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Investigating how information technology has influenced and contributed to sports and games

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Abstract

The field of physical education and sports wields substantial influence over the impact of technology in our lives, an impact that extends to the well-being of the whole individual, encompassing both body and mind. Information technology assumes a pivotal role in the human experience, particularly in the context of sports and games, where its integration is rapidly expanding. For example, novel devices serve various purposes, aiding referees in decision-making and quantifying athlete performance during games, thus assisting coaches in tailoring training programs and game strategies. It mitigates errors in the organization and administration of sporting events on a global scale. The application of information technology in sports has given rise to a scientific discipline, fostering research endeavors, advancing learning and coaching methods, conducting biomechanical analyses, and contributing to field research. Notable areas where technology influences sports and games include cricket, athletics, and basketball. In this domain, five compelling technologies have emerged: instant replay, sensor tools, timing systems, RFID chips, and equipment development.

Keywords: Athletics, basketball, cricket, information technology, physical education, sports and games

Introduction

Technology can be most broadly defined as the amalgamation of both tangible and intangible entities resulting from the application of mental and physical exertion, all with the ultimate aim of achieving value. In the context at hand, technology specifically alludes to the utilization of tools and machines designed to tackle real-world conundrums within the realm of sports and games. Just as technology has indelibly woven itself into various facets of human existence, its intrinsic role in the evolution and progression of sports stands evident. Indeed, its profound influence is profound, ushering in a new era where athletes now draw competitive advantages from the deployment of cutting-edge sporting equipment—an evolution that some view as discordant with the very spirit of sport itself.

The advent of the latest technological trends, however, has brought about a welcomed transformation in the safety of sports, ushering in an era of unparalleled security and well-being. A prime illustration of this is the emergence of smart helmets and other wearable technologies, which have heralded a paradigm shift in the monitoring of potentially traumatic injuries, thus paving the way for more immediate and effective medical intervention.

One of the most striking manifestations of technology's prowess in the contemporary world of sports is the advent of instant replay—an innovation that has fundamentally reshaped the way we perceive and interpret sporting events. With this ground breaking technology, officials now possess the capability to meticulously re-examine each pivotal moment, affording spectators an additional vantage point of the unfolding drama. The deployment of instant replay has found widespread adoption in sports such as cricket, American football, rugby, soccer, and even combat sports, enhancing the accuracy and fairness of adjudications.

Sensor tools have similarly become indispensable assets in the realm of sports, especially when determining the validity of a goal. These devices come to the fore in scenarios where the unaided human eye may fall short in definitively ascertaining whether a ball has crossed the goal line. Different sports have harnessed an array of sensor tools suited to their unique requirements. For example, cricket leverages the Hawk-Eye system to not only verify the trajectory of the ball but also to determine its hypothetical landing spot had it not encountered an obstruction from a player's foot. On the tennis court, sensor tools employ laser beams to scrutinize whether the ball has transgressed the boundaries of the playing area.

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The value of sensor technologies lies in their capacity to accurately pinpoint the precise location of the ball at any given instant, thus contributing to equitable and transparent decision-making.

Timing systems have undergone a profound transformation, with traditional stopwatches giving way to more advanced mechanisms. Consequently, differences in reaction times no longer impede the precision and consistency of racing events. In contemporary races, the starter pistol serves as the catalyst for an automated timing system, initiating the clock immediately upon discharge. Swimming competitions have embraced innovations like touch pads at the finish lanes, accompanied by wearable inertial sensors that scrutinize an athlete's performance. In addition to this, various racing events employ laser beams and high speed photography to ascertain the rightful victor. The results generated by these timing systems are often reported with a precision that extends to the nearest thousandth of a second, a testament to the meticulous attention to detail in the sporting arena. For world and Olympic records, this precision extends further, with readings recorded to the nearest hundredth of a second. This exactitude serves to eradicate even the most minuscule of errors, thereby upholding the integrity of the sporting contests.

Radio-frequency identification (RFID) chips have assumed a prominent role in timing individual contestants in sporting events. These devices employ antennas to relay wireless signals, facilitating precise tracking of the exact positions of participants throughout the course of a race. Two principal types of chips are employed in these events: active and passive. Active chips, equipped with an in-built power source, can accurately determine the exact moment a participant crosses a designated line. Passive chips, on the other hand, necessitate the presence of sensors embedded within a mat due to their lack of an internal power source.

