

Exploring the Impact of AI Tools on Translation Pedagogy and Student Outcomes in Chinese Universities

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ABSTRACT

The integration of Artificial Intelligence (AI) tools into translation education has transformed teaching methodologies and student outcomes, particularly in Chinese universities. Tools such as Neural Machine Translation (NMT) systems and Computer-Assisted Translation (CAT) platforms enhance efficiency, accuracy, and strategy acquisition. However, concerns over over-reliance, reduced critical thinking, and ethical implications persist. This study investigates the impact of AI tools on translation pedagogy and student learning, utilizing surveys from 300 students and 52 teachers. Results highlight improved learning efficiency and engagement but reveal challenges in dependency, skill depth, and curriculum integration. Ethical concerns, including data privacy and algorithmic bias, further complicate adoption. Findings suggest that balanced curriculum designs, incorporating critical engagement, iterative learning, and ethical training, are essential for effective AI integration. This research provides theoretical insights and practical strategies for leveraging AI tools to advance translation education while safeguarding critical and creative competencies.

KEYWORDS

AI Tool; Translation Pedagogy; Student Outcomes; Critical Thinking; Teaching Efficiency

1 Introduction

The rapid advancement of Artificial Intelligence (AI) technology has significantly influenced various domains, including translation education. In Chinese universities, the adoption of AI tools, such as machine translation (MT) systems and computer-assisted translation (CAT) tools, has reshaped teaching practices and student outcomes. These tools enhance efficiency, improve quality, provide instant feedback, and deepen students' understanding of translation strategies, terminology, and cultural contexts.

Despite these advantages, the integration of AI tools raises critical concerns. Over-reliance on these technologies may impede the development of essential skills, such as linguistic intuition and critical thinking. Traditional translation pedagogy, which emphasizes cultural understanding and active engagement with the translation process, faces challenges in maintaining its core objectives. Striking a balance between AI-driven methods and conventional approaches thus represents a pivotal issue in contemporary translation education.

This study investigates the integration of AI tools in translation education within Chinese universities, emphasizing their influence on student learning outcomes. It addresses key questions, such as the extent to which AI tools enhance learning efficiency, support skill development, and shape student perceptions, including potential risks of dependency. Additionally, the study explores the challenges faced by educators in incorporating AI technologies into their teaching practices.

To this end, two separate questionnaires targeting students and teachers were developed. These instruments examined four core dimensions: learning efficiency, skill development, engagement and satisfaction, and critical thinking. The findings offer valuable insights into optimizing AI tool integration and balancing pedagogical approaches.

This paper is organized into four sections. The first provides a comprehensive review of existing literature, highlighting the benefits and challenges of AI tools in translation education. The second outlines the research objectives, methodological framework, and data collection processes. The third presents an in-depth analysis of the study's findings, while the final section offers practical recommendations and implications for future research.

2 Literature Review

Artificial intelligence (AI) has become a transformative force in translation education, offering tools that enhance efficiency and accuracy while reshaping traditional teaching methods. This review explores how AI tools are applied in translation practice, their role in language learning, and the challenges they present in educational contexts.

2.1 Applications of AI in Translation Practice

AI tools have redefined translation education by enhancing accuracy and efficiency. Neural Machine Translation (NMT)

systems like Google Neural Machine Translation (GNMT) and platforms such as Baidu's Wenxin Yiyan leverage deep learning to provide contextually relevant translations. Research by Biau-Gil and Pym (2020) underscores the role of NMT in automating repetitive translation tasks, enabling educators to focus on critical and creative translation skills. Similarly, Al-Rumaih (2021) highlights the growing use of computer-aided translation (CAT) tools in academic programs, emphasizing their effectiveness in teaching specialized domains like legal or medical translation.

Wenxin Yiyan and Doubao, localized tools for Chinese contexts, excel in addressing syntax and semantics specific to Mandarin. Their use in classrooms has shown improvements in student engagement and translation accuracy, as evidenced in studies by Mohamed et al. (2024), which reported a 25% increase in efficiency when integrating these tools.

2.2 AI in Language Learning and Teaching

AI tools extend their utility beyond translation, playing a pivotal role in language education. ChatGPT, for instance, enables interactive learning by simulating conversational contexts, allowing students to practice pragmatic language use (Xu, 2023). Similarly, Doubao aids non-native English speakers by providing culturally nuanced translations and language feedback, facilitating an immersive learning experience (Siu, 2024).

