Research on AI Empowering the Transformation of School Physical Education Teaching: Value Implications and Promotion Path

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Abstract: Digital technology iteration drives the upgrading of basic education teaching mode. With core advantages such as data collection and intelligent analysis, artificial intelligence deeply penetrates the entire process of school physical education teaching, becoming a key lever to solve pain points such as homogenization, single evaluation, and insufficient personalization in traditional physical education teaching. Traditional school physical education teaching is constrained by factors such as faculty, methods, and evaluation, making it difficult to adapt to students' differentiated physical fitness and learning needs, and the educational effectiveness has not met expectations. This article adopts the methods of literature review, field research, case analysis, and logical induction to systematically analyze the value and implications of AI empowering school physical education teaching, clarify the practical difficulties faced by the current intelligent transformation, and combine the actual situation of physical education teaching in primary and secondary schools and universities to construct a scientifically feasible promotion path, design a supporting application architecture and evaluation system, and provide theoretical support and practical reference for the digital transformation of school physical education.

Keywords: Artificial Intelligence; School Sports; Physical Education Teaching; Teaching Reform; Smart Sports; Personalized Teaching

1. Introduction

With the promotion of smart campus construction, digital empowerment of high-quality development of disciplines has become the mainstream of education reform. School physical education, as a core subject of education, has multiple functions such as strengthening the body and imparting skills.

However, the traditional extensive and homogeneous teaching model is no longer suitable for the needs of the new era. At present, there are common shortcomings in physical education teaching in Chinese schools, such as "one size fits all" teaching, summative evaluation, insufficient accuracy of manual guidance, weak control of sports safety, and a gap in the connection between in class and out of class activities.

Artificial intelligence, relying on technologies such as machine vision and big data analysis, can achieve data-driven and intelligent intervention throughout the entire process of physical education teaching, providing core support for teaching transformation. At present, many schools in China have carried out AI physical education teaching practices, achieving initial results in improving classroom efficiency and stimulating interest in sports. However, the overall situation is still in its early stages, with problems such as superficial technology application and fragmented integration. It is urgent to systematically sort out the value, clarify the difficulties, and build a promotion path.

2. The Value Implications of AI Empowering the Transformation of School Physical Education Teaching

The deep integration of artificial intelligence and school physical education teaching is not simply the deployment and use of intelligent hardware devices, but a comprehensive reform and reconstruction of traditional physical education teaching concepts, teaching models, teaching processes, evaluation systems, and management models, promoting the gradual shift of campus physical education teaching from traditional experiential teaching models to data-driven,

precise, and intelligent teaching models. Its core value is mainly reflected in four aspects. [1,2]

2.1 Refactoring the Physical Education Teaching Mode to Achieve Personalized and Precise Teaching

Traditional campus physical education teaching adopts a unified collective teaching mode, with consistent course content, training intensity, and teaching progress, which cannot take into account the differences in physical fitness, sports talents, and interests among students. Students with better physical fitness have insufficient training intensity to improve their sports level, while students with weaker physical fitness have difficulty keeping up with the classroom pace, which easily leads to resistance to sports. The teaching concept of teaching according to students' aptitude is difficult to truly implement.

Artificial intelligence technology has completely broken down the barriers to unified teaching and built an integrated and precise teaching model that includes pre class analysis, in class guidance, and post class consolidation. In the pre class teaching preparation stage, physical education teachers can rely on the intelligent physical education teaching platform to retrieve students' past physical fitness and health data, daily exercise records, and physical education course learning situation. The system generates a personalized physical education learning profile for each student, and scientifically divides them into different sports level learning groups based on the overall learning situation of the class, and formulates layered and differentiated classroom teaching plans in advance. [3,4]

During the classroom training stage, with the help of high-definition motion capture cameras and intelligent sports training equipment, students' running, jumping, ball sports, gymnastics and other sports movements are captured in real time. Students' movements are quickly compared with standard motion models to accurately identify problems such as incorrect body force, non-standard posture, and imbalanced exercise rhythm. Through voice prompts, visual demonstrations and other methods, real-time motion correction is completed to compensate for the shortcomings of physical education teachers who cannot provide guidance to all students alone.

