

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

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## ABSTRACT

With the "artificial intelligence +" showing up in the field of education, its research has become a hot topic at the moment gradually. This article combines the technological means of artificial intelligence with the core of teaching Chinese as a foreign language, which finds that its biggest problem is the difficulty of the Chinese language itself and the large differences between the teaching objects through analysis of the needs and characteristics of teaching Chinese as a foreign language. Research on the application mode of artificial intelligence + teaching Chinese as a foreign language highlights the application mode of "AI assistant + teacher" and "AI tutor + teacher", using artificial intelligence technology to solve its existing problems existing to realize the personalized and efficient teaching. The thesis comprehensively discusses the application of artificial intelligence in teaching Chinese as a foreign language from the background, mode, and so on.

**Keywords:** artificial intelligence, teaching Chinese as a foreign language, application research

## 1. INTRODUCTION

Teaching Chinese as a foreign language is essentially a kind of language teaching and also a second language teaching [1]. During its practice, teachers, and students will encounter a lot of problems due to various reasons such as inconsistent time and space conditions, short development time of the subject, not fully mature system, and a large gap between the teaching object's cultural backgrounds and first language, what hinder the process of teaching, learning and communication between the two sides. Artificial intelligence has swept through and penetrated into all aspects of social life, which not only changing people's living habits and ways but also deepening into various professional fields, including the field of education. In July 2017, the "Next Generation Artificial Intelligence Development Plan" issued and implemented by the State Council pointed out that "use smart technology to accelerate the reform of talent training modes and teaching methods and build a new education system that includes smart learning and interactive learning. In March 2019, the first core goal of "Key Points of Education Informatization and Cybersecurity Work in 2019" issued by the Ministry of Education was to compile the "China Smart Education Development Plan" and hold an international conference on artificial intelligence and education [2].

Currently, artificial intelligence has a certain range of applications in the education field. For example, the commercial speech recognition rate of iFlytek developed by China reaches 97%, and it is widely used in examination evaluation and distance teaching [3]. In the practice of teaching Chinese as a foreign language, the

Confucius Institute has cooperated with Tomorrow Advancing Life to tailor a learning program for Chinese language learning [4]. At present, artificial intelligence can understand Chinese and provide real-time feedback, which is of great help to foreign Chinese teaching. Nevertheless, during the domestic practice of how to use artificial intelligence in teaching Chinese as a foreign language, there is still no systematic and mature research on its theory.

Next, we will explore the application of artificial intelligence in Chinese teaching.

## 2. PROBLEMS IN PRACTICE OF TEACHING CHINESE AS A FOREIGN LANGUAGE

In recent years, the "Chinese Popular" has swept the world. Chinese has attracted many foreign friends with its broad and profound cultural background and breathtaking charm. Although Chinese teaching is essentially a kind of language teaching, however, cultural, economic, and other aspects will inevitably be involved in the teaching process, which requires teachers of teaching Chinese as a foreign language to have a very abundant knowledge reserve, and they need to understand ancient and modern things. Only in this way can the antique charm of Chinese and the new words and meanings developed with the progress of the times be taught to students and help them learn the Chinese.

Secondly, Chinese is "the most difficult language in the world to learn", officially acknowledged by the United Nations Educational, Scientific and Cultural Organization (UNESCO). From the perspective of practice of teaching

Chinese as a foreign language, the most difficult problem lies in the tones, the common language of the modern Chinese nation—Mandarin has four tones. In the dialect, Cantonese has as many as nine tones. Although, Cantonese, as the official language of Hong Kong and Macao, it is different from Chinese teaching. However, the four tones are already a big challenge for most students who use non-tonal languages, unless they are exposed to Chinese since childhood or live in the Chinese area, otherwise, it is difficult to approach the level of native speakers in the use of tones. Even people who use tonal languages are no exception. For example, for some Hong Kong and Macao artists, who appear on TV today, their Mandarin cannot be called the standard.

### **3. RELATIONSHIP BETWEEN ARTIFICIAL INTELLIGENCE AND EDUCATION AND TEACHING**

Artificial intelligence is a comprehensive discipline that integrates computer science, cybernetics, informatics, linguistics and other majors and disciplines, the interpenetration of various disciplines has effectively promoted the development of artificial intelligence. As one of the three top technologies in the 21st century, artificial intelligence technology has already shown significant application advantages in the field of education and teaching.

