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A Subjectivity-Oriented Pedagogical Model for Human-Machine Collaborative Translation

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Abstract

Large language models are reshaping translation practice in the age of AI, bringing profound challenges to translation education. Many studies have focused on the construction of technology-empowered teaching models or competence-oriented teaching models. Translator subjectivity construction remains underexplored. Based on the social-constructivist perspective, the present study investigates the construction of translation subjectivity through teaching practice. From skill training to subjectivity construction in human-AI collaboration translation, this study proposes a three-stage pedagogical model, including subject establishment, subject collaboration, and subject regulation. Across the three stages, a dynamic role evolution of teachers, students, and AI tools has been illustrated with examples from authentic in-class practices in a graduate course. With teachers' scaffolding support and later gradual withdrawal of scaffolding, students finally develop autonomous decision-making abilities and other higher-order competences required in AI-assisted translation, achieving a human-in-command rather than human-in-the-loop position. The evolving roles demonstrate the progressive pathway of translator subjectivity construction, providing an alternative framework for translation education in the AI era.

Keywords

Translator subjectivity; pedagogical model; human-machine collaborative translation

1. Introduction

The rapid development of artificial intelligence (AI), particularly large language models (LLMs), has greatly challenged both translation practice and translation studies. Scholars (Zhang, 2024; Hu, 2026) have pointed out the necessity and urgency to reshape translation education. Wang et al. (2026, p. 2) proposed "a paradigm shift towards an open, dynamic, and intelligent ecosystem for translation education". Many studies have noticed the importance of AI tools and examined how translation education can be better empowered by technology. Currently, few people would doubt the use of AI in translation practice. However, questions like translator subjectivity construction in human-machine collaborative translation have been seldom discussed. Translation education should shift from skill training to subjectivity construction. The present study, grounded in classroom practice, investigates how translator subjectivity can be progressively constructed through progressive pedagogical design.

2. Literature Review

2.1 Human-Machine Collaborative Translation Pedagogy

Domestically, some pedagogical approaches are investigated and constructed based on certain perspectives.

Adopting a cognitive perspective, Shi et al. (2026) constructed a four-stage, progressive human-AI instructive model in order to explore ways of improving the teaching of culture-specific item translation. To better cultivate students' communicative competence during translation education, Sha et al. (2026) developed an inquiry-based human-AI collaborative teaching model. Sha et al.'s model divided the teaching process into three stages (before-class, in-class, and after-class), and each stage had three steps undertaken by different agents (teachers, students, GenAI), respectively. Li et al. (2024), emphasising the development of translation competences, divided the whole human-AI collaborative model into three layers, three steps for students, three steps for teachers, and three roles for AI or LLMs, cultivating multiple competences such as specialised skills, translation review competence, cross-disciplinary capacity, and information literacy.

Some studies have paid more attention to the interaction between teachers, students, and AI or LLM platforms. Guided by Bloom's Taxonomy (Bloom, 1956) and focusing on objectives at knowledge, skills, and critical thinking levels, Wang et al. (2025) established a three-aspect system of human-AI collaborative teaching goals and explored their four-stage collaborative teaching framework.

Beyond the domestic context, some international studies have focused on specific modules in human-machine collaborative translation pedagogy. O'Brien (2002) pointed out the value and meaning of post-editing teaching, analysed the detailed skills for post-editors, and proposed essential parts of post-editing training. In their monograph, Nitzke and Hansen-Schirra (2021) analysed theoretical understanding and practical skills pertaining to post-editing to facilitate training of professional translators. Some scholars examined concrete pedagogical ways to cultivate translation competences. Facing the technological challenges, Guerberof-Arenas et al. (2019) introduced course details relating to machine translation, post-editing courses, and project management of machine translation, aiming to develop skills such as creative thinking, teamwork, and problem-solving.

In general, these studies investigate either the technology-empowered approach or the competence-oriented approach. Challenges such as how to use AI and what competences to develop have been tackled gradually. Yet translator subjectivity construction has received limited attention.

