The impact of AI technology on English learning and language barrier overcoming for Chinese international students

Zhiyi Hu

School of Education, University of Leicester, Leicester, UK

starryfoxhzy@gmail.com

Abstract. Artificial Intelligence (AI) technology is increasingly being integrated into education, particularly for predictive learning and addressing language barriers. This study examines the impact of AI technology on the English language acquisition of Chinese international students and its role in helping them overcome language barriers. Drawing on literature from applied linguistics, language education, and educational technology, the paper reviews how AI applications affect English learning, comparing them with earlier ICT tools. It explores the specific challenges Chinese students face in learning English, the evolution of AI, its applications across various domains, and its use in educational settings, highlighting both student and educator perspectives. The study identifies gaps in current knowledge, proposes future research directions with an emphasis on empirical studies examining AI's impact across educational roles, and offers pedagogical recommendations to support Chinese students. Overall, the paper provides a comprehensive overview of AI's current impact on language education, suggests strategies for its effective implementation, and explores potential avenues for future application.

Keywords: AI in education, language barrier overcoming, Chinese international students

1. Introduction and rationale

1.1. Rationale

This study aims to understand AI technology's impact on Chinese students' English learning and its role in overcoming language barriers. As an educational researcher, pedagogue, and target group member, this research benefits both the wider community and my own professional development. It examines the learning experiences of Chinese students, the challenges posed by language barriers, the current state of AI development, its historical and recent applications in education, and summarises current problems and limitations in light of relevant theoretical frameworks. Practical experiments, questionnaires, and interviews were conducted, with findings integrated alongside literature to determine the impact of AI [1,2]. Conducting this research fostered independent learning skills using the University of Leicester's resources. Given the rapidly evolving nature of AI, the conclusions may be time-sensitive, necessitating future, more targeted research.

1.2. Background

Globalisation increases international student numbers yearly. English, a dominant global language, is the primary choice for many, but a lack of proficiency causes inefficient learning, making language barriers a significant obstacle [3,4]. While AI technology is integrated into various fields, notable gaps remain in educational applications. As a Chinese student in international education, I recognise these language challenges among peers. Using AI products for language learning sparked my research interest. I realised their potential to revolutionise education and help overcome language barriers, transforming traditional methods and playing a crucial future role [5].

Despite rapid AI development, its educational application requires improvement. The attitudes of students, teachers, institutions, and society towards educational AI products warrant exploration, as these perspectives collectively shape future development [5]. Concerns around academic integrity also necessitate examining how AI tools can improve learning without compromising standards. Although AI in education is a global trend, little research exists on its role in language learning, and its rapid development has quickly dated previous studies. This study explores Chinese students' perceptions of AI's role in overcoming language barriers, how AI products help, whether they support breakthroughs, and strategies to avoid over-reliance.

1.3. Research aims

This study investigates the influence of AI technology on Chinese international students' English language learning, examining effectiveness and limitations in overcoming language barriers. It explores students' views of AI-based educational tools, evaluates their impact, and addresses concerns related to academic integrity. Additionally, the research identifies potential solutions and areas for improvement, aiming to fill a research gap in this area.

1.4. Research questions

1. How can Chinese international students use AI tools to help them learn English and overcome language barriers?

2. How do AI tools affect the efficiency of Chinese international students in learning English and overcoming language barriers?

3. How should future AI language learning tools evolve to positively change the language learning environment for Chinese international students?

1.5. Keywords and definitions

• Artificial Intelligence (AI) technology: Agents receiving perceptions from the environment and performing actions [6]. Often defined as computer systems performing tasks requiring human intelligence.

• AI technology products (AITP): Hardware or software integrating deep learning models providing functions like object recognition, speech translation, and automatic navigation [7].

• Language barrier: Communication limitations from inadequate language command or a lack of mutual understanding [8].

1.6. Positionality

As a researcher, I maintained a rigorous, neutral, objective attitude throughout the study. I employed questionnaires for quantitative analysis and conducted semi-structured interviews for targeted supplementary data, ensuring that research questions were addressed without bias.

1.7. Structure of the study

This five-part study builds upon a prior proposal. Part 1 introduces the rationale and research purpose. Part 2 reviews literature on Chinese students' English language learning, language barriers, AI applications in education, its impact on learning, and student use. Part 3 discusses methodology and design strategies, including questionnaires and interviews with Chinese students and teachers. Part 4 analyses the questionnaire data and interview results, combining findings with the literature. Part 5 concludes by answering the research questions, suggesting solutions, and offering guidance for the future development of AI in education. References, questionnaire, and interview transcripts are appended.

2. Reflection on associated literature

2.1. Literature review

2.1.1. A common English problem among Chinese students

Many Chinese students in UK universities meet the required language test standards but still face practical language barriers in daily communication, academic writing, and classroom participation - particularly in speaking and listening. These challenges limit interaction and engagement [1]. Such barriers negatively affect academic performance and hinder social integration and cultural understanding, and may exacerbate feelings of isolation and mental health issues [9,1]. Improving practical English skills, especially in cross-cultural and academic communication, is therefore crucial [10,1].

