Generative AI and the Transformation of Translation Education: A Systematic Review of Empirical Studies

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Abstract

This systematic review examines how generative artificial intelligence (GenAI) shapes translation education through a synthesis of 60 empirical studies published across 37 journals or edited volumes in the fields of translation and interpreting training, educational technology, and applied linguistics. Following the PRISMA framework, the review presents the overall profile of the included studies and analyzes them in relation to three questions concerning how GenAI has been defined, introduced, and used in translation education research, what kinds of learning-related outcomes have been reported, and what pedagogical conditions, learner factors, and ethical and technological boundaries appear to shape its role. The findings show that GenAI is already becoming part of translation-related teaching and learning, but not in one uniform or stable way. Across the studies reviewed, GenAI was introduced through multiple pedagogical roles, including translation assistant, feedback provider, revision scaffold, post-editing aid, and interactive learning partner. Reported outcomes were distributed across several domains, with relatively more positive findings in translation performance and in structured feedback or post-editing tasks, and more mixed findings in learner experience, AI literacy, and process-related domains. Compared with the pre-GenAI era, when technologies such as computer-assisted translation tools were more often treated as external resources and aids, translation education in the GenAI era increasingly positions GenAI as a pedagogical actor that participates in drafting, commenting, revising, simulating, and structuring learning activities, while still requiring human-in-the-loop oversight and judgment. At the same time, the review highlights

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the risk of ChatGPT-centered pedagogy and a gap between academic use and professional workflows. Overall, the review argues that GenAI should be understood not as a simple pedagogical solution, but as part of a broader reorganization of translation education.
Keywords: generative artificial intelligence, translation education, systematic review, pedagogical actor, human-in-the-loop approach

1. Introduction

Recent years have witnessed the meteoric rise of artificial intelligence (AI) and its rapid and widespread application in education (Chiu, 2024; Li & Li, 2025; Sun & Martín, 2025), heralding the advent of Education 4.0, an educational paradigm aimed at cultivating professional skills aligned with emerging technologies such as machine learning and AI (Bhardwaj, 2025). By introducing and integrating these state-of-the-art technologies, Education 4.0 prepares learners to survive and thrive in an increasingly AI-driven world. One milestone of this paradigm shift is the public release of ChatGPT in late 2022 (Kenny, 2024; Peñalvo & Ingelmo, 2023). Since then, generative artificial intelligence (GenAI), a category of AI systems designed to generate original content such as text and images in response to user prompts (Kwok et al., 2025), has rapidly entered various learning contexts (Belkina et al., 2025). For translation studies, this broader development is understood by Bogucki (2026) as the GenAI turn of translation studies, suggesting that GenAI is beginning to influence not only translation practice but also the conceptual and pedagogical orientations of translation studies.

A growing number of studies have begun to examine GenAI in translation-related teaching and learning, but this body of work remains difficult to interpret as a whole, as the literature varies considerably in what it treats as GenAI, how pedagogical use is conceptualized, what kinds of learners and tasks are examined, and what counts as an educational outcome.

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Most commonly, GenAI refers specifically to large language model-based systems such as ChatGPT or GPT-4 (Ayvazyan, Hao, et al., 2024; Guo & Lin, 2025; Sahari et al., 2023); however, in some cases, it is discussed more loosely alongside machine translation or broader AI-assisted tools (Poláček & Tonková, 2025; Yefymenko et al., 2024). At the same time, the available evidence is scattered across different research designs, outcome measures, and educational settings. As a result, it is still unclear how GenAI is actually being introduced into translation education, what kinds of learning-related outcomes have been reported, and under what conditions these outcomes appear to vary.

To fill the research lacuna, a systematic review is needed. Traditional narrative literature reviews normally do not require justification for how information is obtained or selected, nor do they aim to cover all existing research (Ahn & Kang, 2018). By contrast, a systematic review requires a predefined review protocol that must be rigorously followed to identify and compile all available studies pertinent to a specific topic and research design (García-Peñalvo, 2022). Widely used search protocols include the Cochrane guide, SALSA, PRISMA, and PSALSAR, among which PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) is one of the most widely adopted (García-Peñalvo, 2022). Originally consisting of four phases of identification, screening, eligibility, and inclusion in the 2009 version (Moher et al., 2010), the PRISMA flowchart has been updated in 2020, and the 2020 version has merged the screening and eligibility phases into a single screening phase. Thus, the updated version now consists of three phases, i.e., identification, screening, and inclusion (Page et al., 2021). As earlier review work on translation training has shown, rapidly expanding research areas benefit

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from structured synthesis that can map major themes, identify gaps, and clarify future directions (Akbari & Ketabi, 2024; Chan & Tang, 2024; Sarkis-Onofre et al., 2021). Building on this rationale, the present study conducts a systematic review of empirical research on how GenAI shapes translation education.

Three research questions are raised:

RQ1: How has GenAI been defined, introduced, and used in translation education research?

RQ2: What kinds of learning-related outcomes have been reported?

RQ3: What pedagogical conditions, learner factors, and technological boundaries appear to shape its role?