2.2 Translator Training and Translation Education

Some academic explorations of translation education provide theoretical insights into the field. Kiraly (2014) elaborated on social-constructivist translation education in his monograph. Teachers' roles and the relationship between students and teachers were revisited through the lens of constructivism. The classroom was a major field for constructivist learning. Teachers were positioned as "guides, assistants, and catalysts" (Kiraly, 2014, p. 20). Wang et al. (2024) gave a detailed account of the concept, framework, and practical pathway of translation education research in the GenAI era. Qin et al. (2025) proposed that translation education in the AI era has transformed into intelligence pedagogy, providing a detailed account of the transformation of teaching content from hard knowledge to soft knowledge. Qin et al.'s study also emphasised the role of creative, communicative, and independent thinking competences and the collaboration between the three agents of teachers, students, and machines.

Growing attention has been paid to the development of higher-order competences in translation education. Zhang J. (2024) defined the concept and classification of higher-order competences and established a translation teaching model for developing higher-order thinking skills. Grounded in transknowletology, Dai et al. (2025) stressed and redefined deep learning, proposing a pedagogical model for translation technology education to cultivate higher-order thinking skills regarding translation technology. Applying skills of knowledge management to translation education, Mu et al. (2025) developed a four-dimensional translation knowledge network model by combining linguistic, cultural, functional, and cognitive perspectives, emphasising the rational use of AI. Their findings also revealed that the expertise and experience of human teachers could hardly be replaced by machines, and human beings were the final decision-makers.

These studies demonstrate that higher-order competences in translation education have been recognised and examined from diverse perspectives or for specific purposes. These competences are part of translator subjectivity, with which translators can deliver professional output. Despite these advances, translator subjectivity and relevant pedagogical construction remain underexplored.

2.3 Research Gap and Present Study

The established pedagogical models of human-AI collaborative translation primarily pertain to technological

application or competence training. Limited research has focused on the perspective of subjectivity. The present study, based on classroom practices, explores a pedagogical model for translation subjectivity construction, examining how translator subjectivity is progressively constructed in the teaching process, and how the roles of teachers, students, and technology are transformed throughout the process.

3. A Subjectivity-Oriented Pedagogical Model

Translator subjectivity, as Zha et al. (2003, p. 22) put it, refers to the translator's agency to realise certain translation purposes in translation practice, including cultural awareness, humanistic literacy, and cultural and aesthetic creativity. Translator subjectivity, as a higher-order competence, can help students and translators better cope with the challenges put forward by AI. Traditional teaching patterns cannot fully meet the demand of developing translator subjectivity during class. To respond to this challenge, a subjectivity-oriented teaching model derived from two rounds of instructional practice in a graduate translation course is proposed in this study. The case materials discussed in this study were selected from graduates' homework and in-class presentations, which were anonymised before analysis. All case materials were used only for illustrative purposes rather than evaluative.

3.1 Theoretical Foundations

The subjectivity-oriented teaching model is grounded in social-constructivist thinking. Instead of the traditional teacher-centred teaching model, teachers should scaffold students' learning, "provide substantial support for knowledge construction early in the course …, and gradually relinquish control … to the students themselves" (Kiraly, 2014, p. 68). Translator subjectivity is not naturally acquired but needs to be developed gradually. Students at first learn to recognise the existence of subjectivity under teachers' guidance, then learn to wisely employ AI tools, and at the end become independent decision-makers capable of making informed judgements.

Marton et al. (1976) introduced the difference between surface-level and deep-level processing for learners. These two different ways of information processing led to different learning outcomes. Their study showed that learners adopting the latter tended to better understand the underlying or intended meaning in the given materials. Similarly, Siemens (2006) differentiated hard knowledge from soft knowledge. According to Siemens (2006, p. 18), "stable, established, structured, recognised, and organised" knowledge belongs to hard knowledge, while "volatile, rapidly developing, dialogue, and emergent" knowledge is soft knowledge. Hard knowledge can be imparted, but soft knowledge is hard to conceptualise because of its vagueness and subjectivity (Qin et al., 2025, p. 54).

Belonging to soft knowledge, the knowledge and skills of translator subjectivity should be processed in a deep way and need to be developed progressively. Rather than simply remembering the standard translations of the source text, students learn to make active and sound judgements in handling AI-generated translation drafts. Pedagogical methods are designed accordingly in order to cultivate translator subjectivity.

The subjectivity-oriented pedagogical model also places higher demands on teachers. Based on the TPCK approach proposed by Mishra and Koehler (2006, p. 1025), "knowledge about content, pedagogy, and technology is central for developing good teaching". Teachers are expected to integrate knowledge from multiple domains and effectively coordinate various instructional resources to put the proposed model into practice.

