DeepSeek and Grok in the Spotlight After ChatGPT in English Education: A Review Study

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Abstract

As artificial intelligence (AI) continues to evolve, its potential influence on language teaching and learning is increasingly evident. This paper attempts to describe the advances and applications of three large language models: ChatGPT, DeepSeek, and Grok. Understanding these models enhances language teaching and learning. ChatGPT is a widely used natural language processing tool that offers significant benefits in lesson planning, personalized learning, and resource generation, despite challenges related to ethics and information accuracy. DeepSeek, a newer AI model, excels in context-driven error detection and technical tasks such as logical reasoning and coding, presenting a cost-effective and open-source alternative to ChatGPT. It is distinguished by clear and imaginative explanations, making complex topics accessible to learners. Grok, although recently introduced, shows promise in complementing the strengths of ChatGPT and DeepSeek. It excels in creative engaging content and storytelling, which can make learning more enjoyable and impactful. These three chatbots highlight the potential of integrating these AI models to create more effective, engaging, and personalized learning experiences. Future research should focus on exploring innovative applications and addressing the limitations of these AI tools to enhance their impact on English education further.

Keywords: AI, ChatGPT, DeepSeek, Grok 3, English Education

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Introduction

Recent advances in artificial intelligence (AI) have positioned DeepSeek and Grok 3 as strong competitors, following in the footsteps of ChatGPT. Over the last five years alone, applications of AI have evolved at a breathtaking pace (Han, 2024), and the evolution is unstoppable. So far, most studies have extensively focused on ChatGPT, with the majority highlighting its benefits. For instance, Al-Abri (2025) explored various dimensions of large language models, particularly their ability to provide academic support. The author discusses the strengths and limitations of using ChatGPT for tutoring, including its effectiveness in answering questions, providing explanations, and engaging students in interactive learning. The study also examines the impact of ChatGPT on student performance and satisfaction, suggesting that while it offers valuable support, there are areas that require further improvement to enhance its educational utility. Similarly, Arani (2024) argued that integrating AI into language education would improve learner engagement, motivation, and outcomes. The authors provide a conceptual review of the role of AI in personalized language learning. It examines how AI technologies, such as chatbots and adaptive learning systems, can enhance language learning by offering tailored educational experiences. The review discusses various AI applications, their benefits, and potential challenges in implementing personalized learning.

ChatGPT is now losing ground as the two newly introduced tools called DeepSeek and Grok 3, among others in 2025, have gained momentum, giving way to more research to explore the merits and demerits of the newly born tools. These AI models, building on the ChatGPT and its like Copilot and Gemini (Al-Kadi & Ali, 2024), have the potential to transform English education, making it important to compare their effectiveness. Since the introduction of DeepSeek and Grok in early 2025, research on these two chatbots is still in its infancy. This current literature review is necessary as it lays the groundwork for further research on these newer models. Analyzing the competitive landscape helps stakeholders make informed decisions about adopting AI technologies. These points highlight the importance of this literature review in understanding the current state and future potential of these AI models.

This paper provides an overview of three influential AI chatbots, ChatGPT, DeepSeek, and Grok 3, insofar as their use and effects in English education are conceded. It brings to light how these platforms are taking the central stage in English education. The overriding question driving this review is: What's next for English education? This study is not just about technology, it's about the future of learning, ensuring that educators and students alike are prepared to thrive in an increasingly AI-integrated world. The importance of this literature review lies in its exploration of the evolving role of AI, specifically DeepSeek and Grok, in the landscape of English education following ChatGPT.

Following Pati and Lorusso's (2017) guidelines for writing a literature review, this paper is structured around key steps: defining research questions, selecting relevant studies, and analyzing findings systematically. This framework aims to help translate evidence into actionable insights for improving research and practice of AI models in English education in contexts where it is taught and learned as a second or foreign language.

