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EDUCATORS' PERSPECTIVES ON DEEPSEEK IN ELT: A QUALITATIVE CASE STUDY OF PEDAGOGICAL POTENTIALS AND PITFALLS IN CHINESE HIGHER EDUCATION

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ABSTRACT

Aim/Purpose	This study aimed to investigate the perspectives of English Language Teaching (ELT) educators on DeepSeek, emphasizing its pedagogical value, practical challenges, and instructional potential in higher education.
Background	The integration of artificial intelligence (AI) in ELT is reshaping instructional practices globally, particularly in response to rapid technological advancements and shifts toward digital and student-centered learning. In China, these transformations have been accelerated by national education reforms, globalization, and the COVID-19 pandemic, prompting a reconfiguration of teaching approaches through online, blended, and AI-supported modalities. AI tools, including writing assistants and speech recognition systems, have begun to enhance learner autonomy, engagement, and performance by providing real-time, personalized feedback. Among these tools, DeepSeek has emerged as a promising platform that combines advanced information retrieval and generative capabilities, supporting lesson planning, content development, and academic writing. This paper explores how ELT educators in higher education perceive and apply DeepSeek in their teaching, with a focus on its pedagogical benefits, practical challenges, and instructional potential.

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Methodology	This study examined a qualitative approach to ELT educators' perspectives on the benefits, challenges, and instructional potential of integrating DeepSeek into higher education in China. Using purposive sampling, data were collected through open-ended questionnaires from 12 ELT educators at a public Chinese university where DeepSeek has been implemented across academic and administrative functions. Thematic analysis was conducted to examine patterns in participants' responses across three phases of implementation involving before, during, and after classroom use, to provide an in-depth understanding of DeepSeek's pedagogical impact.
Contribution	This study is one of the few to explore the integration of DeepSeek into ELT in higher education. Unlike more widely studied AI tools, DeepSeek was selected for its emerging use in Chinese educational settings and its distinct instructional features, including structured content generation and multimodal support. By focusing on this specific tool, the study expands the scope of AI in education research and offers new empirical insights into its pedagogical value, implementation challenges, and potential to support personalized and learner-centered teaching.
Findings	Findings indicate that DeepSeek offered consistent pedagogical support across three instructional phases (before class, during class, and after class). The most pronounced impact was observed in the before-class phase, where it significantly enhanced lesson preparation efficiency and pedagogical innovation through structured content generation, procedural design, and instructional resource enrichment. During class, DeepSeek supported content diversification, real-time pedagogical adjustments, and student engagement. After class, DeepSeek supported feedback provision, learner autonomy, and extended learning, though its influence was comparatively limited. Overall, the integration of DeepSeek contributed to improved instructional coherence and fostered a shift toward more learner-centered pedagogical practices.
Recommendations for Practitioners	This study recommends that practitioners who integrate DeepSeek ensure comprehensive educator training to utilize the tool's features and functionalities effectively. Additionally, they should focus on maintaining a balance between AI-driven support and traditional pedagogical methods to preserve the human elements of teaching, such as empathy and critical thinking. Practitioners should also consider ethical implications, such as data privacy and potential biases in AI models, and ensure that DeepSeek is used as a complementary resource rather than a replacement for educator expertise.
Recommendations for Researchers	Researchers need to understand the evolving role of AI tools such as DeepSeek in enhancing ELT practices and exploring their long-term impact on student outcomes. Future studies should investigate the scalability of AI integration across diverse educational settings and examine how AI tools can be further refined to address emerging pedagogical challenges. Additionally, research should focus on evaluating the ethical concerns associated with AI in education, including data privacy, algorithmic bias, and the implications for educator-student relationships. Researchers are also encouraged to explore the balance between AI and human interaction in fostering a more effective and holistic learning environment.
Impact on Society	AI technology-based learning, using DeepSeek, could enhance students' learning outcomes and assist educators in developing content, leading to a more efficient and effective higher education system. The proper integration of

	DeepSeek into traditional teaching methods can promote its use and maximize its potential for enhancing learning experiences.
Future Research	Additional research should be conducted to explore and measure the impact of DeepSeek on student motivation, engagement, and academic performance. Further studies should investigate its use across different disciplines and educational contexts to evaluate its effectiveness in diverse learning environments.

Keywords: artificial intelligence, ELT, DeepSeek, educators' perspectives, pedagogical benefits, practical challenges, instructional potentials

INTRODUCTION

The 21st century has brought about major changes in education, with technology as a key driver, and English Language Teaching (ELT) is similarly affected (Al-Khresheh, 2024). Among the most influential developments is the integration of artificial intelligence (AI), particularly generative AI, which enables personalized learning and more efficient instructional delivery (Barnes & Tour, 2025; Feuerriegel et al., 2024). However, its pedagogical value depends on ethical implementation and contextual relevance (Barnes & Tour, 2025). While generative AI tools like ChatGPT dominate ELT research (Al-Khresheh, 2024; Yao & Liu, 2025), empirical research examining how DeepSeek functions in practice remains limited. This study addresses the gap by examining the integration of DeepSeek, an open-source large language model (LLM) developed in China, into ELT instruction. This study aims to answer the following research question: What are educators' perspectives on the integration of DeepSeek into ELT, focusing on the pedagogical benefits, practical challenges, and instructional potential across three phases of implementation: before, during, and after teaching and learning?

DeepSeek has garnered attention for its technical performance, affordability, and public accessibility (Allen, 2025; Parghi et al., 2025). Its latest model, DeepSeek R1 (released in January 2025), reportedly matches OpenAI's O1 in quality while supporting user needs through peer-reviewed content generation, dynamic filtering, predictive prompts, and visual enhancement (Krause, 2025). Unlike commercial LLMs such as GPT-4, Gemini, or Llama, DeepSeek's open architecture allows greater adaptability to local contexts and educational goals, making it particularly relevant for resource-constrained or pedagogically specific environments (Parghi et al., 2025).

As an open-source platform, DeepSeek enables granular customization by educators and developers, facilitating alignment with national curricula, language norms, and culturally specific content. Its domain-specific prompt-tuning capabilities and multimodal output (e.g., voice synthesis, embedded visuals) provide enhanced scaffolding for differentiated instruction (Parghi et al., 2025), which is especially valuable in English language classrooms serving diverse learner profiles (Rahmaniar et al., 2024). This combination of accessibility, adaptability, and instructional functionality justified its selection for closer examination in this study, particularly within the context of Chinese higher education, where localized, cost-efficient, and pedagogically integrated AI tools are in growing demand (L. Liu et al., 2022).

Although this study is situated in the Chinese higher education context, its findings aim to inform broader considerations around the effective and ethical integration of generative AI into ELT instruction. By focusing on educators' perspectives across distinct instructional phases, the research provides a nuanced account of both the potential and the limitations of generative AI in language education.

BACKGROUND AND LITERATURE

The landscape of ELT education in China is undergoing a profound transformation, catalyzed by national educational reforms, globalization, and the rapid integration of digital technologies. The

COVID-19 pandemic marked a pivotal moment, accelerating the adoption of online and blended learning modalities and prompting efforts to diversify instructional approaches toward more interactive and student-centered environments (Linlin, 2021). Parallel to these shifts, ELT instruction is being introduced at increasingly earlier educational stages, driven by the recognized cognitive and global communicative advantages of early language acquisition (Wei & Mamat, 2024).

In China, ELT occurs in a non-native context, where Chinese students often learn from non-native educators who may not speak as naturally or fluently as native speakers. With limited opportunities for interaction with native speakers, learners increasingly depend on technology to practice authentic listening and speaking. This reliance on technology is further amplified by globalization and career-driven aspirations, which emphasize the importance of integrating emerging technologies, such as AI, into ELT (S. Liu et al., 2014).

Despite growing interest in AI-driven instruction, there are still significant gaps in the literature. While AI's potential to enhance learner engagement and communication skills is well-established (Baskara, 2023; Mudawy & Mohammed, 2024), qualitative studies on how ELT educators view and integrate AI tools (especially non-US-centric tools like DeepSeek) remain limited (Moybeka et al., 2023; Mudawy & Mohammed, 2024). Although prior research has explored AI's role in reducing educators' workload and fostering autonomy, such as in-lesson planning and promoting interactive environments (Katsarou et al., 2023; C. Zhou & Hou, 2024), the specific pedagogical and classroom-level impact of DeepSeek is underexplored (Muslimin, 2024). A 2025 meta-analysis revealed that 78% of AI-ELT research focuses on commercial tools, leaving open-source models like DeepSeek understudied (Arabiat, 2025). This gap is critical in China's higher education context, where cost-effective and locally adaptable tools are prioritized (Wu et al., 2022). This study responds to this research gap by investigating educators' perspectives on the pedagogical benefits, challenges, and potential of integrating DeepSeek in ELT instruction.

