

# Research on the Application of Artificial Intelligence in the Teaching of Chinese as a Foreign Language

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**Abstract:** Through the analysis of practical cases, this paper discusses the value and limitation of artificial intelligence in teaching Chinese as a foreign language. This paper first combs the current research status of literature research related to this paper through the method of literature research, then analyzes the elements of teachers and students in artificial intelligence environment, and analyzes the characteristics and quality requirements of teachers and students. Then the application value and limitation of artificial intelligence are analyzed and the research enlightenment is given. Although the application of artificial intelligence technology is of great value, there are still many limitations in its application due to subjective and objective reasons. At the same time, the research of this paper also provides a certain basis for the further research in the field of theory and the practical application of schools and enterprises.

## 1. Introduction

With the rapid development of Internet and information technology, artificial intelligence in China has gradually changed from theoretical technology to practical application, and has achieved rapid development. Especially under the impetus of the recent in-depth learning technology, more innovations will emerge in the field of artificial intelligence, new technological breakthroughs will be realized, and artificial intelligence technology will be applied to more scenes, and so on. These will bring a new round of industrial revolution to the country and region, and will have a subversive impact on the existing industries, including, but not limited to, manufacturing, service industry, education, health care, automobile, agriculture, home and so on. And these will also change the way of human production and life, and make people's life more convenient and faster.

Artificial intelligence, is the key to open the door to the future. The next ten years will be the decade of artificial intelligence, and it is no exception in the field of teaching Chinese as a foreign language. The development of artificial intelligence technology will bring subversive revolution to the teaching industry of Chinese as a foreign language. Therefore, this paper studies the application of artificial intelligence technology such as virtual reality technology, computer aided education technology and natural language processing technology in the field of teaching Chinese as a foreign language, and seeks the corresponding enlightenment through the research.

## 2. Literature Review

At present, the research on artificial intelligence mainly focuses on the theoretical research of artificial intelligence technology such as machine vision, neural network, image processing, machine learning and its application in related fields. At present, artificial intelligence is widely used in various industries, but the research in the field of teaching Chinese as a foreign language is not yet mature and needs to be further studied. Artificial intelligence technology is challenging the classical learning path from two aspects: the uncertainty of learning subject and object status and the possibility of learning scene, and promotes the formation of diversified knowledge innovation path. Jianzhong Li starts with analyzing the essence of knowledge innovation and educational

innovation in the era of artificial intelligence, reveals the subject position of human beings in innovation activities, and puts forward that through the acculturation of feelings and the internalization of knowledge, role reconstruction and mechanism innovation to realize the innovation of education in the era of artificial intelligence. The breakthrough of algorithm and computing power has laid a good foundation for the development of artificial intelligence in the era of artificial intelligence. Zhe-li Hu and Lianying Fu put forward that artificial intelligence is a new factor of production of dynamic revolution. China needs to actively promote the innovation and development of artificial intelligence. Artificial intelligence has the typical characteristics of high integration of technical advantages and social attributes. By analyzing the technical outlet of artificial intelligence, Haoxiang Hou and Wanjuan Zhong put forward some problems, such as the absence of multiple subjects "functional", the lack of governance system "regulation" and and moral "standardization" , and the "blocking" of governance thinking cognition and action mode. And they put forward some corresponding strategies, such as distinguishing the authority of multiple governance subjects, paying attention to the reconstruction of supervision mechanism and ethics, etc., so as to provide support for the realization of intelligence and modernization of educational governance. Technology can speed up the reform of teaching methods and promote students' individualized learning. Shichong Wang and Haiguang Fang found that human-computer collaborative education can give full play to the respective advantages of teachers and artificial intelligence. And they put forward a new "double teacher classroom" environment supported by artificial intelligence education robot, and probe into the effect of classroom application and related measures. After investigating the existing application cases of virtual reality technology in education, Qijie Yu puts forward the means to explore the practice of virtual reality education in school education in order to solve the four problems existing in virtual reality entering school education: technical limitation, cost problem, software problem and poor experience.

### **3. Analysis of the elements of Teaching Chinese as a Foreign language in artificial Intelligence**

Artificial intelligence, as a branch of computer science, is a new theory, method, technology and application system through simulation, extension and expansion of human intelligence. Artificial intelligence has been paid more and more attention in the field of computer because of its great advantages over the traditional production and life style. It has been applied in many fields, such as robot, economic and political decision-making, control system, simulation system, machine learning, computer vision, virtual reality, natural language processing, computer-aided education technology and so on. Artificial intelligence and space technology, energy technology is called the three cutting-edge technologies at the end of the 20th century; after entering the 21 century, it is called the three cutting-edge technologies in the 21 century with genetic engineering and nanoscience. And has been attached importance to by governments, academic circles and enterprises in various countries and regions in the world.