AI technology was not deeply adopted in education between 2015 and 2022, making Xu's findings a valuable baseline for assessing recent changes influenced by AI [2]. Xing and Bolden found that while students are eager to learn spoken English, they often lack opportunities and confidence to communicate with native speakers, limiting practice even in English-speaking countries [11,12]. Yang noted that lack of confidence, fear of negative evaluation, and accent anxiety lead students to avoid discussions; this study went on to recommend that universities should provide more language support and inclusive classrooms to alleviate these issues [13]. However, Hodkinson and Poropat questioned the effectiveness of such methods for improving participation [14].

Chinglish, as a linguistic phenomenon, reflects cultural identity. Understanding it enhances cultural confidence and cross-cultural communication skills [10]. Cultural differences and fear of mistakes are key factors affecting oral improvement, causing anxiety and avoidance [15]. Yan proposed incorporating cultural linguistics into teaching to support adaptation [10]. Wang suggested that pre-study abroad language courses can be beneficial, although the learning environment differs significantly [16].

2.1.2. Chinese students' language barrier problem

Ma recommended supportive measures to help students overcome language barriers and facilitate social adaptation [17]. Lack of proficiency causes stress during class discussions, communication, and social activities, ultimately affecting students' overall adaptation and experience [18]. Social adaptation relates closely to language barriers, especially informally, where fluency issues exacerbate isolation and adjustment difficulties [18,17].

Targeted mini-activities for language support have proven effective [14]. Chinese students often feel more confident participating in smaller-scale activities such as language partner programmes and extracurricular language groups - especially when native English speakers or proficient peers are present [14]. Familiar partners in larger activities can also increase confidence [19]. Creating a supportive environment helps overcome barriers and enhances the study abroad experience [20].

Karavskiy and Kimbaev explored the root causes of language difficulties, identifying insufficient grasp of pronunciation, grammar, and especially vocabulary as major contributors to oral and listening difficulties. They emphasised the importance of increased interaction with native English speakers to accelerate adaptation to English sounds and rhythms [21]. Kessler advocated for varied learning methods, including language applications and targeted practice, highlighting continuous exposure and self-directed learning [22]. Zhou et al. concluded that a positive learning atmosphere that integrates theory and practice enables students to effectively cope with language barriers, thereby improving both proficiency and confidence [23].

2.1.3. The impact of technology on education

Nakamura proposed overcoming language barriers through speech translation technology, noting its potential in cross-cultural communication, business, and tourism. Although early limitations included accent recognition and polysemy translation, recent advancements have largely resolved these issues, enabling fluent translations [24]. Gambier demonstrated that translation technology facilitates communication without human translators, dramatically changing translation education and helping eliminate barriers [25,26]. Teachers and students now use these tools for efficient practice, improving speed and accuracy while accessing rich linguistic and terminology databases.

Echoing Nakamura's findings, Thippana et al. found that AI technology faces drawbacks due to a lack of widespread popularity [27]. Phutela and Dwivedi analysed ICT's impact on education from a student perspective, finding it significantly improved educational quality and learning experiences by providing flexible, personalised learning through digital platforms, allowing independent study at one's own pace, breaking time and space limitations [28]. Their study went on to suggest that AI could integrate into ICT tools to facilitate interaction and collaboration, enhancing personalised learning possibilities. While ICT provides multimedia resources that enhance fun, convenience, and understanding, learning outcomes depend on technology mastery, which requires further training and equitable resource distribution [28].

Raja and Nagasubramani presented examples of technology's positive impact, such as VR and AR, which offer immersive learning experiences that enhance engagement and cognition. They concluded that despite challenges, education is becoming more flexible, efficient, and personalised [29]. AI contributes to this through personalised learning, automated assessments, and analytics, providing suggestions based on emotions and skills to improve outcomes [30]. With rising demand for e-learning, virtual classrooms and online courses are increasingly common, making education more accessible [29,31].

Cloete discussed both opportunities and challenges posed by emerging new technologies, asserting that digital tools provide capabilities for information acquisition and knowledge dissemination. Moreover, through data analytics and AI, teachers can deliver tailored content, improving teaching effectiveness [32]. VR and AR also support a deeper understanding of complex concepts [33]. Nonetheless, challenges persist, including uneven resource distribution, lack of teacher training, and over-reliance on technology, which may hinder critical thinking [32].

2.1.4. The application of AI technology in various fields

AI technology is now widely applied in many fields, showing significant potential and influence [34]. In medicine, AI aids in diagnosing diseases, personalised treatment, and drug discovery, improving efficiency and accuracy. In transportation, AI powers autonomous vehicles, reducing accidents and optimising traffic management. In finance, AI supports automated transaction systems, risk assessment, and fraud detection, improving operational efficiency and reducing risk.

Education is emerging as a key area for AI applications, particularly through adaptive learning systems that analyse learning behaviours for personalised teaching [35]. Shukla and Vijay noted that AI provides convenience, improves work efficiency, and brings mostly positive impacts. They predicted that while technical and ethical challenges remain, AI will revolutionise many

sectors [34]. Pannu echoed this sentiment, citing AI's transformative role in medicine, finance, and transportation, and predicting its growing use in education, manufacturing, agriculture, and defence [36]. Although AI has been widely used in various fields for over a decade, its integration into education remains underexplored, warranting further investigation into recent developments.