AI and English Language Teaching (ELT)

The integration of AI in ELT has evolved from computer-assisted language learning (CALL) and e-learning platforms (Al-Khresheh, 2024) to generative AI tools such as ChatGPT. Through this, personalized feedback and adaptive learning were offered using machine learning and big data analysis (Crompton et al., 2024; Fitria, 2021). These systems support inclusive education and facilitate autonomy by offering dynamic and differentiated instruction (Fitria, 2021). Additionally, AI tools comprising Grammarly, Pigai, and ChatGPT have significantly enhanced writing feedback, learner engagement, and adaptive support of oral fluency through real-time (Al-Raimi et al., 2024; Athanassopoulos et al., 2023; Faisal & Carabella, 2023; G. L. Liu et al., 2024; Zhao, 2022). These technologies reduced educator workload and support learner autonomy by embedding feedback into routine learning.

Several studies have shown AI's pedagogical value in ELT. A study conducted by Rusmiyanto et al. (2023) found that adaptive platforms effectively personalize instruction through real-time feedback and formative assessments. Their study also reported increased learner motivation and engagement through AI-based chatbots that offer interactive practice. Nevertheless, for the benefits to be materialized, AI should be implemented into sound pedagogical practices and tailored to diverse global educational contexts (Al-Khresheh, 2024).

Overview of DeepSeek

LLMs excel in complex reasoning, natural language understanding, and generating coherent outputs. DeepSeek-R1, an advanced model built on reinforcement learning (RL) and multi-stage training, enhances reasoning, safety, and alignment with human preferences. As LLMs are increasingly adopted in education, decision making, safety assurance, and interpretation, generalizing to new scenarios remains a key challenge (Parmar & Govindarajulu, 2025).

DeepSeek has gained significant attention for its innovative approach, particularly in response to challenges such as the U.S. export restrictions on Chinese technology (Allen, 2025). The recently introduced AI model has garnered significant interest from researchers and industry professionals. Trained on extensive datasets containing programming and natural language data, it connects human instructions with machine processes but continues to face challenges in generating high-quality code, accuracy, and handling complex programming issues (Manik, 2025).

Integrating DeepSeek Into ELT

Since its release in January 2025, research on DeepSeek has remained limited. Emerging studies have begun to examine its architecture, pedagogical potential, and practical challenges. Mercer et al. (2025) highlighted that DeepSeek is optimized for efficient reasoning, integrating expert model blending, reinforcement learning, and advanced engineering, which yields high-accuracy results at lower costs compared to other AI models. As an open-source tool, DeepSeek enables user customization and domain-specific adaptation, thereby promoting transparency and flexibility in educational deployment (Sallam et al., 2025). Its context-sensitive reasoning, error detection, and high scalability make it particularly suited for structured learning environments and budget-conscious institutions (Mohammed et al., 2025; Piplani & Bamman, 2018). Moreover, it supports personalized learning by adapting to users' emotional tone, behavior, and expertise, while grounding its responses in peer-reviewed sources (Neha & Bhati, 2025).

Despite these strengths, DeepSeek presents limitations in communicative ELT contexts. Its rule-based outputs are less effective in facilitating open-ended conversation, creative expression, and nuanced dialogic interaction (Albuhairy & Algaraady, 2025). Additionally, the model's performance remains highly prompt-dependent and may require educator supervision to ensure pedagogical relevance and accuracy (Jegede, 2024). These constraints suggest the need for a hybrid approach that integrates DeepSeek with more interactive, fluent AI tools to support imaginative and discourse-rich language learning.

Risk And Limitations of AI Integration

The integration of AI tools such as DeepSeek into ELT requires careful pedagogical and ethical oversight to prevent superficial adoption or unintended misuse (Al-Khresheh, 2024; Dizon et al., 2025). While DeepSeek offers promising functionalities in text generation, content analysis, and personalized feedback, it remains comparatively under-researched relative to tools like ChatGPT, particularly in authentic classroom settings (Albuhairy & Algaraady, 2025; Cheng et al., 2024). Its rigid architecture, domain-specific outputs, and difficulties with nuanced language use present significant concerns for fostering communicative competence (Albuhairy & Algaraady, 2025; Jegede, 2024). These functional limitations intersect with broader ethical concerns surrounding fairness, accessibility, and pedagogical fit.

Selwyn (2022) emphasized that ethical frameworks must be operationalized as safeguards against the uncritical application of AI, particularly given evidence that indiscriminate use can exacerbate existing educational inequalities and compromise instructional quality (Holmes et al., 2022; Seo et al., 2021). Ethical risks associated with DeepSeek include algorithmic opacity, lack of contextual sensitivity, and the potential for educator displacement, all of which may contribute to the dehumanization of education (Gupta et al., 2024; Holmes et al., 2023; Yu & Yu, 2023). In response, scholars advocate critical engagement with AI's socio-political dimensions and recommend educator training initiatives to foster ethical reflexivity and informed implementation (Knowles, 2021; Lee et al., 2021; Selwyn, 2022). This provides some explanation as to why the call for learner-centered AI prioritizes augmentation over automation that supports participatory and interdisciplinary integration strategies (Vasile, 2023).

Furthermore, to translate such ethical and pedagogical considerations into practice, the Technological Pedagogical Content Knowledge (TPACK) framework offers a robust model for aligning AI capabilities with curriculum goals and instructional methods (Lu & Said, 2024; Tondeur et al., 2017).

TPACK emphasizes the importance of synthesizing technological, pedagogical, and content knowledge to ensure meaningful and context-sensitive technology. As Lu and Said (2024) highlighted, this framework enabled educators to integrate tools such as DeepSeek by aligning them with specific learning outcomes and teaching strategies in language education. DeepSeek's features, such as adaptive feedback, domain knowledge retrieval, and multimodal content generation, can thus be deployed to support linguistic development while maintaining coherence with sound pedagogical principles. Anticipated enhancements, including predictive questioning, visual augmentation, and refined moderation capabilities, may further increase DeepSeek's pedagogical utility while addressing current ethical limitations (Ali et al., 2025; Neha & Bhati, 2025).

Previous Studies on the Pedagogical Benefits of DeepSeek

Recent studies investigating DeepSeek's application in ELT have revealed both promising pedagogical benefits and practical challenges. Ali et al. (2025) conducted a quantitative study in Pakistan examining DeepSeek's use in ELT. Their findings, based on questionnaire data analyzed with SPSS25, suggested that while DeepSeek enhances learning by providing immediate feedback, it also faces challenges such as technical limitations and difficulties in learner adaptation. This study provides a foundational evaluation of DeepSeek's effectiveness in English language learning environments.

In higher education settings, Ding et al. (2025) highlighted DeepSeek's real-time knowledge retrieval, adaptive question-and-answer functionalities, and multimodal resource generation, all of which support a shift toward a student-centered pedagogical approach. In addition, Tokmakova and Saenko (2025) explored DeepSeek's use in providing corrective feedback within a professional foreign language course at an agricultural university. The research demonstrated that DeepSeek evaluated various aspects of language performance, such as lexical, grammatical, and content-specific elements, through integrated feedback on tasks. This structured feedback approach is beneficial in the context where high-quality evaluation is essential for improving linguistic competence. Similarly, Mohammed et al. (2025) offer a comparative study of DeepSeek with other AI models, noting its advantages in context-based error detection and cost-effectiveness in ELT. Both studies suggested that when properly integrated, DeepSeek could enhance lesson planning and support personalized learning, although they also emphasized the importance of addressing technical reliability and educators' digital literacy.

In summary, previous studies showed that DeepSeek contributes uniquely by facilitating access to academic resources, generating lesson plans, and supporting automated content creation, all while maintaining linguistic and contextual rigor (Dandage, 2025). It aligns with global calls for curriculum innovation and promotes the design of responsive, evidence-informed instruction (Wu et al., 2022).

Comparative Studies of DeepSeek With Other LLMs

Albuhairy and Algaraady (2025) conducted a comparative analysis of DeepSeek and ChatGPT in the context of adult second language acquisition. Their findings indicated that DeepSeek excels in detecting structural errors, such as subject-object-verb word order transfer in second language learners. Therefore, enhancing contrastive drills and sociolinguistic awareness. Their study advocates for the targeted use of AI tools like DeepSeek to improve language learning outcomes.

