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Original Paper

Research on the Reform and Innovative Pathways of Translation Teaching in the Era of Artificial Intelligence

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Abstract

The rapid advancement of artificial intelligence, particularly machine translation and large language models, is reshaping translation practice and redefining competency requirements in the translation industry. Traditional teaching models that focus primarily on linguistic knowledge are increasingly insufficient for addressing these changes. While AI technologies have improved translation efficiency and accessibility, they also present new challenges for translator competence and pedagogical design. Situated within the context of the AI era, this study examines the impact of artificial intelligence on translation teaching and identifies key problems in current university-level education, including misaligned teaching objectives, limited instructional content, and inadequate evaluation systems. In response, the paper proposes reform principles centered on competency development, human–machine collaboration, and the integration of humanistic values. It further explores practical approaches such as curriculum restructuring, teaching model innovation, and diversified assessment methods. The study concludes that the effective integration of artificial intelligence can promote a shift from single-skill language training to comprehensive competence development, thereby enhancing teaching quality and the practical relevance of translation education.

Keywords

artificial intelligence, translation teaching, teaching reform, human–machine collaboration, innovative pathways

1. Introduction

In recent years, the rapid development of artificial intelligence has significantly transformed the language services industry. The extensive use of machine translation, intelligent corpus tools, and large language models has shifted translation practice from a human-centered activity to a mode of human–machine collaboration. As a result, translation efficiency, cost structures, and application

scenarios have changed substantially, leading to new competency requirements for translators. In addition to solid linguistic skills and cross-cultural awareness, translators are now expected to effectively use intelligent tools to evaluate and refine machine-generated output. This transformation has placed considerable pressure on traditional translation teaching models while also creating opportunities for educational reform.However, current translation teaching practices in higher education have not fully adapted to these changes. Many curricula still emphasize linguistic explanation and manual translation, with limited integration of AI technologies. Consequently, a gap has emerged between instructional content and industry practice. Students often lack systematic guidance in using intelligent translation tools, and existing evaluation systems tend to focus on final translation products rather than translation processes, technological collaboration, or decision-making skills. Such result-oriented approaches struggle to address the growing complexity and diversity of translation practice in an AI-driven environment.As artificial intelligence becomes increasingly embedded in translation activities, reassessing the objectives and implementation pathways of translation teaching has become an urgent task. Key challenges include leveraging the advantages of AI while avoiding pedagogical weakening due to technological substitution, and balancing technical competence development with the cultivation of humanistic values. Against this background, this paper analyzes the impact of AI on translation teaching, identifies major problems in existing models, and explores feasible pathways for reform and innovation, aiming to provide theoretical insight and practical reference for the transformation of translation education in higher education.

2. The Impact of the Development of Artificial Intelligence Technologies on Translation Teaching

2.1 The Evolution and Characteristics of AI-Based Translation Technologies

The development of artificial intelligence–based translation technologies has progressed from rule-driven approaches to data-driven methods and, more recently, to deep learning–driven paradigms. These technological shifts have profoundly influenced both translation practice and the conceptual foundations of translation teaching. Early rule-based machine translation relied on manually constructed grammatical rules and bilingual dictionaries. Although such systems offered limited controllability in specific domains and simple sentence structures, they were constrained by the complexity of natural language, numerous exceptions, high maintenance costs, and poor scalability, often failing to meet real-world translation needs.With advances in computing power and the growth of bilingual corpora, statistical machine translation emerged as the dominant approach. By modeling probabilistic relationships between words and segments using large-scale data, it improved overall fluency and usability compared with rule-based systems (Nguyen, Tran, Nguyen, Lam, Nguyen, & Tran, 2025). Nevertheless, it remained limited in handling long-distance dependencies and deeper semantic understanding.In recent years, deep learning–based neural machine translation has marked a new stage in AI translation, with semantic modeling at its core. End-to-end neural networks can capture broader

contextual information, significantly enhancing coherence and naturalness. The rise of large language models has further strengthened capabilities in multilingual processing, contextual interpretation, and stylistic adaptation, expanding application scenarios from traditional text translation to localization, cross-media content, and real-time interaction. Technologically, contemporary AI translation systems offer near real-time output, acceptable quality for general texts, and increasing platformization and accessibility. This evolution not only reshapes translation practice but also places new demands on translation teaching. Education must move beyond a sole focus on linguistic transfer to include understanding technological principles and limitations, while cultivating students' ability to evaluate, revise, and optimize machine-generated translations. Accordingly, translation teaching must adapt its content and methods to align with AI-driven translation technologies and the needs of the new era (Duan, Gao, & Zhang, 2025).

