Application Analysis Of Smart Wearable Devices in Students' Physical Activity Under the Background Of Big Data

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Abstract. With the rapid development of information technology, big data is gradually being popularized and promoted in various industries. Smart wearable devices have attracted much attention for their objective, accurate and continuous measurement of the amount of exercise. With the continuous improvement of intelligent equipment performance, large data analysis and intelligent wearable device technology can real-time capture the movement of the students in class data: trajectory, heart rate, speed, cost, etc., through data analysis, to monitor and intervene student's sports activities in the class at the same time, can help the teacher more scientific system of the training plan, a more comprehensive understanding of the students in the class level and performance, enhance the level of student's physical stamina and physical health and will bring far-reaching influence to sports research.

Keywords: Big data, Smart wear, Physical activity.

1. Introduction
In recent years, wearable devices represented by intelligent hand ring and smartwatches are widely used, people's physical activity, location, and physical physiological data of every change can be record and analysis of data, which provides a new thought and method for the measurement of physical activity. The rapid development of smart wearable devices has created the possibility of big data research in sports activities. The application of the collected data on students' physical exercise will certainly accelerate the development of China's big data cause. How to make good use of the advantages of big data intelligence, scientifically analyze the influencing factors of smart wearable devices, which can provide practical guidance for the big data research and judgment of smart wearable devices for students' physical activities. It is conducive to better development of students' physical fitness level, provides students with better motivation for sports, fosters sports attitude, improves sports behavior, and achieves a win-win situation between physical fitness improvement and big data intelligent research and judgment[1-2].

2. Application of big data and smart wearable Devices in sports activities
Sports have become an indispensable part of people's leisure lives. The intelligent development of sports goods makes sports and fitness more convenient. Accurate data can provide us with a more accurate and scientific understanding. Under the background of intelligence and supported by the development of science and technology, sports are developing towards intelligence, health, and
science. Smart wearable devices can accurately measure various data generated by users during exercises, such as heart rate and sweat composition, based on their height and weight, exercise habits, amount of exercise, and postures. Smart wearables will give different feedback, switch between different instructions, and can even specify text suitable for the user's exercise plan or provide users with data to meet their personal needs. These intelligent data can be used to obtain human body indicators and motion state, and accurately record motion trajectory, and then carry out statistical analysis and storage of the data.

At present, smart wearable devices are widely used in professional athletes. For example, smart sports equipment worn by skiers can also quickly locate the athlete, record the athlete's displacement route and speed, etc. Sensors in the smart helmet record the number of hits and the force of the impact, indicating the safety risks the athlete faces. Long-distance runners wear intelligent sports equipment, which can measure the athlete's heart rate, oxygen consumption, stride frequency, stride length, and so on, so as to better understand the specific situation of the athlete, which can make training plans and modify training plans according to the obtained data. In the future development of intelligent wearable products, it will develop at a higher and faster speed to achieve the interconnection of all things with the greatest benefit, give more accurate feedback and analysis of data generated by human movement, and conduct secondary feedback, so as to meet human needs for a better life. Smart wearable devices start to make progress in a new direction. These smart wearable devices, on the basis of collecting and analyzing data, provide security for athletes in the process of sports, greatly reduce the probability of injuries in sports, and help improve their sports level and prolong their sports career[3-4].

3. The theoretical research significance of smart wearable devices combined with students' physical health

3.1. Change the traditional school physical education work evaluation system
For students, a student's performance in school sports was previously measured by the student's athletic competition scores and physical education test scores. The evaluation is relative and the result is important, but the process is equally important. The data collected by smart wearable devices can help optimize the evaluation of students' physical activity. Through the collected physical exercise data analysis, we can understand the overall physical exercise situation of students at school, including the exercise process, exercise time, exercise intensity, and so on. Especially for some students with poor physical quality, it is one-sided to evaluate their sports performance only from their sports scores. By monitoring the physical exercise process of students through smart wearable devices, the participation of students can be quantified, so as to develop scientific exercise content and form. For schools, students' physical exercise and physical health in school are important indicators to evaluate the quality of school work. Smart wearable devices are widely used to monitor students' physical exercise process, collect students' physical exercise data, and analyze the influence of physical exercise, academic performance, physical performance, body composition, etc. This can not only understand the performance of students in school sports, but also understand the students in other aspects of the situation, guide students to participate in scientific physical exercise, improve the efficiency of students physical exercise, and can promote the students' physical health level to improve, effectively carry out physical work[5].

