

Application of Generative AI in the Writing of “Chinese+” Textbooks

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Abstract: “Chinese+” represents a new development stage of Chinese for Specific Purposes (CSP) teaching in the history of Chinese language education. With the enhancement of China's international status and the establishment of its national image, international Chinese education has always been guided by practical needs, highlighting the practicality and effectiveness of Chinese for Specific Purposes. International Chinese teachers have earnestly promoted the sustainable development of “Chinese+” education in teaching practice, continuously contributing to the era-specific tasks of the Belt and Road Initiative and the construction of a community with a shared future for mankind. The development of generative AI has exerted a profound impact on international Chinese teachers and Chinese for Specific Purposes, demonstrating remarkable advantages in the construction of “Chinese+” teaching resources. Generative AI can generate texts of a certain difficulty level based on specific chapter titles and key terms. Compared with traditional resource construction models, generative AI assists international Chinese teachers, especially those without professional backgrounds, in better constructing and utilizing resources.

Keywords: Generative AI; “Chinese+”; textbook compilation; medical Chinese.

1. Literature Review

1.1. Research Background

The teaching of Chinese for Specific Purposes (CSP) imposes high requirements on teachers, who need not only solid knowledge of the Chinese language itself and profound pedagogical expertise, but also teaching knowledge of specific professional skills. Li yi(2023) proposed that the reasonable knowledge, skill, and ability structure for CSP teachers should be “Chinese language knowledge and teaching skills + relevant professional knowledge and teaching skills”. [1] However, the current development of various CSP teaching fields is unbalanced. Different countries and domains have distinct demands and development trends for specialized fields, leading to disparities in the compilation and research of specialized Chinese textbooks. As a result, teachers face different challenges in using textbooks, and textbook evaluation needs to be considered from multiple perspectives.

The construction of “Chinese+ vocational skills” resources has gradually become a research hotspot in the field of international Chinese education, primarily because most international Chinese teachers lack professional backgrounds and specific knowledge in specialized fields when constructing curriculum resources. The emergence of generative AI has effectively addressed this challenge. Chen Jiayin (2021) analyzed how to compile textbooks suitable for students' proficiency levels and arouse their interest, and conducted a feasibility analysis of teaching practice strategies. [2]Lv Zhenhua and Ye Jun (2024), taking ChatGPT as an example, analyzed the significant advantages of large language models in constructing “Chinese+ vocational skills” teaching resources. ChatGPT can generate dialogues, texts, exercises, and other content that meet users' needs under specified instructions. Both general Chinese and CSP follow corresponding standard syllabi for curriculum teaching and learning. For instance, HSK exam syllabi specify requirements for textbook compilation, teaching, and student

learning for medical Chinese learners.[3] However, Lv Zhenhua and Ye Jun's article does not specifically address whether AI-generated texts can meet standards such as teaching syllabi.

Existing research has predominantly focused on “Chinese+ vocational skills” teaching and textbook development, but there is a lack of studies on text-related aspects. Research on text can explore whether AI-generated texts are applicable for teachers and the role of generative AI in “Chinese+ vocational skills” courses. This study contributes to promoting the construction and application of “Chinese+” textbooks.

1.2. Research Content and Methods

In recent years, with the enhancement of China's international status and the in-depth development of medical education, the number of international students coming to Chinese universities to study medicine has been increasing. The Interim Provisions on Quality Control Standards for Undergraduate Medical Education for International Students in China promulgated by the Ministry of Education states that the overall goal of undergraduate medical education for international students is to cultivate medical graduates with solid basic medical knowledge, standardized clinical skills, and good professional literacy. Practical Medical Chinese: Basic Course is a part of the Practical Medical Chinese textbook series, [4] which is characterized by strong practicality, reasonable teaching content, and focused treatment of difficult points. Therefore, this paper takes Practical Medical Chinese: Basic Course as an example.

Relying on the dialogue and reading sections of Practical Medical Chinese: Basic Course—that is, the textbook texts—this study uses existing generative AI (taking four common AI models: DeepSeek, Zhipu Qingyan, Wenxiaoyan, and Doubao as examples) to compile the textbook texts of the entire book. Using the International Chinese Education Chinese Proficiency Grading Standards [5] as the evaluation criterion, it analyzes the difficulty level of the AI-generated texts to determine whether they meet language learning standards and can be used in teaching.

