

# Research on Teaching Mode Driven by Smart Education Concept

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## ABSTRACT

**Background:** The rapid development of science and technology, the Internet, big data, artificial intelligence and other technologies have had a huge impact on all walks of life in the society. With the continuous deepening of modern information technology such as artificial intelligence, big data, and the Internet of Things in education and teaching.

**Contribution:** Smart education can promote the transformation of education concepts, reshape the space and structure of education and learning, promote fundamental changes in the level and structure of the education system, and lead the education system to overall innovation.

**Method:** Propose a Smart education realizations teaching model that can bring prerequisites for the upgrading of digital education.

**Results:** Smart education is a high level form of education modeling and an essential requirement for education information to enter a new stage.

**Conclusion:** The proposed model can effectively address the shortcomings of traditional teaching methods and has effectiveness. Exploring the balanced allocation of high-quality education resources and the interoperability of advanced teaching concepts, so as to continuously promote the development of smart education.

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## INTRODUCTION

In recent years, with the rapid development of science and technology, the Internet, big data, artificial intelligence and other technologies have had a huge impact on all walks of life in the society. Human beings are entering the era of intelligence in the information age [1]. In the field of education, the state puts forward a new requirement for the comprehensive ability of talents. The new round of educational reform has emerged as the development of a new generation of digital technology and intelligent technology [2]. With the deepening of education research, the inclusiveness of smart education in the new era has gradually appeared, showing

a strong technical integration ability [3]. In the era of smart education, various high -standard, high -quality smart classrooms, virtual imitation training venues, and digital places have appeared [4]. Smart education shows the development trend of cross -border integration, human -machine collaboration, and active intelligence [5].

Smart education is not only an important part of the country's overall information development, but also the inherent requirements and reasons for implementing the new type of education concept and promoting the high -quality development of education [6]. In the era of smart education, technology empower education, promote education reform, and improve the quality of education [7]. Smart education breaks the boundary of traditional education and learning, promotes the transformation of education concepts, relying on smart means such as big data, cloud platforms, AR virtuals, etc., build a shared smart resource platform, realize the sharing of learning resources, fully meet the personalization needs of learners, stimulate the personal needs of learners, stimulate the stimulation Students' internal learning motivation and cultivation of smart talents [8]. The transformation of smart education to promote education concepts and learning methods has been vigorously promoted in colleges and universities, and it has become the goal of achieving education reform and modernization.

The shift towards smart education, characterized by digital, networked, and multimedia teaching methods, is a key trend in modern education [9]. This transformation is evident in the design and application of intelligent classroom teaching modes, which leverage network technology and big data to enhance learning experiences [10]. The integration of traditional and online learning in the blended teaching model, particularly in the context of a smart learning environment, is also a significant development [11]. Furthermore, the concept of "internet+ education" is driving the innovation of teaching methods, particularly through the introduction of smart classrooms [12]. These studies collectively underscore the importance of smart education in shaping the future of teaching modes.

The previous research on traditional education was not clear about the direction of digital reform. This research is limited on factors such as Big data and computer hardware and software facilities. Independent, this research intents to solve the problem of insufficient Big data and improve the educational effect by digital means. The purpose of this research that is related to community engagement is very valuable and can improve the efficiency of students and teachers.

## METHOD

The methodology for research on teaching mode driven by the smart education concept can be developed by considering the defining attributes, antecedents, and consequences of smart teaching. This can be further enhanced by analyzing the teaching and learning methods in K-12 smart education, with a focus on the Creation Teaching Learning Assessment (CTLA) model. A conceptual model for smart education, such as the CTLA model, can provide a solid foundation for the research methodology. Additionally, the integration of data science and education science can be explored to develop a data-driven teaching mode, which can enhance the precision and personalization of teaching activities. The flow diagram can be seen in [Figure 1](#).

## RESULTS AND DISCUSSION

### 1. Smart Education to Promote the Innovation of Education System

The Ministry of Education issued the "Education Informatization 2.0 Action Plan", proposing a "smart education innovation and development action" [13]. The State Council issued the "Fourteenth Five -Year Plan" National Informatization Plan, which clearly proposed that the education and teaching changes of information technology, intelligent technology, and education and teaching [14]. The proposal of these policies fully reflects the global significance of smart education. Smart education is leading a new round of education reform and becoming the development direction of education in the new era [15].