LLMs in English Education

The use of AI in modern language teaching and learning is inevitable, as it not only assists learners in overcoming the difficulties they encounter during the learning process but also helps them achieve fluency in the target language. Many researchers have emphasized the importance of implementing AI in language teaching and learning (see Al-Raimi et al., 2024; Al-Saiari et al., 2024; Yamauchi, 2009). Al-Raimi et al. (2024) stated that the application of AI in language teaching and learning settings has greatly impacted the teaching and learning process, resulting in learners' better mastery of productive skills. Furthermore, Yamauchi (2009) and Mayora (2006) found that the integration of technology in the English as a Foreign Language (EFL) context can be used effectively to meet the different learning needs of students, motivate them and enhance their language achievement.

Recently, unprecedented innovations in AI have led to the integration of generative AI tools, such as ChatGPT and DeepSeek, in language learning and teaching. The newest

enhancement to the AI family is DeepSeek, which has recently come into the stage and holds great promise for pure text generation, analysis, and context-dependent language modeling capabilities. The AI system DeepSeek can handle a variety of tasks, including image search, vision-language understanding, theorem proving, and large language modeling. The initial application of DeepSeek relied on deep learning for content-based image retrieval using natural language queries (Piplani & Bamman, 2018). The significant potential of these AI-based tools is the capabilities they have bestowed on language teaching and learning for learners and teachers, not only to generate ideas but also to create useful content and learning materials such as texts, audio, videos, etc.

Research has focused on the role of generative AI in the learning process. Young and Shishido (2023) and Yang et al. (2022) found that AI chatbots can engage learners in dialogues if conversational materials are generated well. According to Klímová and Ibna Seraj (2023), these tools improve the learning process as they attract learners and make them encounter real language. On the other side, Albuhairy and Algaraady (2025) compared DeepSeek and ChatGPT for the task of identifying L2 acquisition errors from adult learners, specifically South Asian Arabic learners. The findings of the study showed that DeepSeek is more accurate in context-driven error detection than ChatGPT but provides less detailed feedback. However, both models needed fine-tuned prompts for semantic/pragmatic errors. The results of the current study suggest that AI tools can be integrated into L2 pedagogy for scalable solutions for adult L2 learners.

Employing AI in English can mitigate challenges that learners encounter in their learning. Due to its potential to enhance the effectiveness of language learning processes, existing AI-powered language learning tools offer personalized learning experiences, which are tailored to the specific needs of the student. Furthermore, these tools can give instant feedback on the student's performance, thus helping the student identify the areas that need improvement and focus on them (SumaKul et al., 2022; Al-khresheh, 2024).

ChatGPT

ChatGPT represents a potentially transformative development in language teaching and learning. As an extensive language model, it can generate human-like text based on the given input that is received (Mohammed et al., 2023). Language instructors have used it as an AI-powered chatbot for various purposes and functions in language learning (Bin-Hady et al., 2024). It generates information more conversationally, assimilates knowledge from those interactions, and subsequently delivers increasingly customized responses (Javaid et al., 2023). With its potential benefits, it has fast become a popular AI tool for teachers and students. It helps teachers organize lessons by providing unique ideas for assignments, activities, grammar exercises, and vocabulary practice (Alkadi & Ali, 2024), as well as sample conversations and reading passages targeted to their student's specific needs (Ali, et al., 2023; Bin-Hady, et al., 2023; Diep & Dang, 2025).

According to Huang et al. (2022), ChatGPT is regarded as a supporting and professional development tool that offers suggestions to teachers regarding appropriate lesson plans and instructional tactics. These teaching strategies are based on the most effective practices in language education. Octavio et al. (2024) claim that ChatGPT can help teachers with lesson planning by offering original lesson subject ideas, relevant resources, and recommended activities for worksheets, quizzes, and grammar and vocabulary exercises. Additionally, ChatGPT gives cultural insights, lesson plan suggestions, and new vocabulary terms and phrases suitable for different skill levels. As a result, those researchers verified that ChatGPT may save teachers time by automatically generating instructional duties, including administration and assessment.

Educationally speaking, ChatGPT has the potential to facilitate personalized learning and individualized learning environments through its extensive data resources. Educators can leverage ChatGPT for tailored support and guidance aligned with their specific needs and learning preferences. The program is designed to provide a personalized learning experience by adapting to diverse levels of knowledge, pacing, and individual preferences (Mosaiyebzadeh et al., 2023). ChatGPT provides educators with access to diverse learning

resources, thereby enhancing the educational experience. Educators can utilize ChatGPT as a repository of knowledge to access educational materials and explanations. Additionally, it can suggest pertinent articles, videos, and interactive content to enhance student learning beyond conventional classroom hours (Qadir, 2022).

