The Investigation Related to the Role of ChatGPT in English Language Teaching

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Abstract: As Chat Generative Pre-trained Transformer (ChatGPT) undergoes continuous iteration and development, its impact on language learning is increasingly evident. This necessitates a comprehensive summary to understand this evolving influence. The study employed qualitative research methods to evaluate ChatGPT's influence on language learning across four areas: writing, reading, listening, and speaking. For writing, the investigation centered on determining whether ChatGPT effectively aids non-native English speakers in writing English papers. This involved exploring various aspects that ChatGPT can enhance. The study also sought to understand the potential challenges that may arise. The assessment of reading skills centered on ChatGPT's effectiveness in comprehension, particularly in breaking down complex texts and aiding summarization, alongside concerns about the depth and accuracy of its interpretations. The combined assessment of listening and speaking skills aimed to gauge ChatGPT's utility in oral communication. This included evaluating the potential of ChatGPT to aid in developing conversational abilities, understanding various accents, and enhancing fluency. The study revealed that ChatGPT significantly aids writing and reading, substantially improving structuring ideas and understanding complex texts. The combined listening and speaking skills assessment yielded less definitive results, primarily due to the relative novelty of this application area for ChatGPT. However, despite ChatGPT's effectiveness, it also raises concerns, including ethical issues, potential biases in training data, and challenges in interpretability. The study concludes that careful integration of ChatGPT is essential, and future research should focus on evaluating a range of Artificial Intelligence (AI) tools for language education.

1 INTRODUCTION

As of 2023, English dominates the global language landscape, with approximately 1.456 billion speakers worldwide (Dyvik 2023). It serves not only as a crucial medium for communication among diverse cultures but also as a gateway to vast opportunities in education, business, and everyday life. Consequently, numerous non-native English speakers embark on their English learning journey each year. Achieving proficiency involves overcoming challenges such as complex grammar, extensive vocabulary, and cultural differences from their native language. The variety of accents and dialects further complicates mastering listening and speaking skills. Many works, including (Tambuskar 2022), have highlighted AI's role in tailoring content to individual learning styles and needs. This innovation enables more efficient English comprehension and bridges cultural and linguistic gaps, providing a customized and practical learning experience.

The term "Artificial Intelligence" surfaced in the 1950s (McCorduck et al 1977), signifying the field's birth. Initially focusing on basic problem-solving and computational tasks, AI's scope expanded dramatically in the 1990s, spurred by the internet and computational advancements, heralding the era of machine learning. This evolution culminated in one of the most significant recent advancements: the Transformer model. Introduced as a game-changer in AI, particularly for Natural Language Processing (NLP) (Kalyan et al 2021), its innovative language processing approach laid the foundation for advanced AI applications. A notable example is Chat Generative Pre-trained Transformer (ChatGPT) (Kocoń et al 2023), developed by OpenAI.

ChatGPT, leveraging NLP, Supervised Learning, and Reinforcement Learning (Roumeliotis and Tselikas 2023), integrates these techniques to refine

its language responses based on user interactions, establishing itself as a versatile AI tool. Since its inception, ChatGPT has achieved rapid growth and adoption in fields like accounting, human resources, education, and health care (Fui-Hoon Nah et al 2023). Its transformative impact in education is pronounced, enhancing grammar accuracy, expanding vocabulary (Hong 2023), and boosting learner engagement and motivation (Zhai 2022). Considering its rapid advancement and significant impact on English language learning, a comprehensive evaluation of ChatGPT in the educational sector is essential. This review should not only gauge its effectiveness in language skill enhancement but also explore its potential to modify teaching methods. Understanding these aspects is crucial to comprehending ChatGPT's role in reshaping English language learning.

The remainder of the chapter is organized as follows: Section 2 delves into the methodology employed in this study, examining the approach and tools used to assess ChatGPT's impact. Section 3 presents a discussion of the findings, analysing how ChatGPT influences English language learning and its implications in the educational landscape. Finally, Section 4 concludes the paper, summarizing the key insights and suggesting directions for future research.

2 METHODS

2.1 The Introduction of ChatGPT

ChatGPT, a product of OpenAI's extensive research in artificial intelligence, represents a significant leap in AI, particularly in natural language processing. The core idea behind ChatGPT is to create a system that can understand and generate human-like text based on a given prompt, making interactions with machines as natural and intuitive as talking to a human. At its heart, ChatGPT is designed around the principle of understanding context and generating responses that are not only relevant but also coherent and contextually appropriate. This involves a deep understanding of language syntax, semantics, and pragmatics (Ray 2023).

