

Smart Classroom Teaching Model based on the Concept of Precision Teaching

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Keywords: Precision Teaching, Smart Classroom, Big Data, Teaching Mode.

Abstract: At present, it has entered the era of a new generation of artificial intelligence and big data 2.0. Modern information technologies such as the mobile Internet, artificial intelligence, and big data are profoundly affecting social changes. As a key factor of an intelligent society, higher education should make full use of big data and artificial intelligence technology to promote the development and reform of the education field, and cultivate high-tech talents who adapt to the changes of modern society. In order to accelerate the modernization of education in our country and give more support to the development of contemporary education informatization, this article first sorts out the concepts of precision teaching and smart classroom, and then proposes a new smart classroom teaching model that integrates big data technology under the concept of precision education. The framework of smart education based on precision teaching is presented, and the significance and teaching advantages of smart education at this stage are briefly explained. I hope to provide some reference for the future development and practice of smart education in our country.

1. Introduction

At present, driven by a new generation of information technology, the world has entered a new generation of artificial intelligence and big data 2.0 era. Human society will develop into a new stage of intelligent all things, and the intelligent future represented by artificial intelligence is already moving towards We beckoned [1]. In the future, there will be such a scene, many artificial intelligence products and services and intelligent data information will be as common as water, food, and air, and become irreplaceable products in people's daily lives. The State Council issued the "China Education Modernization 2035" in February 2019, which mentioned that modern technology should be used to improve the reform rate of the talent training model, and finally make the organic combination of large-scale education and personalized training a reality [2]. Smart education is a key factor in the future intelligent society. Higher education needs to integrate advanced technologies such as big data, artificial intelligence technology, and virtual simulation technology with education, to better promote my country's rapid entry into a new stage of smart education development. In order to implement the spirit of my country's 19th National Congress of the Communist Party of China better and more quickly, to further develop my country's education modernization, and to forcefully promote the development of my country's contemporary education informatization [3], the Ministry of Education has drafted and issued education Informatization 2.0 action plan. This action plan can contribute a lot to the rapid development of smart education in my country, and it is a pilot project with a strong guiding force [4].

Based on this, this article analyzes and explains the connotation of precision teaching and smart classrooms, and designs a classroom teaching model based on the big data environment in the era of artificial intelligence through combing a large number of related documents, and a smart education framework based on the concept of precision teaching in the information age It was built and explained the significance and teaching advantages of relying on big data technology to practice wisdom education at this stage.

2. Interpretation of the Connotation of Precision Teaching and Smart Classroom

2.1 Accurate Teaching Connotation

The research of precision teaching first appeared in the United States, starting in the 1960s, and its initiator was O.R. Lindsley. Lindsley and Skinner were the first to apply the operational conditioning method to human learning. "Precision Teaching" was proposed based on Skinner's behaviorist learning theory, advocating the role of learning conditions and the environment [5]. To realize the precise supply of resources, it is first necessary to make appropriate and precise perception of demand in order to capture the precise needs of users [6-7]. Under the current situation of highly developed information technology, high-tech technologies such as artificial intelligence, big data, and cloud computing provide reliable and stable technical support for modern learning, and provide a strong impetus for the better development of precision teaching. In-depth thinking is not difficult to find that the implementation of precision education relies on artificial intelligence and big data technology, etc. [8], to achieve accurate perception of students' learning needs, and can also combine with intelligent software and hardware such as the guidance system of the artificial intelligence department to realize teaching resources. Precise supply. "Accuracy" is a necessary condition for the existence of teaching. Inaccurate teaching is not high-quality teaching [9], students may go astray in their studies, and a lot of energy is paid in exchange for less gains.

Compared with traditional teaching, the teaching process based on the concept of precision teaching (precise perception of demand and precise supply of resources) has a wider range of teaching. At present, the global artificial intelligence and big data technologies are developing rapidly. Thanks to the current global advanced technical support, the precision teaching concepts that were temporarily abandoned due to cumbersome operations and complex recording processes have entered the field of vision of researchers [10], the smart teaching model based on precision teaching will surely become one of the most promising typical applications.