3.2. Help to build a large database of students' physical exercise
The smart wearable device is used as the carrier to monitor the physical exercise process of students and collect the data of physical exercise of students and apply it to the actual physical work. This will be conducive to the establishment of a scientific theoretical system of student physical health monitoring. As for the content of physical health monitoring, the monitoring research of students' physical exercise process is still very few. At present, most of them are testing students' physical health level. As an important factor affecting the level of physical health, the monitoring and data collection of physical exercise can further analyze the effect of physical exercise on students' physical
health, and effectively construct the monitoring system of students' physical health. By building a personal sports database for students, we can even track students' physical activity status, habit formation, and personal development after graduation. Physical exercise is an important reason that affects students' physical fitness levels. The feasibility of monitoring students' physical exercise process through intelligent wearable devices is analyzed, and the specific application of physical exercise data measured by intelligent wearable devices is mainly studied. The government has established real-time physical education and a health database for students, which can better promote the growth and development of students. Based on the analysis of big data, we can not only understand the differences in the development level of students in the same age group but also understand the impact of the differences in physical exercise on the physical development level, as well as the differences in the development level of students at different stages [6]. The establishment of a student growth database can also provide a reference basis for a lot of work, such as students' sports material selection, growth, and development of the final situation. In a word, the establishment of a student sports database is conducive to promoting the construction of the whole country's big data.

4. Practical research significance of smart wearable devices combined with students' Physical healths

4.1. Strengthen students' physique and cultivate their lifelong sports consciousness

Smart wearable devices can be used to monitor students' physical exercise and understand students' physical exercise, including the amount and intensity of exercise, physical health status, and sleep quality. Through the integration of data management, students' physical exercise data collected by smart wearable devices can be more intuitively and accurately understand, so as to conduct research on the correlation between physical exercise performance and academic performance, and put forward Suggestions on specific students' study, life, and physical exercise. The physical exercise data and analysis results collected by smart wearable devices can provide a relevant reference basis for relevant government administrative departments to formulate policies and documents on student physical health. By monitoring the physical exercise data of students through smart wearable devices, the real-time exercise situation of students can be understood, to monitor the students' physical health in real-time, find the deficiency of students' physical exercise in time, send out early warning information in time, urge the students to strengthen physical exercise to enhance their physical quality, guide them to pay attention to physical exercise from the beginning, so as to better complete the learning task. On the other hand, by monitoring the physical exercise data of students through smart wearable devices, students' physical health status can be understood in real-time, students with poor health index can be timely tracked and guided, and students can be urged to develop good living habits, improve their physical fitness level, enhance their athletic ability and overcome difficulties. To guide students to develop the good habit of persisting in physical exercise and to find and cultivate excellent sports talents for the country. That can make them realize the important role of sports and positive significance, develop the habit of conscious exercise. To form a good atmosphere for the development of students' physical education, promote the development of school physical education, and effectively manage school physical education.

The accumulated data of every teacher in the teaching, scientific research, professional title evaluation and academic exchanges, awards, social services, etc, as well as the accumulated data of students in learning, examination, contests, graduation design, employment, and career development, etc, are collected and stored up continuously, which is of great significance for the development of university teachers and students. However, data has not yet been used to mine and correlate the value information. Therefore, the whole life cycle data analysis system is constructed to conduct tracking personalized data mining and analysis on teachers' teaching and research ability development and students' academic and career development on the basis of accumulated data, so as to provide references for the personal development of teachers and students and practical basis for the
development of universities. The life cycle data analysis system logical architecture diagram is shown in the following figure.

4.2. Provide students with personalized and high-quality sports services

The physical exercise data collected by smart wearable devices form a multi-dimensional student database to provide students with high-quality personalized sports services. Firstly, an exercise plan and diet plan can be provided for students. The energy of the human body is composed of consumption and intake. We can calculate the basic energy consumption of individuals through smart devices, and the rest is mainly to control the exercise consumption and food intake of students. Make an exercise plan and diet plan for obese students and underweight students to control their BMI within the normal range. At the same time, we can make a physical exercise plan for students on weekends, winter and summer vacations, so as to prevent many students from lack of physical exercise at home without the supervision of the school and teachers and wasting a lot of time on playing games and watching TV. Smart wearable devices can develop an off-campus physical exercise plan in line with students' actual conditions through their in-school physical exercise and their own actual conditions. According to the physical condition of students themselves, the corresponding training plan can be made for students to improve the training efficiency of students, and effectively improve the students' sports results. At the same time, it can realize the theoretical research of big data in the field of school physical education, and apply smart wearable devices to monitor students' physical exercise process. Under the general trend of big data application development, it can enrich the theoretical research of big data applications in school sports work.

5. Conclusion

In the future era of intelligence, sporting goods will integrate more high-tech elements, serve mankind more comprehensively, meet the material needs of mankind in the new era, make human life more convenient, and contribute to the popularization of sports and fitness. So as to help people better participate in physical exercise, strengthen people's physique, make people's life happier. Data is the core of the information technology system and the basis and source of information displayed in the system. As a smart wearable device to monitor students' physical exercise, it can analyze and display students' relevant sports information based on the student data monitored by the device, and effectively change the learning mode of students in a physical education class and the teaching mode of physical education teachers. Based on the perspective of big data, we can analyze the correlation between students' in-school physical exercise data and personal data, and studies the application of data collection, so as to finally realize the purpose of enhancing students' physical health.

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