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Application Research Status and the Prospect of the Fusion of Science and Technology and Competitive Sports - taking Taekwondo as an Example

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Abstract
In the 21st century, with the development of the scientific and information age, science and technology have been applied to various industries, the sports industry is no exception. Nowadays, science and technology and competitive sports have been deeply integrated, promoting each other, and both have achieved rapid development. Taking Taekwondo as an example, this study summarizes the research status of integrating science and technology and competitive sports at home and abroad. It prospects the further development of science and technology and competitive sports.

Keyword:
Science and technology, Competitive sports, Fusion, Tae kwon do

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Introduction

With the reform and opening up and the strengthening of exchanges between countries, modern science and technology have developed rapidly and integrated into all walks of life in the countryside. Science and technology also made sports contributions like grown by leaps and bounds, and the scientific level of sports has been significantly improved[1]. The integration of competitive sports and science and technology is the future development trend. The competition between national sports events has already gone beyond the scope of sports, and now the competition is more about national science and technology and comprehensive strength. Through research on the integration of science and technology and competitive sports in Our country, we find the existing problems and provide relevant suggestions for future science and technology sports.

In the new era, with the refined development of the sports industry and the constant maturity of science and technology, the effective integration of sports and science and technology has become the future development trend, which plays an essential role in promoting the high-quality development of the sports industry.

In recent years, under the influence of policy and market factors, China's sports industry has entered a new stage of development. The mode of "sports + science and technology" plays an essential role in enhancing the development vitality of the sports industry and accelerating the innovation and upgrading the sports industry and an essential role in innovating the production, supply, and consumption mode of sports products.

Methods

The literature review selected related to integrating science and technology and competitive sports on CNKI. Then, summarize the current situation of integrating science and technology and competitive sports, provide suggestions for developing competitive sports in the future, and promote the high-quality development of the sports industry.

Through the expert interview method, interview with relevant sports experts to understand the latest situation of the integration of sports industry and science and technology, laying a foundation for the writing of the later article.

Population & Sample

Through interviews with five taekwondo experts to understand the current situation of Taekwondo, and literature retrieval to carry out the writing of the paper.

Instrument

Competitive sports include the selection of athletes, sports training, sports competition, and competitive sports management in four parts. The choice of athletes is the primary part of competitive sports. It is directly related to the future development of athletes, so the scientific selection of athletes is significant.

The selection of materials is an essential prerequisite for successful training. In the 1980s, the scientific section of athletes in China entered the initial stage. After decades of development of science and technology, significant achievements have been made in selecting athletes. Genetic factors are the first to consider when selecting materials, and we need to detect traits with high heritability through technology. In sports training, the physiological indicators of athletes objectively reflect their athletic ability, so we need corresponding scientific instruments to monitor the physiological indicators of athletes. Physiological indicators are also affected by genetic factors to a certain extent. In addition, we investigate the families of the tested athletes according to the needs of sports events. To make the data more accurate and effective, we use the most advanced measurement tools for monitoring to ensure that athletes can inherit the related traits of the previous generation to improve the probability of athletes to become talented.

Procedure

The main job of an athlete is to train and compete, and training occupies a large part of the athlete's life. Sports equipment and equipment are necessary for athletes in training. Advanced auxiliary equipment and equipment can help athletes quickly improve their competitive level and achieve excellent results.

The development of China's sports equipment industry began in the late 1980s, because China joined the WTO and Beijing successfully applied for the Olympic Games, provided favorable conditions and development opportunities for the development of China's sports equipment industry. On the one hand, the development of science and technology promotes the progress of competitive sports; on the other hand, the development of competitive sports also drives the progress of science and technology. At the same time, when China won the right to host the 2008 Olympic Games, it is also facing the great challenge of upgrading the science and technology of competitive sports. It puts forward higher requirements for

China's science and technology, including material technology, building technology, biotechnology, medical technology, green technology, etc.

After nearly ten years of development, China's competitive sports in science and technology has been rapid development, not only improve the athletes' technical level, but also make the competition has been a higher appreciation, which shows that China's science and technology and competitive sports have been very good integration.