The development of sports and games equipment has been an instrumental factor in augmenting athlete safety. A pivotal moment in this regard occurred during the 2010 National Football League season when specialized helmets were introduced. These helmets were engineered to absorb and disperse the shock generated by collisions, thereby shielding athletes from the perils of head and neck injuries. This laudable technology has found application beyond the football field, extending its protective embrace to sports such as auto racing and hockey.

It is an undeniable reality that technology has assumed a pervasive presence in the modern world, permeating the domains of both professional and amateur sports. This transformation has ushered in a new era characterized by the integration of advanced tools and devices aimed at safeguarding athletes and streamlining the officiating process, thereby fortifying the foundations of sporting endeavors.

In the sphere of physical education, information technology has similarly played a transformative role, revitalizing the instructional landscape. Apps, online videos, personal computers, laptops, virtual conferencing platforms like Zoom, and learning management systems like Google Classroom have collectively contributed to a dynamic and diversified pedagogical approach, emphasizing the importance of goal setting, time management, and a multifaceted approach to achieving physical well-being. Devices such as pedometers and heart rate monitors serve as illustrative examples of how technology has empowered physical educators to foster the development of physically literate individuals, equipped with the knowledge, skills, and self-assuredness to partake in a

lifelong journey of healthful physical activity.

In the realm of sports and games, information technology emerges as a formidable ally, enhancing the precision of time measurements in sporting performances. This, in turn, equips referees, umpires, and sports officials with the means to make more informed decisions regarding rule infringements. Furthermore, technological advancements have spurred innovations in sport equipment and apparel design, offering spectators an enriched viewing experience and athletes the benefit of superior performance gear.

The transformative potential of technology in sports and games extends to the very core of these activities, affording unparalleled advantages such as weather control, improved field conditions, superior coaching and scouting, advanced training methods, and the assurance of fairness in competition.

As we look to the future of technology in sports and games, it is clear that technological innovation will remain a pivotal driver of change. The integration of the latest trends and cutting-edge technologies will continue to refine the accuracy and fairness of these activities, while ensuring the safety and enhancement of the overall fan experience. Technology's influence is pervasive, revolutionizing the design and functionality of sports equipment and attire, from shoes and uniforms to gloves, helmets, and other gear.

Taking cricket as a prime example, technology has irrevocably altered the dynamics of the game both on and off the field. A plethora of tools, including Hawkeye and Snick-o-Meter, have revolutionized decision making, ensuring fair play and accuracy. Athletics, too, has witnessed the integration of increasingly high tech tools, including computer simulations, advanced video cameras, wind tunnels, and sophisticated mathematical and physical models, empowering athletes to dissect their physical movements, identify flaws, and chart paths to improvement.

In the domain of basketball, the NBA has harnessed replay vision to review "last touch" decisions in the final two minutes of games, enhancing the accuracy of officiating and providing invaluable insights for coaching and player performance reviews.

In summation, the contribution of information technology is incontrovertibly central to the evolution of physical education and its role in promoting fairness and sportsmanship in the world of sports and games. As teaching methodologies are harmonized with technology, the standard of sportsmanship is elevated, and the quality of coaching, scouting, and future development is significantly improved. Thus, my study underscores the fact that the contribution of information technology is an ever-evolving force, constantly adopting new trends that are reshaping the future of sports and games in the contemporary world.

Benefits of Information Technology in Physical Education

The landscape of physical education has been significantly transformed by the influence of technology. It has ushered in a new era where educational tools, such as apps, online videos, personal computers, laptops, Zoom, Google Meet, and Google Classroom, have infused dynamism and diversity into the classroom environment. Instructors harness these digital resources to curate a curriculum that is both varied and dynamic. This modernization of teaching has embraced the power of technology to convey the importance of physical health. Instructors utilize these innovative resources to craft a spectrum of activities that not only reinforce the significance of physical well-being but also delineate how to set and attain

health-related goals within a specified timeframe. This approach embraces meticulous planning and the judicious use of technology in physical education.

