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Study on the Development Pathways of Translators' Technological Competence in the AI Era

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Abstract: As AI technologies become deeply embedded in translation practice, the traditionally human-centered translation process is increasingly transforming into a multi-stage human–AI collaborative workflow, in which translation tasks are reconfigured into a series of sub-processes, including data preparation, prompt design, AI-assisted generation, and post-editing and quality control. Against this backdrop, this paper argues for the necessity of systematically enhancing translators' AI literacy in order to cultivate their ability to effectively understand, manage, and apply AI-based translation tools in professional practice, while also emphasizing the functional positioning and operational mechanisms of AI across the entire translation workflow. At the same time, due attention must be paid to the potential risks posed by generative AI, particularly hallucination-induced errors, so as to ensure translation quality.

Keywords: AI Literacy; Human-AI Collaborative Translation; Translation Technology; AI Hallucinations

I Introduction

Driven by globalization and successive technological revolutions, human civilization has exhibited a trajectory of evolution from simplicity to complexity and from low levels of organization toward highly technology-driven forms. As Marx (1999) observed, "the distinctions between different economic epochs lie not in what is produced, but in how production is carried out, and with what instruments of labor". Instruments of labor function not only as measures of the development of human productive capacity but also as indicators of the social relations through

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which labor is organized. Breakthroughs in artificial intelligence—particularly in social production, cognitive augmentation, and human–machine collaboration—are reshaping modes of social organization and labor structures, propelling human society toward a higher stage of intelligent civilization characterized by the deep integration of technology and society, highly intelligent modes of production, and the normalization of human–machine collaboration (Xiang & Zeng, 2023).

Across different stages of civilizational development, translation, as a core practice of cross-linguistic and cross-cultural communication, has undergone significant transformations in both its operational modes and technological dependencies. Translation practice has evolved from purely human-mediated activity to the emergence of computer-assisted translation (CAT) and machine translation (MT) tools, and further to contemporary human–AI collaborative translation enabled by neural networks and generative AI technologies, reflecting an increasingly deep integration of technology into translation processes. Extensive scholarship in translation technology studies has documented the evolution of machine translation from rule-based systems to statistical approaches and, more recently, to deep learning models. While the integration of CAT tools and AI technologies has substantially enhanced translation efficiency and automation, it has also raised critical questions concerning the translator's role, ethical responsibility, and cultural accuracy (Wang, 2024b; Mercan, Akgün &Odacıoğlu, 2024; Wang, 2024c).

Within the human–AI collaborative translation paradigm of the AI era, translation is no longer a task performed solely by individual human translators, but rather a complex process of cognitive and technological interaction jointly accomplished by human agents and intelligent systems. In this context, "human–machine collaboration" increasingly denotes a cooperative relationship between translators and AI systems, in which translators are required not only to possess linguistic and cultural expertise but also to develop the capacity to deploy, evaluate, and optimize AI-generated translation outputs. Supported by generative AI technologies, this collaborative model is transforming translation practice from the use of auxiliary tools into a co-creative platform, thereby underscoring the growing importance of integrating translational competence with technological literacy in future-oriented translation education (Yang, Chen, & Wei, 2025).

Against this combined backdrop of civilizational evolution and advances in translation technology, this study further explores the reconceptualization of translators' technological competence and the pathways for its systematic cultivation in the AI era, with the aim of providing theoretical foundations and practical insights for translation education reform and the professional development of translators.

2 Reconstructing Translators' Technological Competence in the AI Era

Amid the rapid advancement of artificial intelligence technologies, the impact of AI on the field of translation has extended far beyond incremental improvements at the tool level, bringing about a profound restructuring of translation research, translation practice, and the very constitution of translators' professional competence (Moorkens, & Guerberof, 2024). Existing studies widely acknowledge that artificial intelligence—particularly generative models based on deep learning—has fundamentally transformed traditional translation paradigms, thereby prompting a reconsideration and redefinition of the competencies required of translators.

From a technological perspective, the most immediate change brought about by AI lies in the transformation of translation production modes. Historically, machine translation has evolved from rule-based systems to statistical models

and subsequently to neural machine translation. With the emergence of generative large language models, AI-based translation technologies have achieved substantial improvements in speed, accuracy, and responsiveness, rendering automated language conversion increasingly feasible in a wide range of contexts (Seyyedi, Rasouli, & Azaldin, 2025).

