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Research on Intelligent Classroom Based on AI architecture

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Abstract

We are living in an era of artificial intelligence (AI). The innovative integration of AI and higher education has become the mainstream. The influence of artificial intelligence on education has been widely discussed and studied. In this paper, I mainly introduce the application of artificial intelligence technology in personalized teaching, and study the practice and application of the design of intelligent classroom teaching activities in Higher Education under the background of the combination of artificial intelligence and personalized teaching. The purpose of this study is to improve the personalized teaching effect based on artificial intelligence. This paper applies the construction theory and artificial intelligence technology to the smart classroom system, makes full use of the way of smart classroom in the teaching classroom, and analyzes the effect of smart classroom on the premise of constantly optimizing learning methods and improving learning quality, so as to achieve the purpose of research. With the intervention of new technology in educational activities, the role of teaching continues to show the characteristics of dynamic evolution. Smart classroom fully reflects students' autonomy in learning, and also provides a personalized development platform for students' learning.

Keywords

Artificial intelligence; Individualized teaching; Intelligent classroom.

1. Introduction

In recent years, we have officially entered the information age, followed by more and more mature artificial intelligence (AI) technology. The convenience of people's life is constantly improving. Artificial intelligence technology has been infiltrated and applied in almost all fields of all walks of life, including all links of education and teaching. Nowadays, the Internet has almost reached the full coverage of Higher Vocational Colleges in China, which is enough to see that the impact of informatization and intelligence on the education industry is gradually increasing, and this is only the beginning. At the beginning of 2020, due to the sudden COVID-19, schools across the country began to actively use the online teaching mode, the development of major online education platforms was promoted, and the development and application of intelligent technology in the field of education were vigorously promoted.

In the long run, the reform of education is inevitable, and the development and application of artificial intelligence technology can provide such an opportunity and platform to transform the education industry. However, at present, maturity and harmony are not reflected in the cooperation between the education industry and artificial intelligence technology. More exploration and research are still needed. At the same time, more scholars are needed to promote the progress in this regard, which is my research significance.

1.1. AI Technology

Artificial Intelligence is short for AI. Different scientists understand AI technology differently about its definition. Artificial intelligence is called a new technological science by Anthony Seldon (2019). Artificial intelligence is the use of computer technology to simulate people's

intelligent behavior and thinking process, which involves how to realize the principle of computer intelligence, so that the intelligence of computer is similar to that of people, and advanced applications can be realized by the current level of computer. The core of AI research is to let the computer expand and simulate human intelligent logic, and derive various application systems, technologies and methods in this process. Han Liangchen (2019) semantic recognition, image recognition, robotics, natural language processing and expert management system are considered to be the main scope of research work. Ding Muhan (2021) believes that artificial intelligence refers to the process of simulating human basic ideas and realizing the replacement of human beings by machines by referring to some human habits, methods and processes (based on the existing human wisdom and thought model), so as to realize the intelligent development of machines. The scope of application has been continuously expanded since the birth of artificial intelligence, and its theory and related technology have become more and more mature. In recent years, artificial intelligence has penetrated from Turin testing to the emergence of driverless vehicles, from laboratory research to the external world, from the elite to different strata in various fields of society, from the initial development and experimental stage to the more extensive application stage.

1.2. Individualized teaching

Personalized teaching: a learning mode that highly respects the personality of scholars, that is, personalized learning mode. It arranges learning according to what students need, that is, according to each student's interest, experience, personality and specific needs, so that teachers can prescribe the remedy to the case and what students should be taught. In this way, autonomous learning can evolve into students' ability. Chen Changyu, Li Ming and Luo Lijia (2021) believe that personalized education and personalized learning have the same goal. In the spring and Autumn period, Confucius gave an advanced educational concept beyond that of the times, that is, teaching students according to their aptitude; In 435 BC, Socrates established the four step method of "ridicule midwifery induction definition", namely "Socrates method", and John Dewey (1934) proposed learner centered, which are the historical manifestations of the concept of personalized education.

Corresponding to personalized education is learners' personalized learning, that is, learner centered. Each student can select learning methods and resources according to their hobbies, interests and experience. Their learning state and learning rhythm need to be adjusted in time to complete the learning of a certain kind of knowledge or course. Each learner has the unique characteristics of learning, such as learning, learning and evaluation. In his research on the current situation and practice of personalized teaching, scholar Zheng Fangyuan (2020) believes that personalized teaching refers to that in the teaching process, Zhang Qing (2016) takes curriculum theory and teaching theory as guidelines, takes promoting students' personality development as an important development goal, and also needs to pay attention to students' personality differences and characteristics. Zhai Chun (2017) believes that teachers need to pay attention to the personalization of teaching, So as to better meet students' individual learning needs.