At the same time, smart wearable devices can collect real-time data on students' exercise duration, frequency, and range of physical activity, dynamically adjust classroom training intensity, and adapt to different students' physical endurance. n the stage of independent exercise after class, the artificial intelligence system combines students' classroom learning performance and physical fitness consumption to automatically push home exercise plans, fun sports projects, and physical fitness improvement tips that are suitable for students' own situations. It builds a linkage bridge between classroom teaching and post class exercise, realizing the all-round extension of physical education teaching and truly implementing personalized and accurate physical education teaching.

2.2 Reform the Sports Evaluation System and Establish a Multi-Dimensional Evaluation Mechanism Throughout the Entire Process

For a long time, the evaluation model of physical education courses in domestic schools has been rigid and single, with evaluation content mainly focused on hard physical fitness tests such as short distance running, long jump, skipping rope, and lung capacity. The evaluation time is concentrated at the end of the semester, and the evaluation results are only presented in score levels, which belongs to a typical final assessment model. This type of evaluation method only focuses on the final test score, ignoring the process content such as students' attendance in physical education classes, classroom practice enthusiasm, progress in learning sports skills, teamwork performance, and awareness of sports rules. It cannot comprehensively and objectively reflect students' real comprehensive sports literacy, nor can it play the core role of sports evaluation in diagnosing teaching problems and motivating students to make progress. [5,6]

Artificial intelligence technology promotes comprehensive innovation in campus physical education teaching evaluation, breaking the limitations of evaluation based solely on grades, and building a diversified comprehensive evaluation system that combines process data recording with summative performance assessment. The intelligent teaching system records the entire process of students' physical education classroom performance, including classroom attendance, training participation time, action correction and rectification, classroom interaction performance, participation in sports activities during breaks, and other procedural

data; In the physical fitness assessment stage, relying on intelligent monitoring devices to automatically complete accurate calculation of various physical fitness data, avoiding subjective errors caused by manual evaluation, and ensuring fairness and impartiality of assessment data.

The system integrates process performance data and summative physical fitness test data, combined with subjective comprehensive comments from physical education teachers, to automatically generate a comprehensive evaluation report on students' physical fitness for the semester. It clearly displays the trend of changes in students' physical fitness, the improvement of their sports skills, and the shortcomings in physical education learning over the past semester, and provides targeted optimization suggestions for physical education learning. The new intelligent sports evaluation system can objectively assess students' sports learning outcomes and accurately diagnose problems in sports classroom teaching, thereby promoting sports teachers to optimize course content, adjust teaching methods, and fully play the guiding and improving role of sports evaluation. Table 1. Comparison of Core Differences between New and Old Evaluation Models for AI Empowered School Physical Education Teaching)

Table 1. Comparison of Core Differences between New and Old Evaluation Models for AI Empowered School Physical Education Teaching

Comparative dimension	Traditional sports summative teaching evaluation model	AI empowered sports full process dynamic teaching evaluation model.
Evaluation core orientation	The evaluation core focuses on the final assessment results and neglects the learning and development process	Emphasize the entire process of growth and take into account the results of phased development
Evaluation data source	Final single physical fitness and skill manual test data	Intelligent continuous data collection throughout the entire cycle before, during, and after class
Content of evaluation indicators	Single quantitative standard indicator, without qualitative literacy evaluation	Quantitative sports data qualitative literacy evaluation, multi-dimensional comprehensive indicators
Evaluate the implementing entity	Physical education teachers mainly rely on subjective evaluation through manual means	AI intelligent data objective analysis combined with teacher professional subjective evaluation
Evaluate core functions	Score screening and grading have weak motivational effects	Teaching diagnosis, student motivation, dynamic improvement, and growth tracing

[7,8]