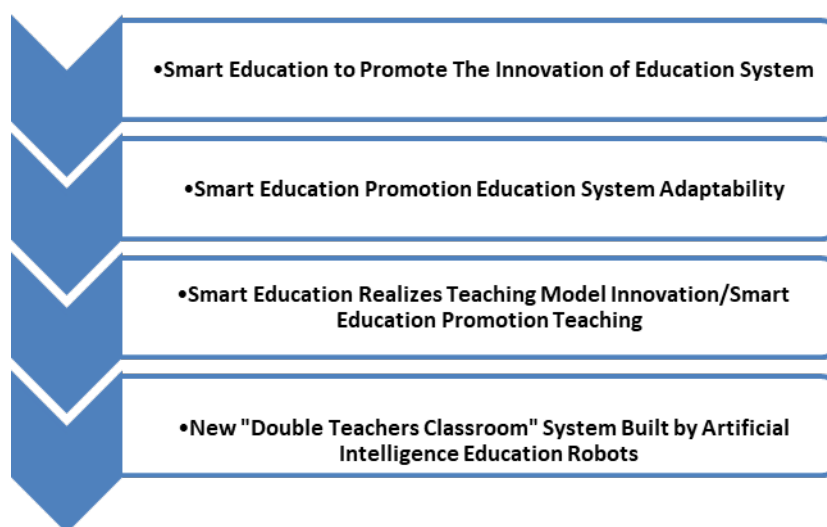


Figure 1. Flow diagram of this research

The overall innovation of education concepts is the development needs of the new era. Smart education that has integrated modern information technology and education and teaching has been widely valued by colleges and universities, and the ability of information teaching has become the core literacy of high -quality teachers in the era of smart education [16]. In macro, smart education relies on key technologies such as big data and artificial intelligence to give the education system to expand the ability of smart governance and scientific decision -making. In terms of micro, smart education can optimize the elements of the education system, help teachers to better integrate teaching and learning, and effectively improve the quality of teaching. With the continuous development of digital learning resources, students can obtain personalized and diversified high -quality learning resources. The Ministry of Education upgraded the former "National Primary and Middle School Network Cloud Platform" to "National Primary and Middle School Smart Education Platform" to provide learners with a large amount of digital, open digital education resources [17]-[19]. The intelligent education platform can integrate diversified high -quality resources and personalized services, and continuously expand the coverage of high -quality educational resources through Internet technology, making large-scale personalized education possible, and is far -reaching significance for promoting fair development of education [20].

### 2. Smart Education Promotion Education System Adaptability

Driven by the technologies such as the Internet, cloud computing, and Yuan universe, the education system driven by smart education fully uses technical means to accelerate the pace

of education environment construction, making the education system more open and convenient, and at the same time, it has stronger adaptability. It can not only meet different types of learning needs, but also break the centralized status of traditional school education, and provide a good environment for online teaching and autonomous learning [16]. During the new coronary pneumonia's epidemic situation, it provided a variety of resources and services online teaching platforms for large -scale suspension and isolation, and intelligent education provided a variety of resources and services. It played a huge role in the process of home learning and online teaching [21]. Today, online and offline integration education has been promoted and practiced on a large scale. It effectively integrates the advantages of online and offline teaching, and will definitely become the "new normal of higher education and teaching" in the future [22], [23]. In addition, the in -depth application of smart classrooms, mobile smart terminals, wearable devices and other technologies promoted the reorganization of the teaching structure, forming a multi -disciplinary cross -integration knowledge system [24], leading the change of education systems, and more adapting to the talent training goals of the new era.

### **3. Smart Education Realizes Teaching Model Innovation/Smart Education Promotion Teaching Methods Change**

In the era of intelligent education, profound changes have occurred in many aspects such as learning environment, knowledge presentation methods, learning methods and means [25]. Relying on big data, cloud computing, artificial intelligence and other related technologies, smart classrooms optimize teaching content presentation forms, record students' learning trajectory, and use data analysis technology to help teachers have personalized guidance to students [26]. The classroom communication methods between teachers and students are more diverse. The curtain, random questioning, and the application of followers have greatly enriched the form of teacher-student interaction during the class, activated the vitality of classroom teaching [27], broaden the channels for students to participate in classroom interaction, and improve interactive quality and efficiency [28]. Digital learning resources and build a flexible education service system [29].

Based on big data, smart education has formed a new mode of adaptive learning. In the preview and review link, teachers can send relevant tasks and resources to each student through intelligent teaching tools, and to comprehensively grasp the students' preview and review situation according to the online learning behavior data that will be feeded in real time, so as to be targeted in a targeted manner. Personalized counseling for students, students can also understand the completion of their learning tasks through the data of smart learning platforms. The application of smart teaching tools and smart learning platform organically connects teachers and students, platforms, and resources. Teachers have changed from knowledge taught to teaching organizations. Students can use the learning platform and resources to carry out independent learning.

