

# Impact of AI Usages to Improve Games in Basketball Players

K. Rejina Devi

*Assistant Professor; Department of Physical Education, Arul Anandar College, Karumathur, Madurai*

*Corresponding Author Email: [rejinadevi@aactni.edu.in](mailto:rejinadevi@aactni.edu.in)*

## Abstract

*Artificial Intelligence (AI) has become an important tool in modern sports training and performance analysis. Basketball is a fast-moving and highly tactical game which requires physical fitness, technical skills, and quick decision making. The use of Artificial Intelligence helps coaches and players to analyse performance, improve skills, prevent injuries and plan training programmes more effectively. This paper focuses on the impact of AI applications in improving the performance of basketball players through data analysis, video tracking systems, wearable technologies and smart coaching tools. The study highlights how AI supports player development, team strategy, and scientific training methods in basketball. The findings show that AI-based tools play a significant role in enhancing performance, reducing human error and improving overall game efficiency.*

**Keywords:** *Artificial Intelligence, Basketball, Sports Analytics, Performance Improvement, Smart Training, Computing in Sports*

## Introduction

The rapid development of digital technology has transformed almost every field, including education, healthcare and sports. In recent years, Artificial Intelligence has emerged as a powerful technology in the field of sports and physical education. AI refers to computer systems that can perform tasks that normally require human intelligence such as learning, analysing, predicting and decision making. Basketball is a dynamic team sport which requires continuous monitoring of players' movements, physical fitness, shooting accuracy, tactical awareness and mental preparedness. Traditional coaching methods mainly depend on observation and experience. However, with the introduction of Artificial Intelligence and computing technologies, performance evaluation has become more scientific and data-

driven. AI tools such as motion tracking systems, video analysis software, wearable sensors and predictive models help coaches and players to understand strengths and weaknesses in a precise manner. Therefore, the present paper attempts to study the impact of AI usages in improving the performance of basketball players.

### **Need of AI in Basketball Training**

Basketball training involves many variables such as speed, agility, shooting accuracy, reaction time, endurance and tactical decision making. Manual observation alone is not sufficient to analyse these complex factors.

The need for Artificial Intelligence in basketball arises due to the following reasons:

- To analyse large volumes of performance data accurately
- To monitor player workload and fitness levels
- To reduce injury risks
- To support objective and scientific coaching decisions
- To enhance individual and team performance

AI helps in converting raw data into meaningful information which can be used effectively for training and competition.

### **Objectives of the Study**

The main objectives of this paper are:

1. To study the role of Artificial Intelligence in basketball performance analysis.
2. To understand how AI tools help in improving technical and tactical skills of basketball players.
3. To examine the impact of AI in injury prevention and player health management.
4. To highlight the usefulness of computing technologies in modern basketball coaching.

### **Methodology**

The present study is based on a descriptive and analytical approach. Information has been collected from published research articles, conference proceedings, sports technology reports and digital sports science resources. The study analyses existing applications of AI in basketball and interprets their impact on player performance and coaching practices.

## **Applications of Artificial Intelligence in Basketball Video and Motion Analysis Systems**

AI-based video analysis tools automatically track player movements, passes, shots and defensive actions. These systems provide detailed feedback about shooting technique, footwork, positioning and movement patterns. Coaches can review performance frame by frame and correct technical errors effectively.

## **Wearable Technology and Smart Sensors**

Wearable devices such as smart bands, GPS trackers and heart rate monitors collect data related to distance covered, speed, acceleration, heart rate and fatigue levels. AI algorithms analyse this data and help coaches to understand physical workload and recovery needs of players.

## **Skill Performance Assessment**

AI systems evaluate shooting accuracy, dribbling efficiency and passing success rate. Based on data analysis, individual training programmes can be designed for players. This personalized training approach improves learning speed and skill development.

## **Tactical and Game Strategy Analysis**

AI tools analyse opponent patterns, defensive formations and scoring opportunities. Coaches can use this information to plan game strategies, player rotations and match preparation. This improves decision making during competitions.

## **Injury Prevention and Rehabilitation**

One of the most important benefits of AI in sports is injury prevention. AI models identify abnormal movement patterns and excessive workload. Early warning systems help coaches to modify training loads and prevent overuse injuries. AI also supports rehabilitation planning by tracking recovery progress.

## **Role of Computing and Data Analytics in Basketball:**

Computing technology plays a vital role in handling and processing large amounts of data generated during training and matches. Data analytics platforms store player performance records and generate reports for coaches and sports scientists.

The integration of computing and AI enables:

- Long-term performance tracking
- Player profiling and talent identification
- Scientific evaluation of training effectiveness
- Better communication between coaches, trainers and medical staff

Thus, computing technologies strengthen the entire sports performance ecosystem

## Conclusion

Artificial Intelligence has become an essential component of modern basketball training and performance enhancement. AI-based systems provide accurate performance evaluation, personalized training programmes, effective injury management and improved tactical planning. The integration of AI and computing technologies strengthens the scientific foundation of coaching and player development. The study concludes that AI has a positive and significant impact on improving the performance of basketball players and will continue to play a major role in the future of sports and physical education.

## References

1. Bartlett, R. (2014). *Introduction to Sports Biomechanics*. Routledge.
2. James, N., Mellalieu, S., & Jones, N. (2005). *The development of performance analysis in sport*. *International Journal of Performance Analysis in Sport*.
3. Liebermann, D. G., et al. (2002). *Advances in the application of information technology to sport performance*. *Journal of Sports Sciences*.
4. McGarry, T. (2009). *Applied and theoretical perspectives of performance analysis in sport*. *International Journal of Performance Analysis in Sport*.
5. Rein, R., & Memmert, D. (2016). *Big data and tactical analysis in elite soccer and team sports*. SpringerPlus.