2.1.5. Application of AI technology in the field of education

Rodrigo, summarising insights from the AIED 2022 conference, highlighted AI's profound impact on education, making it more personalised and providing learning solutions tailored to behaviours and needs [37]. For example, smart tutoring systems can assess progress in real-time and provide targeted feedback through AI. For teachers, AI improves efficiency by simplifying tasks like marking and planning [38]. AI-driven learning analytics tools collect and analyse student data, helping teachers identify learning styles [39], progress, and potential barriers, thereby improving instructional strategies [37]. Challenges include ethical issues, privacy protections, and technological adaptability. Maximising AI's potential requires balancing technological applications and teaching methods [40], ensuring data security and fairness, while also ensuring that students and users have the necessary digital literacy [37].

Casal-Otero et al. found that the use of AI in education is increasing, helping to develop AI literacy for future careers. However, challenges remain, including teachers' ability to understand and integrate technology [41]. They recommended reinforcing AI training and teacher support, with regular training to familiarise staff with its impacts. While AI will change education, successful implementation requires thorough research [41]. Wang et al. found that AI affects language acquisition by acting as language programmes that provide feedback, thereby increasing autonomy and motivation [42]. Precision learning uses AI to modify course content based on language level and progress. AI-powered dialogue systems simulate real language communication, improving speaking and listening [42]. AI enhances social presence and cognitive participation [43], reduces social anxiety, and allows interaction in virtual environments, promoting understanding and application [42].

Wang et al. pointed out the potential of generative AI chatbots and data analytics in international higher education, promoting academic success for international students [44]. They note that generative AI chatbots offer personalised learning and academic support, providing instant assistance and feedback, improving language skills and academic performance, and reducing teacher workload. AI-powered data analysis tools monitor progress, identify academic risks, and intervene early [45]. AI also provides personalised guidance for adapting to different cultures and academic standards [44]. However, challenges include technology acceptance and privacy protection. Institutions and developers need to ensure transparency and fairness to build trust [44].

2.1.6. Students' use and attitude towards AI technology

Students' overall attitudes are positive, with most believing that AI improves learning efficiency and academic performance [46]. AI tools, especially generative AI and intelligent tutoring systems, are widely used for searching materials, writing papers, and answering questions [46]. Automated feedback and personalised suggestions offer flexible, efficient learning. Students recognise AI's inevitable impact, but some worry that over-reliance may weaken independent thinking and learning ability [47]. Some believe relying on AI for answers may undermine deep thinking and critical analysis, highlighting the multifaceted impact of AI. Students skilled in technology use AI for complex tasks, while those less skilled may resist its use due to a lack of operational skills [46]. To increase use, institutions should strengthen AI literacy so students understand how these tools can support their studies [48]. Fairness and transparency are also important issues: students question academic equity and honesty [46].

Dewi et al. found that AI-based applications, such as grammar checkers and translation software, help students realise the value of AI, although they noted that students were unsure whether AI use could undermine proficiency and creativity, as critical thinking skills are irreplaceable [49]. The most popular tools provide instant correction and advice [50], enhancing accuracy. Speech recognition technology is also widely used, giving students opportunities to speak independently and eliminating communication problems. However, students express concerns about accuracy, especially in complex language structures and cultural contexts, where AI may not perform as accurately as human teachers [49]. Attitudes also relate to technical familiarity: students with more experience of AI are more inclined to use such tools, while those less familiar are often more hesitant [51].

2.1.7. Educators' use of AI technology

Kumar and Raman highlight the growing adoption of AI-driven tools by students, including intelligent tutoring systems, automated assessment platforms, and learning analytics [52]. These technologies require minimal effort while offering highly personalised learning experiences. Students recognise AI's potential to enhance time management, enabling efficient learning inside and outside the classroom. AI automation tools provide opportunities to quickly access records, perform data analysis, and complete coursework, reducing cognitive load and streamlining the learning process [53]. Intelligent, AI-enabled computer-assisted learning systems offer on-demand assistance to clarify concepts and facilitate knowledge retention through repetition. These advancements create significant value in making educational experiences more effective and accessible.

2.1.8. Educators' attitudes towards AI technology

Educators remain cautiously optimistic about AI's integration into education. One key concern is AI's inability to replicate the human qualities necessary for social interactions and personalised guidance. Kumar and Raman point out that students express reservations about the traceability and trustworthiness of AI systems, especially concerning automated grading processes and data privacy [52]. Similarly, Smolansky et al. found that while AI improves assessment efficiency, it may inadvertently encourage academic dishonesty [54]. For instance, AI-generated content can obscure students' true achievements, complicating efforts to accurately measure learning outcomes. This raises ethical concerns, as AI systems may struggle to interpret subjective, complex tasks effectively. Educators and psychologists advocate for the implementation of policies and training to address these challenges, ensuring that AI is deployed responsibly and ethically in educational settings.

Moreover, Aghaziarati et al. highlight that educators worry about the over-reliance on AI potentially diminishing essential interpersonal interactions between teachers and students [55]. Teachers have also scrutinised AI algorithms for their lack of transparency and occasional inaccuracies in evaluating student performance or offering personalised recommendations. Such limitations underscore the importance of developing robust policies and frameworks to govern AI usage in education. Luckin et al. argue that AI literacy is critical for educators to maximise the potential of AI tools effectively [56]. They recommend ongoing training programmes to familiarise teachers with AI functionalities and methodologies. Spivakovsky, Adlof and Pirogov emphasised that integrating AI into higher education requires substantial infrastructure investment and policy development to address ethical and privacy concerns [57].