By addressing these questions, the study aims to provide a clearer empirical account of how GenAI is currently entering translation pedagogy, what kinds of results have been reported, and where important uncertainties remain.

2. Related Works

In the term “Generative AI”, “generative” refers not merely to the production of an output, but more specifically to the creation of novel, previously unseen, human-consumable content based on patterns learned from training data (Peñalvo & Ingelmo, 2023). Discriminative models, such as decision tree models that are trained to predict probabilities of labels based on incoming data, may be misunderstood as GenAI (Foster, 2019). However, within the AI research community, GenAI specifically refers to models that create high-quality, human-like material (Harshvardhan et al., 2020; Peñalvo & Ingelmo, 2023). Examples include

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GPT-4 and Generative Adversarial Networks (please refer to Figure A1 in the Appendix for more details).

Research on translation education has already developed into a substantial body of work, but much of it predates the recent wave of GenAI (Chan & Tang, 2024). A useful starting point is Akbari and Ketabi's (2024) meta-analysis of 1,088 articles published in 18 major translation and interpreting journals between 2000 and 2020. Their study shows that translation training research has mainly developed around four broad themes: teaching, evaluation/assessment, testing, and technology. Among these, technology accounts for the largest share (37.13%), followed by teaching (31.61%). It also indicates that technology in translation education was commonly discussed in terms of categories such as machine translation (MT), computer-assisted translation (CAT) tools, audiovisual translation, localization, and translation quality assessment. In this sense, GenAI does not enter a pedagogical vacuum. Instead, it enters an already technologized area of training in which questions of curriculum design, translator competence, translation quality, and assessment have long been established. What changes is not the existence of technology in translation teaching, but the kind of technology now being foregrounded and the kinds of pedagogical questions it raises.

After the release of ChatGPT in November 2022, a limited number of reviews have been conducted on AI for translation as of 14 March 2026, and these have focused on the broader field of translation rather than the pedagogical use of GenAI in translator training; none has specifically examined the role of GenAI in translation education (Chan & Tang, 2024; Nguyen et al., 2025). To have a clear view of this fast-changing field, the present study adopts

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the PRISMA framework to conduct a systematic review of how GenAI shapes translation education.

3. Methods

3.1 Review Design

Although the present systematic review synthesizes findings from empirical studies on the research topic, it does not include a meta-analysis. Meta-analysis is often conducted alongside a systematic review, as both aim to synthesize findings by combining and analyzing data from different studies addressing similar research questions (Ahn & Kang, 2018). Specifically, meta-analysis employs statistical techniques to combine estimates from two or more studies in order to generate a pooled overall estimate (Borenstein et al., 2021; Kang, 2015). In this review, however, despite the inclusion of 60 empirical studies, substantial heterogeneity was observed across research designs, participant types, pedagogical contexts, outcome measures, and statistical reporting. As a result, only limited comparable data were available for quantitative synthesis, and a meta-analysis would not have produced a robust pooled effect size. In addition, no formal quality appraisal was conducted, as the heterogeneity of study designs and reporting practices limited the comparability and interpretive value of standardized appraisal tools. Therefore, neither a meta-analysis nor a formal quality appraisal was conducted in this review.

Following the PRISMA framework, this systematic review first collected data through the three phases of identification, screening, and inclusion. Once the review corpus had been established, relevant information was extracted from each primary study to address the research

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questions. All articles included were coded across a set of analytical dimensions. For the coding stage, 18 studies (30% of the included studies) were independently double-coded, with interrater agreement assessed using Cohen's kappa. Kappa values exceeded 0.70 across all coding categories, indicating substantial agreement (Landis & Koch, 1977). Any remaining discrepancies were discussed and resolved through iterative refinement of the coding framework. After coding, the review moved to the reporting stage, in which the findings were synthesized and evaluated. The review questions were addressed in the Results and Discussion sections.

3.2 Search Strategy, Eligibility Criteria and Screening Procedure

The literature search was first conducted in the SSCI and Scopus databases using the same Boolean search string: ("artificial intelligence" OR "machine translation" OR "ChatGPT" OR "generative AI" OR "large language model") AND ("translation education" OR "translator training" OR "translation teaching" OR "translation pedagogy"). To broaden coverage, supplementary searches were also conducted on ProQuest and Google Scholar. As of 14 March 2026, a total of 512 records were identified: 334 from Scopus, 120 from SSCI, 34 from ProQuest, and 24 from Google Scholar (Figure 1).

