

Application of ChatGPT in “Chinese + Vocational Skills” Education from the Perspective of Interaction Theory

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Abstract

In recent years, driven by globalization and the Belt and Road Initiative, international Chinese education faces an urgent demand to cultivate talents who possess both vocational skills and Chinese communication abilities. The emergence of artificial intelligence technologies, particularly generative pre-trained models like ChatGPT, presents new possibilities for “Chinese + Vocational Skills” education. However, its application encounters challenges such as technological accessibility, data biases, and high user demands. To address these issues, this study, based on interaction theory, explores the prospects of ChatGPT in “Chinese + Vocational Skills” education, along with the challenges and corresponding recommendations. This paper aims to discuss how the application of ChatGPT in vocational Chinese education can bring opportunities for educational digital transformation, effectively enhance education quality, and foster talents capable of meeting global demands.

Keywords: ChatGPT, Chinese + Vocational Skills, educational technology, interaction theory

1. Introduction

As the Belt and Road Initiative progresses, there is a significant increase in the demand for cross-cultural communication and international cooperation. However, with a large number of Chinese enterprises expanding globally, there is a shortage of local talents who possess both vocational skills and Chinese communication abilities for international cooperation (Song et al., 2022). In December 2018, at the 13th Confucius Institute Conference, Vice Premier Sun Chunlan emphasized the integration of specialized

courses that meet cooperation demands into language teaching, implementing the “Chinese +” project, which includes tailored courses in skills, business, and traditional Chinese medicine. This initiative has garnered widespread attention in the international Chinese education community. Combining Vocational Skills has become a new trend in international Chinese education (Cui, 2020). Chinese + vocational education not only helps learners master Chinese but also focuses on cultivating vocational skills to support the Belt

and Road Initiative by nurturing talents with diversified capabilities. However, as a new educational model integrating international Chinese education with vocational education, “Chinese + Vocational Skills” education faces numerous practical challenges. Chen (2023) conducted a survey and interviews with directors of three representative Confucius Institutes in Africa on “Chinese + Vocational Education”, revealing existing issues such as shortages of skilled teachers, specialized teaching materials, practical facilities and equipment, and funding.

In November 2022, OpenAI released ChatGPT (Chat Generative Pre-trained Transformer), a language generation pre-trained model based on the Transformer architecture. Due to its robust language understanding and generation capabilities in natural language processing tasks, ChatGPT has shown immense potential in the field of education. Against the backdrop of educational digital transformation, the Center for International Foreign Language Teaching and Cooperation under the Ministry of Education published the “Guide to the Construction of International Chinese Education Digital Resources (Trial)” and the “Action Plan for International Chinese Online Education (2021-2025).” These documents explicitly outline the development goals of intelligent and digital international Chinese education, aiming to promote high-quality development through digital transformation and injecting strong momentum into the innovation and development of international Chinese education. Zhen (2019) suggests that artificial intelligence can optimize educational systems and enhance Chinese language teaching applications. Similarly, Obaidoon and Wei (2024) propose that artificial intelligence can create language environments and personalized training programs for Chinese learners. Although ChatGPT cannot fully replace actual teaching, it can provide students in “Chinese + Vocational Skills” education with more personalized and flexible learning opportunities, while offering educators more effective teaching aids. In this digital, globalized, and information-driven era, ChatGPT presents unprecedented opportunities for “Chinese + Vocational Skills” education.

Based on this context, this paper attempts to explore the cognitive advantages, application prospects, as well as the challenges and recommendations associated with the

application of ChatGPT in “Chinese + Vocational Skills” education.

2. ChatGPT and Education

2.1 ChatGPT and Interaction Theory

ChatGPT has been a prominent tool this year, developed by the American company OpenAI, based on the Transformer architecture, a language generation pre-trained model used for generating natural and fluent conversations. In this report, ChatGPT refers not only to OpenAI’s development but more broadly to generative pre-trained models used as chatbots, similar to the conceptual composition of ChatGPT, including future localized ChatGPT models.