This paper aims to analyze the feasibility of generative AI in textbook compilation, so as to promote the development and application of “Chinese+”textbooks, advance the development of “Chinese+ vocational skills”, and assist international Chinese teachers in teaching efficiently and using “Chinese+”textbooks rationally.

2. Testing the Application of Generative AI in Textbook Compilation

2.1. Text Generation Test

To detect the feasibility and effectiveness of generative AI



Translate this passage into English:

Please generate a natural and concise medical Chinese dialogue focusing on teachers and students, centered around the four major parts of the human body. It should be suitable for international students at HSK 1-2 level, taking place in a classroom setting. The dialogue must incorporate the sentence patterns “Is it... or...?” and “It is composed of...”. Additionally, include medical vocabulary such as “head, neck, trunk, abdomen, back, and lower limbs.”

Figure 1. Text Training Paradigm

2.2. AI Text Effectiveness Analysis

To verify the effectiveness of textbook texts, scientific theoretical guidance and long-term practical testing are required. As generative AI is still in the exploratory stage, while its convenience has greatly improved text generation efficiency, its effectiveness needs further validation. *Practical Medical Chinese (Basic Edition)*, published by the Foreign Language Teaching and Research Press in 2008, is one of the Chinese language series for international students in China. Co-compiled by frontline teachers from twenty national universities engaged in medical Chinese teaching, this specialized medical Chinese textbook fully considers the characteristics and needs of medical major learners. Taking communicative scenarios as the main thread, it highlights the training of listening and speaking skills. While cultivating language communicative competence, it pays attention to the transition and connection between language knowledge and professional knowledge, and has been recognized by learners and teachers during long-term

in the compilation of Chinese+ textbook texts, we used the training paradigm (Figure 1) of “generating a natural and concise Chinese conversation in the [field], with... and... as the protagonists, [theme] as the topic, suitable for international students at the [level], taking place at [location], using the sentence pattern ‘...’, and incorporating [field] vocabulary such as...”. Four commonly used AI models—DeepSeek, ZhiPu QingYan, WenXiaoYan, and Doubao—were employed to generate text content for the ten topics in *Practical Medical Chinese (Basic Edition)*, yielding a total of over 30,000 characters.

use. Therefore, the texts of *Practical Medical Chinese (Basic Edition)* can provide good reference value for AI-generated texts. At the same time, to reduce the impact of different AI characteristics on the texts, we used different AI models to generate texts respectively. DeepSeek was used to generate Lessons 1, 2, 3, and 4, Doubao for Lessons 4, 5, 6, and 7, and ZhiPu QingYan for Lessons 8, 9, and 10. The content of each lesson includes conversations on two sub-topics under a major topic and short text lessons related to the major topic.

2.2.1. Conversational Texts

Conversations are a process of language transmission and reception, and the conversational texts in textbooks present knowledge points through real communicative modes. Taking the first conversation “Four Major Parts of the Human Body” in the Systemic Anatomy section of the first textbook lesson as an example, we used the above training paradigm to have ZhiPu QingYan generate a conversational text, and the following result was obtained (Figure 2).



ChatGLM

Teacher: Class, today we're going to learn about the four main parts of the human body. Can you tell me what they are?

Student: Teacher, are they the head, neck, torso, and lower limbs, right?

Teacher: Absolutely correct! Now, can you tell the class what parts the head includes?

Student: The head includes the face, eyes, nose, mouth, and ears.

Teacher: Great! Now, the neck is the part that connects the head to the torso. What structures does it consist of?

Student: The neck is made up of the cervical vertebrae, muscles, and blood vessels.

Teacher: Excellent! Next, let's look at the torso. The torso includes the chest, abdomen, and back, right?

Student: Yes, teacher. So, what's the difference between the abdomen and the back?

Teacher: That's a good question! The abdomen is the front part of the body, while the back is the rear part.

Both belong to the torso. Can you give an example to illustrate this?

Student: For instance, after we eat, food is digested in the abdomen; and when we carry a backpack, it presses against our back.

Figure 2. Conversational text

We can observe that the text generated by AI has fulfilled the requirements listed in the training paradigm, with no obvious errors in linguistic logic or content, while also extending beyond the basic requirements of the paradigm. When compared with the textbook texts, although the AI-generated texts contain many unnecessary colloquial words such as very good and excellent, and are less concise in content presentation than the textbook texts, the AI-generated texts maintain consistency with the textbook in terms of content. From the perspective of linguistic logic and content accuracy, no obvious errors are found in the AI-generated texts.