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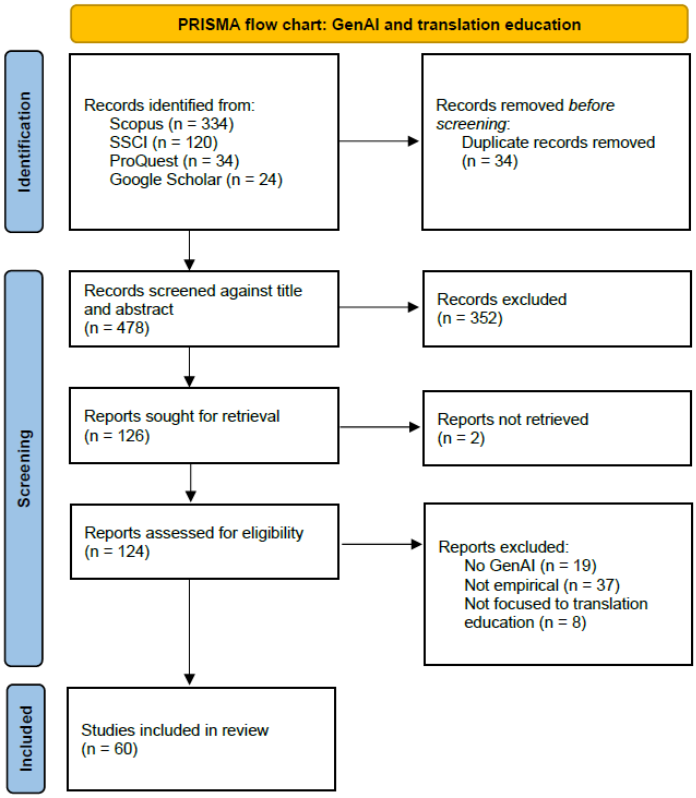

Figure 1. PRISMA flow diagram of the study selection process (Page et al., 2021).

Studies were included in the current review if they met four conditions: they had to focus on GenAI or LLM-based tools rather than broader AI, CAT tools, or conventional neural machine translation (NMT) systems; they had to be situated in translation education, translator training, or interpreting education; they had to be empirical, including qualitative, quantitative, or mixed-methods research; and they had to report learning-related, teaching-related, assessment-related, or process-related findings. In line with the scope of the review, assessment-oriented studies, interpreting education studies, and empirical chapters in books or conference proceedings were included when they contained identifiable empirical data and could be treated as independent units of analysis.

After de-duplication, 478 records remained for title and abstract screening, of which 352 were then excluded. The remaining 126 reports were sought for full-text retrieval; 2 could

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not be retrieved, leaving 124 full-text reports for eligibility assessment. After full-text review, 64 reports were excluded, including 19 that did not focus on GenAI, 37 that were not empirical, and 8 that were not focused on translation education. The final sample, therefore, consisted of 60 empirical studies. The full study selection process is shown in Figure 1.

3.3 Data Extraction and Coding

A structured coding framework was developed to extract both descriptive and analytical information from the included studies. Descriptive coding covered study characteristics such as author and year, country or region, educational context, participant type, sample size, research design, GenAI tool or model, and task type.

Analytical coding was aligned with the review questions. For RQ1, studies were coded for how GenAI was defined and for its pedagogical role, such as translation assistant, feedback provider, revision scaffold, post-editing support, interactive learning partner, or classroom platform. For RQ2, studies were coded by primary outcome domain, including translation performance and quality, feedback and revision, engagement and motivation, and AI literacy or cognitive process. For RQ3, studies were coded for conditions and boundaries, including guided versus unguided use, teacher support, learner readiness, task factors, technological limitations, and ethical concerns. Studies were also coded for the overall direction of reported findings (i.e., positive, mixed, unclear/limited, or negative) within the relevant outcome domain. Outcomes were coded as positive when studies reported broadly beneficial effects of GenAI within the relevant domain. Mixed outcomes referred to cases where both benefits and limitations, or uneven effects across indicators, were reported, while negative outcomes

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indicated predominantly adverse effects. These coded data were later analyzed in the Results section.

4. Results

In this section, the results are first presented through an overview of the overall profile of studies included, followed by a synthesis of the findings in relation to the three review questions.

4.1 Characteristics of the Studies Included

As shown in Table A1 in the Appendix, the final sample consists of 60 empirical studies drawn mainly from translation education (38 studies), translator training (14 studies), and a smaller number of interpreting education contexts (8 studies). Higher education is the dominant setting, and most participants are student translators, MTI students, interpreting students, or learners enrolled in translation-related courses.

In terms of publication outlets, the reviewed studies exhibit a clear long-tail distribution, with a notable concentration in journals and edited volumes focused on translation and interpreting training, educational technology, and applied linguistics (Table 1). Specifically, *The Interpreter and Translator Trainer* appears to be the most active journal on this topic, with nine studies included in the review corpus, followed by *Education and Information Technologies* with four studies. *System* and the edited volume *Translation Studies in the Age of Artificial Intelligence* each contributed three articles or chapters. Several other outlets, such as *Computer Assisted Language Learning*, *International Journal of Applied Linguistics*, and *Sage Open*, each published two studies. The remaining 27 studies are dispersed across outlets

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represented by only a single publication.

In terms of regional trends, research is highly concentrated in the Chinese mainland, rising from 5 studies in 2024 to a peak of 15 in 2025. Hong Kong and Saudi Arabia also peaked in 2025, with 7 and 5 studies, respectively. Overall, the regional distribution showed a sharp surge in 2025 and strong concentration in China (Figure 2).

Table 1. Distribution of the 60 included studies by publication outlet.