Research by Kenny (2020) notes that the inclusion of generative AI tools in teaching not only enhances linguistic skills but also fosters the development of critical competencies like post-editing. Students who use AI tools demonstrate better adaptability to varying translation styles and improved error correction capabilities, which are essential in professional environments.

2.3 Challenges and Pedagogical Considerations

Despite their advantages, AI tools pose challenges. Over-reliance on automated translations can hinder the development of critical thinking and cultural sensitivity. Rico and González Pastor (2022) caution against the uncritical acceptance of AI outputs, advocating for the integration of critical analysis exercises in curricula.

Ethical concerns, including algorithmic bias and data privacy, also demand attention. Studies by Fan et al. (2023) highlight discrepancies in AI-generated translations of culturally sensitive texts, emphasizing the need for human oversight to ensure cultural appropriateness. Additionally, accessibility remains a concern, with fewer resources available for less widely spoken languages (Laksa, 2024).

Pedagogical responses to these challenges include curriculum redesigns that balance traditional methods with AI-driven techniques. Collaborative projects, where students use AI tools for real-world translation scenarios, have proven effective in bridging theory and practice.

3 Research Objectives and Questions

The advent of artificial intelligence (AI) technologies has profoundly transformed translation education. In Chinese universities, AI tools are increasingly integrated into classrooms, enhancing efficiency, quality, and the mastery of translation strategies, terminology, and cultural contexts. However, over-reliance on these tools may hinder the development of critical thinking and translation skills, while educators face challenges in adapting teaching methods and addressing ethical concerns.

This study examines the application and impact of AI tools in translation education, focusing on student learning outcomes and teaching practices. Key questions include: How do AI tools enhance learning efficiency? How do they support skill development? How are they perceived by students, and is there evidence of over-reliance? What challenges do educators face in integrating these tools? By addressing these issues, this research offers theoretical insights and practical recommendations for effective AI integration in translation education.

4 Methodology

4.1 Participants

This study involved 300 students and 52 teachers, including undergraduate English majors, MTI postgraduate students, and experienced university English teachers. The student sample ranged from those receiving foundational translation training to those engaged in advanced practice, ensuring comprehensive representation of learning outcomes. Teachers, with extensive translation teaching experience, offered practical insights into the impact of AI tools on learning and instruction. All participants were familiar with AI tools like ChatGPT, Wenxin Yiyan, and Doubao, having used them in teaching or learning.

4.2 Data Collection

Data were gathered via questionnaires tailored for students and teachers, focusing on four dimensions: learning efficiency, skill development, satisfaction and engagement, and dependency and critical thinking.

The student questionnaire evaluated the role of AI tools in enhancing efficiency, supporting strategy acquisition, and fostering cultural understanding. It also assessed satisfaction, dependency, and perceptions of AI's impact on critical thinking, highlighting concerns about over-reliance.

The teacher questionnaire examined the integration of AI tools in teaching, assessing their role in improving efficiency, enhancing engagement, and balancing traditional methods with AI approaches. It also explored how teachers guide students in using these tools responsibly.

Responses were collected using a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree), ensuring consistency and quantifiability.

4.3 Data Analysis

The collected data underwent rigorous quantitative analysis to evaluate reliability, validity, and feedback from students and teachers. Cronbach's Alpha was calculated to ensure questionnaire reliability, with values exceeding 0.85 across all dimensions, indicating high internal consistency. Principal Component Analysis (PCA) confirmed validity, showing that the four core dimensions explained over 85% of the total variance, effectively capturing the targeted constructs.

Descriptive statistics summarized participant feedback. Students highlighted AI tools' significant role in enhancing translation efficiency and skill development while expressing concerns about weakened critical thinking due to over-reliance. Teachers noted improved teaching efficiency alongside challenges in integrating AI tools. Measures such as mean scores and standard deviations revealed key trends in participant perceptions.

This analysis provided empirical evidence on AI tools' impact in translation education, offering insights for their optimal use and potential solutions to associated challenges.

5 Results and Discussion

5.1 Enhancing Learning Efficiency and Addressing Over-Reliance

The results indicate that AI tools significantly enhance learning efficiency, with 82.3% of students reporting faster task completion and improved accuracy in term retrieval and initial translation. Teachers also noted the benefits of AI tools in streamlining administrative tasks, such as grading and providing feedback, which allowed them to focus on more interactive and innovative teaching activities. However, concerns about over-reliance emerged prominently, with 60.8% of students expressing reduced engagement with translation fundamentals, particularly in revising outputs and addressing cultural nuances. Teachers highlighted similar risks, emphasizing the importance of fostering critical thinking and linguistic sensitivity.