However, a mature smart education system based on the concept of precision teaching has not yet emerged in China, and it is difficult to integrate advanced technologies such as big data and cloud platforms to jointly serve smart education. Therefore, researching and designing a smart teaching platform based on precise perception of demand and precise supply of resources can promote the improvement of the smart education teaching system in colleges and universities, and it has great value in theoretical research and educational practice.

2.2 The Necessity of Integrating Smart Classrooms into Precise Teaching Concepts

The "precise supply" in the smart teaching model referred to in this research should meet the individual learning needs of contemporary college students, and take it as the goal of reform, to solve the outstanding problems in traditional education as a breakthrough point, and provide learning support services Useful innovations in the structure will improve the accuracy and effectiveness of learning support services to a certain extent, increase the attractiveness and appeal of teacher education, and enable students to conduct learning activities more efficiently and freely under the smart classroom model, and promote students The development of innovative thinking.

(1) Pay attention to individuals and their needs, and consolidate the supply of precision education

In the current research, the academic circles generally believe that the guiding ideology of smart education learning support services is: student-centered, more specifically, student-centered. [11] To provide students with thoughtful and meticulous support services during and after class, it is necessary to analyze and understand the needs of students in advance. There are great differences in the needs of students, and even the same student at different stages of learning will have different needs. Therefore, precise learning support services must not ignore the individual situation of students and meet the specific needs of students. For example, according to our random questionnaire surveys and interviews with students of Hubei Normal University, 80.25% of students hope that teachers can pay attention to their needs during class, and 86.5% of students hope that they can get information recommended by teachers. The information is of interest to me but it is not easy to retrieve it by myself. There are differences in the learning needs of students, and their understanding of the

importance of learning is also different. There will also be certain differences in attitudes and ways of dealing with difficulties, which will eventually have a certain impact on the learning effect. Therefore, we must pay attention to individual learners, understand, and meet their needs as much as possible, which is the basis for the accurate supply of teaching services in the smart teaching model under the concept of precision education.

(2) Solve problems, improve efficiency, and highlight the orientation of precise supply

In the traditional classroom teaching model, the push of student learning resources has many problems such as insufficient service quality, wide range and inaccuracy, and resource push is often a formality, resulting in students' low recognition of online resources and a sense of belonging. Real problems such as not strong and low learning efficiency. [12] The resource push support service reform in the smart teaching model must be oriented towards problem-solving, expand the service content, improve service quality, and promote the precise supply of services, to improve the attractiveness and appeal of the resource push module in the smart teaching model. Make students think that the quality of resource push is not good. The meticulous service that students need is to effectively solve their learning difficulties. What students need; we must solve the problems for them in a targeted manner. This is the core concept of precision education practice. Students are likely to encounter a lot of difficulties outside of the learning content during the learning process. Therefore, we must not only focus on academic support such as teaching resources, but also consider other links of thoughtful service and improvement of measures to strengthen the emotional relationship with students. Exchange and communication, provide non-academic support, and ultimately guarantee service quality.

(3) Collaborate and assist each other and work together to create a precise supply model

The personalized push of educational resources for smart teaching under the concept of precision teaching and learning support services should adhere to the principle of collaboration and mutual assistance, forming a joint force, integrating multi-party superior resources, and realizing support services that involve the participation of multiple subjects. The development of support services for students requires the integration of multiple links in the education and teaching process, which should include a comprehensive service of accurate resource push from the classroom to the class, [13] including learning consultation, teaching resource construction, learning process monitoring, and teaching Management, technical support, teaching practice and other links. In each link, it is necessary to efficiently integrate different human resources and material resources as much as possible, and build a learning support service team that includes multiple subjects such as class teachers, tutors, teaching management personnel, curriculum development teams, professional course teachers, and students. And make efficient use of various hardware and software facilities and equipment, provide a variety of technical support and service methods, and give play to the active role of various subjects in learning support services, so that the effect of distance education learning support services can be better promoted and Improve and create a good model of collaboration, mutual assistance and precise service.

