

Research Article

Innovation and Development of Sports Football Teaching Mode under the Background of Big Data and Internet of Things

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Football is a sport that integrates competition, fitness, and entertainment, and its proportion in national development is rising. Under the background of big data, how to better carry out the innovation of physical education teaching mode is an important problem facing the current football reform. This paper mainly studies the effect of sports football teaching innovation on improving the ability of football education and students' interest in football learning. This paper mainly uses the experimental method, the survey method, and the expert interview method to study the theory of football teaching and the model innovation under the big data. According to the basic principles and requirements, the questionnaires were distributed, filled out, and collected on the spot, and finally, the questionnaires were sorted and analyzed to draw conclusions. Finally, according to the experimental results, the average scores of the experimental students in group A were 8.2 and 73.5, respectively. The average scores of group B students were 81.6 and 74.3, respectively. The experimental group was significantly better than the control group in terms of test scores and performance levels, indicating that the use of new teaching methods combining big data and the Internet is of great significance.

1. Introduction

In the context of the high-speed dissemination of new media and the increasing degree of intelligence, football has also received widespread attention. The development of football in my country is very fast, and it has achieved rapid development and progress in all aspects. But in the new era, traditional football education no longer meets the requirements of football teaching. Therefore, in order to ensure the continuous development of football in our country, it is very necessary to innovate the football teaching model.

There are many related theoretical achievements in the research on the innovation and development of sports football teaching mode under the background of big data and Internet of Things. For example, Lucić et al. proposed that the application of VAR technology in football requires additional training and practical experience by everyone involved in the process to ensure the correctness and sufficient speed of the decision-making process [1]. According to Sheth et al., chatbot technology was first introduced as a human chat agent to simulate a conversation with a user

through voice or text interaction [2]. According to Ponnu-samy et al., Internet of Things (IoT) devices operate primarily in wireless media. They discuss how these techniques can be applied to the wireless environment and highlight the design challenges in the wireless environment, arguing that it is critical to develop an IDS specifically for wireless networks [3]. Therefore, it is very crucial to make a reasonable use of big data and the Internet of Things to innovate the football teaching model. This paper will start from the background of big data and Internet of Things technology and conduct in-depth research on the innovative development of football teaching mode.

This paper first studies Internet+ and describes its basic theory. Secondly, it analyzes and describes sports in the context of the Internet of Things. Then, the advantages of the innovative teaching mode in the implementation of college sports and football public elective courses are discussed and then expounds the principles of football sports activities. Finally, through experiments and investigations, the innovation and development of sports football teaching mode are analyzed and compared, and relevant conclusions are drawn.

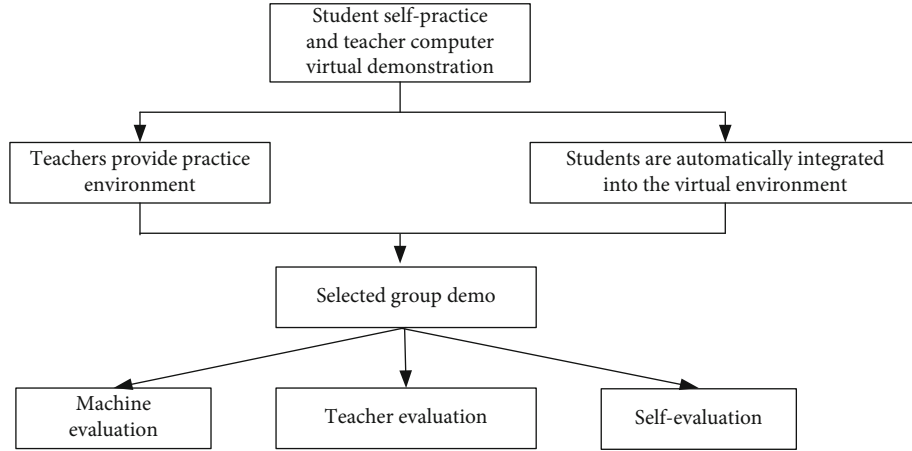


FIGURE 1: "Innovative education" teaching mode.

2. Innovation and Development of Sports Football Teaching Mode under the Background of Big Data and Internet of Things

2.1. *Internet+*. The debate between "Internet + Education" and "Education + Internet" on the Internet still exists [4]. Some researchers believe that online education is like "free education." Online education is a massive recovery and expansion that differs from superficial unions and symbols. So there is a big difference between the two [5].

2.2. *Sports in the Context of IoT*. "Internet + sports" occupies a core position in sports public welfare activities. Combining the "Internet +" service concept with the technology of sports sharing service platform to build an Internet cloud public sports information service platform, users can quickly obtain the required information through the mobile phone anytime, anywhere for free. The Internet sports sharing service improves the efficiency of public sports services [6].

The advantages are the following: there are wider sports organization services, sports facility services are more practical, there are more professional sports consulting services, physical activity is more fun, there is a wider range of sports information services, etc.

It is necessary to build an open online leisure sports platform, connect smart devices, record, collect, analyze and interactive data, integrate big data analysis, continuously increase network services and resources, and provide users with personalized services.

The Sports Information Center is a public sports service organization managed by government agencies and condensing social forces. Sports information is an important part of information disseminated through the Internet, which is conducive to the dissemination of sports culture; interaction is not limited by time and time and stimulates sports network consumption. The combination of Internet sports computer practice and theory has produced the concept of "smart sports," and Internet + will be applied in the process of public service, sports management, and sports reform. Establishing a comprehensive information retrieval

TABLE 1: Random grouping of students in the experiment.

	Experimental class	Control class	Total
A group	29	31	60
B group	26	24	50

TABLE 2: Professional situation of physical education teachers in football sports activities.

	Number of people	Proportion
Soccer	8	13.33
Basketball	12	20
Volleyball	16	26.67
Gymnastics	2	3.33
Track and field	19	31.67
Wushu	2	3.33
Other	1	1.67

platform for the international sports industry through the Internet platform is conducive to changing the way, mode, and concept of the development of the sports industry. Ultimately, a networked sports group is formed, characterized by multiple identities, cohesion of action, and extensive utility of activities. And it has the advantages of venue positioning, personalized fitness programs, low activity costs, and convenient contact channels [7, 8].

2.3. *The Advantages of Innovative Teaching Mode in the Implementation of College Sports and Football Public Elective Courses*. Compared with the traditional teaching mode, the characteristic of the innovative teaching mode is the systematic transfer of knowledge, while the innovative teaching mode is mainly based on awakening students' interest in learning and improving students' learning ability.

The public elective university sports takes the concept of "people-oriented" into account and takes into account the individual needs of students.

There are some deficiencies in the teaching of sports public choice: on the one hand, it is also because the students

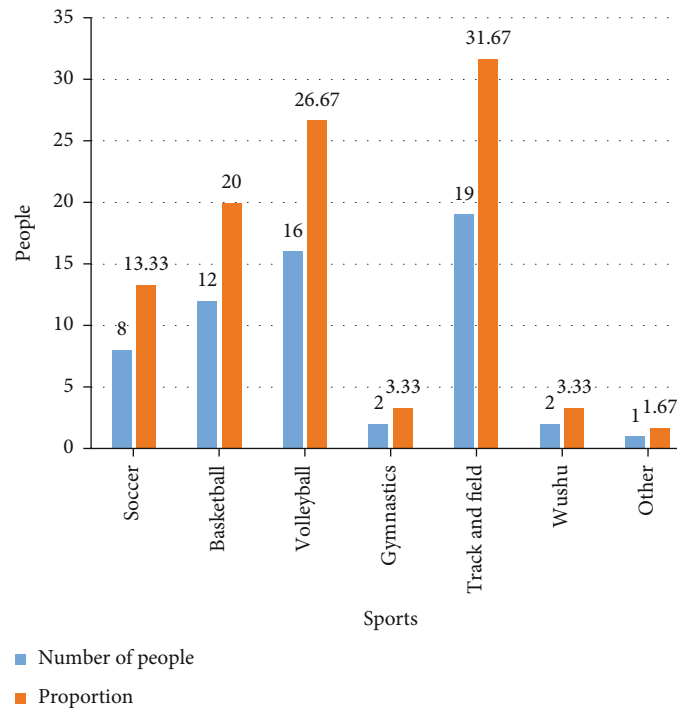


FIGURE 2: Professional situation of physical education teachers in football sports activities.

are affected by the poor sports equipment and facilities, and on the other hand, it is mainly due to the actual problems of the students' own physique.

Innovative teaching mode, on the one hand, can change the attitude of physical education teachers in the classroom and, on the other hand, can improve students' enthusiasm for learning [9, 10].

2.4. Principles for the Development of Football Sports Activities. In fact, the sports mode guided by the theory of "sunshine exercise" is a new gymnastics fashion aimed at improving students' physical health by extending the time of traditional gymnastics and enriching the contents of gymnastics. The time is longer, about 30-40 minutes; the content of the activity is refined, and higher requirements are placed on organization, management, execution, and feedback. Whether it is equipping venues or managing student organizations, it is more complex and rigorous, like traditional cross-class exercises. Flexible organization is the basic condition of sports activities, it is the inheritance and further development of traditional gymnastics, and it is constantly improved and supplemented.

The purpose of school physical activity is to stimulate students' subjective interest in physical activity and improve the physical health of students participating in physical activity by promoting physical development that meets established standards. All sports are student-centered; therefore, sports must embody the principle of subjectivity. Sports football is a strange sport, and the organizers hope to try a series of interesting projects to further meet the positive choices of amateur football fans, so that each student can effectively use different types of extracurricular organization

forms to give full play to students' football skills. Reflect the special ability of students, create special sports programs by allowing students to exercise in a positive football atmosphere, and at the same time improve their enthusiasm for participating in sports [11, 12].

The design and organization of the practice content should be based on the characteristics of students of different ages, and there are different practice content and organization forms to meet the needs of different students. Football and sports should reflect the differences between students. For lower elementary students, less complex and fun activity elements should be used. It allows students to obtain different activity experiences and physical qualities while practicing at different ages and, at the same time, feel spiritually happy [13, 14].

Students' individual circumstances should be fully considered when planning the load of physical activity between classes so that they can achieve their goals without being forced to over- and overexercise. In sports, contingency planning for severe weather is also backed by science. Inclement weather has proven to require indoor activities to avoid students disrupting classes between classes. Of course, for football, it is not necessary to play football indoors but to take appropriate measures [15].

Due to the large number of students participating in football sports activities, there are certain security risks. Facility security, equipment security, and organizational management are security issues that need to be considered. Create a safety plan to avoid problems. Before that, try to avoid safety issues; let students avoid accidents; create a football atmosphere and environment that makes schools, parents, and students feel comfortable; and achieve the purpose of sports activities [16, 17].

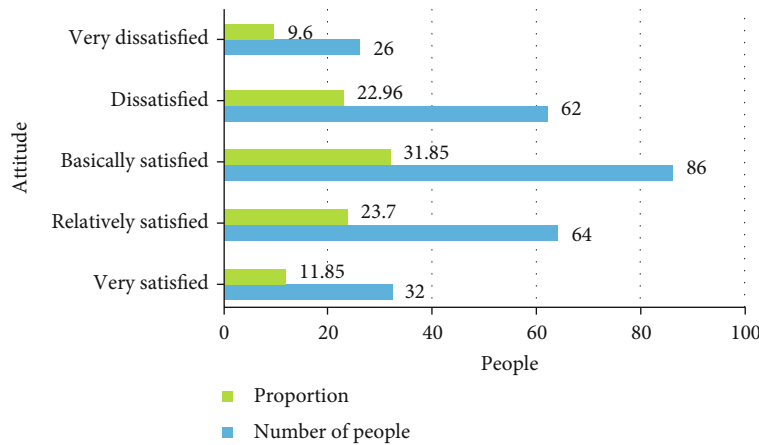


FIGURE 3: Student satisfaction survey on the school's football field.

If the sports projects under a single sports project are not innovative and if they do not meet the original organizational goals, it will be difficult to carry out subsequent sports training and easily cancelled. Innovation is not to be satisfied with the status quo, but to continue to innovate on the original basis, break the traditional business model, integrate some current trends into sports, and let students continue to enjoy football [18]. We must constantly update our organizational and management models to invigorate football and sport from a cultural point of view [19].

2.5. The Basic Way of Implementing Innovative Education in Football Teaching

2.5.1. Change Teaching Concept. The fundamental difference between innovative teaching and traditional teaching is whether students are the main body of teaching activities. Innovative education does not deny the role of teachers, because it fully respects and effectively guarantees the dominant position of students. In innovative education, "missionary and doubt" is for students. Their main role is to help students develop and enhance their creative abilities through learning.

2.5.2. Reform Teaching Methods. Football is very technical and collective, and every technical gesture is not easy to learn and master. So that every student can learn and master various technical actions as soon as possible, make full use of students' existing technical knowledge, and cultivate students' own learning and innovative thinking ability. Incorporating innovative teaching into football lessons and the implementation and establishment of innovative teaching models demonstrate the effectiveness of football teaching models, specifically as shown in Figure 1.

2.5.3. Reform of Teaching Methods and Expansion of Teaching Organization. Teaching methods have their time limit and scope and are limited by their actual conditions. The teaching of traditional techniques and courses is too narrow, limiting the uniqueness of technology and ignoring the particularity of football itself, thus meeting people's needs. It improves over a period of time but also promotes the balanced development of students' innovative abilities.

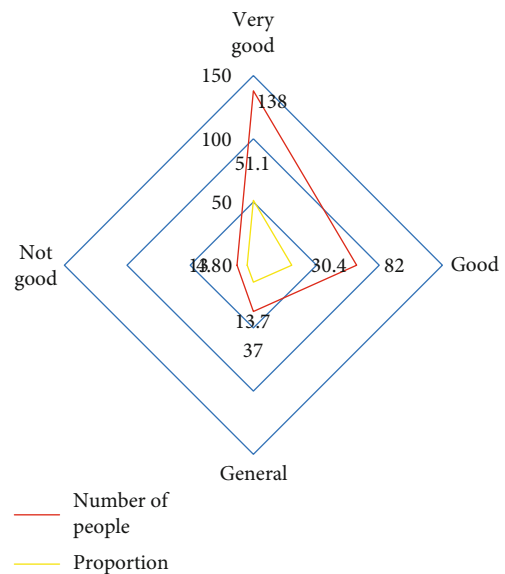


FIGURE 4: Students' attitude towards the diversified teaching assessment of football.

Taking innovative teaching methods as an example, this paper briefly introduces the reform of teaching methods and the development of teaching organization.

2.5.4. Innovation Performance Evaluation Criteria. Schools should consider scientific innovation when evaluating sports and football discipline. The assessment scales down subject-specific content assessments, including football practical skills, research ability, physical condition, mental health, and social adaptation. Focus on changing students' attitudes and progress, promoting development, and improving the quality of education. Innovate the concept of football education and comprehensively improve sports talents: football itself contains a set of qualities that promote the all-round development of talents. Football is an effective way to train high-quality athletes.

TABLE 3: Average test scores of students in experimental class and control class in groups A and B.

A group	Average assessment results	Experimental class	Control class
		77.9	74.1
B group	Average assessment results	Experimental class	Control class
		82.2	73.8

3. Research Objects and Methods

3.1. Survey Objects. Based on the existing physical education theory and practice, the city-level college physical education teaching mode puts forward reform suggestions and reference for improving the innovation of the city-level college physical education teaching mode through document sorting and summarization.

3.2. Research Methods

3.2.1. Survey Objects. The survey objects are the following: primary and secondary school students, college students, and their teachers, as well as related staff.

3.2.2. Questionnaire Design. During the whole process of questionnaire design, we followed various basic principles and requirements of questionnaire design, as well as the relevant requirements of various SPSS software design, and listened to the valuable opinions and suggestions of domestic and foreign experts. According to the needs of specific research projects, repeated necessary design modifications and additions were made, and finally, two design questionnaires were formed, which were determined according to the two different questionnaire research objects, the student questionnaire, and the teacher questionnaire. As the name suggests, the student questionnaire is mainly used to investigate the needs of physical education students, and the teacher questionnaire is mainly used to investigate the current situation of physical education teaching in colleges and universities.

Teacher questionnaires are distributed, filled out, and collected on site. Student questionnaires were conducted using stratified sampling. The reliability of the results was tested using the Pearson correlation coefficient method.

$$\zeta(\alpha, \beta) = \frac{E[(\alpha - \mu\alpha)(\beta - \mu\beta)]}{\sigma_\alpha \sigma_\beta},$$

$$r = \frac{\sum_{i=1}^m (\alpha_i - \bar{\alpha})(\beta_i - \bar{\beta})}{\sqrt{\sum_{i=1}^m (\alpha_i - \bar{\alpha})^2} \sqrt{\sum_{i=1}^m (\beta_i - \bar{\beta})^2}}. \quad (1)$$

The arithmetic absolute value of the Pearson coefficient for the population and sample coefficients is less than or at least equal to 1. According to the calculation, this questionnaire has high reliability.

After choosing a topic, meet with directors or heads of sports and research departments of some vocational schools, and conduct interviews with physical education teachers and scientists in vocational schools and inquire about college physical education teaching mode, curriculum design, time

arrangement, evaluation and evaluation, etc., to ensure the correct progress of this research.

3.3. Mathematical Statistics. All survey samples were conducted anonymously, and the data collected through questionnaires were processed in accordance with the principles of sports and social survey statistics. The sample data were analyzed and sorted using the statistical software SPSS 11.5 and Office Excel.

Through the statistical analysis, summary, and summary of the survey data, combined with the relevant theories, the current situation of physical education in schools in this city is interpreted, problems are found, reasonable conclusions are drawn, and countermeasures and suggestions are put forward.

3.4. Experimental Study. Taking the football class of a sports college in this city as the main research object, a comparative analysis was carried out using the contrast method, specifically as shown in Table 1.

4. Analysis of Experiments and Investigation Results

4.1. Professional Situation of Physical Education Teachers Engaged in Football Sports Activities. As shown in Table 2 and Figure 2, it can be seen that football teachers account for 13.33%, basketball teachers account for 20%, volleyball teachers account for 26.67%, track and field teachers account for 31.67%, and gymnastics teachers account for 3.33%.

4.2. Survey of Students' Satisfaction with the School's Football Teaching Model. As shown in Figure 3, we can see that 11.85% of the students are very satisfied with the football field of their school, 23.7% are relatively satisfied, 31.85% are basically satisfied, and 22.96% are dissatisfied, and 9.6% of students expressed very dissatisfaction.

4.3. Attitudes of Students towards the Development of Football Diversified Teaching Assessment. As shown in Figure 4, 51.1% of the respondents think that the diversity assessment is very good, 30.4% think that it is good, 13.7% think that it is fair, and 4.8% think that it is not good.

4.4. Average Test Scores of Students in Experimental Class and Control Class in Groups A and B. Evaluate experimental and control teams against uniform criteria and categorize real data. The results are shown in Table 3.

The results showed that the average scores of experimental students in group A were 77.9 and 74.1, respectively. The average scores of group B students were 82.2 and 73.8, respectively. The results indicating that the new teaching method adopted by the experimental group is of great significance.

5. Conclusion

In the context of big data and the Internet of Things, my country vigorously advocates national fitness programs. According to the results of this experiment, the experimental group is significantly better than the control group in terms of test scores and performance levels, indicating that the use of big data and Internet technology has an important and positive impact on the innovation of football teaching models. In this environment, school football teaching is carried out. Model innovation is imperative. Online and offline teaching based on IoT technology will enrich football teaching. The innovation of physical education teaching mode is an important link in the development of modern football, and it is of great and long-term significance to improve the level of football in our country. The application of data technology and Internet of Things technology can effectively improve the efficiency of sports classrooms and promote the physical and mental health of students by integrating resource advantages.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The author declares that there are no conflicts of interest.

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