Publication outlet	Number of studies
The Interpreter and Translator Trainer	9
Education and Information Technologies	4
System	3
Translation Studies in the Age of Artificial Intelligence (edited volume)	3
Computer Assisted Language Learning	2
International Journal of Applied Linguistics	2
International Journal of Learning, Teaching and Educational Research	2
International Symposium on Emerging Technologies for Education	2
Sage Open	2
Seminars in Medical Writing and Education	2
Other outlets (each with one article included in the review corpus)	27

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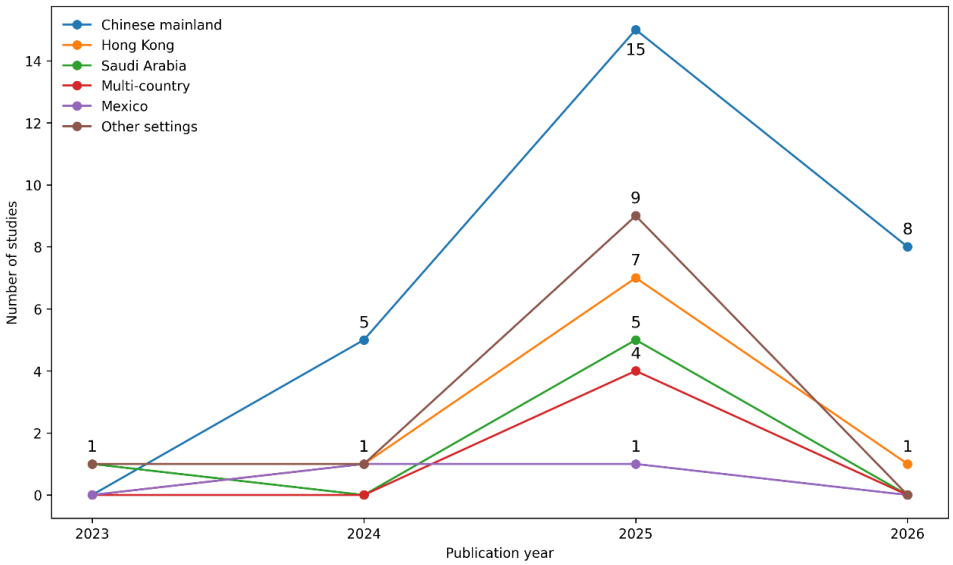

Figure 2. Regional trends in GenAI-related translation education research by publication year.

Five major analytical perspectives have been identified, namely engagement, motivation, and learner experience (17 studies); translation performance and output quality (16 studies); AI literacy, information-seeking behavior, and cognitive processes (12 studies); feedback, revision, and post-editing (11 studies); and broader pedagogical or ethical concerns (4 studies) (Figure 3). More specifically, the word cloud of high-frequency words in the abstracts available for analysis suggests that researchers often rely on constructs such as feedback and engagement to examine how GenAI shapes translation education (Figure 4). This trend will be discussed in the next section to assess whether it differs from research in the pre-GenAI era.

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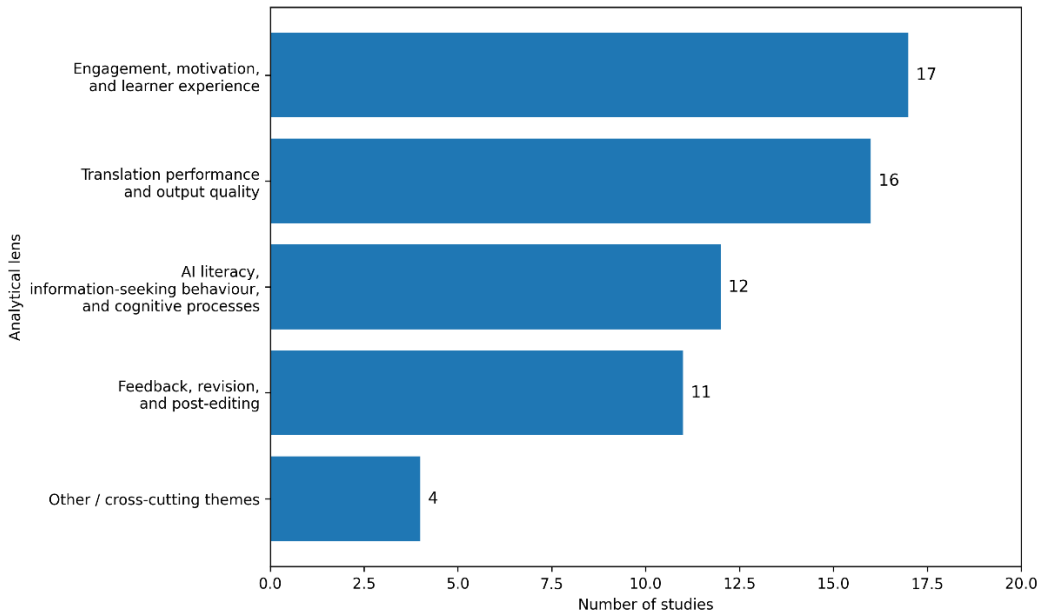

Figure 3. Distribution of the reviewed studies across five analytical perspectives.

