



Technological Empowerment or Cognitive Degeneration? — Construction Dilemmas and Breakthrough Strategies of Translators’ Critical Thinking Ability in the Era of Artificial Intelligence Collaboration

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How to cite this paper: Fang Wang. (2025) Technological Empowerment or Cognitive Degeneration? — Construction Dilemmas and Breakthrough Strategies of Translators’ Critical Thinking Ability in the Era of Artificial Intelligence Collaboration. *Future Trends in AI Research*, 2(1), 21-25. DOI: 10.26855/ftair.2025.06.005

Received: February 11, 2026

Accepted: March 21, 2026

Published: April 3, 2026

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Abstract

Artificial intelligence (AI) is reshaping translation practice, yet its impact on translators’ critical thinking presents a dual paradox of “technological empowerment” and “cognitive degeneration.” Focusing on the construction dilemmas of translators’ critical thinking in the era of human-AI collaboration, this study examines three core challenges: cognitive dependence on algorithmic outputs, which weakens critical scrutiny; the erosion of translators’ subjectivity in post-editing workflows, reducing their role from meaning constructors to text revisers; and efficiency-driven evaluation systems that inhibit deeper critical engagement. To address these issues, the paper proposes strategies grounded in translation cognition and pedagogy: designing a “critical thinking workflow” to reassert translators’ agency in human-AI interaction; promoting metacognition training to enhance self-monitoring and reflection; and establishing a diversified evaluation system that balances efficiency with depth, realigning translation practice with its value-creation mission. This research aims to provide theoretical and practical insights for developing translators’ competencies and transforming translation education in the AI era.

Keywords

artificial intelligence; translators’ critical thinking ability; human-AI collaboration; technological empowerment; cognitive degeneration

1. Introduction

In recent years, generative artificial intelligence represented by large language models (LLMs) such as ChatGPT has rapidly permeated the translation industry chain. Its evolving capabilities in semantic understanding, cultural mapping, style imitation, and multimodal generation have driven a transformation in translation practice from a human-led, machine-assisted model toward a paradigm of bidirectional human-AI collaboration. From early machine translation to neural machine translation (NMT) and now to large language models, AI has evolved from a mere auxiliary tool into an intelligent partner that actively cooperates with translators.

Against this backdrop, translation—a key link in cross-cultural communication—is undergoing a fundamental restructuring of its production models and talent requirements. The rapid advance of technology, however, also raises profound philosophical questions and practical challenges. While AI significantly enhances translation efficiency and lowers language barriers, has it inadvertently eroded translators’ core competency, namely their critical thinking ability? This ability encompasses high-order cognitive activities such as analysis, creative problem-solving, cultural value judgment, and ethical decision-making, which constitute the essential distinction between translators and machines and lie at the heart of translators’ professional value creation.

Currently, the industry exhibits a prevailing optimistic discourse centered on technological empowerment, arguing that AI frees translators from repetitive tasks and allows them to focus on more creative work. At the same time, concerns about cognitive decline are growing, as over-reliance on algorithmic outputs may gradually weaken translators’ capacity for in-depth text interpretation and critical scrutiny. This dual dynamic of empowerment and decline forms the central research question of this paper. The study aims to systematically examine the practical dilemmas in cultivating translators’ critical thinking in the era of human-AI collaboration and to propose a set of actionable strategies, thereby offering academic support for the sustainable development of translation studies and the education of high-level translation professionals.

2. Literature Review

Extensive research has been conducted on the relationship between AI and translation.

Early studies focused on technological pathways and theoretical framework construction. Wang (2019) proposed that AI would restructure the translation system and emphasized the need to establish a theoretical framework adaptable to diverse translation forms. Fu (2019) pointed out that intelligent technology has brought new research topics to applied translation studies, such as standardization, personalization, and ethics in technical translation. With the rise of neural machine translation, research shifted toward technical standardization. Wang (2023) put forward the concept and evaluation indicators of national translation technology standardization capacity, improving the research system of technical standards. To date, research has deepened into the fields of translators’ roles, professional ecology, and ethics. Liu (2026) explored innovative methods for translation ethics research and constructed a research framework for translation ethics.

