sports scientists. The overall discussion suggests that responsible AI implementation can support more personalized, systematic, and evidence-based practices while maintaining human supervision, ethical standards, data protection, and equal access to technology.

FINDINGS OF THE STUDY:

The study found that Artificial Intelligence (AI) has considerable potential to support physical education and sports through digital assessment, performance monitoring, personalized training, and data analysis. AI-based technologies can assist in collecting and analysing information related to physical activity, fitness levels, movement patterns, training intensity, and athletic performance. Wearable devices and smart applications can provide continuous information that supports monitoring of individual progress. AI-based computer vision can assist in analysing body movements, posture, coordination, and sports techniques. The study also found that AI can help teachers and coaches develop more individualized training and exercise programmes according to the needs and performance of students and athletes. AI-supported systems can contribute to performance analysis by identifying patterns in training and competition data. These applications can make selected aspects of fitness assessment, training management, and performance evaluation more systematic and data-oriented.

The study further found that AI can support injury-risk monitoring, rehabilitation, talent identification, tactical analysis, and certain officiating processes. However, the findings indicate that the effective use of AI depends on reliable data, suitable infrastructure, trained professionals, and appropriate

technical resources. High implementation costs and limited access to advanced technologies may restrict adoption in some educational institutions and sports organizations. Data privacy, cybersecurity, informed consent, and responsible use of personal information were identified as important concerns. The study also found that AI-generated information cannot independently account for psychological factors, motivation, emotions, social interaction, or individual circumstances. Therefore, professional judgement remains essential when interpreting AI-based recommendations. Overall, the findings indicate that AI can function as a supportive technology for improving the efficiency, personalization, and scientific basis of physical education and sports, provided that its implementation is responsible, ethical, secure, and guided by qualified professionals.

CONCLUSION:

Artificial Intelligence (AI) is becoming an important technological tool in the modernization of physical education and sports. Its applications in fitness assessment, performance monitoring, personalized training, movement analysis, sports strategy, injury prevention, rehabilitation, talent identification, and officiating demonstrate its broad potential. AI can process large amounts of information and provide systematic insights that may assist teachers, coaches, trainers, and athletes in planning and evaluating physical activities. Wearable devices, computer vision, machine-learning systems, and intelligent fitness applications can support continuous monitoring and individualized feedback. In physical education, AI can assist teachers in understanding students' fitness development and participation patterns. In sports, it can support more detailed analysis of technical skills, training loads, and performance trends. These applications can complement traditional methods and contribute to more data-informed approaches to teaching, training, and performance improvement.

However, the effective integration of AI requires careful consideration of its limitations and ethical implications. High costs, limited technological infrastructure, lack of technical expertise, data-quality issues, privacy concerns, cybersecurity risks, and unequal access can affect successful implementation. AI-generated information should not be treated as a complete substitute for the knowledge, experience, and judgement of physical education teachers, coaches, trainers, and sports scientists. Human supervision is particularly important when AI systems are used for fitness assessment, training decisions, injury-related monitoring, or athlete development. Responsible use of AI requires informed consent, secure data management, transparency, accountability, and appropriate professional training. Overall, AI has significant potential to support the development of physical education and sports by making selected processes more personalized, systematic, efficient, and evidence-based. Its future contribution will depend on achieving an appropriate balance between technological innovation and human expertise, while ensuring that ethical standards, privacy, accessibility, and the educational and developmental needs of students and athletes remain central.

RECOMMENDATIONS

Educational institutions and sports organizations should gradually integrate Artificial Intelligence (AI) into physical education and sports programmes according to their available resources and specific requirements. Physical education teachers, coaches, trainers, and sports professionals should receive appropriate training in AI-based applications, data interpretation, wearable technologies, and digital performance-monitoring systems. AI tools should be used to support fitness assessment, performance monitoring, personalized training, movement analysis, and physical activity planning. Institutions should develop suitable digital infrastructure and provide access to reliable devices, software, sensors, and internet facilities. AI-based systems should be selected according to their accuracy, usability, affordability,

and relevance to the needs of students and athletes. Regular evaluation of AI applications should be conducted to identify technical problems and improve their effectiveness. AI should also be integrated with traditional teaching and coaching methods rather than being used as a complete replacement for professional expertise. Special attention should be given to ensuring that students and athletes understand the purpose and appropriate use of AI technologies.

Strong policies should be established for data privacy, cybersecurity, informed consent, and responsible management of student and athlete information. Personal and performance-related data should be collected only for clearly defined purposes and should be accessible only to authorized individuals. Institutions should regularly review AI-generated assessments and recommendations to identify possible errors, bias, or inappropriate conclusions. Human supervision should remain essential when AI is used for training decisions, performance evaluation, injury-related monitoring, and athlete development. Equal access to AI technologies should be encouraged so that differences in institutional resources do not create unnecessary technological inequalities. Collaboration among physical education teachers, coaches, sports scientists, technology professionals, and researchers should be promoted to improve AI applications. Further research should examine the long-term educational, physical, technical, and social effects of AI in sports and physical education. With appropriate training, infrastructure, ethical guidelines, data protection, and human oversight, AI can be responsibly integrated to support more personalized, systematic, and evidence-based physical education and sports practices.

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