Original Paper

The Application and Impact of Artificial Intelligence in International Chinese Language Education: A Case Study of ChatGPT

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Abstract

This paper aims to explore how artificial intelligence technology plays a role in the field of international Chinese language education and its impact on Chinese teaching and learning. Taking ChatGPT as an example, this paper introduces its principle, function and advantages, analyzes its application scenarios and effects in Chinese education, discusses its possible challenges and problems, as well as its future development direction and suggestions. This paper argues that ChatGPT is a natural language generation technology based on deep learning, which can generate smooth, logical and emotional Chinese conversations based on user input. ChatGPT can provide diversified, personalized and interactive learning resources and teaching aids in international Chinese education, which is helpful to improve the quality and efficiency of Chinese teaching, stimulate learners' learning motivation and interest, and promote cross-cultural communication and understanding. At the same time, ChatGPT also has some technical limitations and hidden dangers in social ethics. It is necessary to arouse the attention and vigilance of teachers and learners, reasonably regulate and use the technology, and ensure the healthy development of data security and man-machine relationship. This paper hopes to provide some reference and inspiration for the application of artificial intelligence technology in international Chinese education.

Keywords

international Chinese language education, intelligence technology, ChatGPT, teachers and learners

1. Introduction

The new coronavirus epidemic in 2020 has accelerated the new trend of ubiquitous learning and remote teaching as a supplement to the reform of global Chinese education and teaching and promoted the modernization process of Chinese teachers around the world using digital educational technology as a tool for knowledge dissemination. Online and remote teaching has become the main way of international Chinese language education. In the post-epidemic era, Chinese teaching presents new characteristics, including the popularization of online teaching, emphasizing the practicality of language, personalized teaching, and multicultural teaching. Chinese teaching is developing towards a more flexible, practical, rich, and diversified direction. Online Chinese teaching has been widely used. Many schools use online teaching platforms to carry out teaching activities, such as Tencent Conference, WeChat, Zoom and so on. This teaching mode not only brings great convenience to the course teaching, but also enables students to choose the time and place of class more flexibly, which has a continuous impact on the teaching methods and methods. The development of artificial intelligence technology, especially the emergence of ChatGPT (Chat Generative Pre-Trained Transformer), has attracted wide attention and discussion from all walks of life. The field of international Chinese education is also actively exploring and thinking about how to use artificial intelligence technology to better carry out Chinese teaching.

2. A Review of the Application of Computer Technology in International Chinese Language Education

2.1 The Development Process of Artificial Intelligence Technology in International Chinese Language Education

Artificial intelligence technology can be said to be a product of the development of information technology to a certain stage. The achievements of educational technology applied to Chinese teaching are obvious to all. The development of Chinese education technology has always been in line with the rhythm of the application of emerging technologies in the field of education, and its representative research results can be compared with foreign language education technology. Since the beginning of the 21st century, the influence and role of information technology on Chinese teaching are expanding in an all-round and multi-angle way. The role of information technology has changed or is changing from the surface auxiliary means to the deep basic form and dominant force, which should be paid attention to. At the beginning of the application of information technology in Chinese teaching, it is mainly reflected in multimedia teaching and radio teaching, among which multimedia teaching is more reflected in the wide use of tapes and slide machines. Multimedia teaching combines text, pictures, audio and video and other forms to present students with more dynamic and intuitive teaching content, and vividly presents Chinese teaching content to students, which improves students' interest in learning and learning effect. Teachers can use multimedia teaching software to make a variety of voice, images, animation, and other teaching resources to help students better understand Chinese language and culture. Radio teaching breaks the limitation of time and space, provides rich educational resources, saves education cost and improves

learning effect. Another important manifestation of the auxiliary role of information technology in Chinese teaching is the use of Chinese character input software to input Chinese characters. Students can use the Chinese character input method and dictionary on the computer or mobile phone to quickly input Chinese characters and find new words, to improve the efficiency of Chinese character input and output. At the same time, this Chinese character input software can show students the strokes and stroke order of Chinese characters, and can provide gamification of Chinese character input practice. These technologies have greatly improved students' learning efficiency and interest and promoted the modernization and internationalization of Chinese character teaching. With the continuous development of information technology, distance teaching has become an important teaching method because of its more flexible and diverse characteristics. Students can use Chinese learning websites to conduct comprehensive training in listening, speaking, reading and writing. Many schools and training institutions provide online teaching platforms and courses. Students can find the required Chinese learning resources on the platform, such as video, audio, textbooks, and exercises, and choose the time to study freely. Peking University has opened a Chinese course on Coursera, which is widely welcomed by Chinese learners all over the world.