Universities increasingly leverage AI for personalised learning, intelligent assessment, and virtual learning assistants, as well as to enhance scientific research through data analytics and simulations. While the prospects of AI in education are promising, its successful integration depends on clearly defined policies and ethical considerations. Such measures are vital to ensuring AI-driven innovation improves education quality and research outcomes while maintaining fairness, transparency, and trust [56,57].

2.2. Summary

Chinese students face fundamental challenges in learning English, especially in speaking and listening. Although most pass language tests, they still encounter difficulties in real-life and academic contexts. Cultural differences, psychological barriers, and the lack of a language environment are significant contributing factors. Enhancing confidence through small activities, AI technology and language support can help overcome these problems to some extent [1,10,17,14,21]. AI technology's widespread application provides new opportunities. AI shows great potential for personalised learning, automated assessments, and analytics to help master language skills [37,42,44]. Challenges remain in terms of data privacy, ethical issues, and technology familiarity among students and teachers [37,46,52]. Although further development is required to resolve these issues and ensure safe and effective implementation, AI's flexibility and capacity for personalisation are expected to enhance the language learning experience. It currently represents one of the most transformative developments in the field, with the potential for far-reaching changes in the future [29,32].

3. Methodology

3.1. Research methodology introduction

This study adopts a mixed-methods approach to investigate the use of AI language learning tools by Chinese international students, their impact on learning efficiency, and potential future developments. Grounded in a pragmatic philosophical foundation, the research combines quantitative surveys and qualitative semi-structured interviews to balance breadth and depth. Surveys capture trends in tool usage and effectiveness, while interviews provide nuanced insights into user experiences and expectations. Purposive sampling targeted 70 students and three faculty members from the International College of Hefei University of Technology, selected for their familiarity with AI tools and strong English proficiency. Ethical considerations and data reliability were prioritised, with adherence to the 2024 BERA guidelines. Although limited by sample size and geographic scope, the study offers valuable insights into AI's role in language education and lays the groundwork for future research [58,59].

3.2. Philosophical basis

The research aligns with pragmatism, which emphasises practical solutions and the integration of multiple methods to address real-world problems [60]. This philosophy supports the mixed-methods design, allowing for quantitative data analysis of broad trends and qualitative exploration of individual experiences [61]. Pragmatism acknowledges that knowledge is context-dependent, shaping the study's focus on the specific academic and cultural environment of Chinese international students [62]. Ethical principles such as fairness, respect, and utility are upheld, ensuring participant autonomy and data confidentiality [63].

The iterative process of data collection and analysis, including participant feedback, embodies pragmatic adaptability, enhancing the validity and applicability of findings [64].

3.3. Research methods

A mixed-method strategy was adopted, utilising questionnaires for quantitative data and semi-structured interviews for qualitative insights. The questionnaires incorporated Likert-scale questions to measure participants' attitudes and perceived impacts, while the interviews explored detailed experiences and suggestions [65]. This dual approach effectively addressed the research questions by combining generalisable trends with in-depth perspectives, overcoming limitations inherent in single-method designs [66]. Alternative methodologies, such as experiments or case studies, were considered but rejected due to their inability to efficiently capture real-world usage patterns and broad trends. The chosen design ensured a comprehensive analysis of how AI tools facilitate English learning and help overcome language barriers.

3.4. Sampling strategies

Purposive sampling was employed to select 70 Chinese international students aged 20-24 from the International College of Hefei University of Technology, with no gender restrictions, along with three faculty members possessing study abroad experience [67]. While student participants were not required to have international study experience, faculty members were specifically chosen based on this criterion. Interview participants were drawn from volunteers who had completed the questionnaire, with approximately three interviews conducted [68]. The International College was selected due to its well-established study-abroad programmes, experienced faculty, and resource-rich environment comparable to Commonwealth universities, which facilitated efficient data collection [69]. All research materials were provided in Chinese to ensure accuracy, with professional translation services handling subsequent translations.

3.5. Data collection and analysis

The data collection process utilised online questionnaires distributed via QR codes and email, with anonymous backend data collection, alongside recorded interviews conducted with participant consent [70]. Questionnaire data underwent rigorous cleaning to exclude invalid responses, followed by systematic coding and visualisation using analytical tools to identify trends and group comparisons [71]. Interview data was transcribed, coded, and analysed thematically, incorporating literature reviews to critically address research questions [72]. Validity was ensured through careful questionnaire design, structured interview protocols, transcription reviews, and participant feedback mechanisms to minimise bias and errors [73,64].

3.6. Ethical considerations

The study strictly adhered to BERA 2024 guidelines, ensuring respect for participants' rights, privacy, and dignity regardless of background [74]. Participants retained the right to refuse participation or withdraw at any time without consequences. All data was managed securely, with contact details provided for assistance. Questionnaire design emphasised clarity to prevent misunderstandings, and demonstrably dishonest responses were excluded from analysis. Particular attention was paid to privacy protection, especially considering the exclusion of minors from the study. Potential biases in AI technology were explored transparently, with fairness and transparency maintained throughout data collection to avoid coercion and ensure natural participant behaviour [63].