2.3 Connotation of Smart Classroom

In 2001, "Teaching Wisdom—The Implication of Educational Wisdom" written by Max Van Meenan in the famous educational research of the University of Alberta in Canada [14] led a wave of popular trends in smart education. Fan Meinan believes that the wisdom of education is full of complexity and multi-modality; the basis of wisdom education is the teacher's feelings towards students and must be able to serve students. In 2008, IBM announced the "Smart Earth: Agenda for Next Generation Leaders", which believes that smart technology is gradually penetrating many aspects of people's lives. In 2009, IBM initiated the wisdom education advocacy and put forward the five major road signs of smart education, and then more and more concepts such as smart education and smart classroom were mentioned.

Gu Xiaoqing et al. [15] believe that smart education is the inevitable choice for education to move from the traditional era to the digital era and even the future index era. Smart education is not a single "+informatization" concept. The penetration of information technology has changed the educational

system and its composition. The roles of the elements of the educational system and the relationships between them can be reconstructed. The educational environment, educational strategies, and educational methods can all be reconstructed. Was gradually redefined.

Professor Zhu Zhiting[16] defined "Smart Education 2017" as: the essence of smart education is to build an ecological learning environment that integrates technology, and cultivate data wisdom, teaching wisdom, and cultural wisdom of human-computer collaboration. The principle of "thinking, creating" allows teachers to implement highly effective teaching methods and allows learners to obtain appropriate personalized learning services and good development experience.

There are two main aspects to the understanding of smart classroom. On the one hand, from the perspective of pedagogy, psychology and other theoretical perspectives, the primary goal of education is to open students' wisdom, rather than just teachers passing pure knowledge and skills to students; on the other hand, from the perspective of modern information technology, it will rapidly the development of modern science and technology is brought into the classroom, creating an intelligent and interactive smart classroom environment. These two aspects of "wisdom" do not separate the opposite relationship. On the contrary, they coexist and promote each other. The goal of using advanced technology such as big data and cloud computing to build a classroom environment is to train students to have A higher intelligence individual.

3. Smart Teaching Process Framework

In the process of the new education and teaching reform, the overall direction of education development should be closer to students' personality development and independent choice. The key content of this paper is how to organically integrate the concept of personalized learning with the methods in the smart education system, relying on the concept and framework of precision learning, and accurately push learning resources based on learners' interests, so that learners can accept more clearly and meaningfully. Targeted learning content ultimately enables the smart education goal of precise learning to be achieved. Learners can also properly control the learning progress according to their own needs to ensure the efficiency of learning. It is already in the relatively mature era of artificial intelligence and big data. The society is already in a state of information disclosure and resource sharing, which can stimulate students' learning potential more quickly and efficiently. Relying on the advantages of artificial intelligence and big data environment, it is possible to build a more complete intelligent teaching model based on precision learning. The research and design of the teaching framework is based on the refinement of the learning goals of multi-professional students and the internal reflection of teachers, which can better collect learning preferences and matching resources in the teaching collaboration system, and form an orderly contrast mapping between preferences and resources relation. Relying on preference positioning and recommendation systems, a standardized and unified smart learning resource recommendation model is created.

3.1 Key Elements of Teaching System Construction

This article mainly aims at some problems exposed in the current education and teaching links in colleges and universities. Under the background of the era of artificial intelligence and big data 2.0, this paper proposes a smart education and teaching system based on precision learning from the perspective of smart education. Through many domestic and foreign literature research and specific teaching practices, the smart classroom teaching model based on precise concepts designed includes the following three main factors.

(1) Create a collection module for precise perception of demand in the smart teaching model. By exploring the deep correlation between different teaching resources and students' interests, learning preferences can be matched with learning resources more accurately and intelligently. Therefore, to build a teaching platform based on demand-accurate perception in a big data environment, it is necessary to pay special attention to the role of demand-accurate perception collection mechanism.

(2) Build accurate resource supply modules in smart teaching mode. Incorporating intelligent big data analysis technology into the teaching process, the cloud platform can collect and securely store

the data records generated by the learners during the knowledge exploration stage. Relying on intelligent systems to perceive and accurately analyze learners' learning preferences is of great help to the practice of designing personalized and precise teaching strategies. Finally, through the synergy of various intelligent modules, a smart teaching module with precise supply of learning resources is realized.