The full name of ChatGPT is Chat Generative Pre-trained Transformer. “Chat” indicates its purpose for handling conversational tasks. “Generative” signifies that the model is capable of generating text. “Pre-trained” indicates that the model has been trained on specific tasks beforehand, allowing it to be fine-tuned on smaller tasks to fit specific application domains. “Transformer” refers to a neural network architecture particularly suited for processing sequence data, introducing self-attention mechanisms to effectively capture dependencies across different positions in input sequences.

In the field of language learning, Interaction Theory emphasizes that learners construct knowledge through interaction and communication with other speakers (Chapelle, 2005), providing theoretical support for the feasibility of AI chatbots like ChatGPT in assisting foreign language teaching. Ben-Sira (1980) found that doctors who provide good emotional interaction during patient treatment promote positive evaluations of treatment outcomes, highlighting the importance of individual self and interpersonal interaction. Similarly, AI chatbots can act as language learning companions, providing real-time and dynamic dialogues that enable learners to engage in autonomous learning within simulated contexts, thereby enhancing language skills. Additionally, since chatbots are not human, errors in communication with them do not cause shyness or anxiety in foreign language learners, helping to maintain their communication confidence and motivation. Research by MacIntyre and Charos (1996) indicates a positive correlation between second language confidence, motivation, and willingness to communicate; conversely, second

language anxiety correlates negatively with willingness to communicate.

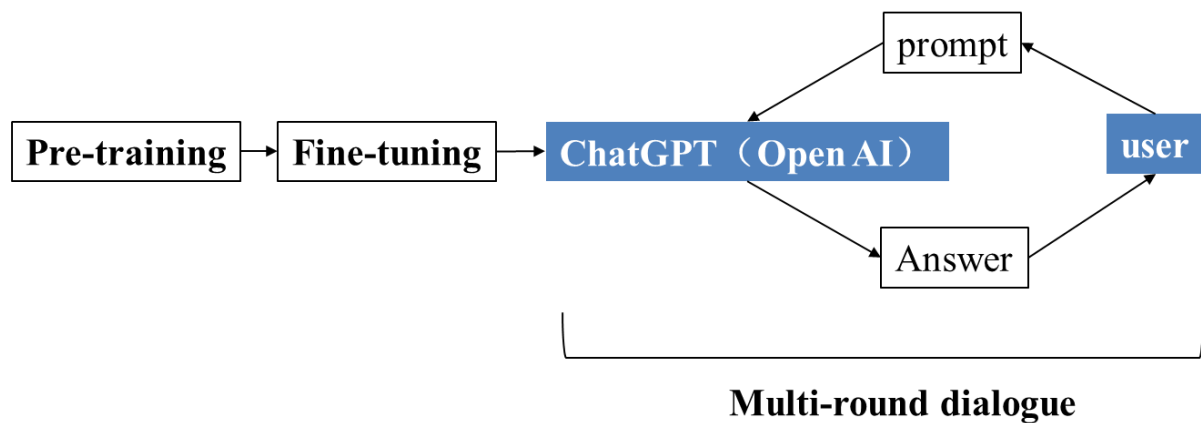


Figure 1. Principle of User Interaction with ChatGPT

Figure 1 illustrates the principle of user interaction with ChatGPT, detailing how the ChatGPT model generates responses and interacts with users through text. ChatGPT begins with pre-training on large-scale text corpora, aiming to develop a broad understanding of language rather than focusing on specific tasks. After pre-training, the model undergoes fine-tuning on specific tasks to adapt to particular uses. When a user inputs text, the model interprets the user's intent, which may include previous conversation history. Based on the user's input and context, ChatGPT utilizes attention mechanisms to capture key information in the discourse and generates a text segment in response. The generated text is typically a natural continuation of dialogue that the model deems appropriate. Users can further interact based on the model's generated response, forming a conversational chain. The model iterates continuously, using the current conversation history to generate more accurate and coherent responses.

In conclusion, ChatGPT demonstrates significant potential in the education sector due to its robust language understanding and generation capabilities in natural language processing tasks, thereby presenting opportunities for educational digital transformation.