In the field of language teaching, ensuring the correctness

of texts is a fundamental requirement. Meanwhile, we must also pay attention to the language proficiency of learners. The difficulty level of textbook texts directly affects learners' understanding and absorption of linguistic content. Although Chinese+ courses integrate the characteristics of professional knowledge, they essentially retain the features of language teaching. Therefore, when compiling Chinese+ textbooks, the difficulty of the texts should follow the gradual progression rule of language learning to ensure that students can master the content smoothly. We used the reading difficulty grading system for Chinese as a second language constructed by Cheng Yong et al. to conduct a difficulty statistical analysis of the textbook texts [6](Table 1).

Table 1. Statistics on the difficulty of textbooks and AI conversations

	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7-9
textbook	4	12	4	0	0	0
AI	0	10	9	1	0	0

From the above figure, we can observe that the difficulty of the conversational texts in the textbook mainly concentrates on Level 3, with some involvement of Levels 2 and 4, while Levels 5 and above are not present. Overall, the difficulty of the conversational texts in the textbook is positioned at the primary level. The conversational texts generated by AI mainly fall into Levels 3 and 4, with one text even reaching Level 5, while no texts at Level 2 are included. The overall difficulty is higher compared to the textbook conversational texts.

The difficulty of the textbook conversational texts is mainly distributed between Levels 2 and 4. This difficulty

setting conforms to the regular teaching law, helping learners gradually improve their language skills in an orderly manner. Among all difficulty levels, the number of Level 3 texts is the largest. This difficulty level is suitable for most learners, ensuring both challenge in the learning process and avoiding excessive difficulty. The difficulty of AI-generated conversational texts mostly concentrates in the range of Levels 3 to 4, with no involvement of Level 2. This phenomenon stems from the characteristics of AI generation algorithms. When generating content, AI often expands according to specified requirements, leading to an increase in text complexity.