Regarding translators’ critical thinking ability, academia has long recognized its significance. As a core topic in translation teaching and research, it refers to the high-order cognitive activities exhibited by translators during the translation process. Wen et al. (2009) proposed a hierarchical model of critical thinking ability, dividing it into metacognitive ability and critical thinking skills, and noted that this ability runs through the pre-translation, during-translation, and post-translation stages. Current research has expanded from theoretical discussions to teaching practice, holding great significance for translator training.

Nevertheless, there is an obvious gap in existing research: most studies either focus on AI’s technical effectiveness or translators’ adaptive strategies, while few systematically explore the specific challenges posed by human-AI collaboration to “critical thinking ability” as a core variable and its construction paths. Building on this foundation, this study places “translators’ critical thinking ability” within the grand narrative of “AI-human intelligence” collaboration, directly addresses the potential risk of “cognitive degeneration”, and attempts to construct a comprehensive research framework from “dilemma analysis” to ‘strategy breakthrough’, aiming to fill the theoretical gap in this field.

3. Construction Dilemmas of Translators’ Critical Thinking Ability in the Era of Human-AI Collaboration

AI’s intervention in translation is not a purely technical process but a socio-technical process that profoundly influences translators’ cognitive habits and professional practices. Currently, the construction of translators’ critical thinking ability faces three major dilemmas.

3.1 Weakened Cognitive Independence and Critical Scrutiny Capabilities

Translations generated by large language models (LLMs) often exhibit high fluency and surface-level accuracy, which can lead translators to develop an unconditional trust in these automated outputs. This dependence inhibits translators’ instinctive critical scrutiny when faced with AI-generated content—a phenomenon known as “automation

bias,” which refers to the tendency to over-rely on automated system results without adequate verification. Wang & Zhang (2024) noted that in the ChatGPT-assisted translation model, human translators’ critical awareness is diminished, and their subjective initiative is eroded. Moreover, prolonged exposure to machine translations of varying quality may foster over-reliance on model outputs, gradually causing translators’ skills to decline due to lack of practice.

3.2 Dissolution of Translators’ Subjectivity and Narrowed Role Scope

In traditional translation practice, translators are complete “meaning constructors”, with subjective judgments permeating the entire process from understanding the source text to selecting expressions. However, with the widespread application of AI translation, the traditional human-centered service model has been restructured. Translators are no longer the sole language producers but increasingly assume the role of “post-editors”. Their work is no longer “creation from scratch” but “revision within an existing framework”, which greatly limits the space for exerting critical thinking ability. For example, when translating a poem full of imagery and ambiguity, traditional translators would repeatedly refine the musicality, symbolic meaning, and emotional tension of words—a creative process full of critical thinking. In contrast, with AI assistance, translators may only need to proofread the AI-generated standard answer, their subjectivity confined to minor grammatical and factual revisions, reducing them from authors to proofreaders. This undoubtedly constitutes a dual diminishment of translators’ professional value and critical thinking ability.

3.3 Inhibition of In-depth Critical Thinking by Efficiency-Oriented Evaluation Systems

In the current translation market, especially in commercial translation, the evaluation system generally adopts word-count-based pricing and takes delivery speed and error rate as core indicators. This piece-rate wage model highly commercializes the translation process, making in-depth thinking an economically inefficient behavior. Under immense time pressure, translators’ optimal choice is to quickly accept AI outputs and make superficial revisions, rather than investing substantial time in background research, cultural verification, and stylistic refinement. In an efficiency-oriented evaluation system, translators may tend to use general translations provided by AI, thereby sacrificing professionalism and accuracy. This evaluation mechanism not only inhibits individual translators’ motivation for critical thinking but also forms a negative incentive of “bad money driving out good money” at the industry level.

4. Construction Paths and Breakthrough Strategies for Translators’ Critical Thinking Ability

Facing the aforementioned dilemmas, passive adaptation is equivalent to waiting for obsolescence. Proactive and systematic restructuring from three dimensions—workflow, cognitive training, and evaluation system—is essential to achieve a breakthrough.

4.1 Constructing a “Critical Thinking Workflow”: Reshaping Translators’ Dominant Position in Human-AI Interaction

The primary breakthrough lies in changing the mode of human-AI interaction from “AI-led, human-following” to “human-led, AI-empowered”. To this end, we propose a five-step “critical thinking workflow”:

Task Prediction and Goal Setting: Before using AI, translators must first analyze the text type, translation purpose, target audience, etc., to clarify the core tasks and quality standards of the translation project.