2.2 ChatGPT in Education

In recent years, the application of artificial intelligence chatbots in education has garnered widespread attention (Chen et al., 2023; Ji et al., 2023; Kucuk, 2024; Liu et al., 2022; Liu et al., 2023; Lu et al., 2021; Obaidoon & Wei, 2024;

Wang et al., 2024; Yang et al., 2022). Ji et al. (2023) summarized the roles of conversational AI in foreign language learning, including as resource assessors, needs analysts, conversation partners, and feedback providers. Chen et al. (2023) conducted a survey of 448 university students to explore the role of ChatGPT in higher education, finding that task-technology fit, technical features, and compatibility indirectly impact student performance. Obaidoon and Wei (2024) analyzed and evaluated four popular AI models (ChatGPT, Google Bard, Microsoft Bing, and Claude) in generating feedback for Chinese writing. Results indicated that Claude showed the highest average consistency with human teacher scores, followed by Google Bard. Compared to teachers, AI models excelled in surface-level vocabulary, grammar, and mechanics critiques but showed limitations in providing rhetorical, pragmatic, and structural feedback. Kucuk (2024) conducted a study with control and experimental groups to compare the learning outcomes of grammar education centered around traditional teacher- and textbook-based methods versus ChatGPT-centered grammar education. The study found significantly higher scores in ChatGPT-centered grammar education compared to traditional methods.

Unlike general international Chinese teaching, the combination of "Chinese + Vocational Skills" education presents a unique instructional model. This educational approach not only covers Chinese as a second language but also focuses on declarative knowledge required for specific professions (such as industry backgrounds, terminology, standards) and procedural

knowledge (including workflows, operational steps, case studies). Therefore, it is essential to specifically explore the application of ChatGPT in “Chinese + Vocational Skills” education. However, a Google Scholar search using keywords “ChatGPT” and “Chinese + Vocational Skills” did not yield relevant studies.

3. ChatGPT in “Chinese + Vocational Skills” Education

How can ChatGPT be applied in vocational Chinese education? I believe it primarily serves two main purposes: assisting teachers in lesson preparation and aiding students in autonomous learning. On one hand, ChatGPT can assist teachers by providing lesson planning ideas, aiding in information gathering, and offering teaching materials. On the other hand, ChatGPT can facilitate autonomous learning for students by creating an immersive language dialogue environment and alleviating the anxiety associated with interaction with real people, thereby enhancing learning motivation. These are the two primary functions; other potential uses include textbook writing, difficulty assessment, language evaluation, and more. However, these tasks may not align perfectly with ChatGPT’s strengths, potentially leading to issues of lack of specialization. Therefore, it’s crucial to focus on the optimal use cases for new tools rather than expecting ChatGPT to be a universal solution in every aspect of international Chinese education. Otherwise, we risk becoming enslaved to tools rather than using them proactively with agency.

3.1 Assisting Students: Providing Personalized Learning Paths

Traditional education often faces challenges such as wide variations in student proficiency levels and limited teaching resources. The introduction of ChatGPT presents a new opportunity for personalized learning in education. Personalized learning theory posits that each learner has unique initial cognitive levels, specific learning needs, and pathways, and personalized learning experiences can effectively promote knowledge digestion and application.

ChatGPT’s real-time question-answering function provides students with a platform for knowledge discussion anytime and anywhere, making it easy for them to engage in collaborative knowledge building. In addition to personalized developmental paths, individuals

can also guide learners through learning tasks from easy to difficult by setting up career development objectives in advance. By analyzing the demands behind student questioning behavior, ChatGPT can generate personalized learning suggestions and provide learning paths that better meet their actual needs. This personalized learning support helps meet the diverse learning needs of students, encourages them to participate more actively in the learning process, construct learning paths that align with their own knowledge structures, and strengthen their learning motivation and confidence.

3.2 Assisting Teachers: Accelerating the Generation of Teaching Materials

Traditional teaching methods often rely heavily on text and lectures, which can be dull for students, especially beginners and younger learners. Many schools and educational institutions lack sufficient resources to create high-quality teaching materials, particularly in terms of visual and audio content. Different students have different learning styles, with some benefiting more from visual and auditory materials to understand content. This is especially crucial for younger and novice learners who may easily become distracted, where vivid visuals and storytelling help maintain their attention. Additionally, some regions and disciplines face shortages of qualified teachers. Educational videos can partially alleviate this issue by providing high-quality instructional content.