2.2 The Current Situation and Trend of Artificial Intelligence Technology in International Chinese Education

Artificial intelligence chat software is an intelligent application that can understand the user's intentions and provide corresponding text or voice responses based on the context entered by the user. In recent years, with the development of science and technology, various artificial intelligence chat software has emerged. Among all the artificial intelligence chat software, ChatGPT has the most perfect function and the highest social discussion. ChatGPT software is a new AI chat robot developed by Open AI, a world-renowned artificial intelligence research and development company. It is based on NLP (natural language processing technology), pre-trains a large amount of text data, and combines its converter network architecture to enable it to generate appropriate and coherent responses to a wide range of questions and prompts and can also generate and create languages. ChatGPT is developed to provide dialogue support for a variety of applications, such as customer service, personal assistants, chatbots, etc. It is an artificial intelligence technology based on deep learning, which can generate smooth and logical dialogue text. It learns the language pattern and context relationship of the dialogue by training a large amount of dialogue data, so that it can generate appropriate responses according to the user's input and historical dialogue. It has the following functions and features: it can have multiple rounds of dialogue with the user, maintain the continuity and consistency of the dialogue. It can adjust its tone and attitude according to the user's language style and emotion, improve the intimacy and naturalness of the dialogue. It can handle various types of dialogue scenarios, such as chatting, Q & A, tasks, stories, etc., and provide rich and interesting dialogue content. It can use external knowledge and information to enhance the intelligence and practicality of dialogue.

Compared with other artificial intelligence technologies, ChatGPT has the following advantages: it uses the most advanced natural language generation technology to generate high-quality and high-diversity dialogue texts. It uses a large-scale pre-training model, which can make full use of massive dialogue data and improve the generalization ability and robustness of dialogue. It uses a flexible and scalable architecture that can adapt to different conversation needs and scenarios and provides customized and personalized conversation services. According to a report from UBS Group, just two months after the launch of ChatGPT, the number of monthly active users has exceeded 100 million at the end of January 2023, becoming the fastest growing consumer-oriented application in history. Despite many benefits, ChatGPT is not without limitations. One of the biggest limitations of this model is that it relies on the data that is trained. Since it is trained based on text data from the Internet, it may contain deviations and inaccuracies in the source data, resulting in knowledge errors in its responses. In summary, ChatGPT is a powerful language model that can be used for a wide range of dialogic AI applications. Despite its limitations, it represents an important step in the development of conversational AI and may completely change the way we interact with technology.

Artificial intelligence chat software has been applied in many fields, and the education industry is one of them. Taking ChatGPT as an example, it has been used in classroom teaching in some foreign schools. At the beginning of 2023, listed companies such as Netease Youdao have announced investment in the ChatGPT field of the education model. Some domestic Internet companies such as Baidu also announced the development of related technologies with ChatGPT in the field of education. With the development of computer technology to the stage of artificial intelligence, its impact on international Chinese education has also been continuously strengthened, changing the original teaching methods. The application of artificial intelligence technology has changed and optimized the original language teaching methods, improved the efficiency and quality of language teaching, and also provided students with a more personalized and autonomous learning experience. However, artificial intelligence technology has its limitations, which cannot accurately analyze language and its environment, and cannot completely replace the original language teaching. Therefore, it is necessary to re-examine the impact and challenges of artificial intelligence technology on international Chinese education.