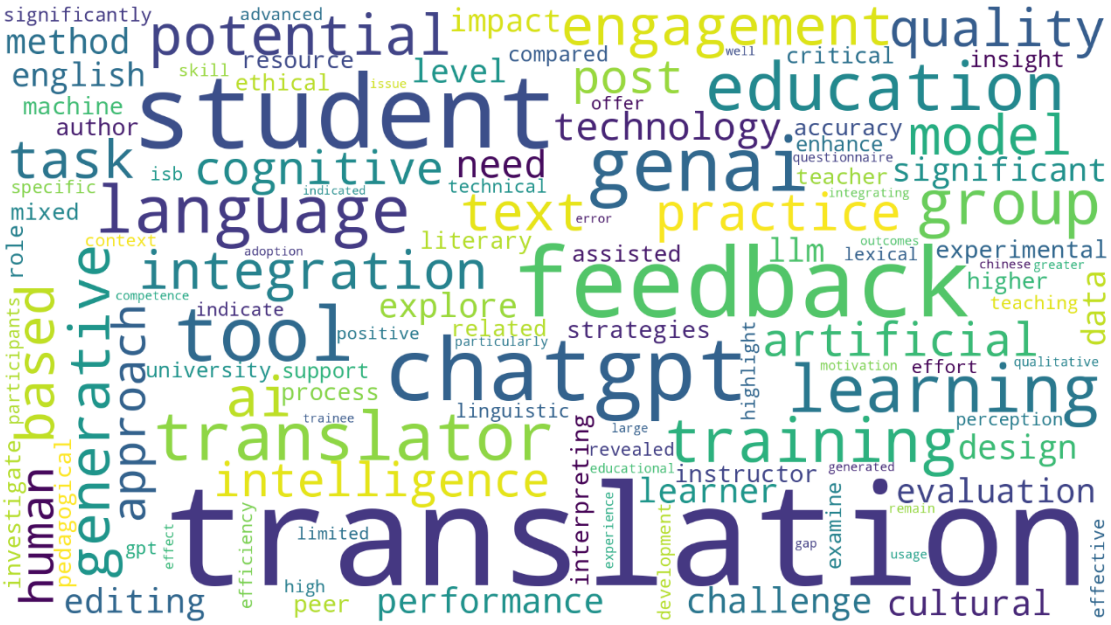

Figure 4. Word cloud of high-frequency terms in the available abstracts of the reviewed studies.

4.2 Definitions, Introduction, and Uses of GenAI in Translation Education Research

Across the reviewed studies, 44 (73.3%) explicitly operationalized GenAI primarily through ChatGPT, indicating a strong reliance on a single model as a proxy for GenAI in the

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current literature. More diversity is observed in the pedagogical roles GenAI played in the research (Table 2).

Table 2. Pedagogical roles through which GenAI has been introduced into translation education.

Pedagogical role	How GenAI is positioned in the reviewed studies	Typical learner activities
Translation assistant	In this role, GenAI is embedded in translation production itself, assisting learners during task completion rather than serving merely as an external reference tool.	Drafting target segments, making lexical choices, reformulating expressions, and exploring terminology.
Feedback provider	Here, GenAI becomes part of the feedback process, contributing comments, explanations, and revision suggestions within the evaluative dialogue around learner texts.	Interpreting feedback, explaining errors, revising drafts, and comparing feedback sources.
Revision scaffold	Rather than standing outside the task, GenAI supports revision from within the learning process by helping learners notice problems, compare alternatives, and make decisions.	Revising drafts, self-correcting, comparing alternatives, and making reflective adjustments.
Post-editing support tool	In post-editing tasks, GenAI is incorporated into guided revision sequences, contributing to iterative refinement rather than offering a finished output to be passively accepted.	Post-editing, MTPE practice, allocating effort, and refining translation quality.
Interactive learning partner	This role frames GenAI as a dialogic participant in learning, supporting preparation, simulation, reflection, and exploratory interaction.	Preparing for tasks, running simulations, engaging in reflective dialogue, and exploring prompts and responses.
Platform or structured training component	At this level, GenAI is built into broader instructional systems, adaptive learning environments, or classroom platforms instead of being used only as a standalone chatbot outside the course structure.	Participating in structured classroom training, receiving adaptive feedback, and completing platform-mediated tasks.