(3) Establish a recommendation model for digital intelligent teaching resources based on precision teaching. Take a series of elements related to students and teachers, such as interests, majors, courses, resources, students, and teachers as the backbone, and create educational resource content based on elements such as teaching objectives, teaching content, learning evaluation, etc., which can be adapted to online teaching platforms. Unified resource storage mode, and establish a smart teaching resource recommendation model.

3.2 The Main Frame of the Smart Teaching Model

In the research, this paper hopes to retain some of the beneficial experience of traditional teaching, and at the same time make some breakthroughs as far as possible to the shortcomings of the traditional teaching mode, and design a smart teaching framework based on precision teaching based on artificial intelligence and big data technology. Build a new generation of more advanced and efficient teaching models based on students' learning preferences as the main body, and an information-based teaching resource recommendation and sharing platform. Create a new type of learning resource hierarchical object resource cluster with intelligent big data analysis and recommendation technology as the benchmark carrier, and with scoring tags, to perceive students' preference information intelligently and accurately. Based on the discovery of preference information, it provides a series of more accurate learning resources for students and promotes the individual development of students. The main frame structure is shown in Figure 1.

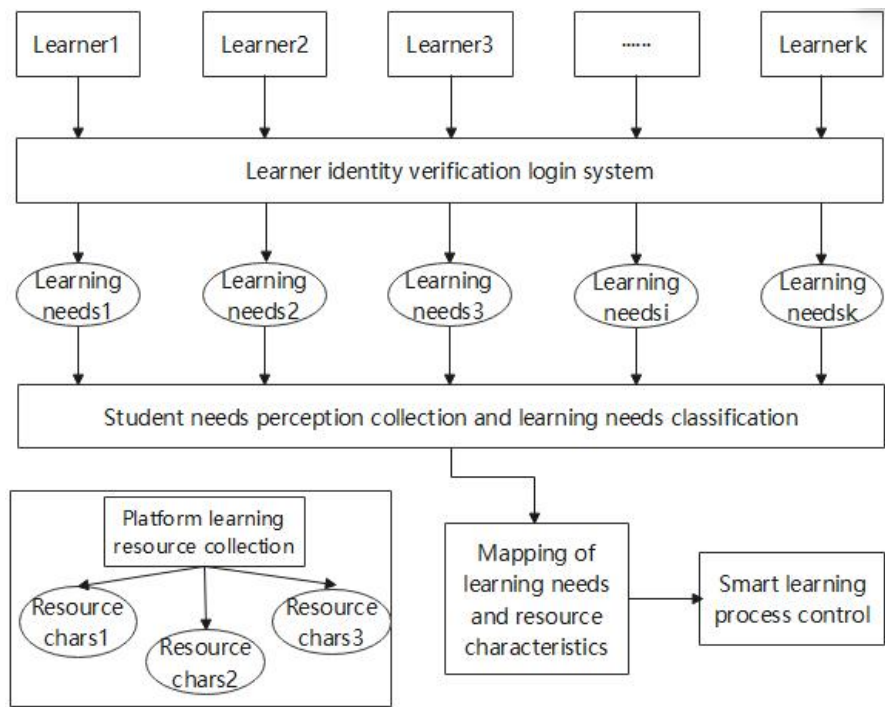


Figure 1. The overall framework of the smart teaching model

4. Conclusion

The smart teaching model based on the concept of precision teaching pays special attention to the learning style of students, and can build a suitable online interactive platform between students and teachers. The platform focuses on the model of precise perception of smart education needs and

precise supply of resources based on precise learning. Through the designed teaching system, students can independently carry out activities such as self-learning and evaluation. Then communicate with the teacher online, and at the teacher's order, the knowledge can be reviewed more efficiently, and the omissions can be checked, to achieve a smooth transition and seamless connection between the theoretical teaching in the classroom and the practical teaching after the class. In the smart teaching model designed, it is necessary to pay special attention to the accuracy of learning source requirements and the accuracy of learning resources in the process of smart education. Under the guidance of the precise learning preference strategy, with precise supply as the support, while taking care of the students' interests, the students' learning autonomy can be enhanced, and the learning behaviors with personalized colors can be strengthened.

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