### **4. New "Double Teachers Classroom" System Built by Artificial Intelligence Education Robots**

In the new courses "dual -teacher system", various sensors, intelligent mobile terminals and wearable devices will generate a lot of data [30]. Although the data can be uploaded to the cloud, if the teaching needs real -time feedback, the speed of the cloud service will not be able to understand the students based on real -time feedback. The main marginal devices of this study are human intelligent education robots. Edge computing is a new computing model based on

network edges [31]. In the edge calculation, the downstream data on the edge represents cloud services, and upstream data represents IoT services. Edge computing is any computing and network resources between the path of the data source and the cloud computing center. The edge computing platform generally includes four levels: network, computing, storage, and application [32]. Under the smart classroom, this layer can integrate into a new "dual teacher" classroom environment. And in response to teaching applications, business computing and data stored in the process of circulation. Data is essential for personalized learning and accurate teaching and research [33]. The data generated by students is integrated to the "artificial intelligence education robot" end, and the most personalized teaching can generate feedback and results through the "cloud platform" and "big data platform". Based on the basic understanding of marginal computing and cloud computing, we can find that artificial intelligence education robots have the following advantages as a terminal equipment for marginal computing: First, it relieves the pressure on the cloud platform. The school generates a lot of data every day, and only limited key data is valuable [34]. In the classroom, artificial intelligence education robots directly provide services next to teachers and students. In summary, in the classroom, artificial intelligence education robots can well meet the real-time needs of teachers, and realize the efficiency and real-time nature of human-machine collaboration.

After the data is uploaded to the massive data platform, it may be used by third parties. In the cloud computing model stored in the data center, it is difficult for educational researchers to control the data access and use fine particle size control [35]. At the edge of calculation, all private data are stored and used by artificial intelligence education robots. Education researchers can limit private data in the firewall, choose some processing data, and cloud computing data needs to be uploaded to the cloud. This model of this model. It can ensure the security of data, as shown in Figure 2.

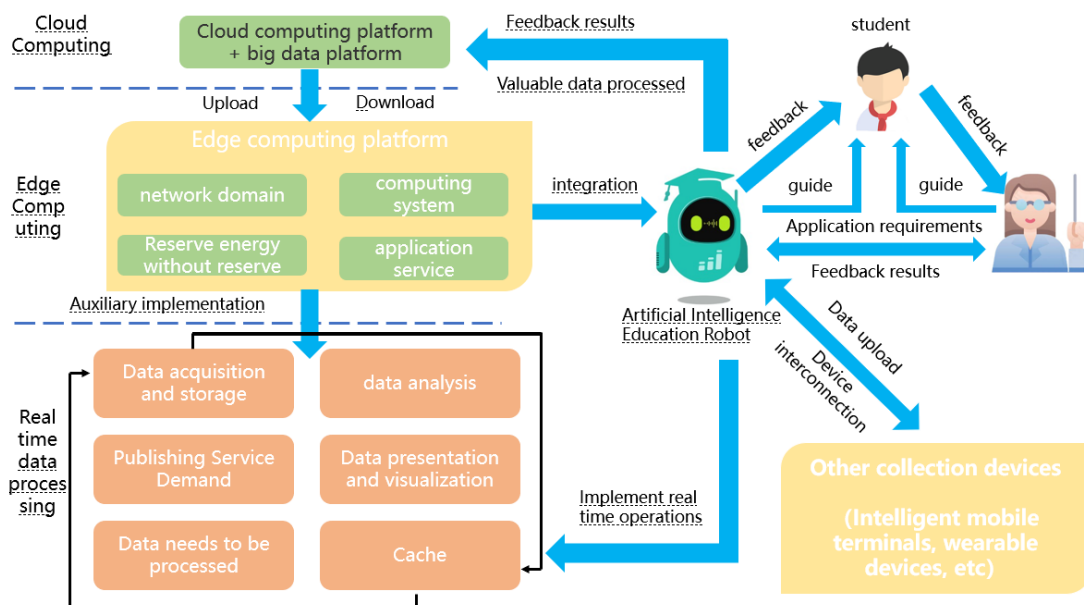
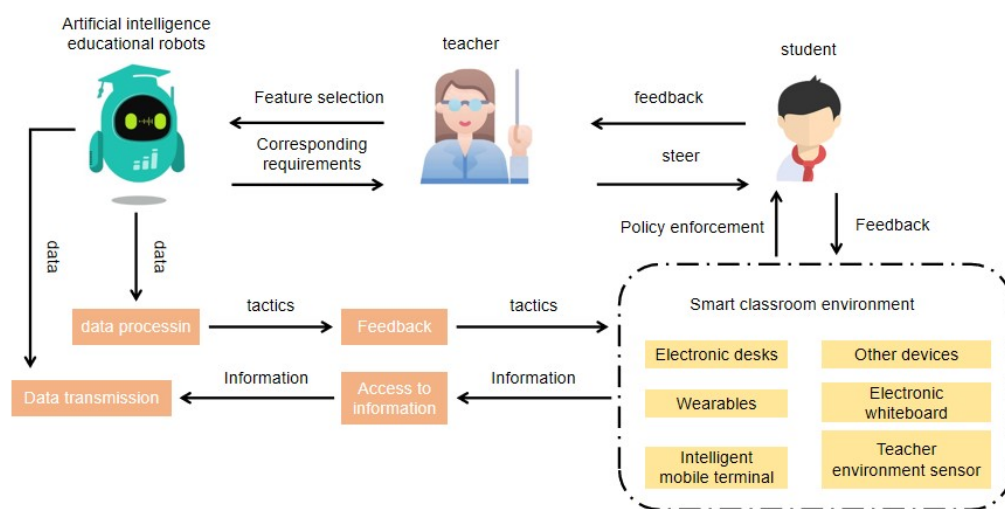