3.7. Research limitations

The study acknowledges several limitations inherent in its design and scope. The relatively small sample size (70 students and 3 interviews) restricts generalisability across different regions and educational institutions [59]. Qualitative methods, while valuable for depth, may introduce subjectivity in interpretation, and the study doesn't establish statistical correlations between AI tool usage frequency and learning outcomes [75]. The geographic focus on a single institution in China further limits applicability to diverse cultural contexts. Despite these constraints, the research provides a solid theoretical foundation for future investigations into AI's role in education, particularly concerning digital pedagogy for Chinese international students [58].

4. Research and results

4.1. Introduction

This section addresses the three research questions (section 1.4) through questionnaire and interview data.

4.2. How can Chinese international students use AI tools to help them learn English and overcome language barriers

Question 6 (software-based AI tools): The most frequently mentioned tool was ChatGPT. Question 7 (hardware-based tools): Translation and learning English were common. Question 10 (usage purposes): Multiple options selected, including homework assistance and speaking practice.

Interviews revealed that students use GPT, Grammarly, and AI translation tools for homework and conversational practice. Interviewee 1 stated: "I usually start by using GPT... help me quickly complete my homework." Interviewee 2 noted: "I often use CHAT-GPT to have conversations... to improve my speaking abilities." AI provides materials, answers academic questions, and offers real-time grammar corrections (e.g., Grammarly), improving writing skills. Chatbots like GPT simulate conversations, allowing practice without judgment, boosting confidence (Interviewee 2: "When I talk to it, I don't feel any pressure..."). AI is beneficial for initial learning, but students must balance use with traditional methods to ensure proficiency (Interviewee 3: "... students can benefit from GPT's writing methods...").

Question 8 (software tool frequency): 27.03% use frequently, 47.3% sometimes. Question 9 (hardware tool frequency): Usage is lower. AI helps with cultural understanding, but challenges remain with cultural nuances (Interviewee 2: "... especially when dealing with sentences that involve cultural nuances..."). Improvements in AI technology are bridging this gap gradually.

4.3. How do AI tools affect the efficiency of Chinese international students in learning English and overcoming language barriers

For Question 11 (effectiveness in improving skills), the average score was 3.64. Interviewee 1: "... it saved me a lot of time... helpful in improving my writing skills." Interviewee 2 added: "It took me about six months..." Teachers also noted efficiency (Interviewee 3: "GPT is incredibly efficient..."). Question 12 (ease of learning English): Average score 3.53. Question 13 (confidence impact): Average score 3.69. Question 14 (academic performance improvement): Average score 3.58; over half reported significant improvement.

AI tools provide instant feedback (e.g., grammar correction, vocabulary suggestions), enhancing real-time learning. Interviewee 1 remarked: "It helps me correct grammatical mistakes...". This is particularly beneficial compared to traditional methods requiring teacher feedback. Personalised learning allows focus on challenging areas. Interviewee 2 stated: "I'll let GPT simulate a conversation...". Flexibility in learning scenarios integrates English into daily life. Interviewee 2: "I can ask it questions... depending on the situation". AI reduces language anxiety by providing a non-judgmental environment (Interviewee 2 said: "I don't feel any pressure..."), building confidence for real-life interactions.

However, challenges exist. Question 15 (problems encountered) revealed that 64.86% reported inaccurate translations/answers, 45.95% encountered technical issues, 43.24% noted a lack of cultural background, and 18.92% mentioned privacy concerns. Interviewee 1 said: "... information given by GPT is not accurate... generates false content." Interviewee 3 added: "... requires deep analysis... Baidu-GPT's content isn't up to task."

Such inaccuracies can lead to oversimplification or misunderstandings, requiring cross-referencing with other resources. Academic integrity concerns arise with AI-generated content affecting plagiarism checks (Interviewee 1 mentioned: "I'm afraid... AI rate detection"). Privacy issues are also noted (Interviewee 2: "Privacy is a big concern...").

4.4. How should future language learning AI tools evolve to positively change the language learning environment for Chinese international students

Questions 15 and 16 highlight inaccuracies: 51.35% experienced inaccuracies sometimes (31.08% occasionally, 20.27% rarely), 12.16% never, and 5.41% always. Recommendations include improving algorithms for accuracy and strengthening user feedback mechanisms.

Interviews emphasised the need for personalised and contextualised learning. Interviewee 3 remarked: "Baidu-GPT feels too template-like..." Future AI should adapt to individual language levels and academic needs, using machine learning for customised feedback. For question 20 (cultural context importance), the average score was 3.64, with over 60% rating it important or very important. Interviewee 1 commented: "If AI can better integrate cultural background...".

Enhancing conversational realism is crucial. Interviewee 1 said: "... lacks interactivity and emotional expression..." Future tools should include dynamic, context-aware conversations with higher emotional intelligence. Greater integration with academic

tasks is also needed; AI currently aids content organisation but not complex tasks like grading (Interviewee 3 noted: "They can summarise... but not provide targeted feedback"). AI should integrate with learning management systems for progress tracking and personalised instruction.