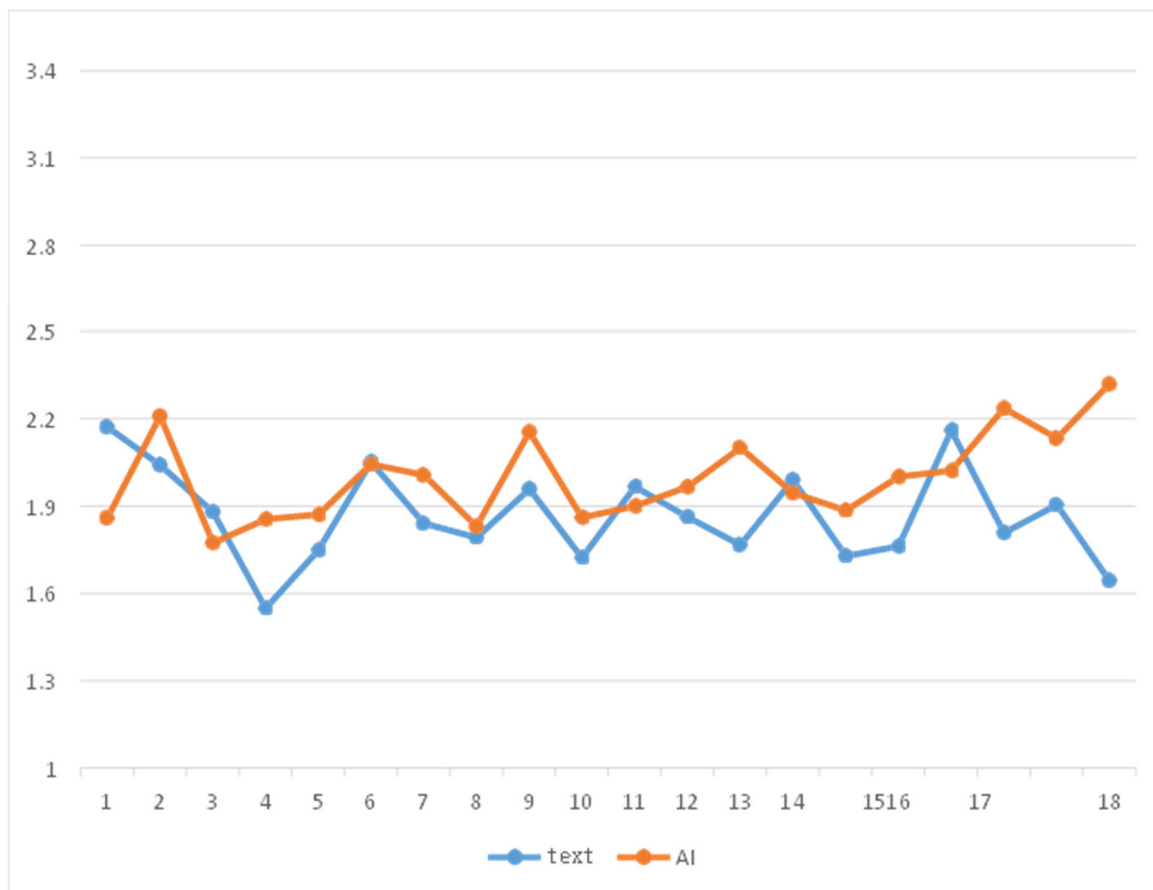


Figure 3. Comparison of the difficulty of the textbook and the AI conversation text

Through the application of text difficulty analysis tools, we conducted a comparative study on the 20 generated conversational texts and the textbook conversational texts. As shown in Figure 3, it is evident that the difficulty of AI-generated conversational texts and textbook conversational texts exhibits significant differences across different topics. For example, in the sixth conversation on “Cold,” the

difficulty of the AI-generated text is basically consistent with that of the textbook text; while in the 20th conversation on “Skin Scald,” the difficulty difference between the AI-generated text and the textbook text is more remarkable. Overall, the difficulty of AI-generated conversational texts generally exceeds 1.9, while the difficulty of textbook conversational texts remains at approximately 1.9.

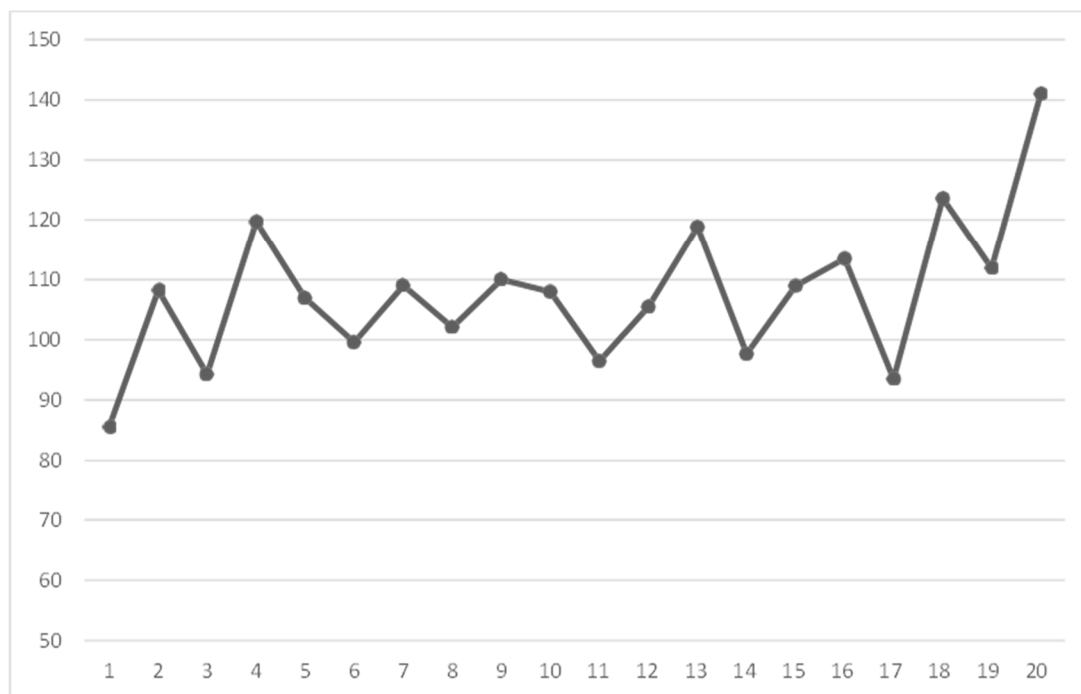


Figure 4. Conversational text AI vs. textbook difficulty

From the perspective of the difficulty ratio between AI-generated conversational texts and textbook conversational texts, although there are certain differences in difficulty, the overall fluctuation range of difficulty does not exceed $\pm 10\%$. Only in a few topics do the texts show phenomena of (lower than expected) or (higher than expected) difficulty.