Traditional video production requires multiple specialized roles such as scriptwriters, directors, cameramen, editors, animators, and voice actors, each demanding specific skills and experience. While powerful, traditional video editing tools like Adobe Premiere and Final Cut Pro are complex and require systematic learning and practice to master. In contrast, AI-assisted tools offer significant advantages: utilizing AI tools like ChatGPT can automatically generate teaching scripts and content, saving time and effort spent on manual writing. Tools like MidJourney enable rapid generation of high-quality illustrations and animations, bypassing the complexities of manual drawing. Platforms such as Pika and Runway provide comprehensive solutions where users input text and images, and the system autonomously generates videos, streamlining the production process. AI’s ability to swiftly generate content

significantly shortens production cycles and enhances workflow efficiency.

AI-powered drawing and animation tools vividly recreate characters and scenarios from mythical stories, making it easier for students to understand and remember narrative details. Engaging educational videos contribute to the preservation and promotion of traditional culture, stimulating students' interest in and sense of identity with Chinese culture.

In conclusion, ChatGPT is transforming the role of teachers into a new educational model of human-machine collaboration. Foundational, procedural, and repetitive tasks are handled by artificial intelligence, allowing teachers to focus on tasks such as educational innovation,

humanistic care, critical thinking, and digital intelligence development—tasks that machines cannot perform.

4. Challenges of ChatGPT in “Chinese + Vocational Skills” Education

There has been considerable research on the risks associated with the use of ChatGPT (Khowaja et al., 2024; Capraro et al., 2024). This study focuses specifically on the challenges of applying ChatGPT in vocational Chinese education. Potential challenges of employing ChatGPT in vocational Chinese education include biases in training data, accessibility of ChatGPT, user considerations, as illustrated in Figure 2.

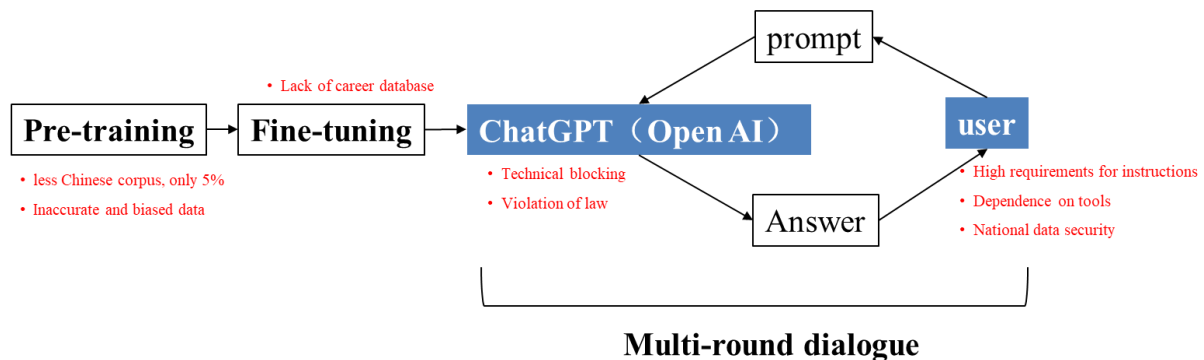


Figure 2. Potential Risks of Applying ChatGPT in Vocational Chinese Education

4.1 Accessibility of ChatGPT

Due to complex political and economic relationships, technology providers like OpenAI may impose restrictions on users from certain countries or regions. This technological blockade could manifest in restricted access, reduced service quality, or even direct account lockdowns. These measures could severely impact Chinese users' experience with ChatGPT, potentially preventing them from accessing and using the tool effectively.

Even without direct user locking, Chinese users face technical barriers and legal risks when accessing ChatGPT. The servers hosting ChatGPT are managed by OpenAI and primarily located in the United States. Accessing these services directly often requires the use of VPN or similar circumvention technologies. However, circumventing restrictions is a sensitive topic in China and involves a complex set of laws and regulations. Using circumvention tools may be considered illegal in

China, exposing users to corresponding legal risks.