Sector-specific studies also highlighted DeepSeek's broader impact simulations and automation within accounting, observing that it enhanced analytical skills, supported practical simulations, and contributed to the development of technical competencies. Albuhairy and Algaraady (2025) concluded that DeepSeek holds significant potential for driving AI-powered innovations in accounting practices. Similarly, Aydin et al. (2025) conducted a comparative analysis of DeepSeek, Qwen LLM, and ChatGPT, emphasizing their open accessibility and the lack of query restrictions. Their evaluation, based on forty research articles in healthcare and Digital Twin technologies, demonstrated that DeepSeek produced accurate academic content comparable to ChatGPT, reinforcing its role as an effective generative AI tool.

Collectively, these studies presented compelling evidence that DeepSeek could enhance immediate feedback, error detection, and personalized learning in ELT, while also contributing to sector-specific innovations in fields such as accounting and healthcare. However, they also highlighted the need for further research into systematic educator training, ethical frameworks, and overcoming technical and digital literacy challenges to ensure DeepSeek can realize its full educational potential.

METHODS

RESEARCH DESIGN

This qualitative study explores educators' perspectives on DeepSeek's integration in ELT at a Chinese public university. A single-case design was selected to examine how institutional AI policies shape pedagogical practices, aligning with Abdous' (2011) process-oriented framework to analyze impacts across, during, and after teaching and learning.

LOCATION OF STUDY

This study was conducted at a public university in Shaanxi Province, China, selected for its pioneering implementation of the DeepSeek across its academic and administrative domains. As an applied science institution with an expanding focus on internationalization and English-medium instruction, it offers a distinctive context for ELT research. Following the adoption of DeepSeek, the university introduced a suite of AI-driven educational innovations that covered a variety of "big model +" teaching functions, including smart course platforms, AI teaching assistants, intelligent learning support tools, automated question generation, and assignment evaluation, establishing it as a timely and relevant site for investigating AI integration in ELT.

POPULATION AND SAMPLING PROCEDURES

The sample population for this study consists of ELT educators at a public university in Shaanxi Province, China. The study employed purposive sampling to select 12 participants with experience using DeepSeek in their teaching practices. Selection criteria included: (i) active participation in classroom teaching, (ii) experience with AI-assisted teaching tools, and (iii) willingness to provide rich and reflective insights. Additionally, demographic characteristics of (i) age, (ii) years of teaching experience, (iii) professional title, and (iv) familiarity with DeepSeek (ranging from beginners to experts, as detailed in Table 1) were considered to ensure diversity of perspectives across different user groups. In qualitative research, the core criterion for sample size is "Theoretical Saturation" (Guest et al., 2006). Through iterative data collection and analysis, when the 10th to 12th participants were included, no new themes (such as new dimensions of benefits, challenges, or potential) were identified, indicating that the data had reached saturation. The 12 participants were sufficient to reflect the core perspectives of the research question.

This study strictly adhered to ethical guidelines, and participants were fully informed of the study's purpose, the principle of voluntary participation, and their right to withdraw at any time. Informed consent was confirmed before entering the questionnaire-filling stage. All data are identified by codes (e.g., T1-T12), and the original data are encrypted and stored in the cloud, accessible only to the research team. The analysis results were presented in a summary form to ensure that personal identities are not identifiable. Participants were clearly informed that the data would only be used for academic research and related publication. Table 1 lists the demographic information of the participants.

Figure 1 presents the participants' self-reported familiarity with using DeepSeek AI software for teaching operations. A self-report mechanism was employed to enable participants to accurately assess their own familiarity, allowing for a distinction between their perceived knowledge and actual proficiency with technology. The results indicated that the largest group of participants (41.68%) self-identified as having an intermediate level of familiarity, with 33.35% rating their proficiency as ad-

vanced, highlighting their active engagement with DeepSeek. A smaller proportion (8.30%) was classified as beginners, while 16.67% identified themselves as experts, indicating a high level of proficiency and involvement with the tool. The variation in familiarity levels underscores the importance of considering participants' foundational knowledge and interaction with AI tools when interpreting their feedback.

Table 1. Demographic overview of the participants

Variables		Frequency	Percentage
Gender	Male	5	41.67%
	Female	7	58.33%
Age	25-35	4	33.33%
	36-45	5	41.67%
	46-55	3	25.00%
Qualification	Master's Degree	7	58.33%
	PhD Degree	5	41.67%
Academic Rank	Associate Professor	3	25.00%
	Assistant Professor	4	33.33%
	Lecturer	5	41.67%
Teaching Experience	1-10	6	50.00%
	11-20	3	25.00%
	More than 20	3	25.00%
Total		12	100%

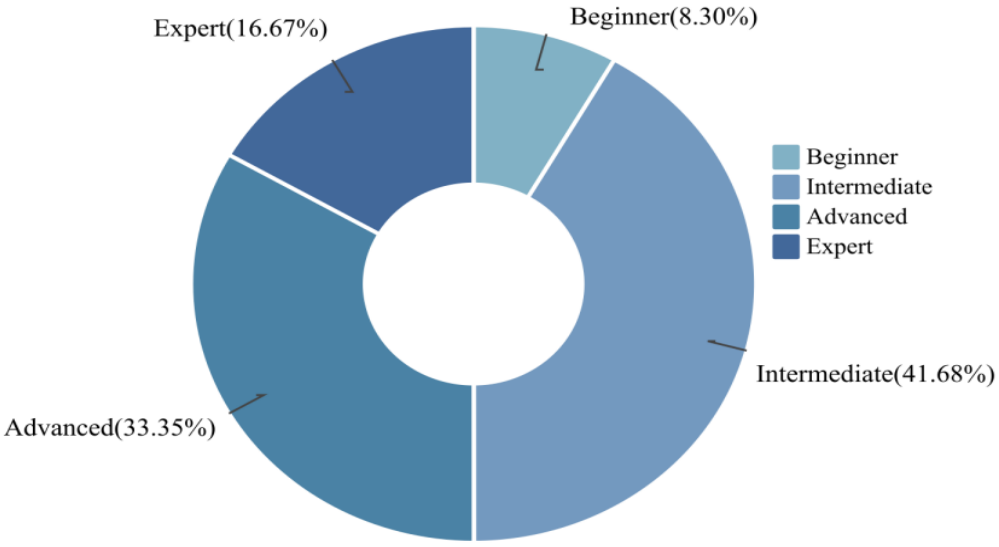

Figure 1. Participants' familiarity with DeepSeek

INSTRUMENT

This study adapted an open-ended questionnaire developed by Al-Khresheh (2024) to explore educators' perceptions of integrating DeepSeek into ELT. Open-ended questionnaires are important in qualitative research because they capture nuanced, in-depth feedback and reveal emerging themes that structured surveys may overlook. The questionnaire consists of two parts. The first part was comprised of detailed demographic information, including participants' age, gender, country/region of residence or teaching, educational background, academic level, and total years of teaching experience. The second part included six open-ended questions focusing on the integration of DeepSeek with ELT. Example questions include:

- "From your perspective, what unique opportunities does DeepSeek bring to your ELT approach?"
- "What challenges or limitations have you observed when incorporating DeepSeek into your ELT methods?"
- "Looking ahead, how do you envision the evolving role of DeepSeek and similar tools in ELT?"

The open-ended questionnaire format was designed to encourage participants to engage in broad and deep reflection, thereby helping to comprehensively and vividly understand the emerging role of DeepSeek in ELT. The revised questionnaire questions are provided in Appendix A.

PROCEDURE FOR DATA COLLECTION AND ANALYSIS

Researchers distributed an electronic version of an open-ended questionnaire, adapted from Al-Khresheh (2024), to 12 ELT educators via the QuestionStar platform and collected the questionnaire data. Data analysis employed deductive thematic analysis, following the six-stage framework proposed by Braun and Clarke (2006). This method is a widely used qualitative analysis approach that assists researchers in identifying, analyzing, and reporting patterns in the data. During the analysis process, data were coded to identify recurring themes related to educators' perceptions of the benefits, challenges, and potential of integrating DeepSeek into ELT (Nowell et al., 2017).

The researchers used manual coding to provide an in-depth interpretation of the data to make content judgments and coding decisions to ensure that subtle meanings in participant feedback were captured. The formation of themes was based on the coding results and developed gradually through six stages: familiarizing oneself with the data, generating initial codes, identifying themes, reviewing themes, defining themes, and writing the paper. This process ensured a close logical connection between themes and coding, guaranteeing the systematic and scientific nature of the research analysis.

Figure 2 illustrates the workflow adopted in this study, clearly showing the complete workflow from research design, sample and sampling, questionnaire distribution, data collection and analysis, and results analysis and presentation. This process not only reflects the logical correlation and sequence of each link but also highlights the key points and technical methods of the key nodes in the research process, which provide an important visual reference for understanding the overall design and implementation path of this study.