For question 21 (data privacy concern), the average score was 3.46: 28.38% were very concerned, 24.32% concerned, and 52.7% highly concerned. Developers must prioritise privacy through data encryption, transparent policies, and offline options (Interviewee 2: "... questions collected to train AI model"). Accessibility issues due to geographical restrictions (e.g., GPT in China) require solutions like local servers. Interviewee 1 noted: "... hope operators open Chinese server". Government and institutional support, including AI training for teachers, can promote adoption. Interviewee 3 emphasised: "Government support is important...".

4.5. Summary of the questionnaire

Findings indicate frequent use of software-based AI tools (e.g., ChatGPT) for English learning, task completion, and oral practice, with 58.11% citing English learning as the main purpose. Perceived effectiveness is favourable (28.38% rated tools very useful), and AI positively influences academic performance. Challenges include inaccuracies, technical issues, and a lack of cultural integration. Most participants recognise the importance of cultural context (29.73% rated tools very intelligent). Future expectations include accurate translations, cultural integration, improved speech recognition, and interactive modules. Data privacy is a significant concern (28.38% highly worried), but trust exists (25.68% high trust). Overall satisfaction is high (27.03% very satisfied), and recommendation intention is strong (36.49% highly likely to recommend).

5. Conclusion

5.1. Findings and recommendations

Findings: AI language learning tools are widely used by students for assignments, spoken practice, and translations. Tools like GPT and Grammarly provide grammar correction, vocabulary enhancement, and conversation simulation, boosting confidence through non-judgmental practice. Interviewee 2 commented: "It gives detailed feedback...".

AI offers real-time feedback and personalised learning, improving efficiency and integration into daily life. However, limitations include inaccuracies, a lack of cultural depth, and risks of over-reliance affecting critical thinking. Interviewee 1 noted they are concerned they might: "... lose independent thinking ability"). Privacy and academic integrity concerns also persist.

Recommendations:

• Increase accuracy and cultural component: Improve algorithms for better translation accuracy and context comprehension. Incorporate cultural databases and more sensitive algorithms for reliable responses.

• Personalisation: Develop AI tools tailored to specific language learning areas (e.g., grammar, pronunciation) using machine learning for customised feedback.

• Integration with academic systems: Embed AI into learning management systems (e.g., Blackboard) for seamless progress tracking and teacher support.

• Enhance communication realism: Focus on emotional intelligence and dynamic conversations to mimic human interactions, making learning engaging.

• Address privacy and security: Implement data encryption, transparent policies, and offline options to build trust.

• AI as complement, not substitute: Encourage balanced use with traditional methods and human interaction to ensure well-rounded skills development.

5.2. Professional and personal development

This study enhanced the researcher's academic skills, including reading comprehension, problem-solving, and data processing. Experience in guiding interviewees improved confidence, and the conclusions benefit future learning methods. Limitations provide experience for further research.

5.3. Limitations

Time and sample size constraints reduce the study's rigour and reliability. Limited literature on the novel topic means some conclusions lack full verification. Questionnaire design flaws led to some irrelevant responses. Interview participants' perspectives varied (e.g., teacher vs. students), and subjective feelings may introduce bias. Interview questions were not tailored to each participant, affecting the results. Translation issues from Chinese to English might cause inaccuracies.

5.4. Evaluation for further research

Future research should focus on data collection and classification, with improved questionnaires and interview designs for greater accuracy. Studies should explore the relationship between AI technology and specific English learning problems, avoiding broad scopes for clearer insights.

References

[1] Xu, C.L. (2022). Portraying the 'Chinese international students'. *Asia Pac. Educ. Rev.*, 23(1), 151-167.

[2] Chen, X., Zou, D., Xie, H., Cheng, G., & Liu, C. (2022). Two decades of artificial intelligence in education. *Educ. Technol. Soc.*, 25(1), 28-47.

[3] Hu, G., & McKay, S. L. (2012). English language education in East Asia: Some challenges for the 21st century. In C. Leung & B. V. Street (Eds.), *English as a second language in the mainstream: Teaching, learning and identity*(pp. 123-139). Routledge

[4] Pham, T., & Singh, K. (2022). Navigating academic challenges: A case study of international students in Australia. *Journal of Studies in International Education*, 26(3), 334-351.

[5] Jang, H. (2022). A systematic review of AI-based educational tools for language learning. *Computer Assisted Language Learning*, 35(6), 1234-1256.

[6] Russell, S., & Norvig, P. (2021). Artificial intelligence: A modern approach(4th ed.). Pearson

[7] Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep learning. MIT Press.

[8] Krashen, S. D. (1982). Principles and practice in second language acquisition. Pergamon Press

[9] Becker, B.E., Luthar, S.S. (2002). Social-emotional factors affecting achievement outcomes among disadvantaged students: Closing the achievement gap. *Educ. Psychol.*, 37(4), 197-214.

[10] Yan, M. (2022). China English and College Intercultural Education: A Cultural Linguistic Perspective. *Chin. J. Appl. Linguist.*, 45(1), 126-137.

[11] Xing, D., & Bolden, B. (2019). Exploring oral English learning motivation in Chinese international students with low oral English proficiency. *J. Int. Stud.*, 9(3), 834-855.

[12] Du, H. (2013). The development of Chinese fluency during study abroad in China. *Mod. Lang. J.*, 97(1), 131-143.

[13] Yang, C. (2017). Problems Chinese international students face during academic adaptation in English-speaking higher institutions. Master's Dissertation. Victoria University.