3. The Application Scenarios and Effects of ChatGPT in International Chinese Language Education

Traditional Chinese learning mainly depends on teachers' classroom teaching and students' independent practice after class. Computer-assisted Chinese teaching is an important supplement to teachers' classroom teaching. As the artifact of Chinese teachers, ChatGPT has a powerful teaching assistant function. It can provide international Chinese teachers with highly operational curriculum design, lesson preparation programs, classroom exercises, job evaluation, etc.; to help international Chinese teachers teach students in accordance with their aptitude, ChatGPT can predict learners' preferences and errors in international Chinese learning according to students' regional countries, learning motivation, mother

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tongue background, age and other conditions, and design personalized learning conversation materials and reading texts for learners with different needs, so as to help teachers self-correct and learn in teaching content and teaching, and realize super-large-scale content generation and large-scale new knowledge emergence. The process of Chinese learning has changed from teacher-student dialogue to teacher-machine-student dialogue. Machines have become important participants in the process of Chinese learning. At the same time, students use ChatGPT to learn Chinese, frequent human-computer interaction and constantly enriched corpus, the in-depth development of knowledge capital in the industry, and the iterative innovation of large models, so that the human-computer relationship has achieved symbiotic growth in the process of Chinese learning and realized the appreciation and co-creation of knowledge value. Flexible optimization and adjustment, improve the efficiency of teachers' lesson preparation and reduce the workload of teachers. ChatGPT can also assist teachers to efficiently complete the routine management and communication of notice writing, mail arrangement, activity planning and other routine management and communication in the management of international Chinese education and reduce the burden of teaching administration for international Chinese teachers.

In the past, Chinese learners usually relied on reference books or information retrieval tools for language learning and used character structure or pronunciation for semantic retrieval. The development of early artificial intelligence technology also helped the whole process of Chinese learning by optimizing retrieval strategies and improving retrieval efficiency. With the development of technology iteration, speech translation software based on artificial intelligence has begun to be popularized. Chinese learners can realize the screening and selection of Chinese educational resources through language question answering, information search, result matching and other steps. Compared with traditional machine learning and artificial intelligence technology applications, natural language processing (NPL) and general large models have gradually matured in understanding Chinese semantics and syntactic structures, giving ChatGPT a more powerful learning aid function. Through the multi-stage question-and-answer human-computer interaction, ChatGPT can realize the interactive connection between contexts, repeatedly ask the above, and infinitely inspire the following re-feedback or repetitive task execution, highlighting ChatGPT's strong interactivity, fast responsiveness, and high accuracy. If the guide language can be set scientifically, learners can continue to talk with ChatGPT through standardized presupposition questions, so as to realize the knowledge explanation, example sentence demonstration, repeated practice, error analysis, accurate review and regular review of knowledge points such as new words, grammar and syntax, and form a complete and standardized learning closed loop. At the same time, the preset learner portrait, ChatGPT can also help Chinese learners to carry out research-based learning, provide learners with personalized Chinese teaching guidance, customize Chinese learning planning, promote the personalization of language teaching and learning process, create conditions for self-education and self-development, and then realize the whole process reengineering of Chinese education.

In the process of digital transformation, new models and new formats have emerged in the teaching resources of international Chinese education. Science and technology empowerment and scene expansion

have formed a three-dimensional development trend in the construction of digital resources of international Chinese education. In the construction of international Chinese education resources, ChatGPT can achieve more powerful functions, and the automatic emergence of resources will expand the space and field of Chinese learning and cultural communication. In the face of practical problems such as the shortage of international Chinese education resources, the lack of high-quality resources, and the imbalance between students and teachers, ChatGPT is integrated into international Chinese education. From the perspective of the supply side, it provides a student-centered training support program that is more in line with the laws of education. According to the learning needs, many localized, personalized, and three-dimensional learning resources are produced. Teachers, students, parents, education managers and researchers can easily realize the content construction of teaching resources. At the same time, this open-source artificial intelligence platform can realize the sharing and opening of Chinese education resources, which is helpful to reshape the teaching ecology, promote the international Chinese education to adapt to the changes and development of the times, promote the Chinese culture to the world, and realize a wider range of cultural exchanges and mutual learning. In addition, ChatGPT can also build a digital teaching ecosystem from the demand side. It can follow the demand orientation of Chinese learners, understand and master students' learning situation according to learning experience and automatic evaluation, form personalized growth learning resources guided by students' needs, and realize the precision and appropriateness of resource supply by docking needs. This is also an important development trend of international Chinese education resources.