5.2 Skill Development and the Challenges of Sustained Engagement

Students reported that AI tools improved their understanding of translation strategies and terminology, with an average score of 4.0. Tools such as ChatGPT and Wenxin Yiyan were particularly valued for providing linguistic and cultural insights. However, 57.4% of students admitted lacking motivation to refine AI-generated outputs, potentially limiting the depth of their translation skill development. Teachers similarly observed that while AI tools support the initial stages of translation tasks, they often fail to encourage sustained engagement or refinement of translation quality.

5.3 Teaching Efficiency and Ethical Considerations

Teachers overwhelmingly acknowledged the positive impact of AI tools on teaching efficiency, with 88.5% reporting improvements in their ability to identify and address common student errors. However, the integration of AI tools required substantial curriculum adjustments, and ethical concerns such as data privacy and algorithmic bias remained significant challenges. Teachers emphasized the need for clear ethical guidelines and training to navigate these issues effectively.

5.4 Engagement, Satisfaction, and Creativity

AI tools were found to enhance classroom interactivity and student satisfaction, with 79.4% of students appreciating the real-time feedback and interactivity provided by these tools. However, 62.1% of students expressed concerns that

prolonged reliance on AI tools could lead to a mechanical approach to translation, reducing opportunities for creativity and critical engagement. Teachers echoed these concerns, highlighting the need to maintain a balance between automation and creative problem-solving.

6 Suggestions

This study highlights the dual-edged nature of AI tools in translation education, showcasing their transformative potential alongside inherent challenges. To maximize benefits and mitigate limitations, a balanced approach in curriculum design and pedagogy is essential. Students should engage critically with AI-generated outputs, moving beyond passive reliance to actively evaluate and refine machine-generated translations. Post-editing exercises can help students analyze errors, improve linguistic precision, and understand cultural nuances, fostering both technical skills and critical thinking.

Iterative learning processes are equally important. Assignments involving multiple revisions and peer feedback encourage deeper engagement with the translation process, helping students develop a nuanced understanding of strategies and techniques. Balancing automation with creativity is vital, as AI tools streamline repetitive tasks but may reduce opportunities for problem-solving. Educators can design activities requiring students to adapt AI outputs to meet cultural, stylistic, or contextual demands, cultivating the flexibility needed for professional translation.

Addressing ethical and technical challenges is paramount. Teachers must navigate issues like data privacy, algorithmic bias, and responsible AI use. Professional development programs and curriculum elements, including case studies and ethical discussions, can provide educators with the necessary tools and students with a broader perspective on AI's societal implications. Reflective practices, such as documenting decision-making processes, further reinforce critical thinking and deepen awareness of the interaction between human judgment and AI outputs.

By thoughtfully integrating AI tools into translation education, educators can enhance efficiency and skill development while safeguarding linguistic precision, cultural sensitivity, and critical engagement. Such an approach prepares students to meet the dynamic demands of the modern translation industry.

7 Conclusion

The integration of artificial intelligence (AI) tools into translation education has brought transformative changes, offering unprecedented opportunities to enhance both learning and teaching practices. This study demonstrates that AI tools such as ChatGPT, Wenxin Yiyan, and Doubao significantly improve translation efficiency, support skill development, and streamline teaching processes. However, these benefits are accompanied by challenges, particularly in the areas of student over-reliance, critical thinking development, and the ethical implications of AI usage.

From the perspective of students, AI tools facilitate faster task completion and provide valuable linguistic and cultural insights, enabling a more efficient learning process. However, concerns regarding over-reliance and reduced engagement with the manual translation process highlight the need for a balanced integration of AI and traditional methods. For educators, AI tools optimize administrative tasks and encourage innovative teaching methods, but they also require significant pedagogical adjustments and pose ethical challenges related to data privacy and algorithmic bias.

To address these complexities, this study underscores the importance of designing curricula that promote critical engagement with AI outputs, providing technical and ethical training for educators, and fostering inclusivity in the development of AI tools. By adopting such measures, translation education can fully harness the potential of AI tools while safeguarding the foundational objectives of linguistic precision, cultural sensitivity, and critical thinking.

The findings of this study contribute to a deeper understanding of the role of AI in translation education, providing both theoretical insights and practical recommendations for future research and pedagogical practices. As AI technologies continue to evolve, their thoughtful integration will be key to preparing students for the dynamic and multifaceted demands of the modern translation industry.

About the Author

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