4.2 Training Data Issues

The performance of ChatGPT is heavily influenced by the training data it receives. If the data is incomplete, biased, or inaccurate, the model's predictions may lack reliability. When confronted with complex or higher-order thinking tasks, such as critical thinking, ChatGPT's ability to respond may be comparatively weak. Its answers could contain errors or fabrications, sometimes appearing reasonable but actually fraught with inconsistencies. Therefore, in such contexts, ChatGPT might mislead novice learners and potentially serve as a medium for spreading advanced falsehoods or misinformation. Currently, Chinese language corpora make up only 5% of ChatGPT's total data, which introduces cultural biases and potential misunderstandings that are critical considerations in the field of international

Chinese education. Furthermore, in terms of fine-tuning, there is a lack of vocational databases for optimization.

4.3 High User Demands

When using generative AI tools like ChatGPT, precise instructions are necessary for accurate outputs. Ambiguous or unclear instructions may result in inaccurate or unexpected responses. Moreover, prolonged reliance on generative AI tools may diminish users' ability to think independently and solve problems autonomously. In educational settings particularly, excessive reliance on ChatGPT could potentially impact students' critical thinking skills and innovative spirit (Royer, 2024).

Additionally, the use of generative AI tools raises concerns about data privacy and security.

User conversations and data could be stored and utilized for various purposes, posing significant risks in industries dealing with national security or sensitive information. Data breaches could lead to misuse of critical technological information, posing serious threats to national security and corporate interests. Especially in sensitive sectors like government agencies, defense industries, and high-tech enterprises, caution must be exercised when using generative AI tools like ChatGPT to prevent potential security vulnerabilities.

5. Recommendations for ChatGPT in 'Chinese + Vocational Skills' Education

Through Interaction theory, similarly, we can propose measures to address challenges, as shown in Figure 3.

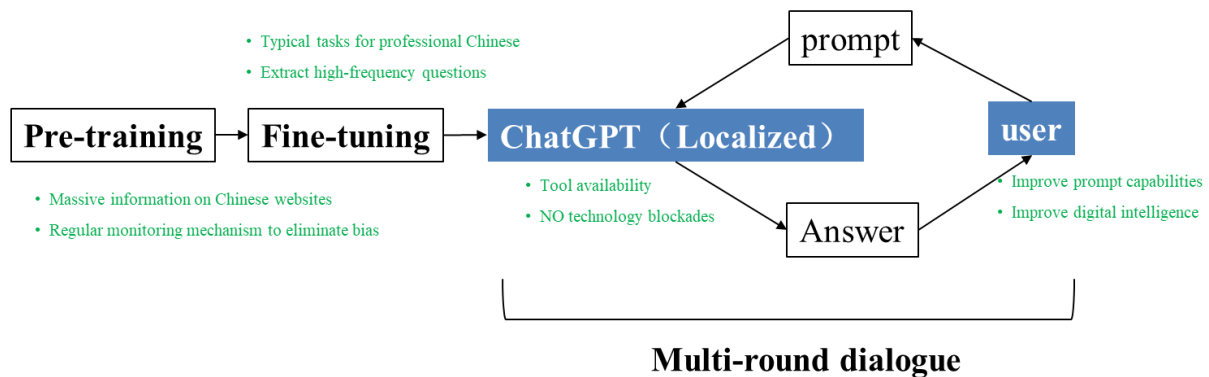


Figure 3. Development of Localized ChatGPT Models

5.1 Development of Localized ChatGPT Models

In China, accessing foreign websites may involve legal and compliance issues. Developing localized AI language models can provide high-quality artificial intelligence services to users without violating relevant laws, thereby meeting the needs of domestic users. By independently developing local ChatGPT models, China can effectively avoid dependence on foreign countries in critical technologies, enhancing the country's autonomy and competitiveness in the field of artificial intelligence. This is crucial for ensuring technology security, data security, and national information security.

Moreover, local AI language models can better understand and process the country's language and cultural background, thereby providing services that are more aligned with user needs. For example, they can have deeper insights into

local languages, dialects, cultural customs, and improve user experience and satisfaction. Currently, in China, companies like Baidu have introduced "Wenxin Yiyuan", Alibaba has "Qianwen Da Model", and iFlytek has "Xunfei Huoxing Cognitive Model". It is evident that generative artificial intelligence has become a new battleground for internet enterprises, and there will be more mature language models and applications in the future.

