Information Teaching Platform of College Physical Education Based on Artificial Intelligence Technology

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Feifei Li[1,*]

[1]School of Physical Education, Yili Normal University, Yining, 835000, Xinjiang, China

*Corresponding author E-mail:tyfy_lff@ylnu.edu.cn

Absrtact. These years, with the continuous in-depth reform of domestic education, the educational model of high school physical education is changing. The teaching system of physical education curriculum based on AI technology can not only improve the working efficiency of management departments, but also promote the construction of digital, information and intelligent campus. The main purpose of this study is to analyze the basic characteristics of artificial intelligence and the significance and impact of teaching reform.This paper discusses the new idea of artificial intelligence in the elements of teaching activities by using interview method and case analysis method, which enlightens the application of artificial intelligence teaching and promotes the intelligent development of education and teaching.Based on the universities and AI technology as the research direction, this paper puts forward the introduction of AI into physical education curriculum education, and realizes individualized targeted teaching by constructing Agent layer and data service layer. By comparing the results of the control group and the experimental group, and through the investigation of the students in the experimental group, the system has improved the students' physical education achievement to a certain extent. Compared with the control group, the experimental group improved the students' interest in sports.

Keywords: AI Technology, Information Age, Physical Education Teaching, Education Reform

1. Introduction

China's Economic development is closely related to the cause of education, and the economic development will eventually promote the progress of higher education. After the reform and opening up, the achievements of economic construction have attracted much attention. Although the cause of higher education has been in twists and turns, it has moved forward,after the end of the last century, China expanded the scope of higher education. The scale of higher education in China shows a large expansion trend.The scale of college students is expanding, which puts forward new challenges to the structure of higher education, which requires the structure of higher education to adjust to meet this

challenge.

AI is a new direction of the progress of modern society of the rapid development of information technology. At present, AI has made some attempts in the stage of higher education, but the application of AI in education is still in the initial stage. How to effectively apply AI technology in school education has become one of the difficult problems in the integration and development of AI technology and school education. As one of the great causes of human foundation, education must need to inject the new force of the times and the powerful thrust of AI. In the 21st century, the frontier, hot and convenient new technologies have emerged, among which AI has infiltrated into various industries at an unimaginable speed. The familiar speech recognition, system positioning, intelligent public transport and so on are all the technical applications of AI. AI and education integration has opened, increase the construction of AI base, in the curriculum to add AI knowledge popularization, encourage schools to carry out AI research and application, intelligent programming and other to gradually enter the teaching field[2]. The application of AI technology in the field of education will change the existing educational form and pattern, and efficient intelligent technology will provide more accurate educational services. As the end link of talent training, higher education should keep an alert attitude, be ready to meet the test of AI to higher education, and provide more accurate educational services for student training. The change of higher education structure is a long process, and its development and change is not only the change of external environment, but also the process of higher education's upward development and self-transformation. As one of the important components of social system, higher education is no exception. Therefore, we should focus on "AI higher education "[3].

Agent technology has been expanded from the field of AI since the end of the last century, and can be used for reference and fusion with many other types of fields. Operate and complete the corresponding tasks, and finally achieve the result of adapting to the environment with the adjustment of the environment. By introducing agent technology into the teaching system, we can provide different teaching models according to the different needs of all kinds of students, and use formative evaluation to evaluate students' learning process, performance and efficiency.

2. Basic Concept

2.1 Theory of Educational Change

The educational change is divided into two types R.G Harvey Locke and C.V Good: planned change and natural educational change: in the process of educational change, the attempt to achieve the purpose of educational change through the universal implementation of a specific plan belongs to the planned change, which belongs to the educational reform, revolution and so on. This educational change not only sets clear goals, but also has certain programs and strategies for change; Educational change without certain program and obvious intention is "natural educational change ", which is the opposite of planned educational change[4]. For example, teachers can change or adjust their teaching methods at will in the course of teaching, the number of students increases sharply due to the sharp growth of the population, and the number of schools decreases due to natural disasters are all "natural education changes ".

