

Opportunities and challenges brought by artificial intelligence to second language teaching: A case study of international Chinese language education

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Abstract. In the context of the widespread application of artificial intelligence technology, international Chinese language education is taking on new characteristics. The next generation of artificial intelligence is profoundly impacting the global education landscape and transforming the methods of knowledge production, driving the digitization of international Chinese language education and innovating all elements of education. It is systematically constructing a new ecosystem for the future of international Chinese language education, attracting extensive attention and lively discussions in the education field, including the domain of international Chinese language education. This paper, through a review of the application of computer technology in the field of Chinese language teaching and a discussion of the challenges and opportunities it currently presents, analyzes the strengths and weaknesses of artificial intelligence technology in the context of international Chinese language education. It offers strategies for Chinese language teachers to effectively utilize artificial intelligence technology, employ flexible teaching methods to address challenges, and enhance teaching effectiveness.

Keywords: artificial intelligence, second language teaching, Chinese as a foreign language

1. Introduction

With the rapid development of information technology, artificial intelligence (AI) presents enormous potential in the field of education. China places great emphasis on empowering educational reforms with AI. In October 2022, the 20th National Congress of the Communist Party stressed the need to promote digital education, aiming to establish a society and nation focused on lifelong learning for all citizens. With the continuous push from government support and technological development, AI-based educational reforms have shown significant results. As the global demand for learning Chinese continues to increase, international Chinese education should actively utilize AI technology to optimize Chinese teaching methods, advancing the digital transformation of international Chinese education. In 2022, Sun Chunlan, the Vice Premier of the State Council, pointed out at the International Chinese Education Conference, "We need to innovate in informatization, digitalization, and intelligent construction, creating a more open, inclusive, high-quality, and accessible international Chinese education landscape to better meet the Chinese

learning needs of people worldwide." It's evident that AI plays a pivotal role in the future academic and industrial transformation and development of international Chinese education. ChatGPT's upgraded version, GPT-4, as the most advanced generative AI product from the American AI research company OpenAI, will bring opportunities and challenges to the international Chinese education field. Therefore, clarifying the relationship between international Chinese education and AI, and exploring the digital transformation models of international Chinese education, will help accelerate the leap-forward development of international Chinese education.

2. Opportunities

As a large language model, ChatGPT can efficiently learn the features and patterns of language through pre-training technology with a massive corpus. It automatically generates text responses based on user needs and continuously enhances its language accuracy and logic by fine-tuning the pre-trained model for specific tasks. As a powerful generative AI product, ChatGPT has demonstrated excellent performance in autonomous learning, creativity, multi-modal information processing ability, and personalized customization ability, bringing new opportunities for international Chinese education.

2.1. Strengthening students' Chinese self-learning ability

ChatGPT can significantly enhance students' ability to learn Chinese on their own from multiple aspects. Through its advanced natural language processing technology, ChatGPT provides students with personalized answers to questions and intelligent tutoring. It can simulate real immersive Chinese conversation scenarios, helping students train their listening and speaking skills. Moreover, ChatGPT has text generation and language modification capabilities, enabling it to automatically produce Chinese reading materials of different difficulty levels and assist students with vocabulary queries, sentence understanding, and paragraph analysis when they encounter reading challenges. In terms of writing, ChatGPT can automatically correct students' Chinese essays, quickly detect and rectify grammar mistakes, and guide them in various Chinese writing styles.

2.2. Enhancing teachers' Chinese teaching ability

ChatGPT boosts the teaching capabilities of international Chinese teachers throughout the teaching process using digital teaching methods. During lesson planning, teachers can swiftly acquire comprehensive Chinese preparation materials via ChatGPT and develop more refined lesson plans. During instruction, teachers can leverage ChatGPT to implement various teaching models, such as flipped classrooms and smart classrooms, according to students' needs and their teaching styles. After class, ChatGPT can assist teachers in assigning homework, designing exams, analyzing each student's performance, and facilitating personalized student assessments.