Across the studies reviewed, GenAI most often functioned not as a replacement for student translation but as a layered pedagogical support embedded at different points in the learning process. First, in some studies, it operated as a translation assistant, helping learners draft target segments, reformulate expressions, solve immediate lexical problems, and make terminology choices during task completion, including in business English translation teaching, classroom translation practice, and literary translation comparison tasks (Abdelhalim et al.,

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2025; Kwok et al., 2025; Li & Tian, 2024; Quan, 2026). Second, GenAI frequently appeared as a feedback provider, generating comments, explanations, and revision suggestions that were explicitly compared with teacher, peer, or self-feedback. In this role, GenAI became part of the evaluative dialogue around learner texts rather than merely part of text production (Cao & Zhou, 2025; Su et al., 2025; S. Xu, Y. Sun, et al., 2025; X. Xu et al., 2025). Third, it was positioned as a revision scaffold, with its value lying in helping learners notice problems, compare alternatives, and refine translations through guided revision rather than simply producing a final answer (Guo & Lin, 2025; Yao et al., 2025). Fourth, GenAI also functioned as a post-editing support tool, particularly in MTPE sequences where learners used it to revise, evaluate, and improve machine-generated output (Tian et al., 2025). Fifth, it served as an interactive learning partner. This role is more frequently observed in interpreting education and in process-oriented research. For example, Chinese MTI postgraduates reported using GenAI for interpreting preparation, scenario simulation, and reflection, while also expressing concerns about bias and contextual fit (Zhong & Ma, 2026). Sixth, GenAI also functioned as a platform or structured training component. In such cases, its pedagogical function extended beyond immediate task support to structured classroom training, adaptive feedback, and platform-mediated learning activities (Aleedy et al., 2025; Han & Mo, 2025).

To sum up, these roles suggest that GenAI was pedagogically positioned less as a static tool than as a flexible participant in drafting, feedback, revision, and reflective interaction.

4.3 Types of Learning-related Outcomes Reported

The 60 studies reported outcomes in four main domains: translation performance and

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quality; feedback, revision, and post-editing; engagement, motivation, and learner experience; and AI literacy, information-seeking behavior, and cognitive processes (Figure 5).

First, studies on translation performance and quality suggest that GenAI can improve selected dimensions of learner output under relatively structured instructional conditions, especially accuracy, fluency, terminology handling, lexical support, and efficiency (Li & Tian, 2024; Quan, 2026; Tian et al., 2025). However, these gains are not reported uniformly across indicators, and some studies indicate that GenAI may strengthen particular linguistic features or speed-related outcomes more readily than overall translation quality (Guo & Lin, 2025). Second, in feedback, revision, and post-editing, the reported pattern is also broadly positive but more conditional: several studies show that GenAI can support revision uptake, reflective engagement, and post-editing when embedded in structured feedback designs (Jiao et al., 2025; Su et al., 2025; Tian et al., 2025; Yao et al., 2025). However, comparative work with teacher, peer, and self-feedback shows that its value depends heavily on how feedback is framed, how learners interpret it, and whether it is regarded as reliable and pedagogically appropriate (Cao & Zhou, 2025; S. Xu, Y. Sun, et al., 2025; Zhang & Li, 2026). Third, the domain of engagement, motivation, and learner experience contains the largest number of studies but also the strongest concentration of mixed findings (Figure 5): learners often describe GenAI as useful, accessible, and motivating because it offers immediate support and reduces uncertainty during tasks (Andrade & González, 2024; Han & Mo, 2025; Zhang & Doherty, 2025), while the same line of research repeatedly notes concerns about trust, dependence, contextual accuracy, and appropriate use (Muftah, 2025; Sahari et al., 2023). Fourth, studies on AI literacy, information-

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seeking behavior, and cognitive processes indicate that GenAI changes how students work as much as what they produce: GenAI-based searching appears more interactive than conventional web searching but can also be more prolonged and reliance-prone (Cai & Tian, 2025, 2026). Process-oriented studies further suggest that GenAI may redistribute cognitive effort rather than reduce it (Tian et al., 2025; Yao et al., 2025). Research on AI literacy also indicates that familiarity with GenAI does not necessarily imply critical or effective use (Yu et al., 2025; Zhang & Doherty, 2025).

