

The importance of technology in sports

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Abstract

Today, it is stated that the use of technology has become a necessary need. It is known that people need to pay attention to new developing technologies, update themselves, improve themselves and benefit from advanced technologies. Technology, which provides convenience to humanity in solving problems and developing applications, is evaluated as a whole with sports science and is seen to trigger development and progress in many sports fields. It is clear that technology is used to increase the efficiency and quality of sports training. Technology facilitates the tasks of the athlete and the coach, and success is achieved by using it comfortably in training and competitions. Not only in training and competition, but also in sports organizations, entertainment and the sports industry, technology contributes to sports and sports development as it provides comfort and convenience to people. Technology and sports are a subject that needs to be evaluated in a much broader spectrum. In this context, the current section will attempt to provide information about the use of technology in sports and what the technologies used in sports will provide.

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Introduction

Today, technology has a great impact on the development of social life. Technology, which provides convenience in human life, appears as the application of science, which plays an important role in the effective and efficient use of time. Technology, which is expressed with expressions such as mechanical equipment or digital machines, is generally seen by people as having the concepts of science, engineering, technical events, applications, management, culture and society and is expressed in connection with these (İşman, 2014). The term technology, which has many definitions, can be expressed as the development or use of tools and equipment, machines and methods related to the field to be applied to solve human problems.

Technology plays an important role in the ergonomics of sports facilities and sports products. It is seen that with the use of technology, thanks to advanced sports equipment, athletes can improve themselves, perform better and break new records (Atasoy & Kuter, 2005, Haake, 2009). Due to this situation, the connection with technology is increasing and it is said that there is a need. With the increase in need, technological developments progress and athletes develop in their own branches. As can be seen, technology is used at high levels in the field of sports and at the same time, it produces positive results in the development of athletes and branches and faster technological advances are made (Haake, 2009).

If we consider the technology in sports in the world, it is said that many productions have been created thanks to the control and coordination of objects on the internet, the use of online systems, cloud technology, the emergence of three-dimensional printers and robotic systems. In this way, it is seen that the technology that harmonizes with sports creates different incentives by taking advantage of all interactions (Tekin & Karakuş, 2018).

Today, many laboratories are created and research and development studies are carried out to produce products through sports technology. These technologies are not only limited to sports products, but also have proven their effectiveness in many products such as headphones, flags, whistles, etc. used by referees who manage the matches, as well as applications with wi-fi, fiber systems, satellite vehicles in matches. On the other hand, it is stated that sports facilities have become smart facilities that are easy to use thanks to smart systems such as camera systems, computer-aided software and scoreboards. Thanks to the technological tools and equipment used, it is seen how much progress has been made in training science by creating analyzes in virtual environments in terms of the development of athletes (Devecioğlu, 2011).

It is easier and more feasible to follow and examine the athlete's performances, to reach sufficient information about the general physical and fitness status, and to take necessary measures (Ünlü et al., 2018). The use of technology in sports provides information not only about

athletes but also about coaches and referees (Andreassen, 2018). From this point of view, it seems that, thanks to the use of technology, the physical and physiological parameters of athletes are examined more easily, general evaluation is made, and training programs are applied accordingly (Kafkas et al., 2009). Thanks to the training programs applied, athletes are prepared for the competitions accordingly and it is reported that the success achieved is thanks to the technological tools used (Akin et al., 2004). It is seen that the use of technology in sports provides both an advantage in terms of time and a clearer level of validity and helps us to provide clearer information to science (Haake, 2009).

Sport

Sport is defined as an important social phenomenon that is accepted as an indicator of cultural and welfare level in our modern societies and affects all areas of social life (İmamoglu, 1992). Sport is a competition, unity and cultural activity that develops human abilities and at the same time creates its environment individually within the framework of recreational or professional activities, transforming it into an individual environment within certain rules, equipment and socialization (Erkal, 1982).

Human beings have felt the need to train their bodies for two purposes; the first is to train for self-defense and struggle, and the second is to create mental, emotional and social development. In this respect, society attaches great importance to sports education as well as the development of the human body, mind, emotions and personality (Arun 1991, Dyson 1981).

Sport has also become an important part of education today. The media's approach to sport, people's desire to lose weight and keep fit and, more importantly, the worldwide achievements, changes in daily life and the public mood have shown that sport adds value on a daily basis. On the other hand, as sport is updated every day with the help of science and technology, the technical, technological, educational and economic standards of their countries become competitive as the records of the players and teams involved improve (Açıkada & Ergen, 1990).

Exercise is of great importance in creating a healthy social environment for children. Sport is said to help students channel their energy into the right areas, develop social and positive skills, and transfer the skills learned from these activities to other areas of the world (Çamlıyer, 1997).