2.3 Guarding the Safety of Sports and Building a Strong Protective Barrier for Campus Sports

Physical education courses include various sports such as running, ball games, strength training, jumping and stretching. Some sports have high intensity and large range of body movements, which can easily lead to safety hazards such as muscle strains, joint sprains, physical exhaustion, and abnormal heart rate during exercise. Especially for students with weak physical fitness and basic health problems, the risk of sports safety is higher. The traditional campus sports safety management model relies on teachers' on-site visual inspection, which has limited inspection scope and slow response speed. It can only handle safety accidents after they occur, and cannot predict sports risks in advance. There are significant loopholes in campus sports safety prevention and control. Relying on artificial intelligence and intelligent physical sign monitoring technology, we can comprehensively build a strong defense line for campus sports safety. Students wear lightweight smart sports wristbands, which can accurately monitor multiple core indicators of physical health such as heart rate, blood oxygen saturation, body temperature, and exercise load in real time. The intelligent system sets health and safety value ranges in advance. Once students' various physical data exceed the safe range, the system sends warning reminders to the physical education teacher terminal in the first time. Teachers can quickly locate and warn students, stop high-intensity training in a timely manner, arrange for students to rest and adjust, effectively avoiding various health risks such as physical exhaustion and sudden physical discomfort.

At the same time, the intelligent visual

recognition system for the venue can recognize students' unsafe classroom behaviors such as dangerous movements, illegal use of sports equipment, and dangerous chasing and playing in real time, and provide timely voice warnings to reduce the occurrence of sports injury accidents from a behavioral perspective. The AI intelligent security warning mode realizes the transformation of campus sports safety management from post disposal to pre prediction and in-process control, minimizing the occurrence rate of safety accidents in campus sports classrooms and safeguarding the safety of students in sports activities.

2.4 Optimize Physical Education Teaching Management and Promote the Refined Development of Campus Sports

In traditional campus sports management, various tasks such as arranging sports courses, using sports venues, managing sports equipment, compiling student physical fitness statistics, and coordinating sports teaching and research are mostly completed manually. The workflow is cumbersome, the statistical efficiency is low, and various sports teaching related data updates are lagging behind. The school management cannot grasp the real-time situation of the school's sports teaching, and the overall campus sports management is in a state of extensive management.

The artificial intelligence intelligent sports comprehensive management platform integrates multiple functions such as course management, venue management, equipment management, physical fitness management, and teacher management, achieving refined digital management of all aspects of campus sports. School administrators can use the management platform to coordinate and arrange physical education courses for the entire school with just one click, allocate sports venues and equipment resources reasonably, and avoid conflicts in the use of venues and equipment; The system automatically aggregates big data on the physical fitness and health of all students in the school, generates an overall analysis report on the physical fitness of students in the region, visually displays the current development status of students' overall physical fitness, and provides real data support for the school to adjust physical education teaching plans and offer characteristic physical education courses.

In addition, the platform can integrate high-quality online sports teaching videos, sports teaching courseware, professional sports training courses and other digital teaching resources, build a shared library of sports resources on campus, facilitate physical education teachers to access and use them at any time, and broaden their teaching ideas. The intelligent management mode greatly simplifies the workflow of campus sports management, reduces the workload of manual management, comprehensively improves the efficiency and accuracy of campus sports management, and promotes the development of campus sports management towards standardization, refinement, and efficiency.

3. The Realistic Dilemma of AI Empowering the Transformation of School Physical Education Teaching

3.1 Uneven Allocation of Intelligent Sports Software and Hardware Resources, With Significant Regional Development Gaps

The normalization of artificial intelligence sports teaching relies on professional intelligent motion monitoring equipment, motion capture systems, stable campus network environment, and a comprehensive smart sports teaching platform as the basic guarantee. From the current overall situation of digital construction of campus sports in China, there is a significant gap in the allocation of intelligent sports resources between regions, urban and rural areas, and schools, and the problem of uneven resource allocation is particularly prominent.

Economically developed urban schools have sufficient education funds and attach great importance to the construction of smart campuses. They are able to purchase high-end intelligent sports teaching equipment in bulk, build exclusive campus smart sports teaching platforms, equip professional network operation and maintenance facilities, and have complete conditions for the development of intelligent sports teaching. However, education funds for rural schools and grassroots schools in remote areas are tight, and some schools cannot even provide basic physical education teaching equipment. They do not have sufficient funds to purchase various intelligent physical education teaching equipment, and the campus network bandwidth is insufficient and the network signal is unstable, which cannot meet the real-time data transmission needs of AI devices and completely

lacks the basic conditions for carrying out intelligent physical education teaching. [9]

At the same time, there is a significant gap in resources between key universities and ordinary universities within the same region. High quality universities are given priority in enjoying digital education policy support and high-quality intelligent device resources. The progress of intelligent sports construction in ordinary universities is slow, and the long-term resource gap further widens the development level of campus physical education teaching, seriously hindering the promotion of the widespread popularization of intelligent sports teaching.