These theoretical perspectives collectively lay the groundwork for the proposed subjectivity-oriented pedagogical model. Based on these foundations, the construction of the model is presented in the next section.

3.2 The Three-Stage Model

The proposed subjectivity-oriented pedagogical model in this study comprises the following three stages, namely subject establishment, subject collaboration, and subject regulation. Each stage will be analysed in detail with several cases.

3.2.1 Stage 1: Subject Establishment

The first stage is the starting point of the teaching model, during which students develop an in-depth understanding of the selective nature of translation, the limitations of machine translation, and the translator's role as a decision-maker. The AI-generated translations serve as the object of critical evaluation. Teachers provide scaffolding support and act as learning facilitators.

At this stage, there are three primary teaching steps. Students are first guided to read and compare different

translations of the same original text, including translations generated by both human translators and machines. Divided into groups, students discuss which translation is better and why it is thought to be a better one. During the stage of subject establishment, students first engage with the selective nature of translation. Different translations reflect different positions, perspectives, and orientations. The following case materials illustrate how students engaged in critical analysis.

One group of students compared four English translations of a dialogue between Red Boy and his father from Chapter 42 in *The Journey to the West*. Two translations were produced by human translators, Anthony C. Yu and W. J. F. Jenner, and two translations were generated by one LLM and one traditional neural machine translation system, namely DeepSeek and DeepL. After a comparison of translations regarding address terms, tone, sentence structures and logical relations, and culture-loaded items, students found that different translations led to different portrayals of Red Boy and revealed translators' choices in interpersonal relationships and social hierarchy.

Such comparison enables students to appreciate that translation is not merely a matter of right or wrong, but of choice-making. Each choice made by translators contributes to the meaning of translated texts and readers' reception.

In the next step, students are required to identify translation errors and inappropriate expressions in the translations generated by different AI tools. Besides, these detected translation errors need to be analysed in groups and classified into different types.

One group of students collected several AI-generated translations of a Chinese literary text and compared them with human translations. Students found that AI-generated translations tended to have deviated or completely wrong meanings of some culturally loaded expressions. Some expressions were translated by adopting the strategy of literal translation, and some were translated into phrases with broader semantic meanings or with opposite evaluative connotations. For example, "江湖中人" was translated as "people in the rivers and lakes", and "热血青年" was rendered as "hot-blooded young people".

The comparison between high-quality human translations and machine translations helps students to gain insights into the limitations of machine-generated translations. Moreover, students can further explore questions such as how human translators can contribute when AI fails to adequately cope with distinctive expressions.

The final step is to discuss the meaning of fidelity in translation and reconsider its boundaries in the AI era.

Based on the human and AI translations of two literary texts, one group of students discussed the multiple aspects of fidelity in translation, including semantic, formal, emotional, and imagery fidelity. The core issue of their analysis was: when AI could provide semantically correct translations but did not fully capture the emotions and imagery in the original text, did fidelity remain a fundamental principle in translation? Students reached a consensus that fidelity was not limited to semantic equivalence, but involved the preservation of meaning, style, rhythm, and emotional effects. AI could achieve surface-level semantic equivalence, usually resulting in a loss of underlying emotions and style.

Previous discussion allows students to actively pay attention to the emotional and stylistic fidelity in later stages. The first stage lays a cognitive foundation for the following construction of translator subjectivity.

3.2.2 Stage 2: Subject Collaboration

The next stage moves to the collaboration between humans and machines. Here, machines primarily refer to AI tools or LLMs. AI provides initial translation drafts and alternative translation options. Students take active responsibility for decision-making, post-editing, and style improvement. The role of teachers transforms from knowledge providers to providers of scaffolding, offering strategic guidance at critical points in the learning process. At this stage, the human-machine relationship evolves from a vague form of cooperation into a clearly defined collaboration, in which humans take the leading role and machines serve as intelligent assistants.

There are also three steps involved in this stage. To begin with, students complete a translation task by obtaining machine-generated initial translations and attempting to revise these translations through human post-editing. Here, the machine-generated initial translations include translations generated by both traditional neural machine translation systems (NMT) and LLMs, in order to compare the differences between NMT- and LLM-generated output.