5.2 Addressing Data Training Issues

In vocational education, the practical sources of training data are crucial for enhancing learning efficiency. Training data should originate from typical tasks in frontline practices to ensure that ChatGPT learns knowledge that closely aligns with actual job requirements. To enhance the professionalism of ChatGPT in "Chinese + Vocational Skills" education, the concept of typical tasks can be introduced. Typical tasks

refer to common and representative tasks within specific occupational fields, encompassing relevant declarative and procedural knowledge, frequently asked questions, and common responses.

To minimize potential errors and biases in ChatGPT, it is recommended to establish effective supervision mechanisms. Regular quality control and supervision can help detect and correct inaccurate or biased information generated by ChatGPT. By establishing a professional review team, ensure that ChatGPT's outputs meet vocational education standards and industry requirements, thereby enhancing system reliability and accuracy.

During the testing phase, experts can propose various typical questions to assess the accuracy of ChatGPT's responses. This process helps identify potential issues and areas for improvement, ensuring the system's performance is more reliable in real-world scenarios. During retesting phases, the expert team can regularly review the distribution of questions and ChatGPT's preferences in answering them. This supervision helps promptly identify and correct any potential biases or inaccuracies, continuously improving the system's performance level.

5.3 Addressing User Issues

With the widespread application of AI technology in various fields, future societies will increasingly rely on technology-driven solutions. Individuals with AI awareness can better adapt to these changes and utilize AI technology to enhance efficiency and innovation. Teachers need to first possess AI awareness and capabilities before effectively nurturing students' AI awareness and capabilities. Specific strategies for teachers to cultivate students' interaction with AI include:

Cultivating students' questioning abilities: Since feedback from generative AI depends on the instructions provided by users, students need to learn how to ask appropriate questions to receive accurate feedback. Teachers can provide key questions relevant to students' professions as references and design tasks for AI interaction to help students improve the accuracy and effectiveness of their questions. This not only enhances students' learning efficiency but also fosters their critical thinking and communication skills.

Developing students' information discernment

abilities: Information generated by ChatGPT may contain errors or cultural biases. Students need to be capable of distinguishing the authenticity of information and assessing its quality. Teachers should guide students to use information reasonably based on its purpose and correctness, avoiding blind trust in AI-generated content. Through such training, students can improve their critical thinking and information literacy, enabling them to approach and use AI more rationally.

Cultivating students' awareness of the appropriate use of AI tools: Students should learn to use AI tools appropriately in learning and work contexts, neither rejecting nor overly relying on AI. Teachers should emphasize the importance of independent thinking and encourage students to maintain independent thinking and innovative abilities when using AI tools. While using AI tools sensibly can enhance efficiency and effectiveness, independent thinking and judgment are irreplaceable.

6. Conclusion

With the acceleration of globalization and the advancement of the "Belt and Road" initiative, the demand for cross-cultural communication and international cooperation continues to grow, making it urgent to cultivate talents with both vocational skills and Chinese communication abilities in international Chinese education. In recent years, with the development of artificial intelligence technology, particularly the emergence of generative pre-trained models like ChatGPT, new possibilities have been provided for "Chinese + Vocational Skills" education. ChatGPT not only simulates real human dialogue but also provides personalized learning solutions and assists teachers in lesson preparation, thereby enhancing teaching effectiveness and efficiency. However, the application of ChatGPT in "Chinese + Vocational Skills" education still faces multiple challenges, including issues such as technology accessibility, biases in training data, and high user requirements. To address these challenges, approaches such as developing localized ChatGPT models, introducing training data sourced from practical experiences, establishing effective supervision mechanisms, and cultivating students' AI usage capabilities can enhance its effectiveness in vocational Chinese education.

In summary, the application of ChatGPT in

“Chinese + Vocational Skills” education brings unprecedented opportunities for the digital transformation of education. By leveraging this new technology effectively, we can significantly improve the quality and efficiency of international Chinese education and cultivate talents capable of meeting global demands. At the same time, in the process of promoting its application, attention should be paid to the deep integration of technology and education, empowering teachers to play a leading role in ensuring educational quality and fostering students’ holistic development. Looking ahead, with continued technological advancements and accumulated application experiences, ChatGPT is poised to play a greater role in vocational Chinese education, contributing to the innovation and development of the “Belt and Road” initiative and international Chinese education.

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