The term "artificial intelligence" was proposed in 1956 by a group of visionary young scientists, led by McCasay, Minsky, Rochester and Shennong, to explore and solve a series of problems in machine simulation intelligence. The path to the development of artificial intelligence is shown in figure 1. Weak artificial intelligence only focuses on certain tasks such as speech recognition, image recognition, virtual reality and so on. They are only used to solve specific and single problem. Since it was proposed, weak artificial intelligence and its related fields have made continuous breakthroughs, but weak artificial intelligence and its related fields do not really have intelligence, nor will they have independent consciousness. Strong artificial intelligence includes learning, language, cognition, reasoning, innovation, etc., and can think independently, can plan and solve problems, can be compared with human beings, but strong artificial intelligence is still in the bottleneck state, which requires the continuous efforts of human beings, especially scientific and technical personnel. In that late stage of artificial intelligence, super artificial intelligence will appear, in which the compute and thinking ability of artificial intelligence is far beyond the human brain, and in almost all fields, including scientific innovation, the same as and social skills, are much more intelligent than the human brain. Artificial intelligence will break the thinking latitude

of the human brain. The development of artificial intelligence will still be very long, which requires human beings to promote the development of artificial intelligence technology through unremitting efforts and continuous innovation.

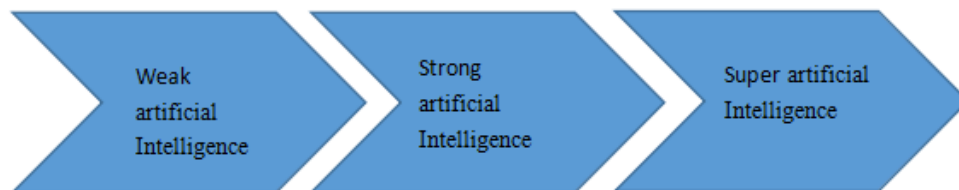


Figure 1: the Development of artificial Intelligence

Artificial intelligence technology attempts to construct a swarm intelligence system to realize human-computer fusion by obtaining huge data sets from cross-media information, which is impossible in the past, but today, with the increasing algorithm design and computer computing power, all of this will become possible. Artificial intelligence technology has been implemented in many fields and has been fully applied in practice.

#### **4. Application of artificial Intelligence Technology in Teaching Chinese as a Foreign language**

Virtual reality technology integrates all kinds of information through simulation environment, natural skills, perception and sensing equipment, and forms a kind of omni-directional and multi-angle three-dimensional scene, so that users can immerse themselves in the interactive three-dimensional dynamic scene and entity behavior system environment. Virtual reality technology, as the most potential trend technology, its three-dimensional expansion of our perception space. However, the development of virtual technology is not mature enough, there are many problems to be solved.

According to the development and popular trend of virtual reality industry, virtual reality technology is generally divided into four categories. The first kind is browse virtual reality. Desktop virtual reality uses electronic screen as a window for users to observe the virtual world through simulation. This kind of virtual reality is widely used in China in the 1990s, but it lacks a real sense of realistic experience. The second kind is immersive virtual reality, that is, virtual reality helmet system. By closing the user's vision, hearing, and other feelings, the user gets the feeling of being present and immersed in a specially created virtual sense space by means of input devices such as position trackers and data gloves<sup>[20]</sup>. The third kind is virtual reality to enhance reality, which not only simulates the real world, but also uses the object to enhance the participants' feelings to the real environment. The fourth category is distributed virtual reality, which combines all kinds of virtual systems with real systems or hardware-in-the-loop systems to form a strict networking standard to experience virtual experience through distributed connections.

#### **5. The Application of Artificial Intelligence in the Teaching of Chinese as a Foreign Language**

The practical value of artificial intelligence technology is mainly reflected in the following three aspects.

First of all, autonomous learning based on open network environment. According to Vigosky's recent Development Theory, there is a gap between the current level of students and the possible level of development of students, known as the nearest development area. Under the guidance of teachers and auxiliary reading tools, students promote learners to search for and analyze and collate materials independently, so as to reach a further level of possible development through autonomous learning. Students can obtain learning resources from the internal database and the vast external Internet. Through the auxiliary reading system, students can be provided with good conditions for students' memory and understanding. The open environment expands the learning space, not just limited to the content of teachers' courseware and the materials given by teachers. The evaluation function of the auxiliary reading system can also make a timely evaluation of the learners' learning

situation, which is helpful to improve the learners' cognition of their own learning level.

Secondly, communication learning based on interactive operating environment. The MCAI courseware system provides many interactive interfaces. Students need to interact with the computer system, including text, voice, and even action or expression, in the course of the operation of the courseware system. The most essential characteristic of language is communication. In the process of communication and operation with machine through Chinese language, users can realize the great role of Chinese language. In the process of communication, discussion and operation, deepen the understanding of the current knowledge.

Finally, immersive learning based on virtual experience environment. Experiential teaching is a kind of teaching in which students learn relevant skills and knowledge through personal experience of things and pay attention to learning methods and understanding ability. Experiential teaching is difficult to implement in the traditional teaching mode because of the limitations of time and space, but the development of virtual reality technology provides the possibility for all of this, and creates the situation of life and practice for students in the process of classroom teaching of Chinese as a foreign language. The immersion of virtual reality technology brings students multi-sensory stimulation, and the teaching content is applied in the actual situation, which deepens the understanding of the teaching content.

## 6. Conclusion

With the development of computer information technology, artificial intelligence technology has been embodied in various industries, and plays a great role. The deep integration of artificial intelligence technology and teaching Chinese as a foreign language has obvious effect on the development of both sides. This paper studies the application of common artificial intelligence technology, virtual reality, MCAI courseware system and natural language processing technology in teaching Chinese as a foreign language, analyzes the application value and limitations, and provides some feasible suggestions for the practice of subsequent teaching mode.

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