In today's social world, people are so busy that they are physically and mentally tired. Due to this situation, doing sports and enrolling in different sports clubs leads to an increase in social needs. By bringing people together in this

way, member clubs help to create a healthy, peaceful and prosperous social environment. Sport is considered as a great opportunity to bring people together with nature through sport culture. Developing a sense of nationalism among people and motivating them towards common goals, sport also contributes to world peace (Balcıoğlu, 2003).

Technology

Technology; It is defined as an important element that enables people to access, receive and share information with other people and to use the information received in the best way. In our age, thanks to the combination of science and technology, human beings have gained greater power than ever before (İşman, 2003).

It is stated that technology has affected everyone's lives since the beginning of life in our world and has become one of the most important issues for humanity (Ata, 2008). Today, it is reported that the use of technology has become a necessity. People need to update and develop themselves by paying attention to new technologies and benefit from advanced Technologies (Yılmaz et al., 2010).

When the name technology is mentioned, this expression makes human beings think of it as a description of a wide area. When technology as a whole is examined, it is seen that it covers an infinite and diverse range of technology.

Here, the most well-known and expressed types of technology among these types are listed as follows;

- Computer technology,
- Information and Communication Technology,
- Mobile technology,
- Medical technology,
- Energy technology,
- Agricultural technology,
- Transportation technology,
- Industrial technology,
- And finally, "Artificial intelligence technology is emerging as (Gezgin, 2023).

Technology in Sports

The continuous development of computers and technology brings with it the intensity of sports activities. Technological tools have been shown as a reference in terms of development because of the accuracy of the movement made by the athlete during the competitions, the ability to achieve the best degree in the shortest time and the importance in sports performance (Xu & Chen, 2022).

Technology, which is seen as a science that occurs with the progress in the mentioned tools and equipment, is an important factor in the development and production of science. Technology, which provides convenience to human beings in solving problems and developing the application, is considered as a whole with sports science. Therefore, innovation acts as a whole with technology and sports. Innovation in sports is expressed as a collective process that occurs through innovation and mutual dependencies between individuals and institutions. For this reason, technology and innovation in sports are handled by applying them on and off the field. When we examine the technology, when we look at the formulas applied in many areas of tools and equipment in a technical way, performance stands out as the basis. The use of the desired equipment for the development and realization of sportive movement and performance is realized through the use of devices such as multimedia. It has been stated that the importance of sports science has increased with the fact that sports has become more and more involved in human life and that it has developed at a high rate in our age. In order to achieve success in the field of sports, it has been reported that technology, communication and information can benefit from blending even at the smallest level (Akgönül, 2023).

Technological Developments in Sports

There are many definitions of the term technology. It would not be wrong to call technology essentially data. In other words, it is a whole business that processes, stores, analyzes and shares data. Currently, it is seen that the data provides easier and higher level use through the internet with the cloud system. In clubs with elite athletes and coaches, the cloud system is used to ensure that data is stored and used securely. This shows that the data is stored both safely and appropriately (İşman, 2003, Gezin, 2023).

It is seen that the areas of use of sports technologies occupy a wide area today. Analyzers for injuries, tracking devices and GPS technologies for performance, as well as devices that can be integrated into the body such as heart rate, lactate devices, specially designed shoes and clothes for athletes, sensors used for developmental purposes for tests and many improved devices are used by individual or club athletes. Worldwide, researchers and industrial companies are paying more and more attention to sporting activities, and in line with these increasing demands, companies and researchers have started to categorize their products in order to develop and obtain new products.

These are generally divided into three groups;

- Computer supported physical games

- Virtual Training Modules
- Mobile apps and devices for physical activities (Tekin and Karakuş 2018, Akgönül 2023).

Importance of Technology in Sports

Technology is involved in sports competitions and organizations at national and international level. For example, in sports games, information and simulation technology is applied to explain or explain how the game is played, how it should be learned and what the rules are. Nowadays, sports games have become a big industry and a highly competitive field. Therefore, it will be beneficial to transfer sports education, which will be applied in a modern way with information and technology, to future generations. Thus, technology can be expressed as a contributing and guiding tool (Yücel & Devocioğlu, 2011).

When evaluated from an economic point of view, it is seen that sports are of great importance. Many people around the world are interested in one or more sports. Thanks to technology, these people can easily follow and watch their favorite sports on tablets, computers and smartphones. On the other hand, organizations related to sports are carried out more easily thanks to information and information technologies. Coaches, conditioners, etc., who are at the heart of sports, perform the necessary analyzes by using technology in the laboratory environment and apply technology techniques such as virtual simulation to train better athletes for the future. The speed, endurance, physical or physiological aspects of the athlete are better analyzed by testing and supporting applications with technology (Özen et al., 2016).