ChatGPT serves as a valuable resource for lesson planning across diverse educational sectors. For new teachers with limited pedagogical skills and experience, ChatGPT can be helpful. ChatGPT offers recommendations for lesson topics, subtopics, and learning objectives aligned with the curriculum or subject areas. It provides suggestions for interactive activities, discussions, and resources to improve lesson content. It can also recommend teaching resources, including textbooks, articles, videos, and interactive tools that are aligned with the lesson content. It can recommend additional resources to enhance students' learning experiences (Farrokhnia et al., 2023). ChatGPT can automate the generation of assessment items for evaluating student work and delivering feedback. Creating assessment items in this manner would conserve educators' time and effort. Furthermore, it is essential to ensure that the assessment items are congruent with the standards to enhance their quality. Educators can utilize it to assess written assignments, offer constructive feedback, and recommend improvements (Zhai, 2023; Almegren, et al., 2024). The use of ChatGPT offers several advantages that are enjoyed by both instructors and students alike. For example, ChatGPT is an AI tool that may be used to support inquiries. It can be utilized by both teachers and students to seek clarification, acquire additional explanations, or investigate additional resources that are linked to their teaching and learning goals. As a matter of fact, ChatGPT has the potential to work as a resource that is easily accessible, allowing users to immediately resolve their questions and thereby fostering self-directed learning (Haleem et al., 2022).

ChatGPT is designed to engage in coherent and natural contexts (Gupta, 2024). It is based on the Generative Pre-Trained Transformer manner, which uses a modernizer neural network to process and generate texts (Sarode & Bhamare, 2023). The model has been pre-trained on a vast amount of internet text data, including articles, books, and websites, enabling it to understand language patterns and generate contextually accurate responses (Gupta, 2024; Sarode & Bhamare, 2023). ChatGPT is tuned using supervised machine learning and reinforcement learning techniques, allowing for autonomous language conversation generation (Bahrini et al., 2023). It has applications in various fields, in customer service, virtual assistants, and education (Bahraini et al., 2023; Gupta, 2024). While ChatGPT demonstrates exceptional ability in generating natural-sounding responses, it lacks the level of understanding, creativity, and empathy of humans and cannot fully replace humans in most situations (Bahrini et al., 2023).

Although ChatGPT provides a multitude of benefits, there are also problems associated with its utilization as a tool for educational and research purposes. Concerns have been raised over ChatGPT's capacity to generate texts that resemble those written by humans on some tasks, especially those that require high-level cognitive abilities (Dis et al., 2023). Numerous studies have emphasized the potential drawbacks associated with ChatGPT, primarily concerning issues in ethics, information bias, and the provision of information low quality (Cooper, 2023; Gill & Kaur, 2023; Meyer et al., 2023; Tenhundfeld & ChatGPT, 2023; Zhu et al., 2023). Tenhundfeld and ChatGPT (2023) also noted that outputs produced by ChatGPT were deficient in accurate in-text citations, which is both a constraint and a potential safeguard against the unrestricted use of AI to generate academic passages. For instance, in the context of Spanish as an FL education, Román-Mendoza (2023) highlights the existence of inaccuracies in certain ChatGPT responses.