From the perspectives of translation research and professional practice, the integration of AI has driven a shift from a unitary competence structure centered on linguistic transfer to a multidimensional competence framework oriented toward the integration of linguistic, technological, and collaborative capabilities. Traditional conceptions of translation competence primarily emphasized language proficiency, cultural understanding, and textual transformation. With the intervention of AI, however, translation activities are increasingly decomposed into multiple sub-tasks, such as data preparation, prompt design, AI-assisted generation, and post-editing and quality control. This reconfiguration not only reshapes translators' work processes but also places new demands on their abilities in information processing, technological operation, and collaborative decision-making.

More specifically, technologies underpinning generative AI—such as deep learning and adaptive systems—enable AI models to generate content by automatically learning linguistic patterns from large-scale corpora. This mode of "statistical semantic generation" (a core working principle of generative AI, which generates semantic content based on statistical laws of language) enhances the fluency and coverage of translation outputs, while simultaneously reducing the marginal utility of traditional foundational language skills in certain application scenarios (Jiang, Zheng, & Luo, 2025). This transformation in competence structure yields two important implications. At the technological level, translators must develop a basic understanding of the operational mechanisms, strengths, and limitations of AI tools in order to design effective human–AI collaborative strategies for complex translation tasks. At the cognitive level, translators are required to exercise greater agency in information selection, quality assessment, and cultural representation so as to ensure both the reliability of the translation process and the quality of the translated text.

In the context of the continued development and deepening application of artificial intelligence, the reconstruction of translation competence and the technological empowerment of translators have become unavoidable core issues. Translator training must therefore adapt to ongoing technological change by establishing a forward-looking, systematic, and practice-oriented competence framework.

3 Pathways for Cultivating Translators' Technological Competence in the AI Era

Translation practice in the AI era cannot be equated with a simplistic or "plug-and-play" operation in which source texts are merely pasted into an intelligent system's interface and translated through a few prompts. On the contrary, as generative artificial intelligence becomes deeply embedded in translation activities, the translation process—while achieving substantial gains in efficiency—has also grown in complexity and professional sophistication. Translators are no longer required solely to possess traditional linguistic competence and cross-cultural awareness; they must also understand the operational logic, capability boundaries, and potential risks of AI systems, and exercise effective control over translation quality within a human–AI collaborative framework. When such knowledge and skills are acquired in a systematic and comprehensive manner, the overall quality and reliability of AI-assisted or AI-collaborative translation can be significantly enhanced.

3.1 Enhancing AI Literacy

The core of *AI literacy* lies in emphasizing an understanding of the fundamental principles and social implications of artificial intelligence, rather than limiting attention to the operational skills associated with specific technological tools. Zhang et al. (2024) argue that AI literacy education should be grounded in an integrated framework encompassing knowledge, skills, attitudes, and ethical values. Such a general education framework provides the foundation for learners to grasp the essential nature of AI technologies and to develop critical thinking and a sense of responsibility.

Yin (2024) further emphasizes that the emergence and constituent elements of AI literacy are situated at the intersection of technological development, social transformation, and public adaptation. General AI literacy, therefore, includes not only a basic understanding of technical terminology and operational principles but also a comprehensive awareness of AI-related ethical issues, technological risks, and value orientations—foundational knowledge that has become indispensable across disciplines in the AI era. From an application-oriented perspective, research in vocational education likewise highlights the critical role of general AI literacy—such as foundational AI knowledge, application awareness, and ethical responsibility—in preparing individuals for future professional roles. Empirical findings suggest that, compared with domain-specific AI competencies, educators generally remain at an initial stage of awareness with respect to general AI literacy, and that improvements in such literacy function as a key mediating factor in the effective integration of AI technologies into teaching and professional practice (Han, Guo, & Li, 2025).

In addition, AI literacy has been conceptualized as a multidimensional competence encompassing cognitive, practical, and evaluative dimensions. In particular, a foundational cognitive understanding of AI enhances individuals' capacity to critically assess AI-generated outputs, which constitutes a basic prerequisite for the development of interdisciplinary AI education systems (Wang et al., 2024). From an international perspective, AI literacy research likewise underscores its interdisciplinary and general-education orientation. For instance, some studies propose that the AI literacy paradigm should encompass a fundamental understanding of the scope and technical dimensions of AI, informed and responsible interaction with generative AI systems, and critical evaluation of AI's socio-technical and ethical challenges. Together, these elements constitute a set of interdisciplinary AI education objectives applicable to learners across educational contexts (Tadimalla, & Maher, 2024).