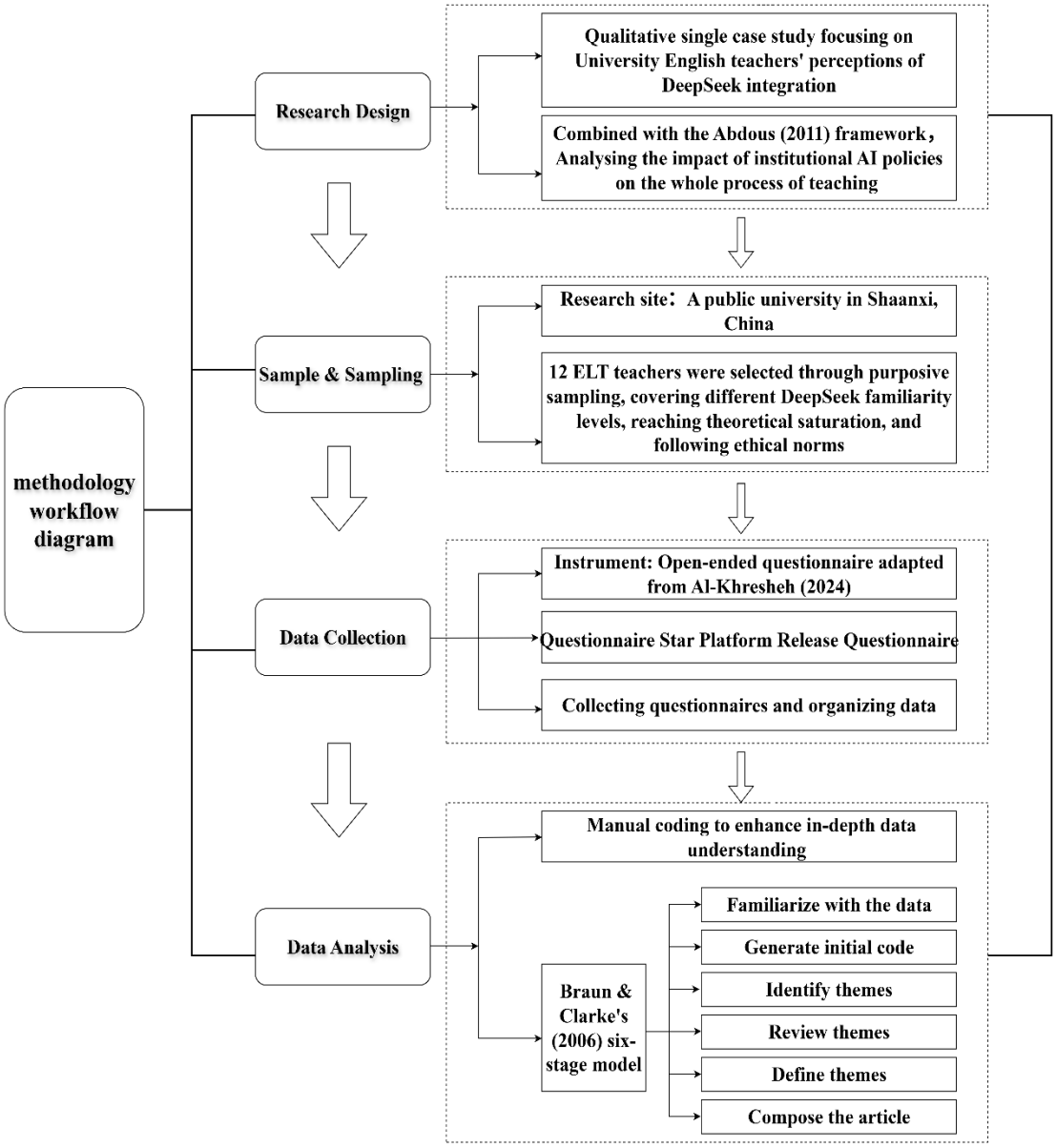

Figure 2. Methodology workflow diagram

RESULTS

According to Abdous (2011), the process-oriented framework comprises three phases: before, during, and after teaching and learning in the context of online higher education. In this study, the framework was adapted to investigate educators' perspectives on DeepSeek integration in ELT across the same three phases of before, during, and after implementation.

THEME 1: TRANSFORMATIVE PEDAGOGICAL SUPPORT

During the pre-class preparation phase, DeepSeek provides comprehensive support for English educators, significantly improving teaching efficiency and promoting instructional innovation. It offers structured teaching design recommendations and process-oriented content generation. For example, one educator noted that *"It provides teaching design ideas and helps generate some process-oriented content,"* thereby enhancing the efficiency and coherence of lesson preparation. Another interviewee stated

that *"it improves lesson preparation efficiency and expands knowledge search channels,"* enabling educators to focus more on improving teaching strategies and optimizing course design. DeepSeek also enriches teaching resources by generating classroom examples, exercises, and multimedia materials. An educator evaluated the tool as *"more engaging for classroom case demonstrations and providing more comprehensive answers to questions."* Additionally, DeepSeek supports the development of creative and interactive pre-class activities. An educator shared a case study where students completed a short quiz before class and then used DeepSeek to generate answers for comparison. This thereby combines classroom preparation with learner engagement to stimulate student interest.

Figure 3 shows the frequency of key advantages of DeepSeek across three teaching stages, with "Instructional design and content generation" having the highest frequency of 10 times and "Pre-class activities and idea stimulation" the lowest at 5 times. DeepSeek enhances educators' pre-class preparation through instructional planning, resource enrichment, and activity development, highlighting its value in improving efficiency and innovation.

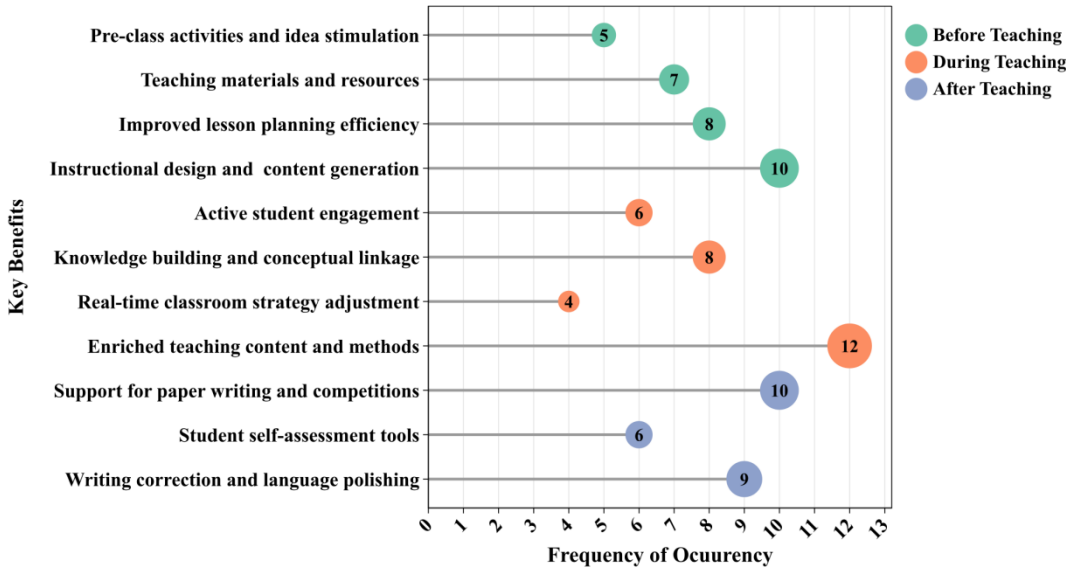

Figure 3. DeepSeek integration: pedagogical benefits before, during, and after ELT

DeepSeek also improves classroom teaching quality and student engagement, with contributions to enriching content and promoting knowledge structure construction. Meanwhile, educators noted that DeepSeek enhances classroom teaching effectiveness through case studies, grammar analysis, and writing models. One educator stated, *"As a classroom case presentation, it is more engaging and enriches teaching content,"* enhancing teaching diversity and improving student attention and learning outcomes. Furthermore, DeepSeek supported educators in adjusting teaching strategies in real-time based on student responses. A participant noted, *"Teaching methods should be adjusted in real-time based on student proficiency and classroom reactions,"* highlighting the tool's role in promoting dynamic teaching. Consequently, DeepSeek helps educators visualize and explain the relationships between language concepts, thereby assisting students in building a more comprehensive knowledge framework. For example, an educator highlighted its value in *"comprehensively summarizing and expanding the relationships between knowledge points and related content."* Moreover, DeepSeek also enhances student engagement through tasks such as generating writing samples for the College English Test (CET) at different score levels, including Band 4 (CET-4) and Band 6 (CET-6). In this respect, the CET-4 and CET-6 are national standardized English proficiency tests for non-English majors in China, assessing intermediate and advanced English proficiency, respectively, and are widely used in academic assessments and employment eval-

uations. As one educator explained, these outputs *"provide students with scoring criteria, enabling them to understand differences in writing proficiency,"* thereby supporting deeper analysis and reflection. In summary, DeepSeek makes meaningful contributions to teaching effectiveness and classroom interactivity.