Concerning the post-editing of the English translation of a Chinese prose, one group of students obtained machine-generated translations by adopting an NMT system (DeepL) and an LLM (ChatGPT). Focusing on lexical and syntactic analysis of the machine-generated translations, students found that post-editing required informed decision-making about terminological consistency and stylistic coherence, rather than simply surface-level correction of spelling, grammatical, or syntactic errors. For example, the discussed prose talked about both the literal,

denotative meaning and figurative meaning of "吃瓜". The literal meaning referred to eating melons literally, and its figurative meaning was following gossip. ChatGPT mixed the two kinds of meanings up and was unable to distinguish the two meanings in context, failing to provide accurate translations of the phrase. Besides, there were several expressions in English to convey the figurative meaning of "吃瓜", and machines encountered challenges in terminological consistency. Syntactically, the Chinese prose featured many four-character structures, creating a rhythmic effect. Unfortunately, machine-generated initial translations lost the rhythm by employing an unnaturally literal translation strategy.

These lexical and syntactical issues in machine-generated initial translations require extra manual review, and the issues can be identified and corrected through human post-editing. The first step enables students to clearly realise the purpose and value of post-editing, which can facilitate their post-editing practice. The subsequent step is to summarise post-editing strategies based on students' previous analysis of lexical, syntactic, cultural, and stylistic issues in the machine-generated initial translations.

In the post-editing of political texts, one group of students compared NMT-generated and LLM-generated English translations of the same political text regarding national cultural soft power, to further distinguish the quality of translations generated by NMT and LLMs. Students discovered that compared to the awkward and redundant NMT translations, LLM-generated output was concise and natural. NMT excelled in terminological consistency and semantic stability, whereas LLMs demonstrated advantages in contextual understanding and adaptation. However, it should be noted that LLMs were prone to hallucinations, sometimes deleting core information and sometimes adding fabricated information. Students proposed that the strengths of both should be leveraged, and during human-machine collaborative translation, it was humans who made the final decisions and took responsibility for quality control.

The final step in the second stage focuses on post-editing practice and group evaluation. Students are required to conduct full post-editing on machine-generated literary translations and then discuss the leading role of humans in human-machine collaborative translation.

Chinese family essays feature a light and informal tone, concise language, personal reflections, and a close connection with everyday life. Translations generated by NMT and LLMs usually fall short of capturing the style and features of these essays. One group of students gave a detailed account of their post-editing practice of one Chinese family essay. Students classified their post-editing strategies into seven types, including terminological consistency, cultural domestication, syntactic reconstruction, stylistic fidelity, formatting requirements, and target-culture conventions. They specifically rewrote the sentence structures and used specific expressions to replace general words in order to represent the tone, rhythm, and style of the original.

Through this practice, students came to realise that post-editing was far more than error correction but rather overall reconstruction. On the basis of maintaining semantic accuracy, the translation should match the original text in terms of rhythm, tone, and style. By this stage, translator subjectivity starts to shift from conceptual understanding to practical application.

3.2.3 Stage 3: Subject Regulation

The last stage aims to shift students' role from effective collaborators to autonomous decision-makers. Students are required to engage in critical evaluation of machine-generated initial translations and reflection on post-editing strategies. Teachers gradually withdraw scaffolding support until students can independently complete the whole process of human-machine collaborative translation.

This stage, as with the previous two stages, also consists of three steps. Regarding the first component in this stage, students are assigned to analyse the major challenge(s) to translator subjectivity in given texts and consider how translators make decisions in handling translation challenges beyond the capabilities of machines. Subsequently, to address these challenges, students make their own choices of translation strategies based on their analysis and judgement, and they should justify the rationale behind their choices. After the first two steps, the pre-translation analysis is completed. In the final step, students accomplish a whole translation project independently, including machine-assisted translation and post-editing, to experience the role and responsibility of a final decision-maker in the translation process.

In the translation practice of political texts, after comparing NMT- and LLM-generated initial translations and official translations, one group of students concluded that one of the major challenges in political texts lay in a

proper understanding of ideology in the original text. Machines could provide semantically correct translations but failed to convey ideological significance, while humans could achieve both. Machine-generated translations might convey ideological meanings that deviated from the original with inappropriate word choices, tense usage, or sentence structures. Human translators could make translation decisions aligned with communicative purposes, supported by a sound grasp of the political and cultural contexts of the target culture.