1.3. Intelligent classroom

At present, there is no clear concept of smart classroom in academic circles at home and abroad. Huang Ronghuai (2017) believes that smart classroom means that teachers and students carry out more classroom interaction in an interactive learning environment, network resources are more easily obtained, and these learning materials can be presented in the classroom to promote the improvement of learning effect. Wang Yihua (2017) mentioned in the research on smart classroom construction and regional practice exploration that with the support of big data, AI and other technologies, daily classroom teaching began to actively introduce innovative teaching methods and ideas, so that smart classroom can innovate the education model

accordingly, make education more interactive and targeted, and improve classroom efficiency. Pang Jingwen, Xie Yueyue, Tang yewei, Wang Mengxue and Wang Wei (2015) believe that the smart classroom based on advanced technology uses innovative teaching modes to build an efficient and intelligent new classroom. Liu Bangqi (2019) proposed the concept of smart classroom, which can be expounded from the perspectives of education and informatization. From the perspective of education, smart classroom mainly refers to the cultivation and generation process of comprehensive quality with "wisdom" as the core. From the perspective of informatization, smart classroom has certain intelligence in teaching, and its realization must rely on advanced information technology.

2. Results

Analog intelligence in artificial intelligence has covered language recognition, image recognition, expert system, automation application, man-machine simulation and other research branches. Although artificial intelligence is only the digital, programmed and abstract simulation of human intelligence by machine system, and it can not have independent will and think independently in a real sense like human beings, artificial intelligence has the intelligent simulation of digital, programmed and abstract. Especially for mechanized operation, AI technology has inherent advantages such as faster, more accurate, more accurate and stronger, especially in complex tasks, The completion degree, quality and effect of artificial intelligence are far better than those of artificial intelligence. Therefore, in the development and cyclic cooperation process of the above five teaching activities, the intelligent teaching mode designed in this paper will rely on artificial intelligence technology to deeply optimize the human-computer interaction and human-computer interaction process in the teaching mode, so as to make it more strongly related, as shown below:

2.1. Improve the efficiency of teaching tasks

According to statistics, nearly one-third of students' time is wasted in the traditional classroom teaching process, and the introduction of intelligent classroom can give full play to the advantages of intelligent screening, intelligent adaptation and intelligent learning of artificial intelligence. With artificial intelligence as the core and based on big data and cloud services, complete closed-loop teaching before, during and after class based on artificial intelligence is realized. Differentiated teaching, precise teaching and intelligent teaching, which cannot be achieved by traditional teaching, can be perfectly realized and solved through artificial intelligence.

2.2. Integrated AI assisted instruction architecture

The artificial intelligence architecture in smart classroom covers all aspects of classroom teaching, such as classroom scene, classroom atmosphere, classroom monitoring, classroom management and so on. With the help of AI technology, the intelligent classroom mainly focuses on the students of the smallest unit in the individual learning unit. In the smart classroom, relying on the data collection, analysis and judgment of artificial intelligence architecture, we can obtain a clear Panoramic Map of students' learning status at a glance, and optimize the comprehensive learning path such as differentiated learning route, learning content and post classroom homework.

The online learning assistant of artificial intelligence architecture can also form an organic relationship between students, teachers and schools, so that teachers can monitor students, schools can monitor teachers, and students can feed back teachers to schools. The three can organically form an integrated education system.

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2.3. Static interface construction based on AI

Human computer interaction based on static interface is the most basic part of the whole smart classroom. The traditional classroom static man-machine interface includes basic static interaction processes such as identity recognition and authentication, population statistics, access monitoring statistics and so on. Identification and authentication can effectively distinguish individual students, individual teachers, individual school administrators and individual school servers. On this basis, individuals belonging to different fields can be assigned different functions and mechanisms. Moreover, it can also build a personalized learning state diagram for individual students in the same field, which is the significance of the static interface of smart classroom.

2.4. AI gesture recognition in Intelligent classroom

Based on the mature application of static interface, artificial intelligence can further carry out more complex and dynamically recognizable human-computer interaction integration construction for the behavior of a certain part of the body. For the simplest example, if students actively raise their hands in class, any teacher may not be able to accurately count which students raise their hands, while gesture recognition in intelligent classroom can immediately feed back the students' raise their hands to the teacher. The smart screen is presented in front of the teacher from different angles of the classroom, and the students' hands are marked with high contrast colors. At the same time, according to intelligent statistics, students who have recently asked questions are distinguished by different color marks. In this way, in the teaching process, teachers can clearly see the situation of students raising their hands, asking questions and not asking questions. Of course, this is only a very limited application of gesture recognition. In fact, gesture recognition, by extension, can carry out all-round and in-depth intelligent integration and construction of the behavior of students, teachers and school service personnel, so as to integrate and build more advanced human-computer common technical expression and deeper intelligent human-computer interaction, and further change from intelligent behavior visualization to intelligent thinking visualization.