In contrast, although its post-class usage frequency is relatively low, DeepSeek still plays a crucial role in enhancing teaching efficiency, supporting learners' self-directed learning, and expanding access to educational resources. As shown in Figure 3, "Support for paper writing and competitions" has the highest frequency of 10 times, while "Student self-assessment tools" has a lower frequency of 6 times. In addition, DeepSeek is frequently used for essay grading and feedback. An educator commented, *"I frequently use it to grade students' English writing. The feedback is very comprehensive, significantly improving my teaching efficiency."* Students also praised the clarity and speed of the AI-generated feedback. Meanwhile, some educators encourage students to use DeepSeek for self-assessment, reflecting a growing emphasis on self-directed learning and metacognitive development. For instance, one educator described this approach as *"having students use AI for self-assessment,"* fostering critical thinking and autonomy. DeepSeek's applications also extend to extracurricular activities, such as academic writing and competitions. As one participant noted, it is *"very useful for writing papers, participating in competitions, and improving skills,"* making it a valuable tool for supporting students' academic and professional development.

Theme 2: Usage Limited by Pedagogical Applications

Firstly, during the planning and preparation phase, educators identified several limiting factors that hindered the effective integration of DeepSeek. The primary issues were the tool's technical reliability and flexibility. As shown in Figure 4, DeepSeek faced key challenges in the pre-, mid-, and post-stages of ELT applications, with "system instability" occurring most frequently (11 times) and "poor vocabulary guidance adaptability" occurring least frequently (5 times). As a result, all educators interviewed mentioned that the system was often unstable, especially when performing complex analytical tasks, with DeepSeek frequently entering a "busy" state or becoming unresponsive. Meanwhile, user restrictions, such as queries and limits that require repeated restarts, further disrupt course planning. Another issue is that the tool does not align with specific course requirements. For example, when attempting to incorporate ideological content (such as teaching materials involving national values, political theory, and core socialist values and patriotism in Chinese higher education), these inclusions must comply with national education policies. Consequently, marked as sensitive content, limiting the scope of course generation. Additionally, DeepSeek is considered to lack in adapting to differentiated instruction, particularly in grammar and vocabulary teaching, as its suggestions lack flexibility due to significant variations in learners' proficiency levels.

In classroom instruction, challenges primarily focus on teaching efficiency and contextual appropriateness. Some educators find DeepSeek time-consuming or poorly synchronized with real-time teaching dynamics, thereby reducing instructional fluency. Some educators reported that in the Career Development unit, when focusing on job interview dialogues and basic career vocabulary instruction, they entered the prompt: *"You are a university English educator. Please generate three discussion questions and 2 example sentences for the Career Development unit, suitable for sophomore-level students, for classroom discussion and vocabulary reinforcement."* However, the discussion questions generated by DeepSeek included topics such as *"How to choose an offer"* and *"What careers are valuable"*, which are related to career significance and do not align with the skill objectives of the English course. Additionally, as shown in Figure 4, five educators expressed concerns that DeepSeek could undermine educators' teaching authority. While DeepSeek supports information dissemination, overreliance on artificial intelligence is believed to weaken educators' role as facilitators of critical thinking and active participation. Some educators emphasize that AI tools should be enhanced rather than replace professional judgment and teaching creativity.

In the later stages of teaching, the main challenges are students' over-reliance on DeepSeek and insufficiently personalized assessment. As shown in Figure 4, "over-reliance by students" was mentioned by educators 10 times, and "insufficiently personalized assessment" was mentioned 9 times. Educators noted that students increasingly use DeepSeek to complete writing and translation tasks, which masks their true language proficiency and reduces opportunities for practice-based learning. This dependency is believed to hinder long-term language development. Furthermore, "Unreliable output content" was mentioned 6 times, with educators concerned that DeepSeek may generate false or unreliable information sources, posing risks for academic writing and verification tasks. Some educators reported instances of unverifiable citations and misleading information, rendering the tool unsuitable for rigorous academic standards. Finally, the frequency of mentions for "Decline in critical thinking skills in writing" was 7 times, with educators believing that complete reliance on the blind use of AI tools for writing weakens students' critical thinking, spelling, and writing abilities, especially in high-level tests requiring originality and cognitive depth, such as IELTS/TOEFL.

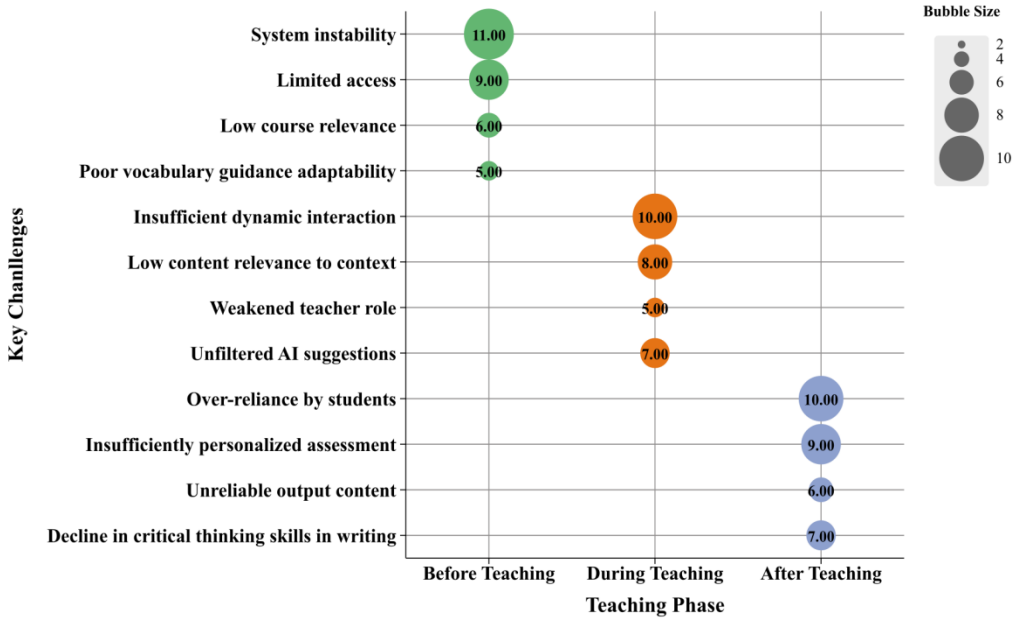

Figure 4. Key challenges in the application of DeepSeek in ELT across stages

Theme 3: Enhancing Educator Empowerment through DeepSeek Integration

In the digital evolution of university English teaching, DeepSeek's impact on educators has transcended the realm of mere tool functionality, deeply influencing the subjective growth dimension of educators. During the teaching preparation stage, DeepSeek assisted educators in transitioning from traditional lesson plan executors to course designers, significantly enhancing educators' autonomy in course construction. Figure 5 illustrates DeepSeek's key potential in the pre-, during, and post-application stages of ELT. Around 80% of educators mentioned "Transition to course designer" and 50% mentioned "Enhance course construction autonomy", indicating that under the traditional model, educators relied heavily on existing templates for course design, limiting flexibility and innovation. With the introduction of DeepSeek, educators can break free from these constraints and actively explore diverse possibilities in course architecture. One participant envisioned DeepSeek as a *"data collector and framework writer"*, while emphasizing that *"AI-generated content must be based on educators' own subject knowledge and teaching judgment"*. Other participants highlighted DeepSeek's broader course implica-

tions, anticipating that it could *"build a systematic course network encompassing all knowledge"*, thereby driving the digital transformation of course design and delivery methods, truly becoming the driving force behind course design.

In the classroom implementation phase, the synergistic efforts of transitioning to a classroom facilitator and real-time responsiveness have driven the transformation of educators' roles from knowledge disseminators to classroom facilitators. One educator remarked, *"When students encounter difficulties during classroom discussions, I can quickly obtain guidance strategies through DeepSeek, enhancing the interactivity of classroom teaching"*. According to Figure 5, approximately 66% of educators mentioned the "Transition to classroom facilitator," noting that after using DeepSeek, the flexibility of classroom interaction significantly improved, enabling educators to control the pace of the classroom better, promptly address student questions, and transform student confusion into opportunities for deeper learning. Meanwhile, around 83% of educators mentioned "Improve real-time response capabilities," praising its ability to *"real-time record pronunciation and grammar errors and promptly correct them, thereby supporting continuous formative assessment."* Moreover, the integration of digital tools has added vitality to active classrooms, helping to create a more dynamic and responsive learning environment.