Educational change theory plays an important role in this study, specifically: the reform of teaching work in the era of AI belongs to the typical planned change [5]. For educational reform, it refers to the reform on the basis of the original teaching advantages and wisdom connotation, and can be further optimized in the teaching process. In teaching methods and means can be further innovated, rather than the overall negative of traditional teaching [6]. "The law of quantity metamorphism" is also the aspect that should be followed in the process of teaching reform. In order to change the teaching in essence, we must fully integrate the teaching and AI technology before we can realize it, and then rise to the whole education. Based on the above reasons, this paper discusses the teaching reform on the basis of the characteristics of teaching work in the era of AI, and changes the function and status of teaching activities with the help of the innovation formed by education under the action of AI.

2.2 AI Teaching

The development of computer technology at this stage is accelerating day by day. With the development of big data and other related technologies, AI has been greatly developed and widely used in different fields. The difficulties encountered in the development of various industries can be helped by AI, as for education[7]. As a technology with enabling effect, auxiliary and subjectivity are two application forms of AI in the field of education , Zhang Kunying, a scholar[8].

AI discussed in this study mainly refers to intelligent teaching environment [9]. For example, electronic whiteboard is a typical information teaching equipment, simple electronic whiteboard can not be counted as intelligent teaching environment, and electronic whiteboard with AI attributes can be called AI teaching application. The AI teaching environment defined in this study refers to the teaching environment which uses AI related technology, including intelligent hardware and software teaching resources and the intelligence used by teachers in the teaching process. The application of AI in educational environment has three main fields: image recognition, speech recognition and human natural language processing. The current applications of AI in secondary vocational schools include intelligent tutor system, intelligent partner, wearable intelligent device, intelligent adaptive learning system and intelligent APP, etc., such as: paper and pen system, fluent English speaking APP, work together network, wisdom school emblem, squirrel AI, walnut programming, blue ink cloud class APP and so on. In the face of the AI teaching environment composed of these elements, secondary vocational school teachers should actively adapt and use it flexibly, study the elements of intelligent learning environment that become one of the elements of teaching, and devote themselves to improving the classroom. At the same time also promote their professional development.

2.3 Impact of AI Teaching

With the development of China's digital economy,the experience, discovery, innovation and inquiry classroom has gradually replaced the traditional teaching, teaching, and memory classroom. The traditional teaching mode has been subverted, teachers are no longer the center of the classroom, teachers need to transform their functions with the help of new Internet technology and AI technology. In the future teaching activities, teachers are no longer traditional knowledge imparting, but psychological guidance teachers. Their main work functions will become to help students adjust themselves, adjust their learning states and emotions in the learning process, help students deal with all kinds of problems encountered in learning, help students better adapt to the new era of classroom, learn to use new teaching tools for autonomous learning, help students develop good learning habits. The transformation and development of teachers is to make individualized learning plans for students, to plan learning paths and plans for students, to help students establish good learning methods and states, and to help transform external knowledge into internal knowledge. Teachers need to follow up students' learning status and progress, give students good advice according to feedback. At present, teachers' professional development needs to adapt to social development, can only change and adjust themselves, use all kinds of new technologies, abandon traditional teachers' roles and functions, and change traditional concepts of professional development. Only in this way can we follow the times and become a qualified new era teacher meet the needs of teachers in AI era[10].

2.4 Statistical Correlation Formula

(1) Mean square error

$$RMSE = \sqrt{\frac{\sum_{(u,i)\in T}(r_{ui} - r_{ui}')^2}{|T|}} \tag{1}$$

(2)Average absolute error

$$MAE = \frac{\sum_{(u,i)\in T} \left| r_{ui} - r_{ui}' \right|}{T} \tag{2}$$

(3)accuracy rate

$$Precision = \frac{\sum_{u\in U} \left| R(u) \cap T(u) \right|}{\sum_{u\in U} \left| R(u) \right|} \tag{3}$$