2.2 The Impact of Artificial Intelligence on Traditional Translation Competency Structures

The deep integration of artificial intelligence into translation practice has transformed translation from a purely human-operated activity into a complex process characterized by human–machine collaboration. This shift has fundamentally challenged traditional conceptions of translators' competency structures. In conventional translation education, linguistic competence—covering vocabulary, grammar, discourse organization, and bilingual transfer—was regarded as the core of professional training. However, in an environment where intelligent translation tools are widely applied, reliance on linguistic knowledge alone has become increasingly insufficient. Although language competence remains a fundamental prerequisite, it no longer represents the full scope of translation competence. In an AI-driven context, cultural understanding has gained heightened importance. While intelligent translation systems perform efficiently in handling general texts, they continue to show limitations in interpreting cultural metaphors, value orientations, and contextual nuances[3]. Consequently, translators play a crucial role in cross-cultural judgment and semantic decision-making. They are required to demonstrate sensitivity to cultural differences between source and target languages and to revise machine-generated output in line with pragmatic norms and cultural logic, thereby compensating for the limitations of technological tools in deeper interpretation. At the same time, technological collaboration skills have emerged as a key component of contemporary translation competence. Translators must not only operate intelligent tools but also understand their mechanisms and appropriate applications. This involves evaluating, revising, and optimizing machine output, as well as maintaining holistic control over the translation process, including tool selection, quality management, and the balance between efficiency and accuracy. In this context, the translator's role is shifting from a "language converter" to a "translation decision-maker" and "quality manager." Overall, translators' competency structures in the AI era are evolving from a single-language-oriented model toward a composite framework (Hartono, 2024). Linguistic competence remains essential, but it must be integrated with cultural understanding and technological collaboration skills to meet the demands of complex and diverse translation tasks, providing a theoretical basis for redefining teaching objectives

and restructuring translation curricula.

3. Major Problems in Current Translation Teaching Models

3.1 Misalignment Between Teaching Objectives and Industry Needs

Against the rapid penetration of artificial intelligence into the translation industry, the teaching objectives of some university translation programs continue to follow traditional, language-centered approaches and fail to respond promptly to changing professional competency requirements. Course objectives often emphasize vocabulary, grammar, and translation techniques, treating linguistic transfer as the primary training focus, while paying insufficient attention to skills related to intelligent translation tools, technological collaboration, and comprehensive decision-making. This orientation overlooks the profound transformation of translation practice, creating a noticeable gap between teaching content and real workplace scenarios. In today's translation industry, AI-based translation has become a routine tool, and tasks are increasingly completed through human–machine collaboration (Özmat & Akkoyunlu, 2025). Accordingly, greater value is placed on translators with composite skill sets. However, some programs still aim to cultivate "purely language-oriented" translators, without systematically incorporating technological literacy, information processing abilities, or interdisciplinary awareness into training frameworks. As a result, students often lack a holistic understanding of technological tools and the flexibility to apply them effectively in real translation projects. This mismatch between teaching objectives and industry needs forces graduates to spend additional time adapting to professional workflows, weakening the practical impact of translation education. Furthermore, an overly singular focus on linguistic objectives limits students' overall development. Translation inherently involves the integration of language, culture, technology, and management. Overemphasizing linguistic knowledge alone may obscure the complexity of translation processes and hinder the formation of a well-rounded professional perspective. Therefore, in the AI era, reassessing and realigning translation teaching objectives with industry trends has become an urgent priority in translation education reform (Artificial Intelligence (AI) and Translation Teaching: A Critical Perspective on the Transformation of Education, 2025).