General AI knowledge involved in translation refers to a foundational body of knowledge that is not directly tied to specific translation technologies, yet is applicable across disciplines for understanding and engaging with artificial intelligence. This category of knowledge encompasses basic AI concepts, historical development, and core principles, as well as a holistic understanding of the capabilities and limitations of AI systems. It constitutes a shared foundational knowledge base that all disciplines should acquire prior to incorporating AI into teaching and professional practice. Within the framework of translator competence development in the AI era, general AI knowledge functions both as the cognitive foundation for the development of technological application skills and as a common support for the formation of rational judgment and critical thinking. Only on this basis can translators effectively evaluate, appropriately guide, and creatively leverage AI-generated outputs in concrete translation practice, thereby achieving genuine human–AI collaboration and cognitive augmentation.

Traditional AI education has centered on mathematics, algorithms, and programming, primarily serving students in computer science and related fields, with the objective of understanding and constructing AI systems themselves. Translators, however, represent a typical group of non-technical professional users whose AI literacy needs do not lie in learning how to develop AI systems, but rather in understanding how to use AI effectively and responsibly in

professional practice. Accordingly, translators' AI literacy should be positioned as a practice-oriented form of AI literacy grounded in application awareness, risk assessment, and professional responsibility, rather than as an engineering-oriented literacy focused on technical implementation. More specifically, the AI literacy required of translators does not emphasize mastery of algorithmic mechanisms or system development. Instead, it highlights the ability to assess the usability, reliability, and potential risks of AI tools within translation practice.

Unlike technology-oriented approaches that focus on how AI systems operate internally, translators must address practice-driven questions such as whether AI is appropriate for a particular translation task and whether its outputs conform to contextual, stylistic, and cultural norms. In translation practice, translators should maintain a critical stance toward generative AI systems, particularly with respect to potential factual inaccuracies, semantic distortions, and cultural misinterpretations in AI-generated language, so as to avoid uncritical reliance on technological outputs.

3.2 Learning to Use Prompts Effectively

In interactions with artificial intelligence systems, the design and optimization of prompts play a particularly critical role. Prompts serve not only as the point of departure for human–AI interaction, but also largely determine the quality and stylistic characteristics of AI-generated translations. Specifically, when formulating prompts, translators should attend to three key aspects. First, translation requirements must be clearly specified. Prompts should explicitly articulate the translation purpose, target readership, stylistic conventions, and domain-specific context, enabling the AI system to generate translations within a well-defined contextual framework. Second, translators may employ imitation and exemplification strategies by providing sample translations or stylistic guidelines, thereby guiding the AI to align its register, tone, and expressive patterns with established norms. This practice enhances the controllability and consistency of translation outputs. Third, iterative inquiry and progressive refinement should be adopted, whereby initial translations are revised and optimized through multiple rounds of interaction. By continuously clarifying detailed requirements, translators can prompt the AI system to gradually approximate the desired translation outcome. Such multi-turn, interactive prompting not only reflects the dynamic nature of human–AI collaboration, but also underscores the translator's central role and agency in translation decision-making.

3.3 Actively Engaging with AI-Powered Search

AI-powered intelligent search and prompt design jointly constitute the core of human–AI interaction, supporting translation quality from two complementary dimensions: information retrieval and instruction formulation, respectively. Generative search represents an emerging form of search technology that integrates generative artificial intelligence with information retrieval. Building upon multi-source information retrieval, it is capable of semantic understanding, integrative analysis, and content generation, producing structured and interactive knowledge outputs through multi-step reasoning. As such, it provides efficient support for a wide range of application scenarios, including academic research, business analysis, and decision-making (Jin, et al., 2026). With the continued evolution of large-model-driven generative search technologies, exemplified by systems such as *Deep Research*, information retrieval is transforming traditional "result-display-oriented search" toward intelligent tools for knowledge generation and decision support. This shift has likewise exerted a profound influence on how information is searched for, filtered, and utilized in translation practice.

