

# An Exploration of Physical Education and Management in Colleges and Universities from the Perspective of Artificial Intelligence: A Case Study of Wuhan Business University

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**Abstract:** President Xi Jinping once sent a congratulatory letter to the International Conference on Artificial Intelligence and Education, pointing out that artificial intelligence is an important driving force leading the new round of technological revolution and industrial change, which is profoundly changing the way people produce, live and learn, and driving human society to usher in an intelligent era of human-machine collaboration, cross-border integration and co-creation and sharing. President Xi Jinping emphasized that China attaches great importance to the profound impact of AI on education, actively promotes the deep integration of AI and education, facilitates educational transformation and innovation, gives full play to the advantages of AI, and accelerates the development of education that accompanies everyone throughout their lives, education that is equally accessible to everyone, education that is suitable for everyone, and education that is more open and flexible. In the Internet+ era, artificial intelligence is rapidly entering the education field as both a new tool for educational reform and new content for curriculum teaching, as well as providing new ideas for educational management. Under the background that the leaders of the Party and the state attach great importance to and constantly emphasize the empowerment of artificial intelligence to education, as a college sports professional, the author takes Wuhan Business University as an example to explore the aspects to be optimized and improved in college sports education and management from the perspective of artificial intelligence, and tries to propose a solution path, in order to provide some reference and materials for the development of college sports education and management in the new era for all peers to share.

## 1 INTRODUCTION

In his speech at the conference to celebrate the 40th anniversary of reform and opening up, General Secretary Xi Jinping pointed out that "we should adhere to the concept of innovation as the first driving force and talent as the first resource, implement the innovation-driven development strategy, improve the national innovation system, accelerate independent innovation in key core technologies, and create a new engine for economic and social development." (Wang 2019)

He stressed at the ninth collective study of the Political Bureau of the CPC Central Committee, artificial intelligence is a strategic technology to lead this round of technological revolution and industrial change, with a strong spillover drive "head goose"

effect. On the mobile Internet, big data, super computing, sensor networks, brain science and other new theories and new technologies, artificial intelligence accelerated development, showing deep learning, cross-border integration, human-machine collaboration, open group intelligence, autonomous control and other new features, which is having a significant and far-reaching impact on economic development, social progress, the international political and economic landscape. In fact, China has always attached great importance to the development of artificial intelligence technology and established the Chinese Association for Artificial Intelligence (CAAI) in 1981.

While China's economy is developing at a high quality, the country is accelerating the construction of an innovative country and a strong science and

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technology nation. In 2017, the State Council issued the Development Plan for a New Generation of Artificial Intelligence (Guo Fa [2017] No. 35), which put forward a clear strategic goal of three steps for the AI industry. In the 2018 government work report, Premier Li Keqiang pointed out that: strengthening the research and application of a new generation of artificial intelligence, promoting "Internet+" in multiple fields such as sports, and AI+sports will become an important innovation point in the field of sports. Taking Wuhan Business University as an example, this paper explores how to draw on useful experience, reasonably introduce artificial intelligence technology, update the concept of college sports management and education, and devote itself to opening new ideas for the construction of college sports, which will help the overall healthy development of college sports, and is also a bit of commitment and contribution to the construction of a strong sports country in the new era.

## 2 IN THE PERSPECTIVE OF ARTIFICIAL INTELLIGENCE: ASPECTS OF PHYSICAL EDUCATION AND MANAGEMENT IN WUHAN BUSINESS UNIVERSITY THAT NEED TO BE IMPROVED

### 2.1 The Aspect of Stadium Management

#### 2.1.1 Basic Overview of the Venues

Wuhan Business University is the first batch of pilot institutions for transformation development in Hubei Province, the only university with three competition venues for World Military Games, and the only university with equestrian major in China, undertaking the equestrian and modern pentathlon events of the 2019 World Military Games, and its sports facilities are the first-class configurations among the universities in Hubei (see the table below).

Table 1: Overview and Basic Data of Main Venues of Wuhan Business University.