3.2 Relatively Monotonous Teaching Content and Methods

From a teaching practice perspective, translation courses at some universities continue to rely largely on classroom instruction and text-based exercises in both content and methodology. The integration of real translation projects, intelligent translation tools, and technological platforms remains limited, making it difficult to reflect authentic translation workflows in an AI-driven environment. Teaching materials are still mainly based on traditional written texts, with training focused on sentence- and segment-level language transfer, while areas such as translation project management, technology-assisted workflows, and multi-platform collaboration receive insufficient attention. Consequently, students' understanding of real translation contexts remains superficial.In terms of teaching methods, instruction is still dominated by teacher explanations and student translation tasks,

with practical components often confined to simulated exercises. Task-driven or project-based training aligned with industry practices is relatively rare (Liu, 2025). Due to limited exposure to intelligent translation tools and online platforms, students have few opportunities to engage in key processes such as pre-editing, post-editing, and quality assessment, which hampers their ability to develop a comprehensive understanding of modern translation workflows and to transform theoretical knowledge into practical competence. Moreover, weak connections between classroom practice and real-world application further reduce teaching effectiveness. Professional translation tasks typically involve strict deadlines, quality standards, and multi-party collaboration, whereas classroom activities are often simplified. As a result, students have limited opportunities to develop judgment and problem-solving skills in authentic settings. In the AI era, translation teaching therefore needs to adjust both content and pedagogy by incorporating real projects, technological tools, and intelligent platforms to better integrate instruction with practice (Tianqin & Liu, 2024).

3.3 Lack of Temporal Relevance in the Teaching Evaluation System

In existing translation teaching practices, evaluation systems remain largely result-oriented, with primary emphasis placed on the accuracy and linguistic correctness of final translations, while insufficient attention is given to cognitive processes, technological application, and collaborative competencies involved in translation. Although such evaluation methods were reasonable in traditional teaching contexts, their limitations have become increasingly apparent as artificial intelligence becomes deeply embedded in translation activities. A single outcome-focused approach fails to comprehensively reflect students' integrated abilities in authentic translation scenarios, nor does it effectively capture the actual influence of AI tools on the translation process.In AI-enhanced environments, translation activities typically involve multiple stages, including text analysis, tool selection, evaluation of machine-generated output, and post-editing. These stages embody essential professional competencies (Tian, 2024). However, existing evaluation systems rarely conduct systematic assessments of students' decision-making abilities, problem-identification skills, or quality control awareness when using intelligent translation tools. Consequently, students tend to focus primarily on final translation results while neglecting reflection on and optimization of the translation process. At the same time, the increasingly prominent role of technological collaboration in translation practice is insufficiently reflected in evaluation criteria, making it difficult to effectively assess students' understanding and mastery of human–machine collaborative translation. Furthermore, the overly uniform evaluation approach constrains the advancement of teaching reform. The absence of process-oriented assessment and competency-based evaluation not only limits instructors' ability to provide dynamic feedback on student learning, but also hampers the cultivation of competency structures aligned with industry requirements. Therefore, in the era of artificial intelligence, developing a more diversified, process-oriented evaluation system that adequately reflects technological collaboration capabilities has become a crucial direction for enhancing the adaptability and effectiveness of translation teaching (Yu, & Liu, 2024).

4. Fundamental Principles of Translation Teaching Reform in the Era of Artificial Intelligence

4.1 A Shift Toward a Competency-Oriented Teaching Philosophy

With the deep integration of artificial intelligence into translation practice, translation teaching urgently needs to move away from the traditional knowledge-centered paradigm toward a competency-oriented teaching philosophy. For a long time, translation education has tended to focus on the systematic explanation of linguistic knowledge and translation techniques, placing primary emphasis on the accuracy and normative quality of translation outputs. However, as intelligent translation technologies have become widely embedded in translation activities, reliance on linguistic knowledge alone is no longer sufficient to address the increasingly complex and dynamic nature of translation tasks. Teaching philosophy must therefore be reoriented toward the development of students' comprehensive competencies. A competency-oriented approach requires translation teaching to place greater emphasis on students' abilities in problem analysis, decision-making, and practical application within authentic translation contexts. In an AI-enabled environment, translators are constantly required to make judgments between efficiency and quality, selecting, revising, and optimizing machine-generated translations. This process imposes higher demands on students' integrated competencies. Accordingly, teaching should not remain confined to the question of "how to translate," but should guide students to reflect on "why a translation choice is made" and "how technology can be leveraged to achieve better translation outcomes." At the same time, a competency-oriented philosophy emphasizes the coordinated development of multiple dimensions of ability. While linguistic competence remains the foundation of translation teaching, it must be integrated with cultural understanding, technological application skills, and professional awareness to form a composite competency structure. This conceptual shift provides a guiding framework for the systematic adjustment of teaching objectives, content design, and evaluation methods, thereby laying an intellectual foundation for building a translation teaching system that meets the demands of the AI era.