3. Design of Information Teaching Platform Information Teaching Platform Based on AI Technology

3.1 Test Environment

The system is divided into management model, teacher model and student model according to the identity of the user of the system. Each Agent individual behavior is designed according to the BDI model, which is specifically a set of behaviors of commitment, intention, ability and belief. Two classes were randomly selected for case implementation: A class and B class, A class as experimental group and B class as control group. Teachers use the traditional teaching mode and the physical education course teaching system based on AI technology in the two classes. Before the experiment, the mapping test was carried out to ensure that the average scores of the two classes were not particularly obvious. After two months, the actual application effect of the physical education curriculum teaching system based on AI technology was checked by comparing the physical education scores, classroom performance and classroom professional growth of the students in the two classes.

3.2 Test Steps

Based on AI technology, the core of physical education curriculum teaching system is to give individualized teaching methods and contents according to different types of students. In the teaching process, according to different student models and learning requirements, through their own reasoning, Intelligent selection of the best program and optimal teaching materials for teaching, combined with the OSITS teaching process and environment, through personality analysis module to analyze students' own cognition and students' own systematic learning request to select suitable teaching methods and content, follow the principle of teaching according to their aptitude: for students with strong learning ability or solid foundation, choose deeper teaching contents and simple teaching methods so that students can explore themselves more and give full play to their potential; for students with general learning ability and weak foundation, strengthen basic training more. Complete the necessary teaching content to achieve the basic teaching purpose; for students with poor learning ability or foundation, appropriate strategies of compulsory learning and after-class task reinforcement.

4. Experimental Results of Course Teaching System

4.1 Reasons for Course Selection

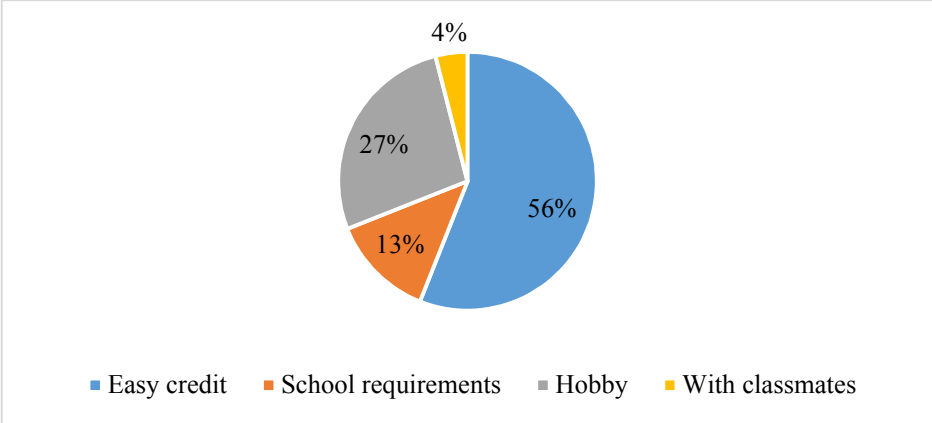

Figure 1. Factors of Students' course Selection

According to figure 1, it can be seen that 56% of the students choose sports public courses because of the simple course examination and easy credit ,27% choose sports public courses because of their interests and hobbies ,13% choose sports public courses because of the requirements of the school, and 4% choose sports public courses together. Basically no students because want to improve the corresponding physical fitness and function and choose the corresponding physical education public class. Therefore, it is necessary to design the recommended physical education public course options based on the students' physical health monitoring data, feedback this option to the students or directly incorporated into the course selection interface of the educational administration system, and then the students consider their schedule and hobbies synthetically. Choose your own sports public class.

4.2 Evaluation System

Table 1. Survey of Evaluation Contents

Evaluation content	Number of Teachers	Proportion	Number of students	Proportion
Teachers' teaching attitude	14	46.67%	442	88.4%
Teachers' teaching methods	13	43.33%	394	78.8%
Teaching effect of Teachers	13	43.33%	278	55.6%
Teachers' sports skills	7	23.33%	351	70.2%
Teachers' ability of work innovation	10	33.33%	185	37%
Teachers' scientific research ability	9	30%	36	7.2%
The moral level of Teachers	13	43.33%	191	38.2%

From Table 1, the content of teaching evaluation of PE teachers is mainly teachers' teaching attitude, teaching methods, sports ability, moral quality and teaching effect, which ignores the innovative ability and teaching and scientific research ability of PE teachers.