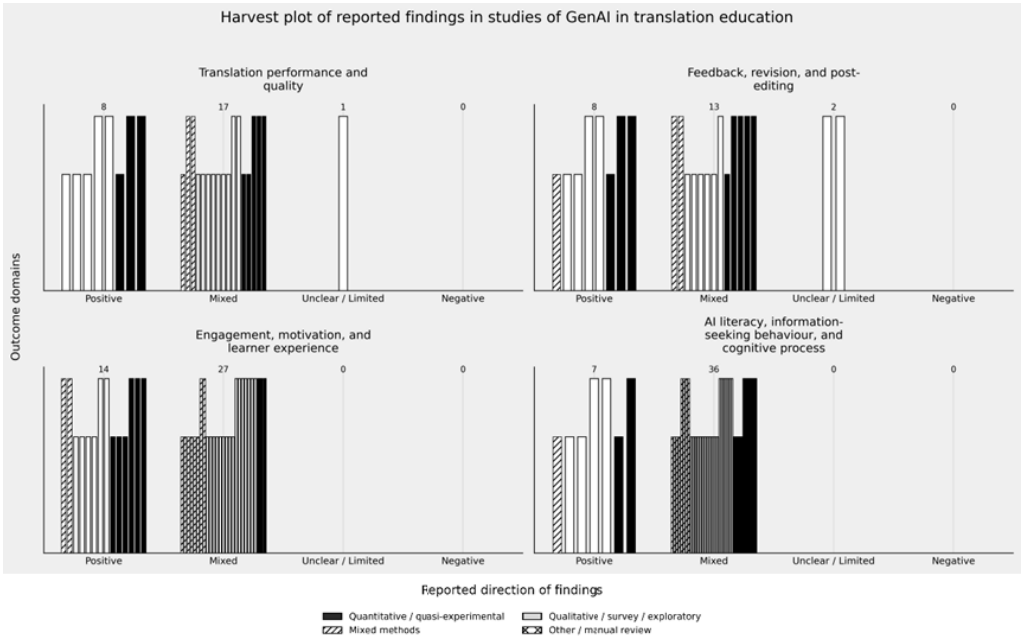

Figure 5. Harvest plot of reported findings in the studies reviewed. The numbers above the columns indicate the number of individual outcomes coded into each direction category within that domain; each column represents an outcome. Variation in column height reflects differences in sample size across studies, with higher columns indicating larger sample sizes. Outcomes were coded as positive when studies reported broadly beneficial effects of GenAI within the relevant domain, as mixed when both benefits and limitations, or uneven effects across indicators, were reported, and as negative when effects were mainly adverse.

Overall, the reviewed studies suggest that GenAI is associated with both product-related and process-related outcomes. Some of these outcomes are reported more consistently than others. However, the overall pattern suggests that findings are more often positive or

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mixed than clearly negative, with mixed patterns appearing especially often in studies of learner experience and AI literacy (Figure 5).

4.4 Conditions Shaping the Role of GenAI in Translation Education

Three broad groups of conditions, i.e., pedagogical design, learner-related factors, and technological or ethical boundaries, have been identified as shaping the context in which GenAI operates in translation education (Table 3).

Table 3. Pedagogical conditions, learner-related factors, and technological or ethical boundaries shaping the role of GenAI.

Broad condition type	Specific condition type	Issue identified in the reviewed studies
Pedagogical design	Pedagogical design	Guided vs. unguided use; explicit vs. informal integration; task-framing
	Feedback configuration	AI-only feedback vs. teacher/peer/self-feedback; feedback complexity; uptake demands
Learner-related factors	Learner readiness and profile	Prior experience, self-efficacy, AI literacy, confidence, and willingness to verify output.
	Interaction pattern	Deep/reflective vs. fragmented/result-seeking engagement; dynamic vs. static search behavior
Technological or ethical boundaries	Technological boundaries	Hallucination, bias, translationese, superficial plausibility, and lack of contextual fit.
	Ethical and institutional boundaries	Over-reliance, academic integrity, data security, and unclear norms of acceptable use.

The first set of conditions concerns pedagogical design. Several studies suggest that guided use is associated with clearer benefits than unrestricted use, especially in feedback, revision, and post-editing tasks when learners are expected to interpret, evaluate, or justify its suggestions (Jiao et al., 2025; Tian et al., 2025; S. Xu, Y. Sun, et al., 2025).

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The second set concerns learner-related factors. Self-efficacy, prior experience, AI literacy, and interaction style appear to shape how students work with GenAI (Andrade & González, 2024; Yu et al., 2025; Zhang & Doherty, 2025). For example, studies on learner interaction patterns suggest that more reflective or recursive engagement may be more conducive to productive use than fragmented or result-seeking interaction (Yu et al., 2025).

The third set concerns technological and ethical boundaries. Across the reviewed studies, learners and instructors raised concerns about hallucination, superficial plausibility, bias, contextual inaccuracy, over-reliance, and data-related risks (Guo & Lin, 2025; Zhong & Ma, 2026).

In general, the results suggest that GenAI is shaping translation education in a differentiated rather than uniform way. It is being introduced through multiple pedagogical roles, associated with a broad set of product- and process-related outcomes, and moderated by instructional design, learner response, and tool limitations.

5. Discussion

In this section, the discussion centers on a comparison between translation education in the pre-GenAI era and its reformation following the GenAI turn. Limitations of the studies reviewed are also discussed.

5.1 The Reshaping of Translation Education in the GenAI Era

The results presented in the previous section, when compared with those obtained in the pre-GenAI era, reveal a major shift from tool-centered understandings of technology. In the GenAI era, a more process-oriented view emerges, in which GenAI is treated as an active

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pedagogical actor, and its effects are understood as conditional, mediated, and interactional.

In earlier technology-related research, tools such as MT, CAT, or localization platforms were typically treated as resources, supports, or objects of instruction (Akbari & Ketabi, 2024). In the present review, by contrast, GenAI is no longer positioned simply as something students use. Because of its ability to generate human-like content, it is beginning to function less as an external aid and more as a pedagogical actor that participates in drafting, commenting, revising, simulating, and structuring learning activities, while still requiring human oversight through a human-in-the-loop approach to interpret, verify, and regulate its contributions (Bogucki, 2026; Brewster et al., 2025).