First, AI-powered intelligent search enables higher-level semantic integration of translation-related information through real-time fusion of multi-source data and on-the-fly reasoning. Unlike conventional search engines that merely

return fragmented source materials, generative search systems can synthesize relevant information across languages and platforms and present key insights in structured and summarized forms. This capability allows translators to rapidly grasp terminological meanings, textual backgrounds, and discourse logic during the translation process, thereby improving both the efficiency and accuracy of translation decisions.

Second, the strengths of generative search in complex query decomposition and integrative reasoning make it particularly well-suited to addressing the demand for in-depth information in translation tasks. When dealing with specialized or information-intensive texts, translators are often required to simultaneously comprehend conceptual evolution, domain-specific knowledge, and contextual variation. Through multi-step reasoning, AI-powered search can generate translation-relevant knowledge outputs that function, to some extent, as cognitive support tools, expanding both the depth and breadth of translation-related searches.

Third, as generative search increasingly evolves into an intelligent decision-support tool, its role in translation is no longer confined to information retrieval alone, but gradually extends to participation in translation judgment and strategic decision-making. For instance, in areas such as terminological selection, stylistic choice, or information prioritization, the synthesized information generated by AI-powered search can provide translators with valuable reference points, thereby enhancing the timeliness and systematic nature of translation decisions.

Nevertheless, the evolution of generative search technologies is not without limitations. Their application in translation-related searches is similarly confronted with challenges concerning the accuracy, interpretability, and transparency of generated content. Overreliance on such systems may result in mistranslation, informational bias, or even the formation of "information cocoons". Consequently, in translation practice, AI-powered search should be regarded primarily as an auxiliary cognitive tool, and its outputs must remain subject to translators' critical evaluation and manual verification.

Overall, by transcending the constraints of traditional retrieval technologies, generative search provides a more efficient and dynamic pathway for acquiring, integrating, and utilizing translation-related information. In doing so, it facilitates the progression of translation practice toward greater intelligence and collaboration in the knowledge-intensive era.

3.4 Emphasizing the Role of AI Across the Entire Translation Process

In the context of the AI era, the cultivation of translators' competencies should not be confined to operational skills related to tool proficiency. Still, it should instead involve a deeper understanding of the overall process through which artificial intelligence intervenes in translation activities—particularly the functions and mechanisms it performs at different stages, including pre-editing, translation generation, and post-editing. Compared with an instrumentalist approach that views AI merely as a text-generating tool, examining AI-assisted translation from a process-oriented perspective enables translators to allocate human–machine tasks more appropriately at each stage, thereby enhancing overall translation quality and workflow efficiency.

In recent years, scholars have begun to systematically examine the application of AI in translation pedagogy and practice from both macro- and micro-level perspectives. Zhou (2023) and Feng (2025) argue that, at the macro level, artificial intelligence can support personalized instructional design through data analysis and learning behavior tracking, thereby fostering learners' autonomous learning abilities. At the micro level, AI has demonstrated considerable potential in concrete translation practices, particularly in areas such as learning assessment, corpus analysis, translation research,

and stylistic presetting. These applications not only extend the technological boundaries of translation education but also shift the focus of translation competence from mere text production toward process management and quality control.

In AI-driven translation practice, artificial intelligence is no longer confined to the stage of translation generation; rather, it is deeply embedded throughout the entire translation workflow. From a process-oriented perspective, AI intervention in translation can be systematically divided into three interrelated and cyclically connected stages—pre-editing, co-translation, and post-editing—thereby forming a comprehensive model of AI-assisted translation processes.

3.4.1 Pre-translation Stage: AI-assisted Pre-editing

The pre-editing stage, as a critical preparatory phase in the translation workflow, has gradually become a key entry point for AI intervention in translation practice. Even before the widespread adoption of neural machine translation and generative AI, empirical studies on specific text types highlighted pre-editing as a crucial means to improve machine translation quality, enhancing both adequacy and coherence (Feng, & Gao, 2017). With the continuous maturation of AI technologies, the scope and methods of pre-editing have expanded, enabling AI to provide effective support during text preprocessing.