Venues	Description	Specifications
Gymnasium	Indoor multifunctional gymnasium	With 2185 seats for spectators, including basketball, badminton, fitness, table tennis and other sports function rooms or fields
Aquarium	Indoor temperature-controlled swimming pool	With 514 seats for spectators (252 fixed seats and 262 movable seats), there are competition pools (10 lanes, 50*25m, 2m deep, 16.3m clear height) and training pools (8 lanes, 50*21m, 0.8-1.8m deep, 10.7m clear height).
Equestrian stadium	Professional competition venue in accordance with FEI standards	2,120 seats for spectators, an 800-ring race track, an equestrian competition course (90m*60m, mixed sand), two warm-up courses (both 60m*60m, mixed sand and natural grass respectively)
Athletic fields	Standard size outdoor athletic fields	Two athletic fields, one artificial turf soccer field with 400m running track, one natural turf soccer field with 400m running track
University Student Center	Multi-purpose Complex	4-story building (under construction), including various sports venues
Tennis courts	Weatherproof tennis courts	2 standard courts

#### 2.1.2 Insufficient Concept and Technology of Green Low-carbon Operation Venues

There are various stadiums in Wuhan Business University, and some of them even reach international standards. Although as a university, the main function of stadiums is to serve teachers, students and nearby residents, without aiming at profit, the daily management of stadiums is still based on manual records, for the energy control and turn-on and turn-off of water, electricity, gas and heat is also based on manpower, and the operation of stadiums as a whole is built in a common traditional management mode. Therefore, on the basis of focusing on the basic service objects, the school's concept of green and low-carbon operation of the venue has yet to be strengthened, and the access to artificial intelligence, Internet + and other technologies to the venue has yet to be realized.

#### 2.1.3 Intelligent Venue Services Not Yet Built

In order to meet the demand of the majority of students and teachers for sports and fitness activities, most of the sports venues of Wuhan Business University adopt the principle of limiting time sections to open for use to all students and teachers, but the venue services are not yet intelligent and humane enough. Such as badminton, basketball, tennis and other venues are more popular and have more participants, but the number of the venues is

limited, and there is also a lack of intelligent online booking system and programs, and students and teachers sometimes have a poor experience on account of 'coming first and get first' situation. The comprehensive service function of the venue is also not perfect, the needs of energy replenishment like liquid calories (a sports drink or a gel chased with water) by teachers and students in the sports venues objectively exist, but are not effectively satisfied. There is also the fact that the identity verification of people entering and leaving the venue mainly relies on verbal inquiries and checks by security and venue managers, and there is no intelligent automatic identification function.

## **2.2 Aspect of Physical Education and Training**

### **2.2.1 Intelligent Teaching Is Still Basically in a Blank State in Physical Education Classes**

At present, nationwide, colleges and universities are generally building intelligent classrooms, which are a typical materialization of smart learning environment, a high-end form of multimedia and network classrooms, and it is a new classroom built with the help of Internet of Things technology, cloud computing technology and intelligent technology. Wuhan Business University is also vigorously building intelligent classrooms in order to further improve the level of smartness and informatization of education in our university, but the intelligent teaching in physical education class is still in a blank state. The traditional physical education teaching method is much overly means-based and formulaic. It gives excessive consideration to the laws of kinesiology and physiology, and pays less attention to students' emotions, experiences and needs.

The application of traditional teaching methods in teaching reflects the authority of teachers in teaching. The seriousness of the classroom atmosphere and the purely indoctrination teaching method subvert the students' main position in learning and lead to the passivity of their learning; at the same time, ignoring the main factors such as students' interests, hobbies and opinions, it can directly undermine students' creativity and motivation. Without good emotional experience, students can also be fed up with boring physical education classes (C4gym 2021).

### **2.2.2 Application of AI Technology Not Yet Applied in the Extracurricular Sports Exercise and Training Scene**

In addition to the physical education courses arranged by the university, there are various kinds of extracurricular sports exercises and trainings in schools, and they are usually organized by various sports clubs and representing teams, with high participation and motivation of students. Although our university chooses to insist on providing them with free venues and various facilities and equipment, however, some intelligent training aids or systems have not been configured.

If there is AI smart equipment configured in extracurricular physical exercise and training scenarios, setting up a personalized sports exercise database, allowing students to play and exercise while being able to look up training data, it can improve students' motivation and lead to more effective improvement of their physical quality and skills. In the physical exercise environment configured with advanced intelligent equipment, it also facilitates the creation of regular and technically supported physical activity conditions and a good exercise atmosphere, promoting the improvement of the overall physical health and sports level of students in school.

## **3 EXPLORING THE PATH OF APPLYING ARTIFICIAL INTELLIGENCE TECHNOLOGY TO PHYSICAL EDUCATION AND MANAGEMENT IN WUHAN BUSINESS UNIVERSITY**

### **3.1 Artificial Intelligence Optimizing the Management and Operation of College Venues**

As mentioned above, the sports venues of Wuhan Business University are comparatively well-equipped, but in the overall operation and management, there is still a lack of support from artificial intelligence technology, and there is still much room for optimization. From the actual and realistic needs of the school, the author believes that that two aspects can be optimized, such as green and low-carbon operation of venues and intelligent venue

services (Fu, Wei and Liu 2021), and the specific ideas are shown in the following table.

Table 2: The application of artificial intelligence technology to be recommended for university stadiums.

Technology	Purpose	Description
Artificial intelligence access control system	Identification of people entering and leaving the venue	Relying on technical support such as face recognition, accurate user portrait and 5G, the system can easily achieve multiple identity verification without having to be bothered, thus effectively enhancing the technological experience of visitors.
Artificial intelligence energy control system	Intelligent control of the operating status of water, electricity, gas and other energy-consuming equipment	The data on temperature, humidity, brightness, air quality, etc. can be obtained in real time through environmental sensors, and the operating status of air conditioning, lighting, exhaust, purification and other equipment can be intelligently regulated based on analysis and judgment by artificial intelligence, Internet of Things and other technologies, which not only effectively saves operational energy consumption, but also ensures a good service environment for the venue.
Artificial intelligence security emergency response system	For stadium emergency response	Artificial intelligence-enabled smart stadiums can detect sudden, abnormal and emergency conditions of facilities and personnel through induction devices in a timely manner, and automatically start emergency response processing programs, thus safeguarding personal safety and property security of the venues
Smart Online APP	Intelligent venue management and reservation system	Venue administrators can monitor the utilization of venues and allocate them on demand through the program line, and school staff, students, and nearby residents can book venues for exercise through mobile phone online software to improve the efficiency of venue utilization and solve the problem of no sports and fitness venues.

### 3.2 Artificial Intelligence Empowering Physical Education Teaching Activities

In the context of national encouragement of Internet+ education innovation, theoretical courses in universities are currently more closely integrated with intelligent teaching. However, according to the authors' observation, smart and intelligent innovation and implementation of physical education courses are not yet common. Traditional physical education is difficult to quantify, record, monitor and analyze.

Through the introduction of technology and scientific teaching solutions, physical education smart class solutions can be taught more systematically, scientifically, intelligently, and interestingly. If big data monitoring and intelligent analysis software is introduced in physical education classes and sports club training, entering the stage of physical education data visualization and making physical education more intelligent through AI analysis of big data. This kind of intelligent sports teaching management, digitalization and visualization of teaching process and accurate analysis of teaching data can promote the transformation of traditional sports teaching to new intelligent sports teaching mode, which can eventually improve the quality of sports teaching.

### 3.3 Optimization of Physical Education System Design by Artificial Intelligence Technology

The optimization of physical education teaching system by artificial intelligence can be described in several aspects. One aspect is the public physical education course selection system for all students. At present, the public physical education course system of Wuhan Business University is based on the web design of the school portal, with low data carrying and processing analysis ability, simple solidification of port functions, large number of users and concentrated access during the course selection time, which often leads to overload collapse and system error, etc. It is not stable enough to run, resulting in the dissatisfaction of some students who have not chosen or have chosen the wrong course, and has also affected the normal operation of teaching work to a certain extent. If the physical education course selection system is fully upgraded or redeveloped through the accurate calculation of artificial intelligence technology, large-capacity data storage, reasonable architecture design, etc. to ensure the stability, smoothness and ease of use of the physical education course selection system, it will provide more convenient and efficient auxiliary functions for physical education teaching (Li 2021).