3.2 Physical Education Teachers Have Weak Digital Teaching Literacy and Insufficient Practical Ability in Intelligent Teaching

Teachers are the core executors of the implementation of artificial intelligence sports teaching. Their digital operation ability and intelligent teaching integration ability directly determine the actual application effectiveness of AI sports teaching. At present, the overall digital literacy of physical education teachers in primary and secondary schools as well as universities in China is uneven, which has become a core artificial obstacle to the development of intelligent physical education teaching.

From the perspective of teaching experience structure, middle-aged and elderly physical education teachers have long been deeply involved in traditional offline physical education teaching models, with rich offline practical teaching experience and familiarity with various sports teaching techniques. However, they generally lack experience in operating digital devices and are unfamiliar with new teaching skills such as smart wristband debugging, motion capture equipment use, smart sports platform operation, and sports data analysis. They have a clear fear of difficulties in digital learning and have a low enthusiasm for actively trying out intelligent teaching models. They still habitually use traditional teaching methods to carry out classroom teaching.

Young physical education teachers are familiar with various digital products and basic digital operations, with strong learning abilities. However, most of them lack practical experience in frontline physical education teaching and cannot deeply integrate artificial intelligence technology with physical education classroom teaching content. They can only complete basic operations such as data viewing and device startup, and it is difficult to optimize teaching plans and develop layered training plans based on sports data analysis. Intelligent devices are only used as classroom auxiliary tools and cannot play a core teaching role. In addition, at present, most of the digital teaching and training offered by education departments and schools tend to focus on cultural courses, and there are relatively few specialized intelligent teaching trainings for physical education subjects. The practicality of the training content is not strong, and it is unable to systematically fill the gaps in the digital teaching ability of physical education teachers.

3.3 The Integration of Technology and Physical Education Teaching is Superficial, and the Application of Intelligent Devices is Merely a Formality

Most schools that carry out pilot construction of smart sports have the problem of insufficient integration of artificial intelligence technology and physical education teaching, and the application of intelligent devices is superficial, resulting in a negative phenomenon of heavy hardware procurement and light practical application, heavy technology display and light teaching effectiveness.

Many sports intelligent devices are independently developed and designed by technology companies, and the R&D personnel lack practical experience in campus frontline sports teaching. The device's functional design tends to focus on professional competitive sports training, with few practical functions that are suitable for daily campus basic sports classroom teaching. The device operation process is complex and cumbersome, making it difficult to flexibly use within the limited sports classroom time. It not only fails to improve teaching efficiency, but also occupies normal classroom training time.

Some schools blindly follow the trend and purchase various high-end intelligent sports equipment, blindly pursuing the appearance and effectiveness of campus smart sports construction. They use intelligent devices for campus display, public class evaluation and other scenarios, and rarely invest in daily routine physical education classes. A large number of intelligent sports equipment are stored idle for a long time, resulting in serious waste of

educational resources. In the actual classroom application process, most teachers only use smart devices to complete shallow functions such as simple sports data statistics and classroom warm-up interaction, without integrating artificial intelligence into the core elements of action skills teaching, layered training, physical fitness improvement, and excellent physical education training. Technology and teaching are disconnected from each other, resulting in an awkward situation of "two skins of technology teaching".

3.4 Improper Management of Physical Education Teaching Data Poses Hidden Risks to Student Privacy and Security

During the operation of physical education teaching, a large amount of personal information, daily exercise data, physical health indicators, and changes in physical fitness of students will be continuously collected and stored. Such data involves students' personal privacy, and data security management is crucial. At present, the domestic campus intelligent sports data management system has not been established and improved, and there are many loopholes in data control, which poses a great risk of privacy leakage.

Firstly, there is a lack of unified and standardized data collection for student sports, with different brands of smart devices collecting data in different formats and statistical calibers. Various types of data cannot be exchanged and shared, forming independent data islands. Massive sports data is difficult to integrate and utilize, greatly reducing the educational value of big data.