The AI-generated conversational texts are logical in content and have a difficulty level close to that of existing textbook texts. Therefore, it is entirely feasible to use generative AI to create conversational texts for “Chinese+” textbooks. However, the difficulty of AI-generated conversational texts can vary significantly with different

topics. Therefore, teachers need to further revise these texts by deleting unnecessary expansions, classroom language, and modal particles.

2.2.2. Short Text Texts

Short text texts, as a key component of textbooks, play a significant role in enhancing learners' reading skills. *Practical Medical Chinese (Basic Edition)* arranges short text texts in each lesson, aiming to summarize the core theme of the lesson in text form, so that learners can master conversational communication practices while being exposed to corresponding reading materials.

Table 2. Statistical analysis of the difficulty of textbooks and AI essays

	Level 4	Level 5	Level 6	Level 7-9
textbook	0	0	4	6
AI	2	2	1	5

The short texts generated by AI are simpler in difficulty than those in the textbook. The difficulty of the latter generally remains at Level 6 or above, while AI-generated short texts include Level 4 and Level 5 texts (Table 2). The

short texts in Medical Chinese elaborate on a medical topic with concise language, incorporating numerous professional terms, which undoubtedly increases the difficulty of the short texts significantly.

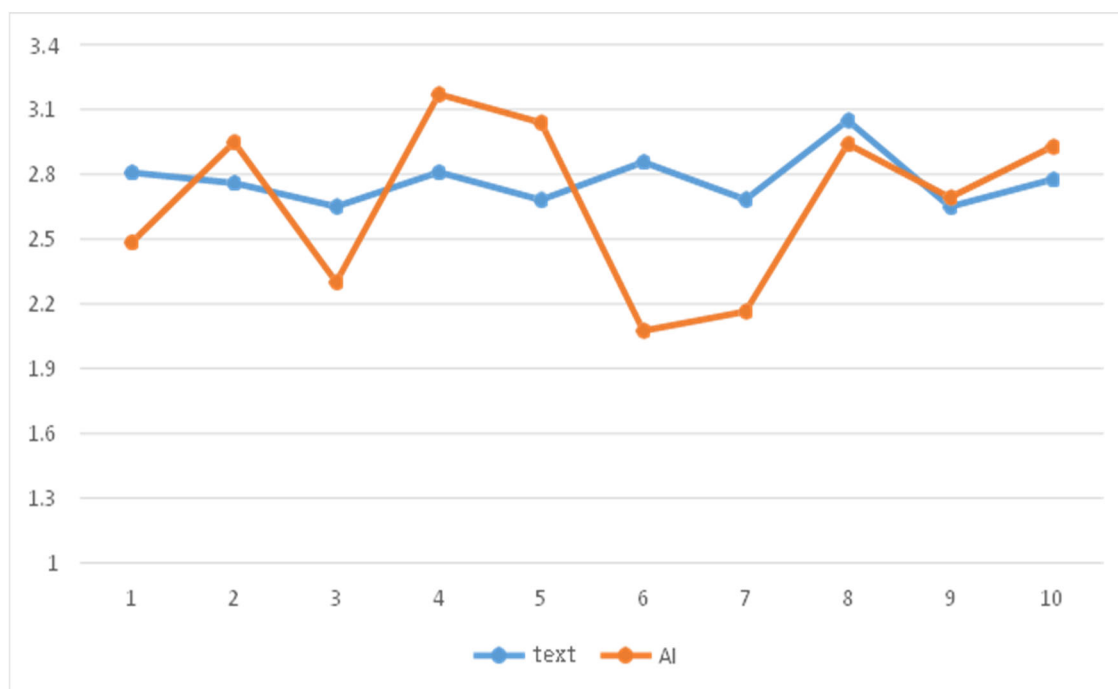


Figure 5. Comparison of the difficulty of the textbook and the AI essay text

In terms of the difficulty of short text texts, the AI-generated ones show drastic fluctuations, while the textbook texts have relatively gentle fluctuations. The overall difficulty

of the textbook short text texts is higher than that of the AI-generated ones. Although there are fluctuations, they are still within the range of 2.6 to 3.1.