Within this technological transformation, pedometers stand out as one of the pioneering examples that readily come to mind when we contemplate the intersection of technology and physical activity. These devices enable precise tracking of steps taken, a metric that is central to assessing an individual's physical activity levels. They represent a tool that empowers both educators and students with data to gauge and manage physical well-being effectively. Furthermore, heart rate monitors come to the fore, providing a realtime window into a student's physiological response during physical activities. By measuring and interpreting heart rate data, educators gain insights into students' physical exertion, enabling the customization of physical education programs tailored to individual needs.

The overarching goal of physical education remains the development of physically literate individuals, equipped with not only the knowledge and skills but also the confidence to sustain a lifetime of healthful physical activity. Technology, in this context, serves as a vital conduit for achieving this objective, fostering an enriched and technologically empowered learning environment.

Benefits of Information Technology Contribution in Sports and Games

Information technology, at the intersection of sports and games, has catalyzed a profound enhancement in the precision of time measurements during sporting performances. This technology-driven improvement empowers referees, umpires, and sport officials with the data required to make more informed and accurate decisions concerning rule infringements. The marriage of technology and sports has spurred innovative developments in the design of sporting equipment and apparel, elevating performance standards while enhancing the spectator experience. These developments extend to a spectrum of game-changing benefits, including control over weather conditions, improved field conditions, superior viewing experiences, enhanced coaching and scouting processes, modernized training methodologies, and the preservation of fairness in competition.

The future of technology in sports and games is underscored by its role as a driving force, steering the transition towards the latest trends for superior accuracy and equitable play. Technology is an ever-present guardian, enhancing the safety of athletes while enriching the overall fan experience. It transforms the decision-making process and bolsters the entertainment value, ushering in an era where the design of sporting equipment and attire takes center stage. From the intricacies of athletic shoes and uniforms to the protective elements of gloves, helmets, and sporting gear, technology has infused sportswear with an infusion of high tech, functionality, and style.

Cricket

The sport of cricket has emerged as a quintessential example of technology's dual role, both on and off the field. This technology-driven transformation is exemplified by an array of digital aids, including cameras and sensors, employed to make astute decisions and ensure the game unfolds with the utmost fairness. Notable among these aids is the Hawkeye system, introduced in 2001, which offers a computer-generated visualization of the cricket ball's trajectory, aiding

umpires in their decision-making process. Additionally, the Snick-o-Meter, an ultra-sensitive microphone discreetly positioned in proximity to one of the stumps, detects the subtle sounds generated when the ball grazes the bat. This technological innovation serves as an invaluable tool in adjudicating contentious moments during play, facilitating more accurate decision-making in the spirit of fairness and sportsmanship.

Athletics

In the domain of athletics, technology assumes an increasingly vital role, underpinned by cutting-edge tools that encompass computer simulations, advanced video cameras, wind tunnels, and complex mathematical and physical models. These tools empower athletes to deconstruct their physical motions into their component parts, providing a nuanced understanding of their performance. This technological metamorphosis supports athletes in identifying flaws and honing their abilities with a view to achieving optimal performance.

Basketball

The National Basketball Association (NBA) has adopted a sophisticated technology known as replay vision, notably employed to review "last touch" decisions in the final two minutes of games. This innovation adds an extra layer of certainty to the decision-making process, empowering referees and officials with the ability to make more accurate judgments, thereby maintaining the integrity of the game. Beyond the realm of officiating, replay vision equips coaches with invaluable insights, offering players the opportunity to scrutinize their performance and optimize their skills for future matches.

Conclusion

The contribution of information technology stands as an indispensable driver in the evolution of physical education, playing a pivotal role in promoting both a friendly and fair ethos within the world of sports and games. This transformation is indicative of a trajectory characterized by innovation in teaching methodologies, the strategic use of technology, and a concerted effort to elevate the standard of sportsmanship, enriching the quality of coaching, and advancing scouting for future development.

As my study unfolds, it underscores that the contribution of information technology represents an ever-evolving force that is dynamically adopting new trends to redefine the future of sports and games in the contemporary world. It represents a catalyst for progress, ushering in an era marked by enhanced accuracy, fairness, and the continual enrichment of the sports and games experience, all underpinned by the transformative power of technology.

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