Since its birth in 1956, artificial intelligence systems have been closely related to education and teaching. Fundamentally, the artificial intelligence system itself is a scientific technology, studying how to fully ensure that computers can effectively integrate education and enhance intelligence. The results of artificial intelligence research are vital to each content of education and teaching, and they also affect all aspects of education, which directly affect the improvement of teaching quality [5]. For example, if the artificial intelligence system can be effectively used in the practice of education and teaching, the teaching efficiency can be improved to a certain extent, and the number and time of the main teacher's work can be reduced, and the intelligence of the teaching object will also be improved. Since there are already outstanding works as a reference for comparison, teaching Chinese as a foreign language is a small branch in the field of education and teaching, there are many methods and modes for the application of artificial intelligence in it.

### **4. ARTIFICIAL INTELLIGENCE + APPLICATION MODE FOR TEACHING CHINESE AS A FOREIGN LANGUAGE**

Licklider proposed the idea of Man-Computer Symbiosis in 1960, it is an expected development of the cooperative interaction between humans and electronic computers, which involves a very close coupling between humans and electronic devices [6]. Artificial intelligence promotes the

Man-Computer Symbiosis: a special smart package is provided to enhance human intelligence and form a "substitute to make up".

#### ***4.1. AI Assistant + Teacher Mode***

Teachers of teaching Chinese as a foreign language need to have an abundant knowledge reserve, artificial intelligence can become the knowledge outsourcing of human teachers, which means knowledge is the research object, through computer software and hardware, computer science, and artificial intelligence systems and expert technology are used as tools to form a complete and huge knowledge base, short time, high efficiency and wide range. Under such circumstances, artificial intelligence exists as a subordinate of human Chinese teachers, which is the "AI assistant + teacher" mode.

In teaching activities, the communication process can be parsed into the form of "subject-object-subject". As a teacher of teaching Chinese as a foreign language, you need to use language, text, and other object mediums to promote the physical and mental development of students [7], and artificial intelligence can assist teachers in completing this task. In the practice of teaching Chinese as a foreign language, teachers have to face many "diversities": cultural diversity, language diversity, and knowledge diversity. In most cases, the objects of Chinese teaching come from different cultural circles and use different languages. Students in the same class may be scattered all over the world, so different experiences and cultural backgrounds will affect the presentation of the teaching effect. How to teach students in accordance with their aptitude is a problem that cannot be ignored, and artificial intelligence can realize personalized demand perception through the collection of characteristic data of students, and finally present it to teachers in the form of data or text. As an assistant, artificial intelligence can act as multi-functional equipment in the teaching process to help teachers of teaching Chinese as a foreign language complete a series of teaching activities. In this mode, no matter how much convenience it brings, artificial intelligence is only in the status of "assistant", what it can do is to make up for some of the defects of the teaching medium and teachers, which is not omniscient and omnipotent. The real teaching quality most still depends on the teachers of teaching Chinese as a foreign language, artificial intelligence only collects and integrates vague information, and transmits it to them in a specific and clear way, real decision-making power is ultimately in the hands of teachers. Teaching interaction is not only the teaching of knowledge, but also the exchange and transmission of emotions and educational ideas, combining the knowledge of various disciplines of pedagogy, Chinese linguistics, and psychology, and sociology, to give a comprehensive and reasonable explanation of the information taught.

Learning Chinese is the same as learning other languages. It is not enough to be able to recognize and listen. The most important thing is to be able to read and speak, which is the difficulty of Chinese precisely. How can one speak

fluent and standard Chinese? This is the pain point of most students who learn Chinese. There are some pronunciations of Chinese that are not found in many foreign students' mother tongues, such as the cacuminal zh, ch, sh, etc.. The same pronunciation has different meanings in different tones. Teach students in accordance with their aptitude not only in terms of cultural background and foreign students' original knowledge but also in pronunciation. There are many apps on the market for practicing spoken English, similarly, there are some apps for practicing Chinese, which is also a manifestation of the assistance provided by artificial intelligence assistants to Chinese teaching. Different pronunciation mouth shapes, vocal positions, and airflow positions, and tones display different audio. Therefore, we can use audio analysis technology to personalize the training of foreign students' spoken Chinese through artificial intelligence. Establish a Chinese phonetic database in sentences, pronunciations, and words. At the phoneme level, it can identify and automate the diagnosis in a more detailed and systematic manner from various aspects such as pitch, tone, fluency ect. and propose correction suggestions. In summary, the "AI assistant" is responsible for the identification and analysis of student information in the teaching of Chinese as a foreign language, and the teacher is mainly responsible for emotional communication, meaning interpretation, and decision-making implementation. In this way, the form of collaborative teaching can improve the efficiency of Chinese teaching and promote the teaching results are better presented. The wise of artificial intelligence is also enhanced in calculation learning. The mechanical work of teachers of teaching Chinese as a foreign language has been reduced, and the experience of teaching strength has increased, which is very beneficial.