Figure 2. A new "dual-teacher classroom" system built by educational robots

### 5. Interactive model

Figure 3 shows the transformation model of the Intelligent Education Internet of Things. In this learning environment, first of all, as a "teacher", AI education robots need to take on some teaching tasks. Some teaching tasks require a lot of energy to complete, or some tasks cannot

be completed by individuals. Therefore, teachers should clarify their needs, which can be achieved through the application of artificial intelligence education robots [36]. Secondly, AI education robots also need to cooperate with the digital environment. As a teacher's teaching tool, the digital environment can assist AI education robots to complete the task of providing or presenting resources. In this learning environment, students can directly feedback to teachers and AI education robots, first feedback to the digital environment, and then feedback to AI education robots [37]. In the end, AI education robots provide teachers with difficulty to achieve personalized learning support [38]. Teachers abandon repeated labor, focus on guiding students 'thinking, exercise the comprehensive ability of students, and pay attention to the cultivation of students' core literacy.



**Figure 3.** Communication evolution model of smart education internet of things

In the classroom environment, all materialized teaching media are connected to artificial intelligence education robots through the Internet [39]. The Internet of Things is generally divided into perceptual layers, reliable delivery layers and intelligent processing layers. The perception layer is a common device in the digital environment, such as electronic desks, electronic whiteboards, wearable devices, classroom environment sensors, smart mobile terminals and other collection equipment.

The reliable transport layer is the campus network or 4G/5G network. In the "Double Division" course, the intelligent processing layer integrates information flow of the robot's artificial intelligence education, collecting equipment platform services, and the artificial intelligence education of the robot. Artificial intelligence education robots are processed to the data of artificial intelligence education robots. The second is to feedback the processing algorithms or strategies to the digital environment. The digital environment will receive relevant strategies, and finally presented and feedback to students in different forms. Teachers and students are still guiding and feedback in the teaching process. However, unlike traditional digital classrooms, teachers need to define their own teaching tasks and application requirements for artificial intelligence education robots during the teaching design process, and choose the corresponding functions on artificial intelligence education robots. Teachers do not need to operate various digital devices themselves, but manages and apply digital devices through artificial intelligence education robots. In the process of using digital devices, students will generate corresponding information, which will be converted from artificial intelligence education robots to data and feedback to teachers. Teachers can immediately search the information they

need. In short, in this teaching link, teachers must not only pay attention to "education", but also clarify the "teaching" responsibility of artificial intelligence education robots.

The key to smart education is to cultivate smart talents. The concept of smart education is centered on the comprehensive development of students, combined with advanced education theory and high-tech. Based on virtual reality and cloud computing technologies, through the smart learning environment and education and teaching methods Combining, realize the construction and sharing of resources, provide a new practice for the innovation of education, promote the change of teaching concepts and teaching models, meet the needs of individual comprehensive development, provide good conditions for cultivating innovative talents, realize the realization Talent training goals in the new era.

Most of the learning in the intelligent classroom environment is fragmented learning. Due to the relatively weak integration ability of students, teachers can set multiple learning topics under each course to provide students with a variety of choices. The development needs to choose to complete the special task to achieve the goal of smart talent training.

## CONCLUSION

In the era of smart education, we should vigorously promote the application of various technologies such as the Internet of Things, cloud computing, and big data in teaching scenarios. Exploring the balanced allocation of high-quality education resources and the interoperability of advanced teaching concepts, so as to continuously promote the development of smart education. In the future, this research will continue to dig deeply into the theoretical model of Digital transformation, build the Digital transformation system of Chinese style courses in Bay Area universities, and form the implementation strategy of promoting Digital transformation of courses, which can provide theoretical guidance and practical reference for domestic and foreign universities and regional higher education Digital transformation.

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