The technical framework of ChatGPT is built upon the revolutionary Generative Pretrained Transformer (GPT) architecture (Zhavoronkov 2022). This involves training the AI on a massive corpus of text data, enabling it to learn patterns, nuances, and the structure of human language. The model is then fine-tuned to generate accurate, informative, and contextually relevant responses to the user's input.

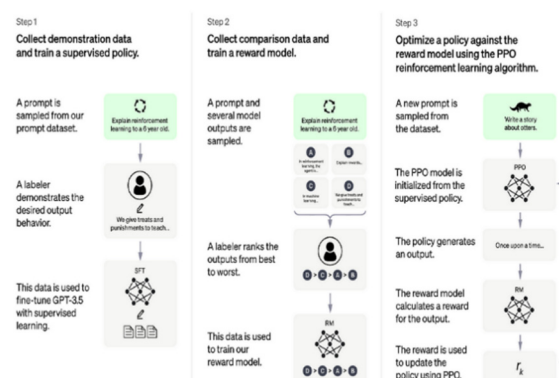The procedure of ChatGPT is illustrated in Fig. 1 (Medium 2022).

Figure 1: The working procedure of ChatGPT.

2.2 The Investigation of ChatGPT on Writing

The integration of ChatGPT into language learning has revolutionized how writing skills are developed. As an advanced AI tool, ChatGPT offers substantial assistance in enhancing various aspects of English writing, such as grammar and syntax improvement, revision, translation, and idea generation (Imran and Almusharraf 2023).

Numerous studies, such as Schmidt-Fajlik' study (2023), demonstrated that ChatGPT is an ideal tool for non-native English speakers to write English papers. Despite its conveniences, many problems and challenges still exist when using ChatGPT for essay writing. One significant concern is the reliance on AI for language construction, which might lead to a lack of deep understanding and originality in the learners' writing (Ningrum 2023). While ChatGPT can assist with structure and grammar, overdependence on AI tools could hinder the development of learners' writing skills and critical thinking abilities.

Another problem is the ethical challenges. ChatGPT is trained on a vast text corpus of existing data, including published materials. Therefore, when generating texts, ChatGPT may produce outputs that closely resemble or inadvertently include excerpts from articles published by other researchers (Li et al 2023). This becomes a critical issue in academic settings, where plagiarism and the unauthorized use of copyrighted materials are taken very seriously.

Moreover, there is a concern about accuracy. As mentioned previously, since ChatGPT is trained on existing data, it may occasionally process and use poor-quality datasets. This reliance on pre-existing data can be particularly problematic in fields that

require high levels of precision, such as medical education and clinical study (Jeyaraman et al 2023). In these areas, the accuracy of information is not just a matter of academic integrity but also of utmost importance for patient safety and effective healthcare practices.

2.3 The Investigation of ChatGPT on Reading

The application of ChatGPT in enhancing reading comprehension skills offers a new dimension to language learning. ChatGPT's ability to analyse and summarize text gives learners a unique tool to deepen their understanding of complex reading materials.

The study of Chui (2023) and Young (2023) shows that ChatGPT aids in breaking down challenging texts, explaining complex concepts, summarizing long passages, and rephrasing them. This mainly benefits non-native English speakers struggling with nuanced or dense academic texts. The AI's capacity to clarify and elucidate content helps improve comprehension and retention. ChatGPT also can condense long passages into shorter summaries while retaining the essential information and themes. This text summarization feature is handy for learners dealing with extensive reading materials and improves learners' verbal ability (Hadwin et al 1999).

However, ChatGPT and similar systems in reading comprehension have their challenges. For example, they often encounter issues such as hallucination and inaccuracies (Zhang et al 2023), where the generated content may only sometimes be factually correct or relevant. Imperfect evaluations are another concern (Zhang et al 2023), as these systems are typically optimized and assessed using reference summaries that might not accurately capture the quality of the generated content. Additionally, they need more controllability (Zhang et al 2023), providing only generic summaries instead of customizable ones tailored to specific user needs or queries.

2.4 The Investigation of ChatGPT on Listening and Speaking

On September 25, 2023, OpenAI introduced a significant update to ChatGPT, equipping it with the ability to speak and listen. This advancement has opened new possibilities for practicing speaking and listening skills. However, the effectiveness of ChatGPT in enhancing these abilities is still a novel concept, with only a limited number of studies currently available to validate its impact on improving learners' speaking and listening proficiency.