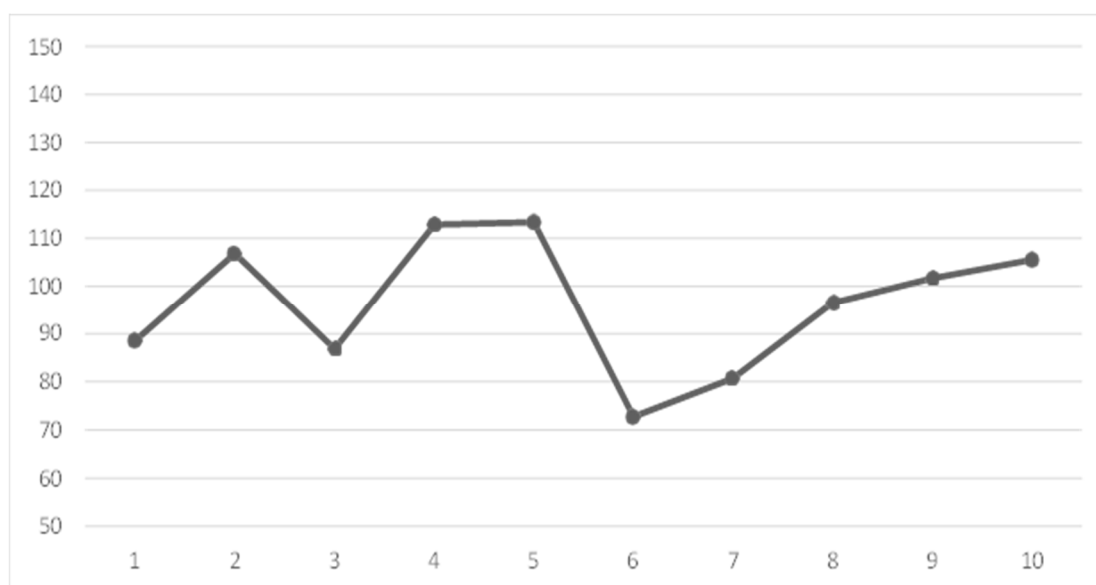


Figure 6. Ratio of the AI to the difficulty of the textbook

From the perspective of the difficulty ratio between AI-generated short text texts and textbook short text texts, the difficulty error between AI-generated short text texts and textbook texts is within $\pm 15\%$.

Due to the characteristics of Chinese textbooks, the relationship between text difficulty and textbook effectiveness is not a simple inverse one. The short text texts in Chinese+ textbooks contain a large number of professional terms (Levels 7-9), which are usually the focus of the course. We statistically analyzed the proportion of professional terms (Levels 7-9) in the number of word types. If the proportion is too low, it means the focus of the text deviates, and the effectiveness is no longer high.

2.3. Generative AI is applied to the analysis of the likelihood of textual writing

As an auxiliary tool, generative AI can help teachers quickly complete about 70% of the data collection work, and teachers can use the remaining 30% of their time to revise the text, greatly improving the productivity of teachers and learners. From the perspective of the working characteristics of generative AI, large-scale generative AI models have deep learning capabilities, and AI can accurately capture the user's feedback and optimize the generated text accordingly in the process of continuous training by users with different training paradigms. Therefore, in order to improve the effectiveness of AI-generated text, feedback can be provided to AI during

multiple training processes, and requirements can be expressed in more precise language, so that AI can generate more targeted text content. In addition, generative language large models rely on corpora to generate text, and users can build their own local corpora according to the textbook, and AI can learn the corresponding generative paradigm from the local corpus to produce more practical text content.

Overall, despite the current rapid development of generative AI, it still does not have the ability to fully simulate the human mind, and the text it generates still needs to be manually corrected by teachers. However, its convenience can still be used as an effective auxiliary tool for teachers and students.

3. Conclusion

Generative AI demonstrates broad application prospects and enormous potential in the compilation of “Chinese+” textbook texts. It brings new momentum and advantages to textbook writing, effectively assisting teachers in creating high-quality and targeted teaching materials, while also providing students with more learning resources and approaches.

However, we must also clearly recognize the potential challenges and risks it faces. In future development, we should fully leverage the advantages of generative AI, proactively address challenges, and achieve deep integration of generative AI with “Chinese+” textbook compilation through measures such as strengthening quality control, standardizing usage methods, and cultivating correct usage habits. This will promote continuous innovation in international Chinese education and contribute to cultivating more global talents with professional skills and Chinese

proficiency. Teachers should continuously enhance their digital literacy and educational capabilities, reasonably applying generative AI to better serve teaching practice. Students should also maintain awareness and ability for autonomous learning while using AI as an auxiliary tool, achieving comprehensive improvement of their overall qualities. It is believed that with the joint efforts of all parties, generative AI will play a more positive role in the field of “Chinese+” education.

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