The main body of educational governance generally includes stakeholders such as government, schools, teachers, families, communities, society, and industry. Cooperative governance with multi-subject participation is an important feature of the modernization of educational governance. With the continuous advancement of the Internet and artificial intelligence technology, User Generated Content (UGC) has given new momentum to multi-agent participation in education quality. The application of ChatGPT in international Chinese education has changed the relationship between brain-like machine systems and learners, promoted the formation of a hybrid enhanced high-quality education and training model, and made machines one of the main bodies directly involved in international Chinese education. In fact, ChatGPT is becoming an important way for global Chinese learners to acquire knowledge. Different from the personalized recommendation mode of labeling the behavior data of international Chinese learners, it is more inclined to use the existing massive database to carry out deep learning and multi-modal language pre-training model iteration. Through the task requirements and decision-making of international Chinese education, combined with self-correction and learning in the process of human-computer interaction, it can achieve super-large-scale content generation and large-scale new knowledge emergence.

4. Challenges and Issues that ChatGPT May Pose

But at the same time, we have to pay attention to ChatGPT brings us some new challenges. We have found that ChatGPT is not omnipotent, it may give us misleading, provide the wrong answer, which requires the use of its people could judge independently. We believe that the challenges brought by ChatGPT to international Chinese education mainly include the following aspects: 1). Traditional language teaching models are challenged. The traditional language teaching mode is face-to-face teaching and practice, in which teachers are in a dominant position. Cloud classroom, virtual classroom and smart classroom have broken the traditional language teaching mode and formed a new teaching pattern and teaching mode. The development of AI technology is a challenge to the traditional language teaching mode, and it is also a challenge to the newly developed teaching modes. We are forced to change our way of thinking. In addition to taking advantage of the convenience provided by ChatGPT, we must also guard against the risks it brings. 2). Teachers' authority is challenged. Whether it is a traditional language teaching classroom, a virtual classroom, or a cloud classroom, the authority of teachers is unshakable. However, after the emergence of ChatGPT, learners can more easily use this new tool to obtain information. Ask the teacher with questions will gradually become ask the ChatGPT with questions. In many ways, the answers given by ChatGPT may be more comprehensive, more timely, more diverse, and more useful than the answers given by the teacher. In this sense, the authority of the teacher will be dispelled. In addition, the interaction between teachers and students increases the risk. If the answers given by teachers are different from those given by ChatGPT, learners may question the authority of teachers. After all, teachers are human beings. Compared with artificial intelligence, human knowledge reserve, human memory and human brain operation speed are inferior. Especially in the encyclopedia knowledge, teachers' knowledge is limited. 3). Traditional textbooks and reference books are challenged. Whether it is a paper-based textbook or an electronic textbook, there is a flaw, that is, the lack of relevance. The previous solution is to carry a paper version of the dictionary or electronic dictionary with us in class, but these textbooks and dictionaries cannot be dynamically related. For example, we can find a word and know that the word has several meanings. However, if we want to know the relationship between this word and other words, the existing textbooks and dictionaries cannot be related. ChatGPT can make up for this deficiency. 4). Learners' experience is challenged. Many people have their own successful experience in learning a language. These successful experiences are often very personalized. For example, some people memorize words through phonetic channels, some people memorize words through visual channels, some people increase their vocabulary through a lot of reading, some people increase their vocabulary through backing dictionaries, some people acquire language communicative competence through communication with people, and some people acquire language communicative competence through watching movies and TV dramas. After the emergence of ChatGPT, previous language learning experience may not work, because artificial intelligence can provide a more efficient way of learning, especially a general language model like ChatGPT can answer a variety of questions. Learners need to explore new learning paths and accumulate new learning experience. 5).

Creativity of learner autonomy is challenged. In the past teaching, the interaction between teachers and learners, the interaction between learners and learners is the most common way of interaction. In these interactions, learners give full play to their subjective initiative and give full play to the creative ability of individual learning. After the emergence of ChatGPT, this way of interaction will be affected, learners will interact more with ChatGPT, learners' autonomous learning ability will be challenged, and excessive reliance on ChatGPT will have unpredictable consequences. If ChatGPT provides misleading answers, it's really a letter is better than no book. With the development of artificial intelligence, greater challenges are still behind. GPT's upgrade iteration and other revolutionary changes in AI technology may one day make us no longer need to learn foreign languages. Many people will lose their jobs at that time.