4.2 A Human–Machine Collaborative Perspective in Translation Teaching

As artificial intelligence is increasingly applied in translation practice, translation teaching needs to move beyond simplistic perceptions of human–machine opposition or technological substitution, and instead establish a teaching philosophy centered on human–machine collaboration. Viewing artificial intelligence merely as a threat or as a tool for efficiency enhancement risks weakening students' recognition of their own professional value and may hinder the formation of a sound professional identity. Therefore, teaching should guide students to understand artificial intelligence as both an important instructional tool and a collaborative partner, while clearly recognizing the central role of human translators in decision-making and quality control.From the perspective of teaching tools, artificial intelligence offers abundant resources and efficient forms of support for translation education. Intelligent translation systems, corpus analysis platforms, and automated evaluation tools can help students quickly access reference translations, analyze linguistic patterns, and identify potential problems, thereby improving learning efficiency. However, the core of teaching does not lie in passive

acceptance of machine output, but in guiding students to critically evaluate machine-generated translations and to understand the scope and limitations of technological applications.From the perspective of collaboration, human–machine translation emphasizes professional judgment and creative revision under technological support. Through task-based practice, teaching should enable students to learn how to make decisions, prioritize options, and optimize translations through interaction with artificial intelligence, gradually developing holistic control over the translation process. This human–machine collaborative philosophy helps students form a balanced understanding of the role of artificial intelligence in translation activities, avoiding both overreliance on technology and the outright rejection of its value, thus laying a solid foundation for their future professional development.

4.3 Upholding Teaching Ethics and Humanistic Values

While artificial intelligence continues to expand the boundaries of translation applications, translation teaching must remain vigilant against technological determinism and uphold teaching ethics and humanistic values. Translation is not merely the transformation of linguistic forms, but also the transmission of cultural meaning and value orientations, involving comprehensive judgments related to context, stance, and social impact. Although intelligent translation systems demonstrate clear advantages in processing surface-level linguistic information, they remain limited in areas such as value judgment, cultural positioning, and ethical orientation. This reality underscores the irreplaceable role of human translators in translation activities.In translation teaching, excessive emphasis on technological efficiency may weaken students' understanding of linguistic and cultural depth, or even lead to the neglect of the potential social consequences of translation behavior. Therefore, teaching should guide students to maintain sensitivity to cultural differences while using AI tools, and to pay close attention to the historical background, value positions, and communicative purposes underlying texts. This helps prevent mechanical reliance on technological output at the expense of cultural appropriateness and pragmatic validity, enabling students to make more rational and responsible translation decisions with technological assistance.Moreover, the integration of artificial intelligence has introduced new challenges to translation ethics, including issues related to responsibility for translated content, norms governing technology use, and academic integrity. Translation teaching should incorporate professional ethics education into the curriculum, guiding students to develop a strong sense of professional responsibility and ethical awareness, and to clearly understand their roles and obligations within human–machine collaborative workflows. Upholding ethical and humanistic principles helps preserve the value foundation of translation education amid rapid technological change, and promotes the coordinated development of technological progress and humanistic spirit in translation teaching.

5. Innovative Pathways for Translation Teaching in the Era of Artificial Intelligence

5.1 Reconstruction of Teaching Content and Optimization of the Curriculum System

With artificial intelligence becoming deeply embedded in translation practice, translation teaching

content urgently needs to move beyond a structure dominated by traditional language training. Through systematic reconstruction of course content, it is necessary to achieve an organic integration of linguistic competence development and technological competence development. Such reconstruction does not involve a simple addition to existing courses; rather, it requires comprehensive optimization of course objectives, knowledge modules, and practical components in response to the new characteristics of translation activities in an AI-driven environment. This approach enables students to understand and apply translation technologies within authentic contexts. In curriculum design, the use of intelligent translation tools should be incorporated into regular teaching content. Students should be guided to acquire basic skills such as machine translation usage, corpus retrieval, and post-editing, while also learning fundamental knowledge of translation technologies in order to understand the working principles and application boundaries of these tools. In this way, students not only learn how to use technological tools, but also develop the ability to make informed judgments about their appropriate use, thereby avoiding blind dependence on or simplistic rejection of artificial intelligence.In addition, the introduction of real translation project cases represents an important means of optimizing the curriculum system. By integrating actual industry translation tasks into classroom teaching, students are able to experience authentic translation workflows during project completion, including needs analysis, tool selection, quality control, and feedback on results. This project-based content design helps break down the barriers between traditional classroom instruction and real-world application, encouraging the coordinated development of linguistic and technological competencies in practice, and enabling students to better adapt to the evolving demands of the translation industry in the AI era.