Strategic Prompting and Interaction: Treat AI as an “intern who needs to be properly instructed”. Guide AI to generate drafts more in line with specific contexts and styles through carefully designed prompts, rather than simply pasting the source text.

Critical Proofreading and Verification: Treat AI outputs as “first drafts” and conduct systematic proofreading. Focus on verifying facts, data, culture-specific items, logical coherence, and potential biases, using professional databases and knowledge graphs for cross-validation.

Creative Reconstruction and Value Addition: On the basis of correcting errors, transcend AI’s average expressions through stylistic polishing, cultural adaptation, and creative reconstruction, infusing translators’ unique value to achieve a leap from qualified to excellent.

Process Reflection and Archiving: Record key decisions, typical AI errors, and personal solutions during the translation process to form a personal knowledge base, realizing the continuous improvement of metacognitive ability.

4.2 Strengthening “Metacognition” Training: Forging Translators’ Self-Monitoring and Reflective Abilities

The core of critical thinking ability is metacognition—thinking about and regulating one’s own thinking process. Translation education should place metacognition training at the core. Specific methods include:

Think-Aloud Protocol Teaching: Guide students to verbalize their thinking processes, doubts, and decision-making bases when translating, especially when processing AI outputs. Teachers provide targeted comments to help students externalize and train their implicit critical thinking processes.

Case Review and Comparative Analysis: Select typical translation cases, demonstrate different approaches to the same problem by various translators (including AI), and organize students to discuss the underlying differences in critical thinking, cultivating their ability to examine issues from multiple perspectives.

Designing a Critical Thinking Checklist: Provide students with a structured self-questioning tool, such as “Does this AI translation conform to the pragmatic function of the source text?” “Is there a risk of cultural misinterpretation?” “Do I have a better alternative?” to force in-depth thinking.

4.3 Establishing a Diversified Evaluation System: Guiding Translation Practice Back to Value Creation

To fundamentally stimulate critical thinking, the evaluation system must be reformed. The industry and academia should jointly promote the establishment of a diversified evaluation model that transcends the binary opposition of “efficiency-error rate”. This model should include at least the following dimensions:

Complexity of Problem-Solving: Evaluate translators’ ability to handle complex issues in texts, such as ambiguity, contradictions, and cultural load.

Research and Innovation Contributions: Assess whether translators have conducted necessary research to solve translation challenges and proposed creative solutions.

Client Value and Impact: Regard whether the translation effectively helps clients achieve their commercial or communication goals as an important evaluation indicator.

Ethical and Responsible Awareness: Evaluate translators’ performance in handling sensitive information and adhering to professional ethics.

By introducing these dimensions, the value of translation will no longer be merely the quantity of language conversion but the intellectual labor and value creation behind it, thereby providing positive incentives for translators’ in-depth critical thinking.

5. Conclusion

The transformation brought by AI to the translation field is revolutionary, but technology itself is neutral—its ultimate effect depends on how humans harness it. The paradox of “technological empowerment” and “cognitive degeneration” is not an irreconcilable fate but an era-specific challenge for the translation industry, educators, and practitioners. By analyzing the three major dilemmas of cognitive dependence, diminished subjectivity, and efficiency-oriented evaluation systems, this paper reveals the severe challenges facing translators’ critical thinking ability in the current human-AI collaboration context. Furthermore, the proposed three-in-one breakthrough strategy— “critical thinking workflow”, “metacognition training”, and “diversified evaluation system”—aims to reshape translators’ core value in the intelligent era, transforming them from “efficiency competitors” racing against AI into “wise decision-makers” who govern AI.

Future research can further verify the effectiveness of the proposed strategies through empirical methods such as eye-tracking experiments, electroencephalography (EEG) technology, and think-aloud protocols, and explore the differences in human-AI collaborative critical thinking models across different language pairs and text types. Ultimately, our goal is to ensure that in the wave of artificial intelligence, translators are not replaced but instead leverage technological power to reach an unprecedented professional height, truly realizing the ideal vision of human-AI symbiosis.

Funding

This article is part of the phased achievements of the project “Generative Large Language Models Empowering the Quality Leap of Business English Translation and Talent Cultivation” — Chongqing Postgraduate Scientific Research Innovation Project (Project No.: yjscxx2025-269-25).

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