This reshaping process can be understood through the interactions represented in Figure 6. Rather than being a direct cause of learning outcomes, GenAI is positioned between three enabling and constraining components, namely pedagogical design, learner-related factors, and technological or ethical boundaries, and three major outcome domains, namely performance, engagement, and AI literacy. In other words, GenAI does not produce effects automatically. Its influence emerges only through the interaction between instructional design, learner readiness and behavior, and the limits imposed by the system itself. What is being reshaped, then, is not merely the technological environment of translation education but the framework through which learning effects are generated, interpreted, and evaluated. This is why the current literature has moved beyond previously dominant constructs such as tools, metrics, and assessment alone, and increasingly foregrounds feedback uptake, engagement, cognitive effort, trust, information-seeking, and AI literacy as central dimensions of inquiry.

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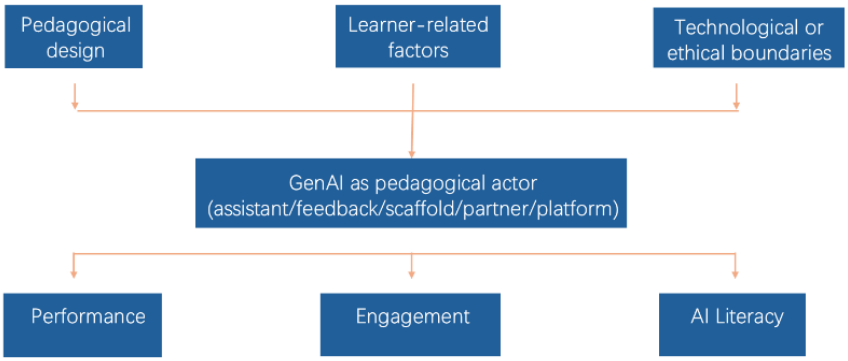

Figure 6. A model of how GenAI shapes translation learning outcomes.

5.2 Possible Limitations of ChatGPT-centered Pedagogy

A risk emerging from the empirical studies reviewed is the over-reliance on ChatGPT. Of the 60 empirical studies included in this review, approximately 44 (73.3%) explicitly identified ChatGPT as the focal tool or model, meaning that the majority of the evidence base was organized around this single model. This concentration matters because it creates a risk that pedagogy becomes too narrowly structured around one platform and one interaction style.

Specifically, a ChatGPT-centered pedagogy risks narrowing students' understanding of the broader ecosystem of GenAI tools. Comparative evidence suggests that ChatGPT itself is not consistently superior to other systems. In a preliminary evaluation, Jiao et al. (2023) found that ChatGPT performed competitively with commercial systems only on high-resource European languages, but lagged more clearly on low-resource or distant language pairs, and also underperformed Google Translate or DeepL on biomedical abstracts and Reddit comments, although it showed some potential on spoken-language data. Broader benchmarking and comparative work suggest that performance varies substantially across models and task types, including cases where prompt engineering improves one model but worsens another. In a Hungarian literary translation study, genre-specific prompts improved Google Bard in several

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dimensions. However, they reduced the quality of ChatGPT 3.5 output, indicating that prompting is model-dependent rather than universally beneficial (Chen et al., 2025).

In short, for translation education, GenAI literacy cannot just mean ChatGPT familiarity.

5.3 The Meaning of Mixed Findings and the Academic-industry Gap

Mixed findings in learner experience and AI literacy have been reported in Section 4.3. Such results can be interpreted as evidence of an academic-industry gap. Within the reviewed studies, the most prominent domains concern engagement, motivation, learner experience, AI literacy, information-seeking behavior, and cognitive process; that is, how students respond to GenAI, regulate its use, and make sense of it in classroom settings, rather than how AI is integrated into professional workflows or how it reshapes labor structures in the industry. These findings are informative, but the industry operates with a different set of priorities and concerns. Wu and Li's (2025) large-scale comparison of academic and industry discourse on AI in interpreting shows this divergence clearly: academia tends to emphasize theoretical foundations and ethics, whereas industry discourse places greater weight on practical applications and workforce impacts. A similar point emerges in Ayvazyan, Torres Simón, and Pym's (2024) discussion of automation-resistant translation literacy, where the emphasis falls not on tool familiarity alone, but on trust building, client communication, and strategic use of automation within real professional workflows. Seen in this light, this divergence helps explain why learner responses may remain mixed: students can recognize the immediate usefulness of GenAI while still being uncertain about what kinds of human contributions will remain professionally valuable.

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Future translators also need to be trained to be more context sensitive. Across the reviewed articles, cultural translation tasks or culturally oriented concerns appear in around 15 studies, and literary translation in around 7. By contrast, only a very small number of studies explicitly addressed high-stakes contexts such as legal or medical translation, while pharmaceutical, financial, and other reputationally sensitive domains remained largely absent. However, the wider literature suggests that this is precisely where the limits of AI autonomy become most consequential (Fang et al., 2023; Lin, 2025; Raído, 2024; Wei, 2025). In such contexts, the issue is not only whether output is fluent, but whether it is trustworthy, accountable, and safe. The pedagogical contexts, therefore, may need to be more diversified to prepare students for differentiated use.

6. Conclusion and Limitation

This systematic review examined how GenAI is shaping translation education through a systematic synthesis of 60 empirical studies. Overall, the findings suggest that GenAI is already becoming part of translation-related teaching and learning, but not in one uniform or stable way. