

# Problems and Path Reconstruction of Physical Education Talent Cultivation in the Context of the Digital Economy

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**Abstract:** The development of the digital economy presents new challenges for the cultivation of talents in physical education programs in higher education institutions. This paper analyzes the requirements for physical education talent cultivation in the context of the digital economy, including solid professional knowledge and skills, proficiency in digital technology application, new media operation capabilities, intelligent equipment operation abilities, innovative thinking and creativity, teamwork and communication skills, and a lifelong learning mindset. The paper also draws on successful applications of digital economy teaching in various Chinese universities, such as Peking University's "Digital Sports" course, Nanjing Sport Institute's "Integration of Sports and Education," Hunan Railway Science and Technology Vocational College's "Campus Sunshine Fitness Run," Beijing Sport University's "Virtual Football Tactical Simulation," Guangzhou Sport University's "Online Sports Dance Competition," and Shenzhen University's "Sports Simulation Game Classroom." The analysis identifies existing problems such as insufficient digitization of teaching resources, lack of digital innovation in practical teaching segments, weak integration of course design with the digital economy, inadequate cultivation of students' digital learning abilities, limited investment in digital equipment and facilities, and knowledge anxiety caused by rapid technological updates. The paper proposes ways to improve the cultivation model for physical education talents in the context of the digital economy: optimizing the curriculum system, enhancing teaching methods and resources, strengthening faculty development, and improving research and innovation capabilities.

**Keywords:** Digital Economy; Physical

**Education Programs; Talent Cultivation; Case Studies; Path Reconstruction**

## 1. Introduction

The development of the digital economy provides abundant resources and a broad platform for the cultivation of talents in physical education programs in higher education institutions. The expansion of online educational resources. With the help of digital technology, universities can access more high-quality domestic and international sports teaching resources, enriching teaching content. For example, students can learn cutting-edge international sports training methods and theories through online courses; online teaching apps can overcome the limitations of time and distance, allowing students to arrange their learning flexibly, thus enhancing the convenience and timeliness of their studies.

## 2. Opportunities Brought by the Digital Economy to the Cultivation of Talents in Physical Education Programs

The application of intelligent teaching methods. Virtual Reality (VR) and Augmented Reality (AR) technologies can create more vivid scenes for sports teaching, enhancing students' learning experiences[1]. For instance, in volleyball tactical teaching exercises, students can experience live game scenarios through a VR technology app, helping them better understand the application of tactics. Big data analysis can accurately assess students' learning status and sports performance, providing a basis for personalized teaching. For example, a customized training plan can be developed based on students' physical data and the mastery of sports skills[2].

## 3. Requirements for the Cultivation of Talents in Physical Education Programs in the Context of the Digital Economy

**3.1 Possess Solid Professional Knowledge and**

### **Skills**

In the context of the digital economy, physical education students in universities need to have a deep understanding of professional sports knowledge, including fundamental courses such as sports psychology, exercise physiology, and sports training theory. They should also excel in the techniques and tactical operations of various levels and types of sports[3-5]. For example, students majoring in football should not only understand the basic rules and tactical systems of football but also master advanced training methods, such as using sports monitoring equipment to obtain players' physical data to create more scientific training plans.

### **3.2 Master Digital Technology Application Skills**

Data analysis ability, proficient in using big data software to process and analyze relevant data from sports events, such as athletes' training data and real-time match data, to assess training effectiveness and performance. For instance, using data analysis to identify a basketball player's shooting accuracy decline during specific match periods, further analyzing the reasons, and developing improvement strategies[6-8].

### **3.3 Have New Media Operation Capabilities**

Familiar with various new media platforms, capable of promoting sports events, and marketing sports brands through new media. For example, organizing and promoting a campus basketball game through social media platforms to attract more spectators and attention.

### **3.4 Possess Intelligent Equipment Operation Skills**

Proficient in operating various intelligent sports devices, such as fitness trackers and smart fitness equipment, and able to adjust training based on the data provided by these devices. For instance, adjusting running training intensity in real-time based on heart rate data monitored by a smart wristband.

### **3.5 Have Innovative Thinking And Creativity**

Able to use digital technology to innovate sports teaching methods, training techniques, and event organization forms[9,10]. For example, developing sports training courses based on virtual reality technology or using online platforms to host innovative sports competitions.

### **3.6 Have Teamwork and Communication Skills**

In the digital economy environment, the implementation of sports projects often requires cross-disciplinary team collaboration, including technical staff, marketing personnel, data analysts, etc. For example, organizing a digital marathon event requires collaborating with the technical team to ensure the stability of the online registration system and working with the marketing team to devise plans to attract more participants, all of which require good teamwork and communication.

### **3.7 Have a Lifelong Learning Mindset**

With the rapid development of the digital economy, new technologies and ideas constantly emerge in the sports field. University students majoring in physical education need to maintain enthusiasm and ability for learning, continuously updating their knowledge and skills. For example, keeping up with the digital trends in the sports industry, participating in relevant online training courses and seminars.

## **4. Innovative Case Studies of Physical Education Talent Cultivation Reform in the Context of the Digital Economy**

### **4.1 Peking University's "Digital Sports" Course**

In the Spring semester of 2024, Peking University launched a new "Digital Sports" course, the first of its kind in Chinese universities. The course leverages digital technologies such as VR to allow students to experience more than ten different sports activities, including skiing, mountaineering, and rowing, within the campus. Students wear smart wristbands that not only contain identity information but also monitor their physical activities and heart rate in real-time; the classroom's large screen can display students' heart rates during exercise, with alerts triggered if the values exceed certain thresholds. The course is open-ended, allowing students to voluntarily form project groups to conduct research or design products related to the "digitization of sports." The teaching faculty are deeply involved in the construction of internet projects like smart venues and health stations, collaborating closely with multiple departments during the course development process.

#### **4.2 Nanjing Sport Institute's "Integration of Sports and Education"**

The institute has deepened the integration of sports and education by investing heavily in the smart renovation of sports venues and accumulating training data to build a solid hardware foundation. The coaching team uses data analysis to develop more scientific training plans for athletes, which have already shown preliminary results in sports like gymnastics, trampoline, and fencing. Both in daily training and major competitions, digital methods such as sensor monitoring are employed to assess athletes' physical fitness and training quality, as well as to analyze data on athletes and their competitors.

#### **4.3 Hunan Railway Science and Technology Vocational College's "Campus Sunshine Fitness Run"**

This sub-project of the college's Sports Department's "One School, Multiple Brands" initiative, the "Campus Sunshine Fitness Run," was designed and launched based on the "Shining Campus" platform. It is the college's first digital empowerment project for sunshine sports. There are eight Sunshine Fitness Run checkpoints on campus, with valid check-in times from 6:00 AM to 9:30 PM daily. Each run has specific distance and time requirements and is included in the physical education course grade assessment. The school is actively exploring new models of smart sports, promoting the digitization, serialization, personalization, and universal participation of sunshine sports activities, and building a distinctive brand of "One School, Multiple Brands" in sunshine sports.

#### **4.4 Beijing Sport University's "Virtual Football Tactical Simulation"**

Using virtual reality technology, this program creates realistic football match scenarios for students. By wearing VR headsets, students immerse themselves in tactical planning and simulations. Teachers can observe students' decisions and actions in real-time through the system, providing guidance and feedback. This interactive approach not only enhances students' understanding of tactics and their ability to respond but also increases the fun of learning.

#### **4.5 A Certain University in Shanghai's**

#### **"Smart Fitness Course"**

In this fitness course, students wear smart wristbands that monitor their heart rate and exercise intensity in real-time. Teachers display all students' data on a large screen and adjust the teaching content and intensity based on the data. Meanwhile, students can view their exercise records and analysis reports through a mobile app and compare and discuss their data with classmates.

#### **4.6 Guangzhou Sport University's "Online Sports Dance Competition"**

Students are organized to participate in an online sports dance competition. Through video live streaming and an online scoring system, students can compete with peers from different classes or even different schools. The audience can vote and comment online, enhancing the interaction and engagement of the competition.

#### **4.7 Shenzhen University's "Sports Simulation Game Class"**

This class introduces sports simulation games such as simulated skiing and simulated racing. Students are divided into groups to compete in the games, learning and mastering sports skills through gameplay. Teachers then provide targeted explanations and guidance based on the game results.

#### **4.8 A Certain University in Nanjing's "Sports Live Teaching and Interaction"**

In special situations, such as inclement weather preventing outdoor teaching, teachers conduct indoor theoretical teaching through live streaming platforms. Students can ask questions by posting comments or messages, achieving real-time online interactive teaching with immediate responses from the teacher.

### **5. Issues in the Paradigm of Physical Education Talent Cultivation in the Context of the Digital Economy**

#### **5.1 Insufficient Digitization of Teaching Resources**

Many teaching resources in physical education programs at universities, such as textbooks and course materials, have not yet been fully digitized, making it difficult to meet the diverse learning needs of students. For example, the quality of some sports demonstration videos may be low, or their availability may be limited,

preventing students from comprehensively and clearly understanding and learning through online channels.

### **5.2 Insufficient Digital Literacy among Faculty**

Some faculty members may not be sufficiently familiar with digital teaching tools and methods and may lack the ability to use big data to analyze students' learning progress. For instance, when monitoring and analyzing students' physical fitness data, they may not effectively utilize relevant software for precise assessment and personalized guidance.

### **5.3 Lack of Digital Innovation in Practical Teaching**

Physical education programs typically emphasize practical training, but in the digital economy era, digital innovation in practical teaching has lagged behind. Applications like simulated sports scenarios and virtual training are not yet widely used, making it difficult for students to experience realistic competition and training scenarios within virtual frameworks.

### **5.4 Weak Integration of Curriculum with the Digital Economy**

The curriculum content may not fully incorporate the application of digital technology in the field of sports, such as courses on sports data analysis, and the use and maintenance of smart sports equipment are relatively few.

### **5.5 Insufficient Cultivation of Students' Digital Learning Abilities**

Universities may not provide enough guidance and support to help students develop the ability to learn independently and acquire physical education knowledge in the digital economy environment. For example, students may not be adept at using online learning platforms, mobile apps, and other tools to enhance their professional skills. Additionally, some students may lack digital literacy in areas such as the application of digital tools, data analysis, and cybersecurity, which can hinder their development in the digital economy. For instance, when live streaming sports events online, they may not know how to handle network failures or ensure the security of the broadcast.

### **5.6 Limited Investment in Digital Equipment**

### **and Facilities**

Due to financial constraints or other reasons, there may be insufficient investment in digital equipment and facilities related to physical education programs, affecting the effectiveness of teaching and practical training. For example, there may be a lack of advanced sports monitoring equipment and virtual training devices.

### **5.7 Knowledge Anxiety Caused by Technological Updates**

The rapid advancement of digital technology requires physical education students to continuously learn new knowledge and skills, which may lead to knowledge anxiety. For example, with the constant emergence of new sports monitoring equipment and analysis software, students need to quickly master their usage and understand the principles of data analysis.

In summary, in the context of the digital economy, there are issues in the cultivation of physical education talents in universities across these seven aspects, which require corresponding measures to propose paths for improvement.

## **6. Path Reconstruction for Improving the Talent Cultivation Model of Physical Education Programs in the Context of the Digital Economy**

### **6.1 Optimizing the Curriculum System**

Introduce digital-related courses. Add courses such as "Sports Data Analysis," teaching students how to collect, organize, and analyze training data, event data, and sports consumption data; establish courses like "Principles and Applications of Smart Sports Equipment," to help students understand the working principles and usage of smart wearable devices, smart fitness equipment, and more; set up a "Digital Sports Marketing" course to learn how to use digital platforms and tools for the promotion and marketing of sports events, products, and services. Where possible, introduce cutting-edge courses like "Virtual Reality and Sports Training," allowing students to explore concepts like virtual scenario training.

Integrate digital technology into traditional courses. In sports training courses, use motion capture technology to analyze movement norms and improvement points; in sports theory

courses, visualize data to show trends in the sports industry and compare various data; in sports management courses, teach how to use digital methods for venue operation, event organization, and management.

## **6.2 Improving Teaching Methods and Resources**

Build a digital teaching platform. Establish an online course resource library, including teaching videos, electronic textbooks, reference materials, etc., for students to access at any time; use the platform for online testing, assignment submission and grading, and tracking learning progress.

Introduce Virtual Reality (VR) and Augmented Reality (AR) teaching. For tactical explanations and rule understanding of certain sports, use VR/AR to create scenarios for students to experience intuitively; for sports rehabilitation courses, simulate the internal structure of the human body and rehabilitation processes to assist teaching.

Digitize practical teaching. Collaborate with digital sports companies to establish internship bases, allowing students to participate in the development and operation of actual digital sports projects; in organizing school sports events, require students to use digital tools for event live streaming, data statistics, and more.

## **6.3 Strengthening Faculty Development**

Train existing teachers. Regularly organize teachers to participate in training and seminars related to the digital economy and digital technology to enhance their knowledge reserves; encourage teachers to take temporary positions in digital sports companies to understand the latest industry trends and technological applications.

Introduce professional talent. Recruit professionals with practical experience from sports technology companies, and internet sports platforms as part-time teachers or visiting professors; hire high-level talents with a background in digital sports research, such as PhDs, to enrich the teaching staff.

## **6.4 Enhancing Research and Innovation Capabilities**

Encourage digital sports research. Establish internal research projects and funds for digital sports, encouraging teachers and students to conduct related research; support faculty and

students to participate in domestic and international academic conferences and competitions related to digital sports.

## **7. Conclusion**

Establish cooperative relationships with companies and research institutions in the digital economy field to jointly conduct project research and technological innovation; promote the transformation of research results, such as bringing developed digital sports training methods and smart devices to market. In conclusion, the digital economy presents both opportunities and challenges for the cultivation of talents in physical education programs, requiring new talent cultivation plans and strategies to train sports professionals who meet the demands of the times.

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