Specifically, AI-assisted pre-editing can be enhanced in several ways: First, classical or highly formal texts can be converted into modern Chinese, reducing source text complexity and minimizing potential errors in AI semantic parsing and syntactic modeling. Second, AI tools can automatically detect and correct OCR errors, improving source text accuracy and standardization. Third, AI can assist in the automatic extraction and preliminary alignment of bilingual terminology, laying a foundation for consistent term use in subsequent translation stages. Through these measures, pre-editing has gradually evolved from a process relying primarily on human expertise to a systematic human–AI collaborative workflow.

On one hand, AI can help translators organize and standardize the structure and language of source texts, such as transcribing classical, historical, or highly formal texts into modern Chinese and automatically correcting recognition errors, thereby reducing translation bias caused by source text quality issues. On the other hand, AI can support terminology identification, keyword extraction, and text difficulty assessment, helping translators form a holistic understanding of text type, register, and potential challenges before translation begins. In this stage, the translator's core task is not to generate the target text directly, but to optimize the translatability of the source text through human–AI collaboration, laying the groundwork for high-quality AI-assisted translation in the subsequent stage.

3.4.2 Translation Stage: Human–AI Co-translation

The translation stage represents the most visible point of AI intervention, characterized by multiple rounds of interaction between the translator and the AI model around text generation. In this phase, AI primarily performs functions such as draft generation, multi-version output, and language restructuring. At the same time, the translator is responsible for defining requirements, guiding the process, and controlling overall direction.

Specifically, the translator must design clear and effective prompts that specify the translation purpose, target audience, textual style, and domain, thereby guiding AI to generate translations within a defined contextual framework. Subsequently, the translator can iteratively refine AI outputs by providing follow-up prompts, adding constraints, or adjusting instructions. This process is not linear but exhibits a dynamic, cyclical, and interactive nature, reflecting the characteristics of human–AI collaborative translation.

At this stage, translation competence is no longer measured solely by linguistic conversion ability but increasingly

by task decomposition skills, prompt design capability, and the ability to regulate the translation production process. The translator's role evolves from a "direct text producer" to a "process facilitator and controller".

3.4.3 Post-translation Stage: AI-assisted Post-editing (AIPE)

The post-translation stage is a critical phase for quality control in AI-assisted translation, evolving from traditional machine translation post-editing (MTPE) to AI-assisted post-editing (AIPE), a new post-translation model adapted to generative AI, which involves translators evaluating and revising highly variable AI-generated outputs with AI support. In the AIPE model, translators face highly generative and diverse AI outputs that require evaluation and revision at a more advanced level. As Wang and Liu (2025) note, this shift is not merely a technological update but represents a systemic reconstruction of translation concepts, workflows, and industry standards.

In AIPE, translators no longer deal with relatively fixed MT outputs but with AI-generated texts that are highly variable and adjustable. This demands advanced evaluative competence, strategic awareness, and quality control skills. AI can assist with grammar checking, term consistency verification, style deviation detection, multi-version comparison, and readability optimization. However, final decision-making authority remains with the translator, who must integrate contextual, pragmatic, and cultural considerations when evaluating and refining AI-generated content. Thus, the post-translation stage highlights the translator's evaluative, decision-making, and quality management capacities and serves as the phase in which the translator's agency is most prominently exercised in human–AI collaborative translation.

3.4.4 Overall Features of the Workflow Model

From a holistic perspective, the "pre-translation—translation—post-translation" workflow does not constitute a set of isolated linear stages but rather forms a retraceable and adjustable closed-loop system. Issues identified during post-editing frequently feed back into pre-editing strategies and prompt design in the translation stage, promoting continuous optimization of the translation process. Therefore, in all stages—pre-editing, co-translation, and post-editing—developing an in-depth understanding of AI intervention mechanisms and expanding the scope of AI application across the translation workflow has become a key objective for cultivating translator competencies in the AI era. Translation activities have shifted from a single-point "AI text generation" model to a full-process human–AI collaborative practice. Accordingly, the translator's role has evolved from that of a "text producer" to a "workflow designer, coordinator, and quality controller". This workflow model provides a clear and systematic theoretical framework for training translators and reconstructing translation pedagogy in the AI era.

Although AI has demonstrated considerable potential in the field of translation, it is essential to remain critically aware of its susceptibility to hallucinations and the risks these pose to translation accuracy and reliability.