DeepSeek

DeepSeek AI, a Chinese startup, has emerged as a rival in the AI landscape, challenging the power of Western technological giants (Brown, 2024). The efficiency and innovation of this open-source AI model are remarkable, and it poses a challenge to the dominance of Western tech titans such as Microsoft, Meta, Google, and OpenAI. DeepSeek AI is a Chinese AI company that emerged from High-Flyer, focusing on advancing AI research beyond financial applications. It has disrupted the closed-source dominance of Western genAI giants

by introducing open-source tools like DeepSeek Coder and models like DeepSeek LLM and DeepSeek-V2. The company's strategic acquisitions and pricing strategies have enabled it to achieve profitability and position itself as a formidable player in AI development (Sallam et al., 2025). DeepSeek AI consists of DeepSeek V3 and DeepSeek R1. DeepSeek V3 is more cost-effective and efficient for large-scale processing tasks while DeepSeek excels in reasoning and logical tasks due to its RL-first training approach. DeepSeek R1 is better suited for niche coding tasks and provides faster and more accurate results in tasks like prime factorization. DeepSeek V3, on the other hand, is better for content generation, multilingual translation, and real-time chatbot responses. Users should carefully assess their requirements to choose the most suitable AI model for their needs (Analytics Vidhya, 2025).

DeepSeek and Grok 3 have just launched, and more research is needed to showcase how these newly introduced AI-driven tools work, compared to ChatGPT. Albuhairy and Algaraady (2025) compare the performance of DeepSeek and ChatGPT in various linguistic areas, highlighting their complementary strengths. DeepSeek was noted for its focus on rule-governed language errors, while ChatGPT excels in contextual and communicative effects. Both models have complementary strengths. More empirical evidence is required to enhance the proclaims that DeepSeek outperforms ChatGPT in technical tasks such as logical reasoning, coding, and solving mathematical problems. Users have reported more satisfactory outputs from DeepSeek for these types of inquiries compared to ChatGPT, which excels in conversational and creative contexts. Jagran Josh (2025) and Mashable India (2025) maintain that DeepSeek is more affordable than ChatGPT, with pricing starting at $0.14 per million tokens, making it a cost-effective option for users and developers alike.

The architecture of DeepSeek places a high priority on performance efficiency, as seen by the fact that it achieves highly successful benchmark results in areas such as language interpretation and code creation. In addition, the open-source nature of many DeepSeek models enables better transparency, community interaction, and customization. This might result in faster advances and more specific applications when compared to the closed-source approach that ChatGPT takes. Furthermore, DeepSeek's emphasis on democratizing AI might enable a wider variety of users and developers to contribute to the evolution of technology. This would result in the development of an ecosystem that is more varied and inventive than the one that is now connected with ChatGPT (Sallam et al., 2025).

Grok 3

Grok is an AI chatbot developed by xAI, Elon Musk's AI company, that exemplifies an innovative method in conversational AI by prioritizing real-time data processing, humor-laden conversations, and sophisticated mathematical reasoning (Wangsa et al., 2024). In contrast to established models like ChatGPT and Bard, which emphasize structured knowledge retrieval and general dialogue, Grok aims to distinguish itself by facilitating dynamic and socially interactive conversations, especially through its incorporation of real-time social media insights. This feature establishes Grok as a potentially formidable instrument for real-time, data-driven decision-making and interactive participation. Nonetheless, despite its potential, Grok remains in its nascent developmental phase, exhibiting numerous constraints that hinder its efficacy. A key limitation is accessibility, as it is presently available solely to X premium users, so it constrains its acceptance among a wider audience.

Moreover, although it demonstrates proficiency in mathematical problem-solving and reasoning, its general knowledge abilities are somewhat restricted, rendering it less dependable in extensive informational tasks than its rivals. Moreover, Grok has been recognized for potential biases in its responses, a difficulty prevalent throughout AI language models, however particularly troubling due to its integration with real-time and user-generated content. Notwithstanding these obstacles, Grok's swift advancement—from its original 33 billion parameters to 314 billion in subsequent iterations—exemplifies considerable promise for enhanced computational reasoning and interactive AI applications. Future advancements are anticipated to concentrate on improving real-time data analysis capabilities, broadening its knowledge scope beyond mathematics and social media information, and increasing accessibility for a larger audience. If effectively refined, Grok may become a

formidable alternative in AI-driven dialogue systems, especially for applications necessitating prompt, context-sensitive responses and engaging conversational interactions (Wangsa et al., 2024).