#### **4.2. AI Tutor + Teacher Mode**

In the Artificial Superintelligence stage, there will also a two-man act of artificial intelligence and teachers of teaching Chinese as a foreign language, which is the teaching mode of "AI tutor + teacher".

In this mode, both human teachers and artificial intelligence are in the position of bishops, and jointly decide teaching methods. Artificial intelligence can accurately analyze students' original language cultural cognition and behavior patterns in learning, plus the combination of complex situations in teaching practice, providing personalized guidance, which is more like an intelligent psychological counseling teacher in the work style. Artificial intelligence is not just an assistant of icing on the cake, it has become a willing ox of the same boat. "AI" tutors have more knowledge reserves and faster calculation and analysis and can carry out teaching in a personalized, intelligent, and contextualized manner. Teachers of teaching Chinese as a foreign language are more inclined to become planners and instructors of teaching work, making the overall plan of the teaching process and grasp the teaching rhythm. Due to their

cognitive intelligence, AI tutors can learn how human teachers deal with problems in complex teaching situations through set rules and massive amounts of data and obtain cognitive abilities and creativity comparable to teachers. According to the individual students' situation choose the teaching method, determine the teaching method and teaching plan suitable for the class. In the practice of teaching Chinese as a foreign language, "AI" tutors can choose different teaching methods according to the students' personal characteristics such as intrinsic motivation and cognitive style. They can use data collection and analysis of each student's behavior to determine their cognitive style. When facing independent students, they use a concentrated literacy method in literacy teaching based on their higher level of psychological differentiation. In reading teaching, more attention is paid to strengthening their overall comprehensive ability to help such students to better learn Chinese. The excellent learning ability and execution ability of artificial intelligence can enable teachers of teaching Chinese as a foreign language to focus more on teaching and return teaching to its standard. Due to various objective reasons, this mode has not yet appeared in the practice of teaching Chinese as a foreign language. It only exists as a vision and still needs to be explored.

### **5. ARTIFICIAL INTELLIGENCE + ADVANTAGES AND EXPLORATION OF TEACHING CHINESE AS A FOREIGN LANGUAGE**

Artificial intelligence + teaching Chinese as a foreign language mode can not only make teaching Chinese as a foreign language practice more efficient and effective but more importantly, it is the change of educational concepts, the innovation of teaching goals, and the transformation of educational modes.

In traditional education and teaching, the individuality of students is often ignored, and more of it is factory processing. However, artificial intelligence + Chinese teaching can better take the commonality and characteristics of students into account, and it is easier to find students' interests. From point to surface, master Chinese knowledge as much as possible, understand Chinese culture, and use Chinese handily for communication and life. This is a change in the concept of education.

In today's intelligent age, the cultivation of students' core literacy is the focus. As a language teaching, teaching Chinese as a foreign language pays great attention to practicality in practice. Rather than instilling knowledge in a duck-filled manner, it is more important for students to understand Chinese creatively and learn from other things, and to acquire the ability to actively learn Chinese. The interaction between artificial intelligence and students can provide practical feedback and knowledge expansion, guide students to actively master the laws of the Chinese

language, and lay the foundation for the cultivation of their core qualities.

Artificial intelligence + teaching Chinese as a foreign language itself is a transformation of the education mode, from a single teaching mode to a diversified, informational, and intelligent one. However, this mode is still in the initial stage of development, and there is still a long way to explore in the future. The gap between theory and practice needs to be slowly bridged.

To continue the development of artificial intelligence + teaching Chinese as a foreign language mode, it is necessary to realize educational transformation, continue the above three transformations, teach students in a modern way, and narrow the digital gap between teachers and students. In addition, artificial intelligence technology itself also needs to continue to develop, so that people can interact with machines and the learning environment, broaden the boundaries of interactive teaching, and promote the development of this intelligent interactive mode. To avoid some of the negative effects of artificial intelligence and establish a trust relationship between artificial intelligence and teachers and students, it is necessary to formulate some corresponding principles as a bridge, to regulate the development and authority of artificial intelligence, together with the policy and other aspects of the protection, to promote the development of artificial intelligence + teaching Chinese as a foreign language mode. As a result, artificial intelligence and teachers of teaching Chinese as a foreign language can truly form a "Man-Computer Symbiosis" relationship, achieve complementary advantages, and conduct highly efficient, personalized, and intelligent teaching.

## 6. SUMMARY

Artificial intelligence is essentially an extension of human knowledge and body. In the current era of artificial intelligence, it can be applied to all aspects of social life. In the field of education and teaching, artificial intelligence has already emerged to help the implementation of teaching activities. Teaching Chinese as a foreign language also conforms to the development trend of the era of artificial intelligence, applying it to the

practice of teaching Chinese as a foreign language, which realizes efficient teaching and personalized education in teaching Chinese as a foreign language.

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