Another group of students summarised the complete translation procedure in human-machine collaborative translation, which was divided into three parts, namely pre-translation, during-translation, and post-translation. Pre-translation referred to the preparation of bilingual terms and the identification of translation challenges as well as original stylistic features. During-translation included pre-editing of the original text (such as long-sentence splitting), obtaining two or three LLM-generated initial translations, and the production of one integrated translation based on the initial output guided by a certain translation orientation. The post-translation mainly comprised the post-editing of the integrated translation based on human review and correction. Notably, students, based on their post-editing experience of political texts, stressed that the strategy of political domestication could ensure that the political implications of the translation were consistent with the political communicative effects of the target culture. Besides, students found that AI hallucinations required particular attention in human review, because AI sometimes arbitrarily omitted or adapted key information in pursuit of fluency. Students also suggested the final revised version should be read aloud for further refinement. These reflections indicate that students' theoretical understanding has advanced alongside their practical experience.

At the stage of subject regulation, the core translator competence lies not in the behaviour of translation itself, but in translation management skills. Comprehensively employing strategies and tools accumulated in the previous stages, translators complete a whole translation project by effectively leveraging AI-generated output, selecting proper translation orientations and strategies for post-editing, and ensuring quality control. Beyond proficient utilisation of strategies, students are also required to clearly answer questions like why one certain orientation or strategy is selected, what kind of translation purpose the selected orientation or strategy achieves, etc. Whether students can provide a justification for the selected translation orientation and strategies marks the key point of shifting from mere users of technology to strategic decision-makers.

4. Discussion

4.1 The Dynamic Evolution of Roles

Recent studies have identified the role transformation of teachers and students. Wang et al. (2026) argued that teachers should shift from knowledge instructors to guides facilitating students' learning. Zhang J. (2024) proposed that teachers should change from traditional knowledge providers to learning facilitators. Shi et al. (2026) noted that the employment of AI enabled students to shift from passive linguistic converters to active cross-cultural decision-makers. Although the changing roles of teachers and students have been identified in previous studies, the progressive process of this transformation has been rarely examined. In practice, the transition from traditional to emerging roles is gradually accomplished through different stages.

In the three-stage pedagogical model proposed in this study, the roles of teachers, students, and machines (mainly NMT and LLMs) keep changing alongside the three stages in human-machine collaborative translation. Such a dynamic evolution of roles demonstrates the practical pathway of translator subjectivity. Translator subjectivity is not innate but can be progressively constructed across the three-stage model.

Throughout the three stages of subject establishment, subject collaboration, and subject regulation, the role of teachers dynamically shifts from knowledge guides to scaffolding providers, and to facilitators in scaffolding withdrawal. Students first are critical evaluators of machine-generated initial translations and reference translations, then become active collaborative users of AI tools, and finally become independent decision-makers who can carry out a whole translation project properly employing technological tools guided by certain theoretical principles. Technological tools or machines, mainly referring to NMT and LLMs in the field of translation, transform from evaluated targets to collaborative tools, and finally to manageable targets.

4.2 Pedagogical Implications

The dynamic evolution of roles imposes new requirements on teacher development, course design, and the use of

AI tools. The key competence in the transformation of teachers' roles centres on the conscious control of scaffolding provision and withdrawal. Teachers should not only master scaffolding strategies but also understand when and how to apply them. Furthermore, knowing when to withdraw scaffolding properly is both vital and challenging.

Traditional course design usually follows a dichotomy between theory and practice, with theory being learnt first and practice following afterwards. The proposed three-stage model in this study encourages a progressive approach from theoretical understanding to collaborative practice and finally to independent decision-making. Students begin with basic conceptual understanding, which can facilitate further learning, and then deepen their understanding during practice. When students develop higher-order translation competences, their theoretical literacy also advances.

Concerning AI tools, they are regarded as cognitive partners during translator subjectivity construction rather than substitutes for humans. This position is determined by teaching objectives. Different perceptions of AI tools lead to different strategies of AI utilisation, thereby shaping human-AI collaborative patterns.