The role of technology in competitive sports includes: improving the level of competition, promoting fairness in the game, and changing the consumer experience of the audience. Science and technology will become more professional in competitive sports in the future. The innovation of athletes' equipment, clothing, training, and diet has promoted the continuous improvement of athletes' competitive level; now in major events, even playback technology, eagle eye technology, etc. help referees with the game, making the game even more competitive. Fair; Future technology should help the audience experience the atmosphere of the game more intuitively. For example, with the current VR technology, future technology innovation in the audience's consumer experience will also promote the rapid development of competitive sports.

After more than 20 years of development in China, Taekwondo has made significant progress. It has achieved outstanding results in the selection, training, competition, organization and management of athletes, and has formed our own sports training system, making our national Taekwondo athletes In recent Olympic Games, we have achieved impressive results. The achievement of these achievements is inseparable from China's science and technology, which provides important support and assistance for athletes' training, prevention of sports injuries, recovery from injuries, and function monitoring.

Nowadays, technology has penetrated into various industries and the development of all industries in the future will not be possible without technology. We must continue innovating and improving our country's technology in competitive sports and showing our country's scientific and technological strength and national strength through sports.

Result

Although taekwondo electronic protective equipment has made great progress compared to the past, it also has some shortcomings. At present, the scores of taekwondo boxing technique and rotation technique still need the judges' artificial judgment. There is no technology to solve such problems at present. Therefore, the artificial scoring will inevitably affect the fairness of the competition. Secondly, Taekwondo belongs to the sport of fighting and confrontation. The sensitivity of electronic protective equipment will be reduced when it is hit in the fierce confrontation, and athletes will not score when hitting the protective equipment, which is also a problem that needs to be solved by technology in the future. Finally, Taekwondo's armguards and leg guards tend to fall off in the confrontation and thus affect the rhythm of the match. Now we hope that the armguards will not fall off in at least one round so as to improve the enjoyment of the match.

In the future, science and technology can help people find and solve problems, like selecting materials more scientific, training more targeted and efficient, organizing games more concise and efficient, and making the games more fair and enjoyable. We still have a long way to go in sports technology.

Discussion

Modern science and technology have been widely used in competitive sports training to help athletes improve their sports skills and performance. Nowadays, international competitions are contests of national sports strength and contests of advanced science and technology[2]. Modern science and technology make sports training more refined, more accurate, more specialized, scientific training methods and means will be more targeted, making the potential of human movement better developed. The introduction of science and technology has changed our training methods and means, and scientific theoretical guidance can help us save the growth time of athletes, so as to help athletes obtain high-level competitive ability.

The application of artificial intelligence, sports biomechanics, human science and other technologies in sports has been very mature. Technicians use relevant scientific and technological equipment to monitor athletes' physiological indicators, track their movement, and then collect and organize data through computers to provide the basis for athletes' training and competition. It is necessary to use science and technology to monitor athletes in an all-around way. Sometimes a change in detail will determine the outcome of the competition. Therefore, it is necessary to strengthen the precision training of science and technology for athletes.

The development of media creates conditions for the popularization of competitive sports.

Due to the development of science and technology, today's media has also made great progress, with greater innovation and upgrading than before. The innovation of science and technology makes it possible for people to obtain information about competitive sports events through media channels, such as the Olympic Games, World Cup, World Championships and other large-scale games. Not all people can watch the games in person, but people can obtain the relevant information through the Internet, live TV, satellite broadcasting and other ways.

Media can be said to be a part of competitive sports, it makes people feel the charm of sports. At the same time, people watch the games through the media to relax and release pressure. Media networks from the previous 3 g, 4 g to 5 g now makes the spread of information more quickly and accurately, enable people to get the information in time, the audience to watch the video images from previous blurred into super clear, 4 k now, audience better watch the effect, the future of science and technology innovation will bring the audience a better consumer experience, this is the outcome of the development of modern science and technology.

Due to the development of science and technology, competitive sports have been widely spread, and through the media to inject its ideas into people's hearts, so that people love sports more, more love competitive sports.

Integration of science and technology and competitive sports – Taekwondo Science and technology development history of Taekwondo As a competitive sport, Taekwondo became an official Olympic sport in 2000 in the 2000s. Taekwondo has made great progress after nearly 20 years of development, and science and technology have also been reflected in the project, especially the transformation of Taekwondo from traditional protective gear to intelligent protective gear[3].

