

GPTalkMate: 外国語教育における大規模言語モデルの可能性と課題 GPTalkMate: Opportunities and challenges of large language models for foreign language education

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1. Introduction

Foreign language education plays a critical role in an increasingly interconnected world, where effective communication across language barriers is essential. With recent advancements in large language models such as ChatGPT, there is tremendous potential to transform foreign language teaching and learning methods. The powerful natural language generation ability of ChatGPT has attracted the attention of many scholars in the education field.

This paper discusses the opportunities and challenges of integrating large-scale language models into foreign language education, focusing on how ChatGPT can improve language learning, and proposes the design idea of GPTalkMate as an interactive language learning system.

2. A brief survey on LLMs and language learning

We screened several keywords related to this study to conduct a systematic search of relevant existing works. In doing so, we limited the technology to *large-scale language models* and *intelligent chat robots*, the function to *foreign language learning*, and the target learners to *international students*. Based on the relevant researches we searched, we summarized and analyzed the limitations of current foreign language learning environments, as well as the opportunities of new models for foreign language learning based on GPT.

2.1 Limitations of conventional approaches

Interactive foreign language learning is particularly important for international students who require comprehensive language skills to navigate their host countries. They need to immerse themselves in local life, engage in daily interactions, and conduct academic research in a foreign language, which demands practical skills in listening, speaking, reading, and writing. Conventional classroom exercises that are divorced from real-life problems or activities will not help learners use the target language [1]. Therefore, interactive language learning approach is vital to enhance the efficiency and proficiency of international students' language acquisition.

A supportive peer network can be important in promoting a positive experience and success in foreign language learning for international students [2]. However, due to the language barrier, it may be difficult for international students to socialize and make friends locally, which may lead to a lack of feedback during the learning process, resulting in anxiety in foreign language learning. Speech-related anxiety has a non-negligible negative impact on learners and foreign language users [3].

2.2 Opportunities of GPT in language learning

The most important benefits that large language models such as GPT bring to foreign language education include *authentic dialogue experience*, *personalized language learning*, *real-time feedback and guidance*, and *reduced language anxiety*.

2.2.1 Authentic dialogue experience

Due to GPT's powerful natural language generation capabilities, it is good at imitating human interaction, and can provide learners with an interactive conversational experience that is no different from talking with native speakers [4].

2.2.2 Personalized language learning

ChatGPT will advance the field of Personalized Learning and Personal Learning Environment [4]. GPT integrates massive learning materials and resources, and can generate personalized learning content according to the level and needs of learners, unlike traditional classrooms where everyone progresses at the same pace.

2.2.3 Real-time feedback and guidance

GPT can improve the independence and autonomy of self-study learners, and increase the motivation and participation of learners by providing personalized support, guidance and feedback [5]. Feedback can be provided instantly [4].

2.2.4 Reduce language anxiety

GPT helps to reduce learners' foreign language anxiety, change learners' mood, and thus actively improve learning efficiency. Conversational AI shows promising prospects in reducing language-related anxiety and learning inhibition [3]. Interaction with GPT may result in changes in learners' motivational affect and increased confidence in language use [4].

Although there are many commentaries about the use of AI, voice robots, and GPT in foreign language education, few studies have applied GPT's natural language generation and interaction capabilities to specific foreign language education practices. We thus propose to provide GPT-based specific learning support for listening, speaking, reading and writing in foreign language through the development of the GPTalkMate system.

3. GPTalkMate

We propose the GPTalkMate system, which offers interactive and personalized language learning experiences. The system focuses on improving listening, speaking, reading, and writing skills through interactive dialogues, personalized reading materials and writing guidance.

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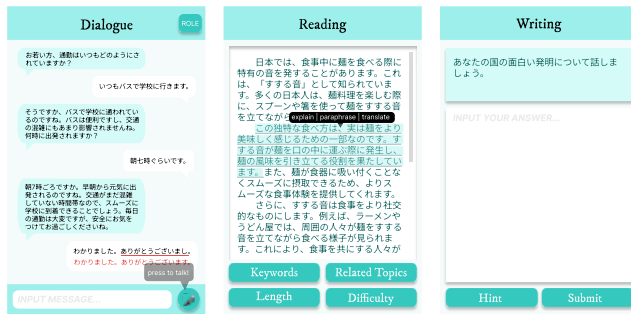


Figure 1 GPTalkMate system design

3.1 Listening and speaking

We exploit GPT's capability to provide interactive dialogues and state-of-the-art speech recognition and synthesis technologies to enable natural conversations between learners and GPTalkMate. Users can request GPT to switch different conversation partners according to their preferences and needs, such as teachers, classmates, children, the elderly so as to achieve the effect of dialogue practices with different people. Regarding the topic of the conversation, the user can raise the topic independently, or the GPT generate and initiate the conversation by inputting relevant keywords of the desired chat content. The user interface resembles instant messaging applications such as Line so that users have intimate conversations. Additionally, when the user does not know how to reply, GPTalkMate generates appropriate prompts based on previous conversations.

3.2 Reading

GPTalkMate generates personalized articles for users to read. The system can generate an article with or without the keywords or topics entered by the user. Users can choose the difficulty of reading vocabulary and the length of the article according to their own needs. For sentences or words that are difficult to understand, the user can request the system to explain/paraphrase/translate the text. After the reading is completed, the system generates one or two short questions along with some hints to help users better understand the content of the article. The system can recommend related topics based on the topics of the previous articles, thereby exposing learners to diverse cultural perspectives and help develop intercultural competence by simulating real-world scenarios and providing insights into different cultures.

3.3 Writing

In terms of writing practice, there are mainly two modes. One is the traditional composition (i.e., formal language writing). The system can generate topics with or without the keywords entered by the user. If there is no clear idea, the user can request the system to provide writing tips or a framework of ideas (such as a mind map), which can help users improve their writing ideas and optimize their writing experience. After submitting the completed article, the system checks and corrects grammatical errors. For some poorly written sentences or words, it provides higher-level example sentences and better vocabulary for user reference, thereby learning vocabulary and sentence-making methods. The system finally generates a complete reference example text, which helps users to learn and summarize experience by themselves.

The other is writing in daily communication. Users talk with GPT by typing, just like chatting in instant messaging apps. The user can select a chat character. The system points out grammatical mistakes and suggest better word and sentence choices.

4. Discussion

4.1 Mobile context-awareness

In future, GPTalkMate can be combined with mobile context perception to bring more realistic and interactive foreign language communication experience. Mobile context awareness can detect user behavior, perceive and understand the environment and situation in which the user is located, suggest context-related vocabulary, and consider context attributes such as the user's environment, geographic location, and native language [6]. For example, when a user goes out in summer, with the sun and the temperature rising, the mobile app automatically reminds the user, *"The temperature is 37 degrees Celsius now, pay attention to sun protection and hydration to avoid heatstroke."* In this way, GPTalkMate will provide an interaction method that simulates human behavior closely, allowing users to feel more like interacting with foreign friends in daily communication, optimizing the interactive foreign language learning experience, and improving learning efficiency and effectiveness.

4.2 Challenges and limitations

There are some challenges and limitations that have to be considered carefully in developing LLM-based learning support environments such as GPTalkMate. They include data privacy and security, model biases and accuracy, and proper support for user engagement and human interaction.

5. Conclusion

We have proposed to provide GPT-based specific learning support for listening, speaking, reading and writing in foreign language through the development of the GPTalkMate system. We believe that GPTalkMate has the potential to revolutionize foreign language education and empower students in foreign language learning.

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