5.2 Innovation in Teaching Models and Practical Implementation Pathways

In the context of artificial intelligence, reliance on traditional lecture-based instruction alone is no longer sufficient to meet the demands of translation competence development. Translation teaching therefore requires systematic innovation in teaching models to better align with authentic translation contexts and industry practices. Project-based learning, task-driven instruction, and blended learning models offer effective practical pathways for translation education, enhancing student engagement and practical depth while facilitating the transformation of theoretical knowledge into applied competence. Project-based learning centers on real or simulated translation projects, embedding teaching content within complete translation workflows. During project implementation, students are required to conduct text analysis, select technological tools, evaluate machine-generated translations, and perform post-editing. Through continuous problem-solving, students progressively enhance their comprehensive translation competence. Task-driven instruction, by contrast, structures learning around translation tasks with clear objectives and operational steps, guiding students to actively acquire and apply relevant knowledge while strengthening their understanding of the translation process. Blended learning models integrate online and offline instructional resources, providing a more flexible learning environment for translation education. Online platforms and intelligent tools can be used for knowledge acquisition, example analysis, and immediate feedback, while face-to-face classroom sessions focus on

discussion, guidance, and skill development. This model helps create learning experiences that closely resemble real translation work environments, enabling students to gradually improve both translation competence and technological collaboration skills through diverse forms of practice, and thereby enhancing their adaptability to actual translation tasks.

6. Practical Case Analysis of AI-Empowered Translation Teaching

To examine the practical effectiveness of artificial intelligence in translation teaching, an English translation program at a university implemented a human–machine collaborative teaching reform in a course entitled Translation Theory and Practice I. Aimed at senior undergraduate students, the course shifted its instructional focus from narrow assessment of translation accuracy to the cultivation of comprehensive translation competence. Intelligent translation tools, real project-based tasks, and process-oriented evaluation methods were introduced to create a teaching environment closely aligned with professional practice. During implementation, the course adopted a Chinese–English translation project based on a technology company's product manual as its core case. The instructor first guided students to analyze the text type, target audience, and communicative purpose, and then required them to use intelligent translation tools appropriately to produce initial machine translations. Students subsequently worked in groups to evaluate the machine output, proposing revisions with respect to terminological accuracy, textual coherence, and cultural appropriateness, and completing post-editing accordingly. Rather than providing standard translations, the instructor facilitated discussion and feedback to prompt reflection on the rationality of different translation decisions. In this teaching practice, artificial intelligence functioned not only as a translation aid but also as a key learning resource. Through repeated interaction with intelligent translation systems, students gradually recognized the efficiency advantages of technology while developing a clearer awareness of its limitations in professional expression and cultural interpretation. This process guided students from simple reliance on technology toward critical evaluation and optimization, transforming their role from passive executors into active decision-makers. In terms of learning outcomes, the reform achieved positive results. Students showed a significantly improved understanding of authentic translation workflows and developed a more rational perception of human–machine collaborative translation. Their post-editing skills and problem-identification abilities were notably enhanced. Moreover, process-oriented evaluation encouraged students to focus on translation reasoning and appropriate technology use rather than solely on final products. Overall, the case demonstrates that, with well-designed objectives and implementation pathways, artificial intelligence can effectively empower translation teaching and support the cultivation of composite translation professionals suited to the demands of the new era.

7. Conclusion

The rapid development of artificial intelligence is profoundly reshaping translation practices and posing new challenges to traditional translation teaching models. Based on an analysis of the impact of artificial intelligence on translation education, this study identifies key problems in current translation teaching with respect to goal orientation, teaching content, and evaluation systems. On this basis, it explores reform principles and innovative pathways centered on competency development and human–machine collaboration. The findings suggest that the well-considered integration of artificial intelligence into translation teaching can promote the updating of teaching content and methods, while fostering the coordinated development of linguistic competence, technological competence, and humanistic awareness. Looking ahead, translation teaching should continue to optimize its instructional systems by fully leveraging technological advantages while upholding humanistic values and professional ethics, in order to better meet the practical demands of translation talent cultivation in the era of artificial intelligence.

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