2.5. AI based classroom thinking visualization

At present, the research of artificial intelligence face recognition has made rapid development. The analysis and modeling of head and face motion have been basically mature and perfect. With the continuous research and development of intelligent distribution, intelligent Internet of things and AI architecture cluster analysis, the in-depth intelligent recognition of eye movement and expression will quickly bring practical technical support to the intelligent classroom. According to classroom teaching and receiving real-time feedback in the three dimensions of head movement, eye movement and expression and perspective thinking activities, the visual integration and construction of thinking can not only provide real-time feedback and online teachers for the moment, but also feed back the fruits of real-time comprehensive analysis to the teaching management department of the school.

2.6. AI based classroom intelligence screening process

If the construction of human-computer interaction integration belongs to the construction of advanced intelligence integration, then the construction of deep intelligence integration belongs to the category of higher intelligence integration. The AI architecture that bears the brunt of this category is the AI integration of intelligent classroom intelligent screening. Intelligence screening is the foundation of deep integration of intelligence, such as intelligence adaptation, intelligence learning and so on. In the information age, disturbing information actually brings a lot of troubles to modern people, and so do students. Due to the different levels of teachers, there must be differences in traditional classroom teaching. This will inevitably lead to the inevitable distribution of achievement differences among students. The intelligent

classroom with the intervention of artificial intelligence can organically screen the teaching contents of famous teachers in the classroom, and intelligently screen students with different degrees, stages and acceptance abilities based on in-depth intelligence. Intelligent screening can build different ways of expression for different people and realize the integration of the whole intelligent classroom. Even if there is no difference in the academic performance of the two students, the intelligent screening system can describe the differentiated pre class preview, in class learning and classroom learning for them in real time according to the overall learning state map. A set of closed-loop customized learning plans such as extensive learning cycle and after-school review under the analysis and judgment of deep artificial intelligence. Similarly, for teachers, intelligent screening will also provide teachers with differentiated improvement and learning plans, which vary from person to person. Differentiated giving and receiving, such as "no class teaching and teaching students according to their aptitude", which once existed in the ideal imagination state, will soon become the standard configuration of the times based on the integration of deep intelligent screening.

3. Discussion

The continuous development and progress of human-computer interaction provides an inevitable progress path for the integration and construction of intelligent classroom. The so-called intelligent adaptation is human-computer interaction at a higher level of abstraction. This abstract level of human-computer interaction has more advanced artificial intelligence recognition technology. It can not only intelligently identify the identity of people interacting with machines, but also provide different roles for different identities in the smart classroom with the support of local cloud. It is the core support of remote Internet cloud, big data and data mining and artificial intelligence architecture. Under the integration of intelligent adaptation, intelligent implementation varies from school to school, It has greatly improved the overall teaching progress of giving and receiving. For students who like to explore, it can greatly stimulate their interest in learning in interesting classroom atmosphere such as game scenes. Driven by subjective initiative, students can master the learning progress independently. In the learning process of differentiated intelligence adaptation, the most basic problems that most students may encounter have long been captured by artificial intelligence and become an updated question and answer paradigm at any time. During the learning process, students can see the auxiliary learning information related to possible problems on the auxiliary screen at any time. At the same time, teachers in online colleges and universities can also give very detailed answers to the questions raised by students in the learning process at any time. The results of the answers will be captured by artificial intelligence and become a question and answer paradigm, so as to push these possible repeated questions directly to students in real time. This intellectual adaptation driven by deep wisdom improves the efficiency of giving, receiving and learning.

Therefore, the intelligent classroom based on AI architecture solves many problems of traditional classroom in terms of efficiency and interest. Advanced intelligent interaction and intelligent deep learning based on artificial intelligence form a closed-loop architecture of intelligent classroom. The deep integration and integration of the two not only provides intelligent expression involving two levels of teaching and learning for real-time teaching, but also provides the whole process support of highly integrated integrated architecture for the three key links of examination, evaluation and management. At the same time, it will bring more accurate, deeper and more intelligent teaching atmosphere, teaching environment, three-dimensional interaction, real-time feedback and other teaching means to education and teaching.

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