2.3. Promoting the construction of international Chinese teaching resources

Through natural language processing and generation technologies, ChatGPT can automatically produce AI-generated content to meet users' demands, advancing the development of Chinese teaching resources. It can cater to the Chinese learning needs of different countries, customizing resources based on nationality, language, level, and specialization. In disseminating international Chinese teaching resources, ChatGPT can employ intelligent algorithms for distribution model analysis, helping craft distribution strategies and merge the construction of international Chinese teaching resources with national communication capabilities.

2.4. Accelerating the upgrade of international Chinese teaching intelligent products

ChatGPT can vigorously promote the upgrade of intelligent products in international Chinese teaching. ChatGPT's technology can integrate with various teaching products, such as combining with intelligent

tutoring systems and automated grading systems, enhancing the effectiveness of Chinese teaching, improving evaluation efficiency, and providing diverse assessment perspectives. ChatGPT can also offer more precise and comprehensive technical support for automated grading systems, achieving more accurate scoring and feedback.

3. Challenges

ChatGPT has deeply integrated with international Chinese education, acting as a study companion for learners, an assistant for teachers, an innovative sharer of teaching resources, and a direct participant in educational governance. Beneath these new roles, transformations, and emerging trends, international Chinese education under the transformation of artificial intelligence still adheres to certain unchanging principles: the goals of education remain unchanged, the standards of teaching are consistent, the status of teachers is unwavering, and the demand for values is steadfast. Within these constants, the application of ChatGPT in international Chinese education still faces many challenges.

3.1. Traditional language teaching methods are being challenged, traditional learning experiences are no longer applicable, and corresponding traditional teaching methods must be reformed.

When ChatGPT and other advanced AI technologies are widely used in international Chinese education, it will lead to a further transformation of the roles of students and teachers in the educational process. Traditional learning experiences will no longer be fully applicable, inevitably prompting a reform in teaching methods.

AI teaching tools, represented by ChatGPT, can answer students' questions at any time, providing them with personalized learning suggestions and resources. This anytime, anywhere learning mode encourages students to shift from passively receiving knowledge to actively exploring, further highlighting the primary role of students in international Chinese education.

Because AI tools like ChatGPT can provide instant feedback and tutoring, the authoritative role of traditional teachers in knowledge transmission is being challenged. The role of teachers needs to change from being pure transmitters of knowledge to guides and facilitators of learning, assisting students more in exploring and deepening their studies. To keep up with the times, teachers need to receive new training, learning how to maximize the use of AI tools and apply them in teaching. Traditional textbook and classroom teaching may no longer be the best methods. Interactive and practical learning methods, such as simulated dialogues, role-playing, and project-based learning, might become more critical. Educators also need to continuously update their skills and teaching methods to adapt to these changes.

Traditional textbook teaching will further evolve towards practical teaching, and the corresponding teaching experience will also change. In the past, memorization and repetition were the main methods for learning Chinese. But now, with AI tools, students can practice and simulate more efficiently. For instance, they can engage in real-time dialogue exercises with ChatGPT, without waiting for classroom practice opportunities.

3.2. Teachers and students become dependent on AI, leading to a decline in creativity.

The tendency to prefer ease and despise toil is human nature. With the availability of dependable tools, teachers and students might become complacent, leading to a lack of creativity.

For students, although ChatGPT is very efficient in retrieving information, isolated questions and answers cannot effectively help students construct a comprehensive understanding of the Chinese knowledge system. Students might overly rely on AI to improve their language skills, overlooking other essential skills such as cultural understanding and contextual responses. When students get accustomed to asking AI for answers, they might no longer make efforts to think and solve problems independently. Over time, their critical thinking and problem-solving abilities could be diminished. ChatGPT can assist students

with various tasks in Chinese learning, especially aiding in Chinese writing, which might promote ghostwriting behaviors, leading to issues of academic misconduct. On the other hand, given ChatGPT's powerful natural language generation capabilities, it becomes challenging for teachers to distinguish between students' and machine's work, making it difficult to accurately assess students' genuine writing abilities. This affects the accuracy and fairness of educational assessment mechanisms.