3.5 Vigilance Against AI Hallucinations

In the context of AI-assisted translation, attention should extend beyond efficiency gains and functional enhancements to include the potential risks associated with AI use. Existing research indicates that the widespread integration of generative artificial intelligence in translation pedagogy and practice does not automatically guarantee improvements in instructional or translation quality. Without systematic guidance and standardized usage, AI may even exert negative effects on learning processes and educational ecosystems. Zhou (2023) provides a systematic review of the risks associated with ChatGPT, identifying issues that are not limited to translation per se but reflect broader

challenges present in AI-enabled translation education and pedagogy, thus bearing wide applicability.

Specifically, at the learning level, excessive reliance on AI may undermine students' autonomy and problem-solving abilities. When students perceive AI as an "instant answer provider" rather than a learning support tool, the essential stages of comprehension, analysis, and decision-making in translation are weakened, which may impede the internalization and transfer of translation skills. At the instructional level, deep AI integration may alter the teacher–student dynamic, marginalizing human participants and shifting the focus of teaching from interactive engagement to platform- or algorithm-centered activity. Such changes, if not critically monitored and managed, risk diminishing the guiding role of educators and the active agency of learners. Furthermore, from an academic integrity perspective, the use of generative AI can introduce challenges. In translation assignments and academic writing, the absence of clearly defined usage boundaries and norms may lead students to submit AI-generated content as their own work, blurring the distinction between original and assisted output. This practice undermines evaluation fairness and academic standards. More fundamentally, risks extend to knowledge security, ethics, and ideological dimensions. Since generative AI models are typically trained on large-scale corpora, their outputs may carry inherent biases, value orientations, or potential ideological tendencies. Uncritical adoption of such outputs in teaching or translation practice could pose potential impacts to knowledge reliability and value guidance.

Simultaneously, as generative AI and intelligent question-answering systems gain prevalence, AI-powered search is gradually replacing traditional search engines as a primary mode of information acquisition. While this shift substantially improves information integration efficiency, it also introduces new risks, notably the phenomenon of AI hallucinations. AI hallucination refers to instances where generative AI produces content that appears plausible but is factually incorrect or entirely fabricated, often in fluent, logically coherent language that can mislead users into assuming its reliability.

The emergence of AI hallucinations is closely linked to the operational principles of generative AI. Contemporary large language models generate the "most probable" linguistic outputs based on statistical distributions, prioritizing linguistic coherence and plausibility rather than factual accuracy or logical validity. Consequently, when training data are insufficient, context is incomplete, or user instructions are ambiguous, AI is more likely to produce hallucinatory content. Research demonstrates that enhancing users' awareness of AI hallucinations can reduce uncritical acceptance of erroneous information, thereby mitigating some of the associated risks (Bi, Chen & Zhang, 2026).

For translation practice and pedagogy, this implies that translators must not only master AI tools but also develop the capacity to identify risks and evaluate outputs critically. In the increasingly routine context of AI-assisted translation and AI-powered search, verification, cross-checking, and re-evaluation of AI-generated content should become integral components of translation competence. Integrating AI risk awareness and risk management skills into translator training is thus both a practical necessity and a crucial safeguard for promoting healthy, sustainable human–AI collaborative translation.

4 Conclusion

This study analyzed the evolution of translator competence across different technological stages, from traditional human translation to tool-assisted translation, and finally to AI-supported co-translation. The arrival of the AI era represents not merely a technological upgrade but a profound transformation of translation philosophy, workflows, and

translator skill structures. Traditional competence frameworks centered on language conversion are no longer sufficient; translator training must integrate new AI-driven requirements alongside linguistic and cultural skills.

We propose a competence development path for translators in the AI era: first, cultivate AI literacy to ensure rational understanding and responsible use of AI; second, train translators to effectively employ prompts, AI search, and other tools to enhance human–AI collaborative translation; third, adopt a process-oriented approach, recognizing AI's roles in pre-editing, co-translation, and post-editing to optimize source texts, improve output quality, and ensure style and consistency. Moreover, translators must maintain risk awareness, especially regarding AI hallucinations, to avoid uncritical reliance on AI outputs.

While AI reshapes translation practice, human translators remain indispensable in tasks requiring deep comprehension, creative interpretation, and cross-cultural mediation (Wang, 2024a). In the AI era, translation competence is no longer just about completing a task, but about achieving high-quality, valuable outcomes under human–AI collaboration. Future research and education must balance efficiency and quality, tool proficiency and human agency, and technological empowerment with humanistic values.

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