Technology triggers development and progress in many sports fields. Computer software is used to increase the efficiency and quality of sports training. Technology facilitates the tasks of athletes and coaches, and success is achieved by using it comfortably in training and competitions (Yaman, 2007).

Studies and Advantages of Technology in Sports

Thanks to the technology at every point of our lives, information is now more easily accessible. Technology, which takes part in more than one field, is constantly developing. Sports experts and employees are constantly following the developments in sports. When it is seen that the developed devices have positive effects on athletes, interaction with technology is experienced more. Thanks to the devices used in athletes in many fields, clearer results have been obtained from athletes and the desire of athletes to achieve better results has improved. In this way, the highest level of technology is used together with sports and

new findings are reported to occur in many branches. This contributes to sports in scientific terms (Haake, 2009).

When we examine the branches, trainings are applied according to the deficiencies of the athletes and measures are taken accordingly. In this case, technology provides us with a lot of help. When we look at the athletics branch, the athlete needs to achieve the best speed. Accordingly, he tries to increase his degree by specializing in exit movements. Scientists and researchers are studying and achieving excellent research results in order to see how the movements are performed correctly or how well they are performed. The development of multi-processing technology for sports video footage, the research of the process of athletics sports and the creation of an analysis system for athletics, and the creation of an intelligent system for combining sensor technology are provided (Xu & Chen, 2022).

On the other hand, the athlete wants to run faster. For this, the lightness and comfort of the shoe must be at the forefront. It is said that running shoes produced with the latest technology are comfortable, lightweight and very protective with its absorbing feature against impacts. It is known that shoes made with nanotechnology have a more flexible structure and bending. This provides an advantage to athletes and people who use it for running, while using less energy and getting efficiency from the shoes (Taylor, 2008, Devcioğlu & Altıngül, 2011).

In order to prepare athletes, not only training but also infrastructure needs to be developed (Buško, 2017). When we look at child athletes, it is seen that one of the most important motor factors is balance. Various experiments are applied and trainings are carried out accordingly in order to ensure development in this and to be more successful athletes in the future (Kocaoğlu et al., 2022). Various devices are used to follow the development of athletes and to ensure their development. One of them is the balance device. Evaluations are made according to the measurement results obtained using the Biodex Balance System (BBS). As can be seen, it is easy to make these measurements and create accurate analyzes with technology (Wendy et al., 2009).

It is seen that in branches such as volleyball, basketball, football, where there are jumps and sudden turns, the rates of injuries, injuries and bad situations as a result of negativity are extremely high, and it is also confirmed that athletes generally experience injuries to the lower extremities (Hewett et al., 1996, Marwan et al., 2012). 4/5 of anterior cruciate ligament (ACL) injuries in the knee occur during landing on the ground as a result of a non-contact movement after a jump (Hewett et al 1996). On the

other hand, unbalanced or decreased muscle strength and strength in the lumbar region are among the factors that cause damage (Chorba et al., 2010). In order to compensate and remedy such problems, a number of methods are used and various devices are used to detect and treat ailments, injuries and disabilities (Cerrah et al., 2010). In this direction, non-invasive devices that allow surface measurements to be made while evaluating physiological curves were used. Most of the measurements were made with inclinometers, goniometers, ultrasound, kyphometers, flexible rulers, spinal mouse and computerized systems used in clinics. The Spinal Mouse is a state-of-the-art electronic device designed to determine spinal movements in the anterior and posterior planes, partial and total physiologic curves. Thanks to these devices, both health and the discomfort of the person can be detected and evaluated in a short time (Algun et al., 2023).

On the other hand, it is very important for athletes and teams that athletes return to matches faster. Due to this situation, it is seen that the cybex device used for athletes reduces the strength differences between the extremities of the athletes and at the same time accelerates the return process to training and matches (Umutlu et al., 2019).

As can be seen, it is obvious that digitalization and the use of technology are increasingly used as a tool in every branch. The idea here is that in order to make management and sports activities more effective, to increase the economy and sports. All sports organizations and teams, which are an important type of organization in sports, should adapt to the digital innovation of sports, and that success and development will go forward in this direction (Renklibay 2022). The development of the modern world, engineering and information technology, affects all levels and branches of sports, helping to increase competition, struggle and entertainment. Competition creates demand, and it is explained that technology is used to meet this demand and to improve sports facilities, management, advertising, broadcasting, equipment and athletes' sports performance (Can Lu & Gan, 2011). It is generally accepted that success in today's competitive environment is closely linked to technological development and power (Şimşek & Deveci, 2018).

Conclusion

Technological developments in the sports sector and developing branches of sports have increased the demand for sports services. It can be said that by incorporating today's latest technology into sports, the subject of playing fields, coaches, athletes and fans and their adaptations will continue to change and develop with every scientific development. It is stated that the use of technology in

sports provides time advantage and is more reliable, which helps us to provide clearer information to science.

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