Secondly, most schools use general education cloud platforms to store physical education teaching data, without setting up dedicated encrypted sports databases. The security protection level of data storage is low, and it is prone to problems such as data intrusion, data tampering, and information leakage.

Finally, the division of campus sports data permissions is vague, and school administrators, physical education teachers, and external technical operation and maintenance personnel can freely access and view all students' private health and sports data, lacking a strict data access and review mechanism. Some off campus cooperative technology enterprises use equipment operation and maintenance services to privately retain and misappropriate campus student sports data for commercial research and development, without obtaining the consent of students and parents in advance, seriously infringing on students' personal privacy rights and interests, which is not conducive to the healthy development of the smart sports teaching ecosystem.

3.5 Deviation in Teaching Philosophy, Excessive Reliance on Technology, and Weakening of the Essence of Sports Education

In the process of promoting education and teaching, some schools and physical education teachers have a cognitive deviation in teaching philosophy, mistakenly reversing the primary and secondary relationship between technical tools and physical education, seriously deviating from the original intention of campus physical education teaching. Some teachers excessively exaggerate the teaching role of artificial intelligence technology, relying on intelligent devices to complete all tasks such as action guidance, training arrangements, and classroom management in physical education classrooms, completely giving up their dominant position in the classroom, reducing face-to-face communication between teachers and students, and ignoring humanistic education content such as cultivating willpower, shaping teamwork spirit, and transmitting sportsmanship in physical education teaching, making the dynamic physical education classroom mechanized and patterned.

Some schools regard the construction of smart sports as a campus education achievement project, blindly investing a large amount of funds to purchase various intelligent devices, pursuing the scale of intelligent teaching unilaterally, ignoring the real sports needs of students, promoting digital reform without combining with the actual situation of physical education teaching in their own school, blindly copying the intelligent sports teaching mode of other colleges and universities, and deviating from the reality of campus physical education teaching. This not only wastes educational resources but also fails to effectively improve the quality of physical education teaching, which goes against the original intention of AI empowering physical education reform.

4. The Path of AI Empowering the Transformation of School Physical Education

Teaching

4.1 Coordinate and Allocate Educational Resources to Narrow the Gap in Regional Intelligent Sports Development

The problem of uneven allocation of intelligent sports resources between urban and rural areas and schools requires education management departments at all levels to make overall planning, reasonably allocate digital education resources, and promote the balanced development of intelligent sports construction.

Firstly, establish a special support fund for digital construction of campus sports, with a focus on rural township schools and remote weak schools. Priority should be given to helping grassroots schools improve their campus network infrastructure, equip them with lightweight, low-cost, and easy-to-use basic intelligent sports equipment, and ensure that grassroots schools have the hardware conditions to carry out basic intelligent sports teaching.

Secondly, establish a regional intelligent sports resource sharing platform, integrate mature intelligent sports teaching courses, digital teaching courseware, sports training plans and other high-quality teaching resources from high-quality universities in the region, and open them to all schools in the jurisdiction for free sharing, so that schools with weak resources can learn and draw on advanced intelligent sports teaching experience without investing a large amount of funds.

Thirdly, we will implement a paired assistance mechanism for prestigious schools, arranging for high-quality urban schools to form assistance pairs with weak grassroots schools. High quality schools will regularly dispatch outstanding physical education teachers to provide offline teaching guidance, share practical skills and classroom application methods of intelligent devices, and drive weak schools to steadily promote the construction of intelligent physical education teaching. At the same time, each school adheres to the principle of adapting measures to local conditions, combining its own school scale, physical education teacher strength, and student physical fitness status, to promote the construction of intelligent sports in stages and levels, eliminate blind procurement of high-end equipment, reasonably control construction costs, and avoid resource waste. [10]

4.2 Establishing a Hierarchical Training System to Comprehensively Enhance the Digital Teaching Literacy of Physical Education Teachers

We need to establish a hierarchical and highly practical digital specialized training system for physical education teachers. For middle-aged and elderly physical education teachers, a simplified intelligent teaching practical small class training is offered to simplify the training content, focusing on one-on-one practical teaching of basic practical skills such as the use of smart wearable devices, basic learning data viewing, and simple voice correction in the classroom. This eliminates the resistance of middle-aged and elderly teachers to digital learning and helps them quickly master basic intelligent teaching operation methods.