5. Conclusion

Grounded in a social-constructivist perspective, this study presents a pedagogical approach to human-machine collaborative translation education in adapting to the challenges in the AI era. A three-stage model, consisting of subject establishment, subject collaboration, and subject regulation, is proposed and elaborated through examples drawn from students' assignments and in-class presentations. The findings reveal that the roles of three major participants evolve dynamically throughout the learning process. The evolution demonstrates the pathway for translator subjectivity construction. Teachers shift from knowledge transmitters to scaffolding providers, and then the scaffolding gradually fades out until students develop higher-order competences. Students are not mere receivers of existing evaluation criteria, transforming from critical thinkers to AI-assisted collaborators and to strategic decision-makers and project coordinators in translation practice. AI tools, initially acting as intelligent tools to generate initial translations and later as collaborative assistants for translation tasks, eventually become valuable resources to be managed in translation project management.

The subjectivity-oriented pedagogical model is expected to provide insights into translation education, with its validity shown through authentic in-class exercises. A further series of empirical studies can be carried out in the future to examine the teaching effectiveness of the three-stage model and refine it accordingly. The model may also be applied in undergraduate classes and other language pairs to assess its applicability.

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References

Bloom, B. S. (Ed.). (1956). *Taxonomy of educational objectives: The classification of educational goals*. New York: David McKay Company, Inc.

Dai, G., Shen, S., & Huang, D. (2024). Deep learning and knowledge infusion: An inquiry into path construction for a translation-technology teaching model. *Contemporary Foreign Language Studies*, (1), 125-138.

Guerberof-Arenas, A., & Moorkens, J. (2019). Machine translation and post-editing training as part of a master's programme. *The Journal of Specialised Translation*, (31), 217-238.

Hu, K. (2026). The transformation and development of translation discipline in the context of artificial intelligence. *Shandong Foreign Language Teaching*, (1), 2-12.

Kiraly, D. (2014). *A social constructivist approach to translator education: Empowerment from theory to practice*. London and New York: Routledge.

Li, X., Peng, L., & Jin, H. (2024). Study on the construction of a human-machine collaborative translation teaching model empowered by technology. *Foreign Language World*, (3), 43-50.

Marton, F., & Säljö, R. (1976). On qualitative differences in learning: I—Outcome and process. *British Journal of Educational Psychology*, (1), 4-11.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, (6), 1017-1054.

Mu, Y., & Zheng, S. (2025). AI-empowered translation knowledge network construction and a new paradigm of human-machine collaborative teaching. *Technology Enhanced Foreign Language Education*, (3), 52-61+112.

Nitzke, J., & Hansen-Schirra, S. (2021). *A short guide to post-editing*. Berlin: Language Science Press.

O'Brien, S. (2002). Teaching post-editing: A proposal for course content. In *Proceedings of the 6th EAMT workshop: Teaching machine translation* (pp. 99-106). UK: European Association for Machine Translation.

Qin, J., & Ma, D. (2025). To innovate translation education in the GenAI era. *Shanghai Journal of Translation*, (5), 52-57+95.

Sha, L., Zhang, C., & Wang, X. (2026). Constructing and validating a GenAI-empowered translation-communication teaching model. *Foreign Language World*, (1), 83-90+94.

Shi, Y., Yue, F., & Li, R. (2026). Constructing and empirically validating a model for teaching human-AI collaborative translation: Some observations through the lens of translation-as-metaphor theory. *Chinese Translators Journal*, (3), 47-54+192.

Siemens, G. (2006). *Knowing knowledge*. Vancouver: Lulu Press.

Wang, H., Wang, S., & Wang, W. (2026). Intelligent translation for the future: How large language models reshape translation education: A panel discussion on translation education innovation in the GenAI era. *Shandong Foreign Language Teaching*, (2), 1-9.

Wang, J., & Zhang, Z. (2025). An LLM-driven pedagogical framework for human-machine collaborative translation. *Foreign Language World*, (5), 69-76.

Wang, L., & Wang, X. (2024). Translation teaching research in the age of artificial intelligence: Concept, framework and pathways. *Foreign Language World*, (6), 83-90.

Zha, M., & Tian, Y. (2003). On the subjectivity of the translator. *Chinese Translators Journal*, (1), 19-24.

Zhang, J. (2024). Constructing a pedagogical model for higher-order thinking in translation education in the context of GenAI. *Chinese Translators Journal*, (3), 71-80.

Zhang, W. (2024). Challenges and prospects for translation programs in the AI era: An analysis based on a large-scale social survey. *Chinese Translators Journal*, (5), 139-148.