Recently, studies have attempted to explore the fascinating concept of "grokking" in neural networks, which refers to a model's ability to generalize effectively even when it looks like it is overfitting. One significant method to enhance grokking is the Grokfast algorithm, which boosts the slower-changing parts of gradients for faster generalization (Lee et al., 2024). Research has revealed how various factors influence grokking behavior, including the amount of training data, the model's architecture, and the optimization methods used (Qiye et al., 2024). Moreover, different theories have been proposed to explain grokking, such as the notion that structured representations develop throughout the training process (Liu et al., 2022). It has been observed that the learning journey comprises four stages: comprehension, grokking, memorization, and confusion. Interestingly, representation learning tends to take place in what is termed the "Goldilocks zone", where there is an essential spot between memorization and confusion (Liu et al., 2022).

Implications

The integration of AI models like ChatGPT, DeepSeek, and Grok 3 can significantly enhance educational practices. ChatGPT, widely used for natural language processing, offers substantial benefits in lesson planning, personalized learning, and resource generation, despite challenges related to ethics and information accuracy. DeepSeek, as a newer AI model, excels in context-driven error detection and technical tasks such as logical reasoning and coding. It presents a cost-effective and open-source alternative to ChatGPT, making advanced AI tools more accessible to educational institutions with limited budgets. The Grok 3 model, although recently introduced, shows promise in complementing the strengths of ChatGPT and DeepSeek. Its integration can lead to more comprehensive and effective AI-driven educational tools. Understanding and utilizing these AI models can create more effective, engaging, and personalized learning experiences. This can lead to better student outcomes and a more tailored educational approach.

When it comes to ethics, the more tools, the more ethical concerns. All three tools, however, present ethical issues related to plagiarism and excessive dependence, potentially impeding students' critical thinking and writing skills (Mohamed, 2024). To optimize the advantages of AI in English education, educators ought to incorporate these technologies as supplementary resources, ensuring that students verify AI-generated content against credible sources while enhancing their analytical and critical thinking abilities (Kristiawan et al., 2024).

Conclusion

As AI continues to evolve, its potential to revolutionize language teaching and learning becomes increasingly evident, paving the way for a more dynamic and responsive educational environment. AI tools ChatGPT, DeepSeek, and Grok AI significantly contribute to language learning, writing assistance, and academic research within language education. These tools provide tailored learning experiences, immediate feedback, and increased engagement, especially in writing proficiency and pronunciation enhancement (Kristiawan et al.,2024). Nonetheless, they pose various challenges, particularly concerning accuracy, as AI-generated content may include factual inaccuracies or misleading information, potentially hindering students' comprehension of linguistic concepts (Jegede, 2024). A further limitation is the absence of adequate citation mechanisms, which hinders learners' ability to verify sources and engage in responsible academic writing (Kristiawan et al., 2024). AI-generated content may exhibit biases in language, cultural perspectives, and ideological viewpoints, thereby affecting students' interpretations of texts (Amin, 2023). ChatGPT is recognized for its sophisticated text generation capabilities, whereas DeepSeek AI emphasizes logical reasoning, which enhances its utility for structured writing tasks. Additionally, Grok AI provides real-time data access, delivering timely and contextualized information (Tolstykh & Oshchepkova, 2024).

This paper offers numerous research topics that could inspire future investigations. Exploring the ethical challenges and considerations of using AI in education, such as data

privacy, bias, and the accuracy of AI-generated content, is crucial. Comparative studies on the effectiveness of ChatGPT, DeepSeek, and Grok 3 in various educational settings and subjects, especially in diverse cultural and linguistic contexts, warrant exploration to identify potential challenges and solutions. Additionally, examining the integration of AI in curriculum design and its impact on learning design and development, assessing both benefits and drawbacks, is essential. Future researchers might also study the role of AI in teacher training programs, focusing on how AI can support professional development and enhance teaching practices. Above all, conducting long-term studies to assess the impact of AI integration on student learning outcomes and academic achievement is vital. These topics can help further understand the potential and limitations of AI in education, paving the way for more effective and ethical use of AI in teaching and learning.

Disclosure Statement:

We (the authors of this paper) hereby declare that research ethics and citing principles have been considered in all the stages of this paper. I take full responsibility for the content of the paper in case of dispute.

Conflict of interest:

I know of no conflict of interest associated with this publication.

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