Another aspect is the optimization of the evaluation of the teaching and learning system. Usually, teachers and students evaluate each other after a physical education course, and the feedback results are based on a systemic fixed form, which cannot reflect the problems of teachers' "teaching" and students' "learning" comprehensively and accurately. If we use artificial intelligence technology to process complex data and deep thinking ability, we can give more comprehensive reference opinions on teaching and learning from multiple perspectives such as teaching, learning, examination, evaluation, measurement, preference, opinions and suggestions, which is also helpful to promote the progress of teaching and learning together.

### 3.4 Establishing Sports Big Data Monitoring and Evaluation System

Usually, colleges and universities will conduct physical fitness test for college students every year, but this test is a fixed period of targeted testing, which is not a dynamic mode of continuous tracking. The artificial intelligence technology using big data monitoring and evaluation can be a collection of big data contents such as students' physical health

monitoring and evaluation, physical education class performance analysis, students' extracurricular physical activity trajectory query, extracurricular sports activities and competitions, various sports classroom teaching and living habits, which is an important content of campus intelligent sports and reflects data "intelligent extraction It is an important reference for "intelligent extraction" and "intelligent analysis" of data, an important basis for intelligent decision-making and a basis for decision making, and provides comprehensive and systematic analysis results and evaluation criteria for campus smart sports (Li and Qin 2021).

At the same time, with the intelligent sports platform system, students' search records are tracked, and their access preferences are analyzed based on their search data, so as to actively provide students with the access functions they may need, such as recommending high-quality sports courses, displaying sports course teaching programs, and pushing domestic and international sports teaching news, to give students and teachers a better access experience and promote students' more targeted participation in physical exercise and thus improve their physical quality.

## 4 CONCLUSIONS

In 2018, the Ministry of Education issued a notice on the Action Plan for Artificial Intelligence Innovation in Higher Education, which clearly proposed to promote the transformation of school education and teaching, evolve to an intelligent campus on the basis of digital campus, build a technology-enabled teaching environment, explore a new teaching model based on artificial intelligence, reconstruct the teaching process and realize teaching according to the material (Yao 2018).

Currently, the materialized design and production of artificial intelligence is mainly based on technologies such as robot design and manufacturing, voice and image recognition, intelligent detection and analysis, and data collection and processing. At this stage, it is still unrealistic to replace teachers with machines to complete education, but empowering and innovating education with the help of the most cutting-edge and advanced AI technology is indeed a correct path in line with the background of the contemporary development. Especially in the field of physical education, there are not many precedents, so it is worth exploring and trying. In the context of the national efforts to build an innovative country and a strong sports country, college sports workers should

innovate and try to create a new situation of college sports education and management with the perspective of artificial intelligence.

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## REFERENCES

- C4gym, 2021. Sports smart classroom subjects to achieve intelligence  
<https://baijiahao.baidu.com/s?id=1720027209278076479&wfr=spider&for=pc>
- Fu Gangqiang, Wei Xinmei and Liu Dongfeng 2021."The basic characterization, application value and deepening path of artificial intelligence empowered stadium wisdom transformation." *Research in Physical Education* 35.04(2021):20-28. doi:10.15877/j.cnki.nsic.20210729.003.
- Li Ruijie and Qin Haiquan, 2021." Hot spot observation and trend analysis of campus smart sports." *Teaching and Management* .21(2021):95-97. doi:
- Li Yuanbo, 2021." Design and Practice of Artificial Intelligence in Physical Education Teaching System." *Mechanical Design* 38.06(2021):165-166. doi:10.13841/j.cnki.jxsj.2021.06.038.
- Wang Zhigang, 2019. Accelerating the building of an innovative country and a world power in science and technology  
<http://theory.people.com.cn/n1/2019/0128/c40531-30592763.html>
- Yao Zhen, 2018. Notice of the Ministry of Education on the Issuance of the Action Plan for Artificial Intelligence Innovation in Higher Education  
[http://www.moe.gov.cn/srcsite/A16/s7062/201804/t20180410\\_332722.html?from=groupmessage&isappinstalled=0](http://www.moe.gov.cn/srcsite/A16/s7062/201804/t20180410_332722.html?from=groupmessage&isappinstalled=0)