During the teaching feedback phase, educators discussed the practicality of DeepSeek in terms of precise assessment and feedback. The platform is valued for its speed and reliability in executing repetitive assessment tasks (e.g., automatic error correction and quiz scoring). In Figure 5, about 83% of educators mentioned "Improve feedback quality," with participants noting that its functions *"act like an educator's assistant,"* particularly in managing foundational assessment tasks. Some educators noted that when grading business English writing, DeepSeek can be used to deeply analyze errors in students' emails, link them to cross-cultural communication principles, and generate personalized feedback and targeted exercises. Input prompt: *"As an expert in business English, please analyze students' business emails (errors: inappropriate tone, cultural references, etc.), generate personalized feedback related to cross-cultural communication principles, and provide targeted exercises."* DeepSeek's output included grammar corrections, paragraph polishing, and email tone adjustment exercises (writing communication letters with clients from different cultural backgrounds). Additionally, around 58% of educators mentioned the "Transition to data-driven mentor," noting that feedback generated by DeepSeek is more precise and actionable, helping students overcome learning plateaus. Educators have transitioned from being mere error correctors to data-driven mentors who can provide comprehensive growth guidance based on data.

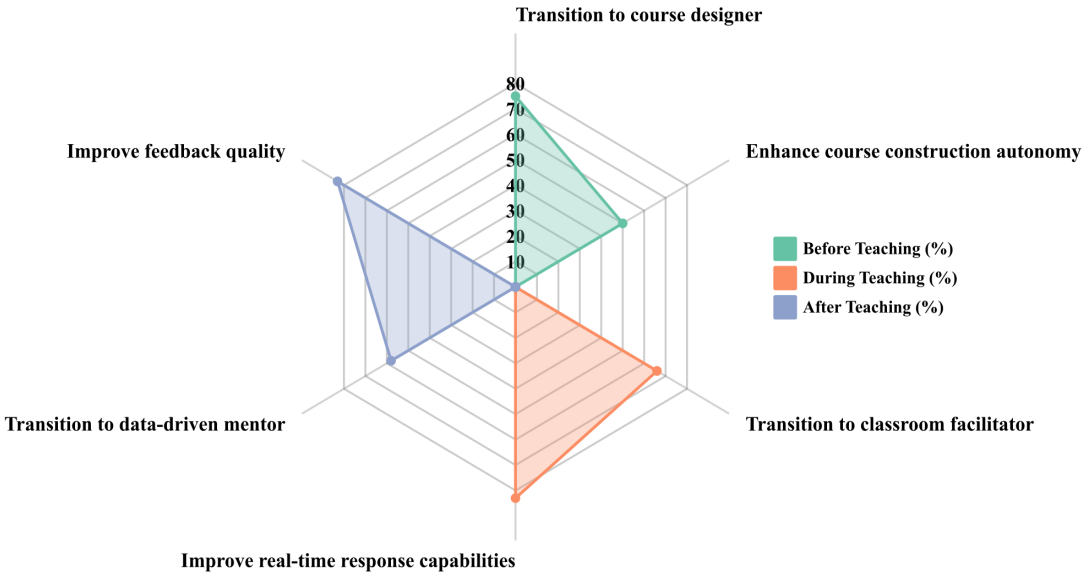

Figure 5. Key potentials in the application of DeepSeek in ELT across stages

DISCUSSION

THEME 1: TRANSFORMATIVE PEDAGOGICAL SUPPORT

The findings suggest that educators perceive DeepSeek as a transformative tool, offering significant pedagogical support before, during, and after class. This structure reflects Abdous's (2011) process-oriented instructional framework, which organizes pedagogical activities across three instructional phases. This framework provided the analytical lens for tracing AI's function across the instructional arc. In doing so, it helped reveal how the tool mediates educator agency, facilitating efficient lesson planning, enhancing in-class delivery, and supporting post-instruction feedback and assessment. Specifically, educators reported that DeepSeek facilitated more efficient lesson planning, enhanced instructional quality, and promoted student engagement, confirming the potential of AI tools in supporting effective and innovative teaching practices. The integration of DeepSeek into ELT represents a significant advancement in digital pedagogy, offering transformative opportunities for personalized learning, enhanced error detection, and interactive classroom experiences. Recent literature reveals that DeepSeek supports instructional methods by combining AI with linguistic expertise, thereby facilitating both educator support and student autonomy in the language classroom (Mohammed et al., 2025). However, such transformation is not inherent to the tool but mediated by educators' pedagogical decisions, aligning with the view of AI as a co-orchestrator of human learning rather than a replacement. This study supports these findings, showing how DeepSeek assists in various stages of teaching, from lesson planning to classroom delivery and after-class activities, aligning with the broader body of research on the benefits of AI tools in educational settings (Ding et al., 2025; Zhai, 2025).

Educators reported that DeepSeek was particularly beneficial in their teaching preparation before class. It provided structured content, teaching design suggestions, and broadened knowledge access. One educator noted that DeepSeek *"improves lesson preparation efficiency and expands knowledge search channels,"* suggesting it aids educators in saving time and accessing relevant resources. This finding is supported by Ding et al. (2025), who stated that DeepSeek is an effective lesson preparation assistant. Moreover, educators utilized DeepSeek to create interactive pre-class tasks, such as comparing students' answers with AI-generated responses. These activities not only prepare students for class but also increase their curiosity and engagement. This aligns with Zhai (2025), who highlighted DeepSeek's role in promoting personalized and adaptive learning by facilitating pre-class engagement that matches students' readiness levels and encourages active anticipation of learning content. However, these benefits must be weighed against the potential for overdependence on AI-generated content, which may constrain educators' own creativity and reduce opportunities for students to engage in original knowledge construction – a concern echoed by Norman (1993) in the context of distributed cognition.

During teaching sessions, educators reported that DeepSeek enhanced instructional quality by providing diverse resources, such as multimedia content, grammar analysis, and case studies. One educator described DeepSeek as making classroom examples *"more attractive and enriching."* This finding is consistent with Kotsis (2025), who emphasized the importance of multimodal interactions in improving student comprehension. The study, as reflected by Mayer (2005), highlighted that the cognitive theory of multimedia learning suggested that learning improved when verbal and visual inputs were combined. Additionally, educators found that DeepSeek allowed them to adjust teaching strategies in real-time based on students' responses and needs. One respondent noted the importance of changing teaching methods *"according to students' levels and classroom reactions,"* a sentiment that resonates with Ding et al. (2025), who advocate for the dynamic use of AI to enhance instructional responsiveness. Nonetheless, educators also noted that some AI suggestions were contextually misaligned, requiring manual adaptation, highlighting the enduring role of pedagogical content knowledge (Shulman, 1987) in filtering AI-generated inputs. Moreover, educators reported that DeepSeek facilitated

the construction of students' knowledge structures, helping students better understand the relationships between different concepts in English. A possible explanation for this might be that, according to Joshi (2025), DeepSeek's performance in formal writing and diagnostic applications helped to strengthen knowledge foundations. Furthermore, the tool's role in enhancing student engagement, as evidenced by feedback on writing tasks, aligns with Ali et al. (2025), who confirmed that DeepSeek contributed to personalized learning trajectories, reinforcing correct language usage and addressing specific errors. However, several educators warned that excessive reliance on AI feedback could diminish learners' critical thinking and independent revision skills, especially in system-generated answers. These risks are heightened in contexts where formative assessment is weak, allowing passive engagement to go unnoticed. It is possible, therefore, that Zimmerman's (2002) theory of self-regulated learning stresses the importance of learners monitoring and evaluating their performances, rather than accepting system-generated suggestions.

In the post-class phase, DeepSeek's role in grading and providing feedback was highlighted. Many educators noted that it *"greatly improved productivity,"* reducing time spent on grading and increasing efficiency in administrative tasks. This finding aligned with Ding et al. (2025), who stated that DeepSeek aids in operational efficiency, allowing educators to focus more on instructional quality. Additionally, some educators encouraged students to use DeepSeek for self-assessment, fostering independent learning and reflection. Mota (2025) supported this by suggesting that DeepSeek's reinforcement learning orientation helped to promote metacognitive development, an essential aspect of critical thinking and self-reflection. Nevertheless, others noted risks of over-reliance, warning that students might outsource too much of the evaluative process to the tool, thereby weakening their analytical writing skills over time. As Biesta (2009) cautioned, education should not merely be efficient but meaningful, involving judgment and deliberation that AI cannot replicate. DeepSeek was also found to support students in extracurricular academic activities, such as writing papers and entering competitions. This is supported by Guo et al. (2025), who stated that DeepSeek facilitated academic tasks beyond the classroom and supported students in their academic and career development. However, some educators expressed concern that such use may obfuscate the line between support and authorship, particularly when students rely on AI for ideation and textual coherence. This raises ethical questions related to epistemic agency, as stated by Idham et al. (2024), and calls for clearer guidelines on the appropriate use of AI in academic production. This broader utility highlighted DeepSeek's versatility in promoting both in-class learning and out-of-class engagement, helping students develop language skills in varied contexts.

The integration of DeepSeek into the ELT classroom, as noted in the literature, not only improves error detection and personalized feedback but also promotes interactive learning environments. Mohammed et al. (2025) stated that DeepSeek excels in context-driven error detection and offers creative explanations, particularly for abstract grammatical constructs. This capability is particularly suited to overcoming common challenges in language learning, where students often struggle with language structure and vocabulary usage. Moreover, Albuhairy and Algaraady (2025) compared DeepSeek with other language models, finding that its context-sensitive error detection makes it particularly valuable in language pedagogy, especially when combined with traditional teaching methods. However, these advantages should not overshadow potential risks, including erosion of educator authority, diminished student effort, and reduced error tolerance in classroom discourse. These findings emphasized the need for comprehensive training programs that prepare educators to integrate AI tools such as DeepSeek into their teaching practices. Therefore, such training must go beyond tool operation to include AI literacy frameworks that equip educators with the skills to evaluate, adapt, and critique AI-generated content within their pedagogical aims.

Theme 2: Usage Limited by Pedagogical Applications

In the planning and preparation phase, educators reported several challenges that hindered the smooth integration of DeepSeek into their lesson planning. Technical unreliability was a significant

issue, as educators noted that the system often became "busy" or unresponsive, particularly when engaging in tasks requiring deeper analysis. This resulted in disruptions, requiring constant restarts, which ultimately hindered the efficiency of lesson preparation. Usage limitations, such as caps on query frequency, further interrupted the planning process, creating frustration for educators. These findings align with X. Zhou (2025), who emphasizes that technological bottlenecks, such as limited computational resources and restricted scalability, hamper the smooth implementation of AI tools in educational settings. However, rather than mere technical setbacks, these limitations also reflect a broader issue of pedagogical readiness. As Selwyn (2022) argues, infrastructure challenges are not neutral but shape what kind of teaching is possible, often privileging efficiency over reflection. Educators' frustration may thus be understood as resistance to the imposition of 'automated time' on the creative and iterative process of planning.

Another prominent challenge was curriculum incompatibility. Educators observed that DeepSeek flagged content related to sensitive topics (e.g., political or ideological themes) as problematic, restricting the material they could include in lessons. Additionally, the tool's lack of flexibility in differentiated instruction has further complicated its use in ELT, particularly for grammar and vocabulary instruction, where students have varying proficiency levels. This concern aligns with Wang (2024), who suggests that AI tools, including DeepSeek, struggle to accommodate the diverse needs of students, making it challenging for educators to effectively tailor content to individual learning needs. Yet, this alignment must be critically examined. The rigidity of DeepSeek's filters reflects the normative assumptions embedded in its training data and moderation systems. As van Dijk (2005) notes, such filters often marginalize non-dominant epistemologies, thereby constraining what is teachable. This is not just a curricular mismatch, however, but a question of epistemic justice. Educators' discomfort thus reflects tensions between standardized AI design and pluralistic classroom realities.

During the classroom delivery phase, DeepSeek's integration raised concerns about instructional efficiency and appropriateness. Educators noted that the tool could be time-consuming, and its content often lacked contextual relevance, leading to suggestions that were irrelevant or confusing in the classroom environment. This aligns with Wang (2024), who highlights that AI-driven content must account for local context, as a failure to do so can result in content misalignment with classroom dynamics. More importantly, context blindness in AI tools reveals their decontextualized logic. As Freire (1970) argues, meaningful education is grounded in the lived experiences of learners; tools that cannot adapt to these realities risk delivering knowledge in a 'banking model' format. Educators' concerns thus highlight the disconnect between algorithmic generalization and pedagogical specificity. Moreover, educators expressed concerns about the erosion of instructional control. While DeepSeek can assist with information delivery, educators worry that over-reliance on the tool could diminish their role as facilitators of active learning and critical thinking. Some emphasized that AI should complement, rather than replace, human judgment and creativity, reflecting the concerns highlighted by Mohammed et al. (2025), who stated that overusing AI tools may undermine the essential human elements of teaching, such as empathy and flexibility. This fear is not unwarranted. Biesta (2009) stated that good education involves the interruption of learning, which is the unexpected, relational, and ethical moments that machines cannot replicate. DeepSeek's logic of optimization may inadvertently displace the messiness of human-led inquiry, reducing the space for spontaneity and responsive teaching.

In the post-instruction phase, educators noted significant challenges related to student dependency and the erosion of authentic assessment. Many observed that students increasingly relied on DeepSeek to complete writing and translation tasks, which obscured their true proficiency levels. This dependency discouraged active learning and reduced the need for language practice, potentially undermining long-term skill development. These findings are consistent with those of Tang (2025), who reported that over-reliance on AI tools can impair the development of critical thinking and problem-solving skills in students. The key concern here is not just 'overuse,' but the type of cognitive outsourcing that AI invites. When learners defer to DeepSeek's feedback without metacognitive

reflection, they bypass the productive struggle that supports language development (Zimmerman, 2002). This is particularly risky in ELT, where fluency and accuracy emerge through iterative effort and correction, not from passive acceptance of AI output.

Further, fabricated content and unreliable sources were highlighted as key issues. Educators reported that DeepSeek often generated unverifiable or misleading information, particularly for academic writing or fact-checking tasks. This problem aligns with Idham et al. (2024), who raise concerns about the ethical implications of AI systems in education, particularly regarding the propagation of biases and misinformation. The tendency of DeepSeek to produce unreliable content makes it unsuitable for rigorous academic contexts, where accurate and credible sources are crucial. Yet this is not only an issue of factual inaccuracy. As Williamson and Eynon (2020) argue, AI systems do not simply 'find' knowledge; they must be produced through computational processes shaped by commercial priorities and datafication. Educators' concerns thus highlight the epistemological risks of uncritically accepting AI output as truth.

Finally, educators expressed concerns that the frequent use of DeepSeek could weaken essential language skills such as critical thinking, spelling, and writing, especially in contexts like standardized test preparation, where original expression and idea development are necessary. This issue further reflects the broader concern of AI dependency reported by Yaseeni (2024), which suggests that while AI can enhance personalized learning, it can also diminish student engagement and creativity, thereby hindering the development of foundational skills. Instead of banning AI use, educators called for structured mediation. For example, writing assignments could require students to annotate DeepSeek's suggestions, compare them with peer feedback, and justify their choices, which is a practice supported by dialogic pedagogy (Littleton & Mercer, 2013). Such strategies preserve students' agency while allowing for critical engagement with AI.

The challenges identified in this study highlight the complexities involved in integrating DeepSeek into ELT. While the tool offers potential benefits, such as enhancing lesson preparation and supporting instructional delivery, its technical limitations, curriculum incompatibility, and potential to foster student dependency present significant barriers to its effective use in higher education. These challenges are consistent with findings from recent studies (Idham et al., 2024; Mohammed et al., 2025; Wang, 2024; X. Zhou, 2025), which highlight the need for careful consideration when integrating AI tools into educational settings. Rather than generic calls for "training," this study suggests three specific institutional actions: (1) invest in AI literacy frameworks that treat AI as a dialogic partner, not an answer machine; (2) revise curriculum to include ethical and epistemic discussions around AI use; and (3) support educator autonomy in deciding when, how, and why to use AI in alignment with pedagogical goals. By doing so, the integration of DeepSeek and similar tools can support pedagogical goals while maintaining academic rigor and fostering the long-term development of students' skills.

Theme 3: Enhancing Educator Empowerment Through DeepSeek Integration

In the planning stage, educators view DeepSeek as a useful tool that provides varied resources to support personalized and differentiated instruction. Some believed it could assist in planning for different student levels or small groups. However, they stressed that educators should still control the content. These insights reflect Joshi's (2025) findings about DeepSeek's ability to customize learning through advanced AI design. This customization aligns with the TPACK framework, which emphasizes the balanced integration of technology, pedagogy, and subject content (Mishra & Koehler, 2006). Educators' insistence on retaining control highlights the importance of pedagogical agency, suggesting that AI should be viewed as an augmentation tool rather than a replacement for human instructional judgment.

During classroom delivery, educators described DeepSeek as a partner that could support learning by giving real-time feedback, correcting errors, and creating adaptive materials. Features like avatars and

simulated dialogues were seen as ways to make classes more engaging. These findings support Umar's (2024) view of AI as a tool for intelligent tutoring, and Vaishnav's (2024) suggestion that AI can promote student-centered learning. However, some educators expressed caution regarding the overuse of such features, particularly avatars and gamified dialogues, as they may distract from core content or reduce academic rigor if not grounded in pedagogical goals. This concern aligns with Selwyn (2019), who warns against the "technological solutionism" that assumes all educational problems can be solved through digital means. Thus, while AI can foster engagement, it must be critically evaluated to avoid superficial learning experiences.

In post-lesson assessment, educators reported that DeepSeek's usefulness in handling routine tasks involved marking quizzes and checking grammar. However, some were unsure about trusting AI-generated feedback, especially when it came to the accuracy of content. This aligns with Umar (2024), who stresses the importance of equipping educators with adequate training and ensuring the ethical application of AI in education. A key risk identified was the potential erosion of educators' assessment literacy, as habitual reliance on AI-generated feedback could lead to de-skilling over time. Across all stages, a key point was that AI should support, not replace, educators. Educators preferred a model where DeepSeek works with them, not instead of them. Fu (2024) supports this view, noting that AI can improve teaching, especially in diverse classrooms; it must complement rather than replace the expertise of educators. This preference reinforces a sociotechnical perspective on educational technology, where the value of AI lies in how well it integrates with human roles, values, and institutional norms. Without careful implementation, there is a risk of shifting cognitive authority from educators to opaque algorithms, which may have long-term implications for professional autonomy and trust in teaching (Williamson & Eynon, 2020).

Therefore, educators acknowledged the considerable potential of DeepSeek, provided it is implemented with caution, adequate training, and ongoing oversight. With robust technical infrastructure and alignment with broader trends in ELT, DeepSeek could play a pivotal role in the future of ELT, contingent upon its ethical and careful integration. To fulfil this vision, institutions should prioritize the development of AI literacy among educators, embed AI ethics into educator professional development programs, and establish feedback mechanisms to evaluate AI's pedagogical value over time. These strategies are essential to empower educators not only to use DeepSeek effectively but also to critique and shape its future evolution.

Based on the preceding discussion of Themes 1 to 3, this study highlighted how DeepSeek's integration into ELT offers both pedagogical promises and significant constraints across the teaching cycle. Theme 1 illustrated its capacity to enhance instructional design and engagement when aligned with educator intent. Theme 2 exposed critical limitations, including technical unreliability, curricular misalignment, and the risk of undermining core language competencies. Consequently, Theme 3 revealed cautious optimism, with educators viewing AI as a supportive but not substitutive tool. Together, these findings highlight the importance of contextualized, ethically grounded integration, supported by prompt literacy, institutional policy, and a reaffirmation of the educator's role in mediating the use of AI in language education.

CONCLUSION

Integrating DeepSeek into ELT in higher education plays an important role across pedagogy, curriculum, and technology. DeepSeek enhances teaching practices by streamlining lesson planning, increasing efficiency, and enabling real-time instructional adjustments and feedback. Rather than replacing human expertise, it supports personalized, interactive instruction while maintaining educator autonomy. However, these potentials could be realized through ongoing professional development and institutional support that enables educators to use AI tools critically and effectively.

KEY FINDINGS

This study empirically explores the use of DeepSeek in teaching English in higher education from the perspective of educators' experiences, filling a gap in the field of ELT and learning research on educators' subjective experiences with this AI tool. The first theme, Transformative Pedagogical Support, is about the advantages of DeepSeek. In the Before phase, while the tool demonstrated benefits in enhancing preparatory efficiency through structured content generation and resource enrichment, its classroom application revealed critical limitations, including system instability, contextual misalignment of outputs, and risks of student over-reliance that could undermine long-term language development.

Notably, educators emerged not as passive adopters but as active mediators of technology, strategically adapting its functionalities while maintaining pedagogical authority. The study highlights the necessity of comprehensive training programs that address both technical proficiency and critical AI literacy while suggesting that institutional policies must evolve to support educators in navigating the complexity of technological affordances and pedagogy. Future research should investigate scalable implementation models across diverse educational contexts to further explore the conditions under which open-source AI tools can most effectively empower language instruction without compromising educational quality or student autonomy. In summary, DeepSeek demonstrates significant instructional support value in ELT, but its functionality is limited, while also promoting a positive transformation of the educator's role.

IMPLICATIONS

The theoretical significance of this study lies in its provision of a localized empirical basis for the application of DeepSeek AI tools in ELT in higher education from the educator's core perspective, thereby enriching the theoretical exploration of the interaction between technology and educators in the field of "AI+Education." In addition, it emphasizes the key role of educators' initiative in the process of technology-enabled teaching and learning. For example, the functional value of AI tools in improving efficiency needs to be transformed into teaching effectiveness through educators' improvement of their own autonomy in curriculum design and their ability to respond in real time. Educators' selective use of AI tools (modifying tool suggestions to fit ideological teaching requirements) revealed that educators are not passive recipients of technology but define the boundaries of technology and lead the direction of its application through professional judgement, which provides a new case for the extension of the theory of educator agency in the digital age.

The practical significance of this study is evident in the results, which provide clear guidelines for university English educators on the effective use of DeepSeek in optimizing their teaching practice. Before teaching, they can use the tool to expand their ideas of lesson design, and the need to anchor teaching objectives to avoid deviating from the core. During class, they can use the tool to enhance classroom interaction and guidance, while also controlling the pace of the lesson according to the students' responses to ensure the appropriateness of the lessons. After class, the tools can be used to improve the efficiency of feedback, and attention to individual differences in students should be added to strengthen learning outcomes.

For educational institutions, the study provides a practical reference for promoting the integration of AI and teaching to address the limitations of the tools (such as system instability and insufficient content adaptability). We should perhaps offer feedback to the developers of the tools to enhance the practicality of usage in our contexts. Also, to address the demand for transformation of educators' roles, we need to design targeted training (such as curricular innovation and data interpretation ability) to help educators master these tools. This synergistic path of educator practice and institutional support could promote AI tools from simple applications to in-depth integration and effectively meet the actual needs of teaching.

FUTURE DIRECTION

Further research should be undertaken to investigate the different types of colleges and universities in more subdivided scenarios of English teaching, exploring in-depth the adaptation strategies of AI tools and diversified teaching needs. Additionally, to further expand the breadth and depth of the research, it is necessary to explore in-depth how to develop a more effective educator training system to enhance the ability and quality of educators to utilize AI technology in response to the rapid development of technological advancements. In terms of practical promotion, it is necessary to explore how to establish an effective incentive mechanism to encourage educators to proactively integrate AI technology into daily teaching and realize the deep integration of technology and teaching, giving a full empowering effect of AI technology on education, and laying a solid foundation for the cultivation of innovative talents to meet the needs of future society.

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APPENDIX: ADAPTED QUESTIONNAIRE'S ITEMS

Gender	Male☐	Female☐	
Age	25-35☐	36-45☐	46-55☐
Qualification	Master's Degree☐	PhD Degree☐	

Academic Rank	Associate Professor☐	Assistant Professor☐	Lecturer☐
Teaching Experience	1-10☐	11-20☐	More than 20☐
Participant consent form			
☐ I hereby consent and acknowledge that all my responses will be kept anonymous. Also, all information that I provided may be used, analyzed, presented, and published for academic and research purposes.			
Question1	From your perspective, what unique opportunities does DeepSeek bring to your English language teaching approach?		
Question2	Can you describe any specific instances where DeepSeek positively influenced the learning outcomes in your classroom or online sessions?		
Question3	What challenges or limitations have you observed when incorporating DeepSeek into your ELT methods?		
Question4	Are there specific areas in ELT where you believe DeepSeek might not be ideally suited or could potentially hinder the learning process?		
Question5	Looking ahead, how do you envision the evolving role of DeepSeek and similar tools in ELT?		
Question6	As technology advances, what pedagogical shifts or modifications do you anticipate will be essential to harness the full potential of tools like DeepSeek in ELT?		

AUTHORS

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Claudia Racquel Xervaser is a Doctor of Education candidate at the School of Educational Studies, Universiti Sains Malaysia. She is a lecturer at ILKKM Sultan Azlan Shah Perak, Ministry of Health Malaysia, where she teaches the Pharmacy programme. Her research interests include language learning, technology integration in education, curriculum and instructional design, and health education. Claudia has participated in various academic conferences and actively contributes to the enhancement of educational practice. Her engagement with mixed methods research reflects a sustained commitment to advancing learner engagement through innovative and evidence-informed pedagogical approaches.