For teachers, more and more teaching tasks can be automatically accomplished by artificial intelligence technology. For instance, intelligent tutoring systems can provide personalized guidance suggestions based on the Chinese proficiency and learning status of every student in the class; automated grading systems can efficiently correct the Chinese compositions of the entire class. If teachers overly rely on AI tools for teaching tasks, such as providing answers and grading assignments, they might lose their leading role in education, gradually becoming mere "operators" of technology rather than "creators" of education. If teachers excessively depend on AI-generated teaching content, they might be less motivated to design new and innovative teaching activities for the classroom.

3.3. The accuracy of the answers provided by ChatGPT cannot be guaranteed, which affects the educational outcomes.

As a representative of the world's most advanced generative artificial intelligence product, ChatGPT possesses powerful natural language generation capabilities. However, it still faces issues such as insufficient quality and quantity of pre-training data, lack of new knowledge, and limitations in the Chinese dialogue system. Moreover, the system itself cannot identify the correctness of its answers, which can easily mislead users.

Firstly, ChatGPT's pre-training data primarily comes from human-written texts. When there is bias in the data or when it is insufficient, ChatGPT might produce inaccurate or biased answers. Secondly, ChatGPT's data updates are limited, preventing it from fully utilizing the latest knowledge in some situations, which might lead to outdated information output. Lastly, since ChatGPT was mainly developed using English as its pre-training database, its capability to handle Chinese tasks is inferior compared to English tasks. There is a need to enhance its Chinese understanding, reasoning ability, and its capability to handle complex Chinese tasks. There are significant grammatical differences between Chinese and English. Chinese complexities such as homophones, polysemy, idioms, and other linguistic phenomena can impact the accuracy of ChatGPT's Chinese content output to a certain extent.

3.4. The resilience of machines and networks is a challenge we face when utilizing AI.

The use of ChatGPT heavily depends on machines and the internet, which poses certain challenges when applying it to Chinese language teaching. Currently, with a daily active user count surpassing 100 million for ChatGPT, facing system failures or network issues is inevitable. Ensuring system and network resilience and consistent maintenance becomes a crucial issue. Additionally, due to the system's characteristics, different languages rely on different corpora, resulting in varied answers to the same question. Due to the aforementioned factors, there might be instances of AI "malfunctions" such as delayed responses or incorrect answers during usage.

3.5. The lack of education on the culture and values behind language teaching.

When we overly rely on ChatGPT for international Chinese education, a potential issue might arise: an overemphasis on imparting language knowledge and skills, while neglecting the profound culture and values inherent in the language.

ChatGPT excels in teaching language structure, grammatical rules, and vocabulary knowledge. While these are indeed the foundations of learning any language, Chinese, being one of the oldest and richest languages in the world, has its underlying culture, history, and philosophy as crucial components of the

language study. When we focus solely on language skills and knowledge, students might miss out on the opportunity to deeply understand the culture and historical context behind the language. For instance, comprehending the stories behind idioms or the origins and significance of festivals.

Language is not just a tool for communication; it also reflects the values and thought patterns of a culture. Teaching solely through technological tools might fail to convey these deeper aspects adequately. If international Chinese education is limited to the proficiency of the language, then the rich traditions of Chinese culture, philosophy, and art might not be adequately disseminated. This could result in students having a superficial understanding of Chinese culture, lacking a deeper appreciation and insight.

4. Countermeasures

Although ChatGPT is not yet perfect, its emergence signifies that the era of deep integration between language education and artificial intelligence has arrived and is unstoppable. How to make good use of ChatGPT and other AI technologies to deeply empower international Chinese education is a question we must ponder and actively address. Based on the analysis of opportunities and challenges presented earlier, we propose the following countermeasures.

4.1. Avoid overuse and standardize the behavior of using artificial intelligence technology.

Guiding teachers and students to use ChatGPT in a standardized manner is an important measure to ensure the quality of international Chinese education. By establishing clear guiding principles and norms, we can ensure that teachers and students use ChatGPT reasonably and appropriately. For instance, set limits on the time spent using ChatGPT in each class or only allow its use during specific learning segments. Additionally, regular reviews should be conducted. At the end of each semester, teachers should reflect on and evaluate the effectiveness of using ChatGPT, as well as its actual impact in the classroom.

4.2. Establish the right attitude, do not overly reject AI, but treat it as a tool and integrate it organically into classroom teaching.

By offering AI education training and clarifying the role of AI for teachers and students, we can ensure that they have the correct attitude towards AI. This enables the organic and appropriate integration of ChatGPT into international Chinese education, thereby enhancing the quality of education.

By organizing specialized seminars and workshops to introduce teachers to the basic knowledge of AI, the features of ChatGPT, and how to integrate it into teaching, we can eliminate misunderstandings and fears about AI. At the same time, it should be clearly stated in the teaching plan that ChatGPT is used as an auxiliary tool and is not a substitute for teachers. It can help address common classroom issues or provide students with additional practice materials. Based on this, we can demonstrate its effective use through real classroom examples, showcasing how to use ChatGPT effectively, such as simulated conversations, supplementary exercises, and homework assistance. Furthermore, regular feedback should be collected from teachers and students to understand how they use ChatGPT and their opinions on its effectiveness in the classroom. Based on feedback and new teaching needs, strategies and methods for using ChatGPT in teaching should be continuously updated and improved.

4.3. Cultivate students' ability to distinguish the truth of facts, and teachers actively correct errors existing in ChatGPT.

Educate students not to rely entirely on AI's answers, cultivate their critical thinking, hold a skeptical attitude towards the answers given by AI, and correct them when errors are found. Design classroom activities, such as having students compare the answers from ChatGPT with those from textbooks or other sources, to enhance their discernment. When ChatGPT provides inaccurate answers, encourage students to actively seek other resources to verify the information.

4.4. Adjust the objectives of language teaching and the evaluation methods.

Adjust the teaching objectives, emphasizing critical thinking and creativity in language teaching, and encouraging students' personalized expression and innovative thinking. Through an effective feedback mechanism, create a positive cycle and encourage students to provide feedback after each use of ChatGPT, so that teachers can understand its actual effects. Innovate in evaluation methods, increasing the weight of listening and speaking exercises, introducing project-based assessments, allowing students to demonstrate how they apply what they've learned in practice.

4.5. Enhance the focus on pragmatic levels and cultural factors.

Ensure that when using ChatGPT for language teaching, the focus is not just on language structure or grammar, but more importantly, on the cultural background and practical use of the language. By incorporating real cultural scenarios, we can delve into specific expressions in Chinese and the cultural meanings behind them.

We can further promote Chinese culture by organizing special activities or workshops related to Chinese culture, such as Mid-Autumn Festival celebrations and Chinese tea art performances. Additionally, design in-depth discussion topics in the teaching process, such as "Etiquette expressions in Chinese" or "The collision between traditional and modern Chinese culture", to enhance the cultural depth of international Chinese education.

5. Conclusion

Generative artificial intelligence, exemplified by ChatGPT, has attracted widespread attention both domestically and internationally. When considering its impact on the advancement and discipline of international Chinese education, there's a mix of opportunities and challenges. We pay more attention to the sustainable development of the new generation of artificial intelligence. On one hand, we are tolerant of its shortcomings and confident in technological progress and future development; on the other hand, we don't blindly follow trends and exaggerate claims. We actively practice and test the functionalities of ChatGPT in the field of international Chinese education, exploring what the new generation of AI can and cannot achieve. We take a proactive yet cautious approach to foster a deep integration of international Chinese education with AI, aiming to empower high-quality development in this field. In essence, technology and education are not adversaries; they should merge and innovate together. Given the rapid development pace of generative AI, the international Chinese education community should embrace change with an open-minded and inclusive attitude, enhance teachers' and students' digital literacy, and fully harness technology to empower education. Only by defining the relationship between humans and tools can technology truly amplify its role in international Chinese education, ensuring AI's positive trajectory in this domain.

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