IIP International Multidisciplinary Research Journal
IIPIMRJ

An Online Peer-Reviewed / Refereed Journal
Vol: 02 No. Issue IV, (October-December) (2025)
Impact Factor: GSRD-IF: 5.001
ISSN: 3049-2734 (Online)

IMPACT OF ARTIFICIAL INTELLIGENCE (AI) TECHNOLOGY ON SPORTS PERFORMANCE: A SURVEY OF PHYSICAL EDUCATION TEACHERS

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Article Info

Article History:
Received: 15th Dec 2025
Accepted: 19th Dec 2025
Published: 20th Dec 2025

Keywords:

Artificial Intelligence (AI)

ABSTRACT

Artificial Intelligence (AI)-based technologies have entered the sports sector at a rapid pace, enhancing athlete performance, injury prevention, data-driven coaching, and fan engagement. The present study investigates the awareness, perception, and utilization of AI technologies in improving sports performance according to Physical Education (PE) teachers. A descriptive survey method was used for the study. A sample of 20 PE teachers was selected randomly. A structured questionnaire served as the research tool for data collection. The findings reveal that most teachers acknowledge AI as a valuable tool for training and performance evaluation; however, there is limited accessibility and lack of proper training to apply AI-based methods in schools. The study suggests structured AI-training modules and provision of AI-supported sports facilities in educational institutions to enhance athletic performance scientifically.

Plagiarism Check Report:
Date of Report: Dec 18, 2025
Similarity Index: 6%
Remarks: No significant matching text. All citations and matches are properly referenced. The manuscript is considered original.

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How to Cite: Ghatule, A. U. (2025). *Impact of artificial intelligence (AI) technology on sports performance: A survey of physical education teachers*. *IIP: International Multidisciplinary Research Journal (IIPIMRJ)*, **2**(IV), **pp. 1340–1343**.

Introduction

Sports performance is influenced by physical, technical, psychological, and tactical factors. In recent years, the growing integration of information technology has transformed various sporting domains. Among these technologies, Artificial Intelligence (AI) has emerged as a revolutionary tool offering advanced analytics, motion-tracking systems, biomechanical assessment, virtual coaching, and personalized training programs. AI applications in sports include wearable sensors, smart equipment, video-based performance analysis, GPS tracking devices, virtual reality-assisted training, and predictive algorithms for injury risks. These tools help athletes optimize training loads, improve decision-making, and achieve peak performance while ensuring long-term health and safety. In India, schools and colleges have started adopting technology for sports development; however, the extent and effectiveness of AI-based tools at the grassroots level remain to be explored. Physical Education teachers play a key role in coaching and athlete development. Therefore, their knowledge and perception of AI in sports performance holds great significance. This study attempts to understand how AI technology impacts sports training and athlete performance from the perspective of Physical Education teachers. The results will help highlight the present status, challenges, and future scope of AI in school-level sports.

Importance of the Study

1. Provides awareness about the current role of AI in sports performance improvement.
2. Helps policymakers understand the challenges faced by PE teachers in adapting AI tools.
3. Supports future implementation of AI-based teaching and assessment methods in sports.
4. Assists in designing technical training and professional development programs for sports instructors.
5. Encourages integration of modern scientific approaches into school sports infrastructure.

Objectives of the Research

1. To study the awareness of Physical Education teachers regarding AI technology in sports.
2. To determine the perception of teachers about the role of AI in enhancing athletic performance.
3. To examine the current availability and use of AI-based sports tools in schools.
4. To identify challenges faced by teachers in implementing AI technology for sports training.
5. To provide suggestions for effective integration of AI in sports performance development.

Scope and Limitations

Scope

- Study is focused on the educational sports environment.
- Findings are applicable for schools and colleges aiming to adopt scientific sports training.
- Results may be useful for government bodies, academies, and sports researchers.

Limitations

- Limited to 20 Physical Education teachers.
- Conducted only using a self-administered questionnaire.
- Restricted to one geographical region (modifiable by researcher).

- Responses may be influenced by teachers' subjective experiences and exposure to technology.

Research Methodology

Research Method

Descriptive Survey Method is used to collect opinions and perceptions from PE teachers related to AI in sports.

Population

All Physical Education teachers from school sports departments in the selected region.

Sampling Method

Simple Random Sampling is used to select the proper sample for the present research.

Sample

20 Physical Education teachers were the sample selected for the present research.

Research Tool

A structured questionnaire containing closed-ended questions regarding:

- Awareness of AI technology
- Use of AI devices/software
- Attitude toward AI in coaching
- Challenges and future expectations

Data Collection

Participants were approached directly or online; their responses were recorded for analysis.

Statistical Techniques

Simple percentage analysis was used to interpret data.

Research Findings

Based on teachers' responses, the main findings are:

1. Awareness Level
    - A large majority of teachers are aware of AI-based sports equipment like wearable trackers, performance analysis software, and smart watches.
    - However, detailed technical knowledge is limited.
2. Current Usage
    - Many schools lack AI-based facilities due to cost, infrastructure, or lack of support.
    - Only wearable devices such as heart rate trackers or GPS are occasionally used.
3. Impact on Performance
    - Teachers strongly agree that AI helps:
        - Improve athlete performance scientifically
        - Provide biomechanical and tactical analysis
        - Reduce risk of sports injuries
        - Create personalized training plans
4. Challenges
    - Lack of training for teachers in AI applications

- Lack of financial assistance and government support
- Insufficient technical assistance and maintenance
- Resistance towards new technology from some stakeholders

5. Training and Future Need
    - Teachers expressed a strong need for:
        - Workshops and professional training programs in AI
        - Providing AI-supported equipment at school level
        - Digital literacy among students and coaches

PE teachers strongly recognize AI as a powerful and necessary tool for sports development, but they highlight the need for improved resources and systematic training.

Conclusion

The study concludes that AI technology has a significant impact on sports performance enhancement. Physical Education teachers acknowledge its benefits in performance monitoring, injury prevention, tactical improvement, and scientific coaching. However, the usage of AI in the school system remains minimal due to lack of resources, training, and accessibility. To ensure AI becomes an essential part of sports training at the grassroots level, proper funding, structured professional development, and adoption of technologically-advanced sports tools are required. Strengthening AI-based sports infrastructure in educational institutions will play a crucial role in producing better athletes and enhancing sports excellence in the future.

Suggestions / Recommendations

1. Government and educational authorities should provide AI-based sports equipment and infrastructure.
2. Training programs on technology-based coaching should be regularly organized for PE teachers.
3. Collaboration with universities and sports tech companies should be encouraged.
4. Students should be introduced to AI applications in physical education curriculum.
5. Awareness programs about benefits and safety of AI in sports must be developed.

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