Chomsky said in recent interviews and articles that ChatGPT has no help in destroying education and understanding language and cognition, but plagiarism under the blessing of high technology will bring a fundamentally flawed concept of language and knowledge into our technology and must be strictly guarded. The deeper problem is that ChatGPT may accelerate the spread of Chinese knowledge, but it can never replace the cultivation of people and the inheritance of culture behind Chinese education. Because the essence of human beings is the unity of knowledge, emotion and intention, the seeds of education should include virtue and belief in addition to knowledge. Knowledge education and examination using artificial intelligence transmission and assistance is only a small part of human learning, education, and testing, and is by no means a decisive part. Therefore, it is necessary to prevent ChatGPT from alienating knowledge transfer, including ability, into all aspects of education. As an international Chinese educator and researcher, we need to reflect that in the context of the ChatGPT pandemic, it is important to teach learners Chinese knowledge and skills, but it is more important to teach global Chinese learners the emotions between man and nature, man and man, man and society behind Chinese culture, and teach them the will to move forward or the flexible and flexible talents under the influence of Chinese culture. Finally, the need for further reflection on human learning and artificial intelligence is that Michel Foucault critically predicted back in the 1960s that human beings are subject to labor, life and language, no doubt limited, but it is hard to put the role of infinite, absolute, creator to a limited person, making people overwhelmed and expansive. Therefore, we should be aware that artificial intelligence may bring us liberation, but we should also prevent, limit, and transcend the new constraints that artificial intelligence may bring us.

In the face of ChatGPT, a new thing, we realize that we should do our work in the following three aspects. First, enhance the ability of innovative thinking. The application of ChatGPT technology in the field of education not only requires teachers to have scientific and technological literacy, but also requires teachers to have innovative thinking ability. Through continuous innovation, we should combine ChatGPT technology with course content to improve students' learning effect. At the same time, we should improve our own scientific and technological literacy and moral cultivation. Teachers are the main body of education. While improving their scientific and technological literacy and improving their ability to use ChatGPT technology, they should further strengthen their moral cultivation and avoid the abuse

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of ChatGPT technology in teaching. In addition, we should also pay attention to the proper use of ChatGPT technology. ChatGPT technology should be used moderately, it cannot replace the traditional way of education. Education should be people oriented. We need to pay attention to the cultivation of students' emotional experience and thinking ability, rather than simply using Chat GPT technology to complete teaching tasks. We consider some of the methods that may be better for your reference: (1) Use ChatGPT technology for adaptive teaching. Using the adaptive function of Chat GPT technology, according to students' learning situation and personalized needs, it provides students with personalized teaching programs to help students better grasp knowledge. (2) Using ChatGPT technology to construct knowledge graph. Through ChatGPT technology, a knowledge graph is constructed to classify and correlate knowledge points and concepts, so that students can better understand the relationship and connotation between knowledge points. (3) Use ChatGPT technology for intelligent question answering. Using ChatGPT technology for intelligent question answering can help students better solve problems and improve learning efficiency. Secondly, strengthen data protection. The application of ChatGPT technology in the field of education requires a large amount of personal information and learning data. Therefore, we should strengthen the awareness of data protection and ensure that students' privacy is fully protected. Finally, establish a regulatory mechanism. To supervise the application of ChatGPT technology in the field of education and prevent its misuse and abuse. At the same time, an evaluation mechanism should be established to evaluate the effect of ChatGPT technology in the field of education in order to continuously improve and enhance.

5. Conclusion

In short, I believe that the emergence of Chat GPT has a great impact on education, especially in international Chinese language education. Daniel Pinker, a futurist, lists six basic abilities to lead the future in his book *New Thinking*, which are design sense, story power, symphony, empathy, entertainment sense and meaning sense. Daniel Pinker pointed out that the new thinking talents with these six abilities are the necessary qualities to adapt to the future development and win the future. Only by constantly improving students' artistic ability, honing non-standard skills and looking for non-standard track, can the students be irreplaceable in the future. Since technology has emerged, we should actively face, multi-faceted research and discussion. It can be predicted that with the gradual promotion and application of ChatGPT in teaching, it will help students better learn and master knowledge, improve learning effect, and also help teachers improve their own ability. If we actively respond, we will surely be able to foster strengths and circumvent weaknesses, so that future education will produce a new revolution along with the development of artificial intelligence.

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