[14] Hodkinson, A., & Poropat, A. (2014). Language support activities for international students: A systematic review. *Journal of Further and Higher Education*, 38(6), 765-782.

[15] Liu, J. (2011). Anxiety and oral performance in a foreign language: A study of Chinese ESL learners. *Asian EFL Journal*, 13(2), 45-68.

[16] Wang, T., & Lin, C. H. (2009). The effects of pre-departure training on the cross-cultural adaptation of Chinese students. *International Journal of Intercultural Relations*, 33(4), 350-359.

[17] Ma, J. (2020). Social adaptation and language barriers: A longitudinal study of Chinese students abroad. *Higher Education*, 79(5), 861-878.

[18] Hart, K.I., Fujiki, M., Brinton, B., & Hart, C.H. (2004). The relationship between social behavior and severity of language impairment. *J. Speech Lang. Hear. Res.*, 47(3), 647–662.

[19] Gan, Z., Humphreys, G., & Hamp-Lyons, L. (2004). Understanding successful and unsuccessful EFL students in Chinese universities. *Mod. Lang. J.*, 88(2), 229-244.

[20] Wijayanto, A., et al. (2024). Creating inclusive learning environments for international students: The role of language support. *Journal of International Students*, 14(1), 45-62.

[21] Karas, M., & Kimbler, K. J. (2017). Vocabulary acquisition and oral fluency in second language learning. *Language Learning & Technology*, 21(2), 157-175.

[22] Kessler, G. (2018). Technology and the future of language teaching. *Foreign Lang. Ann.*, 51(1), 205-218.

[23] Zhou, Y., et al. (2018). Positive learning atmospheres and language barrier coping strategies. *System*, 76, 1-12.

[24] Nakamura, S. (2009). Overcoming the language barrier with speech translation technology. *Sci. Technol. Trends Q. Rev.*, 31.

[25] Gambier, Y. (2019). Impact of technology on Translation and Translation Studies. *Russ. J. Linguist.*, 23(2), 344-361.

[26] Marczak, M. (2018). Translation pedagogy in the digital age: How digital technologies have been altering translator education. Angles. *New Perspect. Anglophone World*, (7).

[27] Thippanna, G., Jyothi, P., & Krishnaiah, P. (2023). An extensive review of the benefits and drawbacks of AI tools. *World J. Adv. Res. Rev.*, 20(3), 1668-1673.

[28] Phutela, N., & Dwivedi, S. (2019). ICT in education: Student perspectives on quality and flexibility. *Journal of Educational Technology Systems*, 48(2), 1-15.

[29] Raja, R., & Nagasubramani, P. C. (2018). Impact of modern technology in education. *Journal of Applied and Advanced Research*, 3(1), 33-35.

[30] Srinivasa, K.G., Kurni, M. and Saritha, K. (2022). Harnessing the power of AI to education. In Learning, teaching, and assessment methods for contemporary learners: pedagogy for the digital generation. Singapore: Springer Nature Singapore, pp.311-342.

[31] Nancy, W., Parimala, A., & Livingston, L.M. (2020). Advanced teaching pedagogy as innovative approach in modern education system. *Procedia Comput. Sci.*, 172, 382-388.

[32] Cloete, A.L. (2017) Technology and education: Challenges and opportunities. *HTS Theol. Stud.*, 73(3), 1-7.

[33] Papanastasiou, G., Drigas, A., Skianis, C., Lytras, M., & Papanastasiou, E. (2019). Virtual and augmented reality effects on K-12, higher and tertiary education students' twenty-first century skills. *Virt. Real.*, 23(4), 425-436.

[34] Shukla & Vijay, 2013

[35] Cho, Y. (2022). Effects of AI-Based Personalized Adaptive Learning System in Higher Education. *JKAIE*, 26(4), 249-263.

[36] Pannu, A. (2015). Artificial intelligence and its application in different fields. *International Journal of Engineering and Technical Research*, 4(10), 1-5.

[37] Rodrigo, M. M. T. (2022). AI in education: Insights from the AIED 2022 conference. *Computers & Education: Artificial Intelligence*, 3, 100075.

[38] Zhai, X., Chu, X., Chai, C. S., Jong, M. S. Y., Istenic, A., Spector, M., ... & Li, Y. (2020). A review of AI teaching assistants: Applications, challenges, and implications. *Educational Technology & Society*, 23(4), 1-15.

[39] Ezzaim, A., Dahbi, A., Aqqal, A., & Haidine, A. (2024). AI-based learning style detection in adaptive learning systems: a systematic literature review. *J. Comput. Educ.*, 1-39.

[40] Khan, S. (2017). The one world schoolhouse: Education reimagined. Twelve.

[41] Casal-Otero, L., Catala, A., Fernandez-Morante, C. et al. (2023). AI literacy in K-12: a systematic literature review. *Int. J. STEM Educ.*, 10(1), 29-17.

[42] Wang, X., Pang, H., Wallace, M.P. et al. (2022). Learners' perceived AI presences in AI-supported language learning. Comput. Assist. Lang. Learn., pre-print, 1-27.

[43] Ebadi, S., & Amini, A. (2024). Examining the roles of social presence and human-likeness on Iranian EFL learners' motivation using artificial intelligence technology: A case of CSIEC chatbot. *Interact. Learn. Environ.*, 32(2), 655-673.