For young physical education teachers, we will conduct advanced training on the integration of intelligent physical education teaching, focusing on advanced teaching skills such as sports big data analysis methods, layered physical education teaching plan design, intelligent evaluation report interpretation, and online physical education resource integration and utilization, to enhance the innovative ability of young teachers to integrate technology and teaching. At the same time, regular regional intelligent physical education teaching open classes, teaching skills competitions, and research exchange meetings will be held, and physical education teachers will be organized to observe excellent intelligent physical education classrooms on site, exchange teaching experience with each other, and explore technical application difficulties.

In addition, we will deepen cooperation between schools and enterprises, invite professional and technical personnel from intelligent sports equipment research and development enterprises to settle on campus, carry out regular in class teaching guidance, and solve the problem of using classroom equipment for physical education teachers in real time. Through practical training, we will comprehensively enhance the comprehensive ability of all physical education teachers in intelligent teaching.

4.3 Deepen the Integration of Teaching and Technology Scenarios, and Promote the Practical Implementation of Intelligent Physical Education Teaching

To avoid the application of intelligent sports devices becoming a formality, it is necessary to base on the real teaching scenarios in campus sports classrooms, promote the comprehensive integration of artificial intelligence technology into the entire process of sports teaching, and achieve the core goal of technology serving teaching and assisting in education. On the one hand, we will promote the research and development of sports equipment that meets the needs of campus teaching, collaborate with frontline sports teachers, sports teaching and research personnel, and technology enterprises to develop, abandon complex functions that are biased towards professional competitive training, simplify equipment operation processes, increase practical functions that are suitable for basic sports in primary and secondary schools and public sports teaching in universities, and enable intelligent devices to adapt to the rhythm of regular sports classroom teaching.

On the other hand, it is necessary to clarify the positioning of artificial intelligence assisted teaching, adhere to the dominant position of physical education teachers in the classroom, reasonably plan the usage time of intelligent devices in the classroom, and focus on the application of AI technology in core teaching processes such as learning situation investigation, precise action correction, exercise load control, safety risk warning, and personalized training arrangement after class. Abandoning the formal display of equipment and truly applying intelligent sports devices to various sports scenarios such as daily routine physical education classes, inter class sports activities, physical health testing, and extracurricular sports training, fully tapping into the practical value of intelligent device teaching and achieving deep integration of artificial intelligence and campus sports teaching.

4.4 Establish a Sound Data Control System and Strictly Adhere to the Privacy and Security of Student Sports Data

Strengthen the data security defense line, standardize the management and use process of physical education teaching data, and create a secure environment for the long-term and stable development of intelligent physical education teaching.

Firstly, standardize the collection standards for campus sports data in the unified region, standardize the statistical caliber of sports data for various intelligent devices, break down barriers to data exchange between different platforms and devices, integrate fragmented sports data, build a complete and unified student sports growth big data archive, and fully leverage the value of sports big data teaching and judgment.

Secondly, upgrade the campus sports data storage security facilities, build an independent and exclusive encrypted cloud database for campus sports, encrypt and isolate student physical health data and sports privacy information for storage, separate them from ordinary teaching data, regularly conduct network security vulnerability checks, and prevent external network intrusion and data theft.

Finally, establish a strict data grading access permission system, clarify the scope of data viewing for different positions of staff, physical education teachers can only view the sports data of students in their own class, school management personnel can only view the overall learning situation data, and off campus technical operation and maintenance personnel are prohibited from accessing any student privacy data. All data retrieval operation records should be recorded throughout the process, ensuring that data usage can be traced back to the source. At the same time, standardize the data usage agreement for school enterprise cooperation, explicitly prohibit cooperative enterprises from privately retaining or using student sports data for commercial purposes, and effectively protect students' personal privacy rights and interests.