Before the 2008 Beijing Olympic Games, Taekwondo used traditional protective gear. Later, due to the development of sports and science and technology, Taekwondo switched to more advanced intelligent electronic protective gear, which has increased the appreciation and fairness of the competition at a certain level[4]. Taekwondo training equipment has also changed from a simple foot target to an electronic foot target that can measure strength and quantity. Now science and technology have also made innovations in the selection of taekwondo athletes. Electronic sandbags, electronic foot targets and mobile phone terminals can be connected to get the data of tested athletes kicking targets, helping coaches select excellent talents.

Now, engaged in the technical personnel of the science and technology is in constant efforts to put the taekwondo sports science and technology. In the patent, Taekwondo has seen much intelligent product design (a taekwondo knuckles electronic protective devices, digital intelligent monitoring system of training, taekwondo assistant software). In addition, taekwondo competition venues are now highly science and technology, such as in Wuxi Taekwondo Championship venue have been completed. The venue hardware configuration is complete, the game of "eight claw screen" become the tae kwon do classic refresh screen, and customize the "lake awning" the venues, enrich the sports stage art space, It is the NBA arena of Taekwondo. In the future, major taekwondo competitions will be held here, so integrating science and technology can attract people's attention.

The progress of science and technology should help people solve problems and simplify complex issues. The use of technology in Taekwondo reduces the interference of human factors, and the score is based on the real strength of the players on the court.

Conclusion

In China, development of Taekwondo has made great progress after more than 20 years, whether in the selection of athletes, training, competition, organization and management. All of the elements have made great achievements, and formed our own sports training system, so that our national taekwondo athletes in the recent several Olympic Games have made proud results. These achievements are inseparable from China's science and technology, science, and technology for athletes training, sports injury prevention, injury recovery, function monitoring to provide necessary support and help.

Science and technology and competitive sports complement each other, depend on each other and promote each other. After decades of development, they have been integrated with each other, especially the impact of science and technology on competitive sports is huge. It makes the spread of sports more widely and makes sports more enjoyable, science and technology are indispensable to the development of sports. Today, science and technology have penetrated all industries, and the product of all walks of life in the future is inseparable from science and technology.

We should constantly innovate and improve our country's science and technology in competitive sports technology. Sports is a good media to show our country's scientific and technological strength and national strength. Our nation always walks at the forefront of the world and offers the responsibility and style of a big country.

Human's pursuit of science and technology is endless. We can not predict tomorrow's science and technology to what extent, will develop to what extent, this is exactly where we look forward to. Now we are in the era of sports power, through sports we can spread

Chinese culture, enhance the status of the country in the international community, improve the influence of the country[5]. Sports are not only sports but also reflect the comprehensive national strength from the side. Innovation leads to development and science and technology accomplishes the future. On the road of sports in the future, science and technology are more needed to support the integration and common development of the two[6].

The role of science and technology in competitive sports includes: improving competitive level, promoting fair competition and changing audience's consumption experience. In the future, science and technology will be more specialized in competitive sports. The innovation of athletes' equipment, clothing, training, and diet will promote the continuous improvement of athletes' competitive level. At present, replay technology and hawk-eye technology in major matches help the referee make the match decisions, making the game fairer. In the future, technology should help audiences experience the atmosphere of games more intuitively. For example, VR technology today will also promote the rapid development of competitive sports through innovation in audthe ience consumption experience.

References

杨涛 (2010) 科技革命与体育的背离[J]. 南京体育学院学报(社会科学版), 102(24): 65-68.

黄滨. ,&周江勇 (2011) 信息技术与体育科学的发展[J]. 体育文化导刊12(1): 154-157.

鲁凡. ,&高志红 (2010) 对我国跆拳道项目首次使用电子护具效果的研究[J]. 武汉体育学院学报239(44): 73-77, 96.

江炬(2014) 电子护具时代女子竞技跆拳道技战术发展趋势分析[J]. 广州体育学院学报134(34): 77-80.

张雷. ,&等人, （2021） 面向2035年远景目标的体育强国建设：实践回顾与理论分析[J]. 天津体育学院学报, 2021, 171(36): 274-279.

钟秉枢. ,&李楠 (2021) “十四五”展望：科技革命视角下我国体育的新发展和独特功能[J]. 首都体育学院学报33(5): 1-5.