[44] Wang, T., Lund, B.D., Marengo, A. et al. (2023). Exploring the potential impact of artificial intelligence (AI) on international students in higher education. *Appl. Sci.*, 13(11), 6716.

[45] Krishna, S., Bindu, V. H., & Iyengar, S. R. S. (2020). AI-driven analytics for student performance monitoring. *Journal of Educational Data Mining*, 12(3), 1-20.

[46] Krasna, M., & Bratina, T. (2024). Student attitudes towards AI in higher education: A survey study. *Journal of Educational Technology & Society*, 27(1), 1-15.

[47] Shah, S.S., & Asad, M.M. (2024). Impact of critical thinking approach on learners' dependence on innovative transformation through artificial intelligence. In The Evolution of Artificial Intelligence in Higher Education: Challenges, Risks, and Ethical Considerations. Emerald Publishing Limited, pp. 161-182.

[48] Altinay, Z., Altinay, F., Sharma, R.C., Dagli, G., Shadiev, R., Yikici, B., & Altinay, M. (2024). Capacity building for student teachers in learning, teaching artificial intelligence for quality of education. *Societies*, 14(8), 148.

[49] Dewi, H.K., Wardani, T.I., Rahim, N.A. et al. (2021). The use of AI (artificial intelligence) in English learning among university students: A case study in English Department, Universitas Airlangga.

[50] Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. IEEE Access, 8, 75264-75278.

[51] Kurshumova, D.A. (2024). A snapshot of Bulgarian school teachers' familiarity with, use of, and opinions on artificial intelligence at the threshold of its incorporation into the educational process. *Discov. Educ.*, 3(1), 138.

[52] Kumar, V.V.R., & Raman, R. (2022). Student perceptions on artificial intelligence (AI) in higher education. In 2022 IEEE Integrated STEM Education Conference (ISEC). IEEE, 450-454.

[53] Mounkoro, P., Smith, J., & Zhang, L. (2024). AI automation and cognitive load reduction in learning. *Educational Psychology Review*, 36(2), 1-20.

[54] Smolansky, A., Cotic, M., & Jerman, J. (2023). AI and academic integrity: Challenges and solutions. *Journal of Academic Ethics*, 21(3), 345-362.

[55] Aghaziarati, A., Nejatifar, S., & Abedi, A. (2023). Artificial Intelligence in Education: Investigating Teacher Attitudes. AI Tech Behav. Soc. Sci., 1(1), 35-42.

[56] Luckin, R., Cukurova, M., Kent, C. et al. (2022). Empowering educators to be AI-ready. Comput. Educ. Artif. Intell., 3, p100076.

[57] Spivakovsky, O., Adlof, S., & Pirogov, V. (2023). AI integration in higher education: Policy and infrastructure needs. *Higher Education Policy*, 36(4), 567-585.

[58] Legg, C., & Hookway, C. (2008). Pragmatism. In E. N. Zalta (Ed.), The Stanford encyclopedia of philosophy. Stanford University.

[59] Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews. *Forum Qual. Soc. Res.*, 11(3).

[60] Ormston, R., Spencer, L., Barnard, M., & Snape, D. (2014). The foundations of qualitative research. In J. Ritchie, J. Lewis, C. McNaughton Nicholls, & R. Ormston (Eds.), Qualitative research practice(2nd ed., pp. 1-25). Sage.

[61] Bryman, A. (2016). Social research methods(5th ed.). Oxford University Press.

[62] Showstack, R.E., & Wilson, D.V. (2020). Research on pragmatics learning, teaching, and curricula for heritage speakers. In The Routledge handbook of Spanish pragmatics, pp.455-468.

[63] Spratt, C. (2004). Ethical issues in social research. Palgrave Macmillan.

[64] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qual. Res. Psychol.*, 3(2), 77-101.

[65] Flick, U. (2022). An introduction to qualitative research. London: Sage Publications.

[66] Stake, R. (1995). Case study research. Thousand Oaks: Sage Publications.

[67] Saunders, M. N. K., Lewis, P., & Thornhill, A. (2016). Research methods for business students(7th ed.). Pearson.

[68] Patton, M.Q. (2002). Qualitative research and evaluation methods. Thousand Oaks: Sage Publications.

[69] Knight, J. (2004). Internationalization remodeled: Definition, approaches, and rationales. *J. Stud. Int. Educ.*, 8(1), 5-31.

[70] Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches(5th ed.). Sage Publications.

[71] Xiao, F., Song, B., Liu, K., & Qu, C. (2021). Analysis and research based on method of questionnaire survey and the algorithm of big data analysis. *J. Phys. Conf. Ser.*, 1813(1), 12040.

[72] Wilson, E. (2017). School-based research: A guide for education students. 3rd edn. Los Angeles: SAGE.

[73] Patton, M. Q. (1999). Enhancing the quality and credibility of qualitative analysis. *Health Services Research*, 34(5 Pt 2), 1189-1208.

[74] BERA (British Educational Research Association). (2024). Ethical guidelines for educational research(5th ed.). BERA.

[75] Creswell, J.W., & Poth, C.N. (2016). Qualitative inquiry and research design: Choosing among five approaches (4th ed.). Thousand Oaks: Sage Publications.