4.3 Experimental Application Analysis

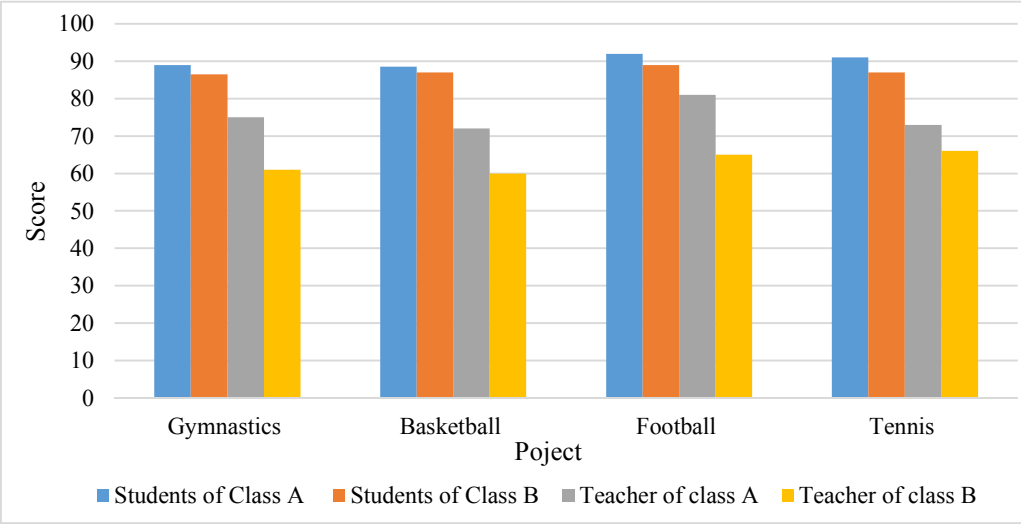

Figure 2. Comparison of Students' and Teachers' professional Improvement in Classes A and B

As shown in Figure 1, it is the B class under the traditional education mode and the A class under the physical education system based on AI technology, and the professional growth of teachers under the traditional education mode and the AI education system respectively. A class is more optimistic than the B class in gymnastics, basketball, football and tennis, according to the picture.

Table 2. Grades of Students in Classes A and B and Teachers' professional Improvement

	Students of Class A	Students of Class B	Teacher of class A	Teacher of class B
Gymnastics results	89	86.5	75	61
Basketball results	88.5	87	72	60
Football results	92	89	81	65
Tennis results	91	87	73	66

The results of students after different educational methods can be seen in Table 1. The curriculum education system based on AI is superior to the traditional education model in all kinds of courses, and in the situation of teachers' professional promotion, A class teachers also score higher than B class teachers. (According to research, A class is more interested in physical education and more willing to participate in sports in their spare time. The physical education curriculum education system based on AI technology is particularly important in this respect. Students have been promoted by academic achievement and interest, and teachers have also improved their professional ability in the system.

5. Conclusions

The traditional mode of physical education is mainly based on teachers' teaching by words and deeds, but it lacks the cultivation and guidance of students' interest in physical education. At present, the cause of physical education in our country is relatively imperfect, and students do not get their due physical education. The purpose of AI participation in education is to form a new educational form, to enable intelligent technology to assist students to learn better, to take all kinds of students' needs as the center and to assist in teaching. In the two-month period of AI participation in physical education, the role of teachers has changed from the traditional teaching mode of teaching through speaking to multi-dimensional teaching, and has also had an impact on students' position, learning content and

methods in teaching. Students have changed from passive listening to lectures to active knowledge. The physical education system based on AI technology has obvious auxiliary function for students to learn.

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