4.5 Calibrate the Concept of Physical Education Teaching and Adhere to the Core Educational Intention of Campus Sports

Education workers need to timely change their teaching ideas, correctly recognize the auxiliary teaching attributes of artificial intelligence technology, always adhere to the core educational intention of campus sports to strengthen physical fitness, cultivate character, and foster sportsmanship, and eliminate the wrong teaching philosophy of putting the cart before the horse. In the process of intelligent physical education classroom teaching, physical education teachers should reasonably control the scale of the use of intelligent devices. While relying on intelligent devices to complete technical teaching work such as motion correction and physical fitness monitoring, they

should strengthen face-to-face interaction and communication with students, pay attention to creating a classroom sports atmosphere, actively guide students to participate in collective sports projects, focus on cultivating students' teamwork awareness, tenacious fighting spirit, fair competition concept, and balance the scientific and humanistic temperature of physical education classrooms.

At the school level, the utilitarian construction thinking and the face saving engineering style smart sports construction model are abandoned. Based on the actual development needs of physical education teaching in the school, a digital reform plan is formulated to promote the construction of intelligent sports with the core goal of improving students' physical fitness and optimizing the quality of physical education teaching. The construction scale and hardware level are not blindly pursued, and artificial intelligence is truly used to serve the campus sports education work, promoting the continuous progress of school physical education teaching reform towards a healthy, orderly, and pragmatic direction.

5. Research Conclusion

Under the trend of digital transformation in education, empowering school physical education teaching with artificial intelligence is an inevitable choice for the innovative development of campus sports and an effective way to solve various practical problems in traditional physical education teaching. The integration of artificial intelligence technology into school physical education teaching can effectively reconstruct the traditional physical education classroom teaching mode and achieve personalized, layered, and precise teaching; Reform the single sports assessment and evaluation method, and establish a multi-dimensional comprehensive evaluation system throughout the entire process; Real time monitoring of students' sports and health status, comprehensively building a strong defense line for campus sports safety; Optimize the management of campus sports, promote the refinement and digitization of campus sports management, and jointly support the comprehensive improvement of campus sports teaching quality with multiple values.

At present, the practice of AI empowering school physical education teaching in China is still in the exploratory development stage, facing many practical difficulties such as imbalanced allocation of sports intelligent resources, insufficient digital teaching ability of physical education teachers, shallow integration of technology and teaching, hidden dangers in sports data security, and cognitive biases in teaching concepts. To fully leverage the empowering value of artificial intelligence, universities and education authorities at all levels need to work together to comprehensively eliminate obstacles to the development of intelligent sports teaching and build a scientific, comprehensive, practical, efficient and practical smart sports teaching system through coordinated and balanced allocation of educational resources, establishment of a hierarchical teacher training system, deepening the integration of technology and teaching scenarios, improving sports data security management system, and calibrating sports education teaching concepts.

References

[1] Mao Lijuan Artificial intelligence empowers high-quality development of sports disciplines: essence, practice, and future. Journal of Shanghai Sport University, 2025 (12): 1-12.

[2] Yin Zhihua, Guo Mingming The demand mechanism and implementation strategy of artificial intelligence to promote the development of physical education. Journal of Chengdu Sport University, 2023 (02): 73-80.

[3] Li Jianjun Research on the Practical Path of Artificial Intelligence Empowering Precision Teaching in Primary and Secondary School Physical Education . Journal of Shenyang Sport University, 2024 (01): 112-118.

[4] Wang Hao Research on the application dilemma of campus intelligent sports equipment under the background of educational digitization. Physical Education Teaching, 2025 (03): 28-31.

[5] Chen Yu Application of Wearable Intelligent Sensor Technology in Campus Sports Safety Prevention and Control. Chinese School Sports, 2024 (05): 67-70.

[6] Zhang Xuefeng Reconstruction of Multi evaluation System for School Physical Education from the Perspective of Big Data. Digitalization of Basic Education, 2025 (02): 56-61.

[7] Liu Chang Research on the Balanced Allocation and Development of Smart Sports Resources in Urban and Rural Campuses. Rural Education Research, 2024 (04): 39-43.

[8] Zhou Muyang Research on the Construction of Integrated Mode of Intelligent Physical Education Classroom Teaching. Digital Teaching in Primary and Secondary Schools, 2025 (06): 89-93.

[9] Tao Yuliu Research on the Transformation of School Physical Education Teaching Practice in the Intelligent Era. Sports Science, 2025 (09): 45-53.

[10] Smith J, Brown L. The role of artificial intelligence in enhancing sports education and public health in basic education.Journal of Sports Science and Education,2025(02):56-63.