From the insights provided in Young and Shishido's study (2023), it is evident that ChatGPT has potential in this realm. This research highlights ChatGPT's ability to engage learners in realistic dialogues. This feature is particularly beneficial for practicing conversational skills, as it allows learners to experience and respond to spoken English in various contexts, enhancing their speaking and listening abilities. The AI's capacity to understand and respond to voice inputs means that learners can receive immediate and interactive feedback on their pronunciation, fluency, and usage, which is crucial for developing practical speaking skills.

Moreover, as explored in the study (Xing 2023), integrating ChatGPT with convolutional neural network models presents a promising approach for enhancing English listening skills. By engaging in real-time conversations with AI-driven systems, learners can actively practice their listening comprehension, getting exposed to various accents, speech patterns, and vocabularies. This immersive experience helps them become more familiar with natural English language usage, significantly improving their listening capabilities.

3 DISCUSSION

The application of ChatGPT in English language learning has shown transformative impacts, particularly in enhancing reading and writing skills. ChatGPT's advanced NLP capabilities have significantly improved comprehension, grammar accuracy, vocabulary expansion, and idea generation for language learning. The AI's proficiency in analyzing and summarizing text has made it a valuable tool for non-native English speakers grappling with complex academic texts. ChatGPT's assistance in structure, grammar, and even creative idea generation has proven a significant boon in writing. Yet, the impact of ChatGPT on listening and speaking skills remains an emerging area of study. While the recent update enabling ChatGPT to speak, and listen has opened new possibilities for its application in these areas, concrete studies and extensive research to substantiate its effectiveness still need to be completed. Early indications suggest potential, but more empirical evidence is needed to confirm its benefits in improving speaking and listening proficiency.

Despite these advancements, there are significant concerns about ChatGPT's application to language

learning. While ChatGPT has shown proficiency in aiding with English writing, over-reliance on it can impede the development of writing skills. It is recommended to use ChatGPT primarily as a tool for refining and enhancing language skills rather than as the primary avenue for content creation. Ethical concerns also arise, especially regarding ensuring the originality of content and preventing plagiarism. Establishing clear guidelines and educating learners about the importance of originality in their work is crucial. Incorporating plagiarism detection tools and emphasizing the ethical aspects of academic integrity can help mitigate this risk. Given ChatGPT's reliance on vast datasets, inaccuracies can be a concern. Learners should be taught to verify AI suggestions against trusted sources, especially when precision is critical.

ChatGPT and other similar large language models also have limitations that could affect language learning. A fundamental limitation is the lack of interpretability in ChatGPT's responses (Rimban 2023). In language learning, understanding the reasoning behind specific linguistic choices is crucial. Learners need clarity on why specific phrases or structures are used to grasp important language rules or cultural nuances. For instance, when ChatGPT generates a complex sentence structure, learners may need help understanding the grammatical rules applied, leading to potential misunderstandings. Moreover, due to privacy constraints surrounding ChatGPT's training database, verifying the absence of biased data in its training materials becomes challenging. These biases can significantly impact ChatGPT's language outputs. When language learners interact with ChatGPT, they may encounter responses that reflect unbalanced or skewed language use. This issue becomes especially critical when learners try to understand and use cultural nuances, colloquial expressions, or diverse dialects. Without transparency in the training data, it is difficult to ensure that learners are exposed to a broad and unbiased linguistic spectrum.

The future of ChatGPT and similar AI tools in language learning is promising but requires careful navigation. As technology evolves, it can be anticipated more sophisticated AI models capable of providing more nuanced and culturally aware language learning experiences. Continued research and development, ethical guidelines, and educational best practices will be vital to unlocking the full potential of AI in language education.

4 CONCLUSION

The study undertaken here assessed ChatGPT's effectiveness in addressing these challenges across four critical aspects of language learning: reading, writing, listening, and speaking. While ChatGPT has shown notable proficiency in improving reading and writing skills through its advanced NLP capabilities, its impact on listening and speaking skills requires further exploration and empirical validation. Given the concerns identified, such as over-reliance issues and ethical concerns, it becomes evident that ChatGPT should be regarded as a secondary learning tool in language education. These concerns underscore the need for a balanced approach, where traditional learning methods are complemented, not replaced, by AI assistance.

This study only focuses on the effectiveness of ChatGPT. However, it is crucial to recognize that numerous other tools, such as Grammarly and Rosetta Stone, are available for English language learning, each offering different approaches and capabilities. While not covered in this study, these tools also play a significant role in the landscape of language learning. Future research plans include expanding the scope to compare ChatGPT with these and other educational tools to evaluate their effectiveness in enhancing various aspects of English language learning more comprehensively. Such comparative studies will contribute to a broader understanding of the optimal use of technology in English language education.

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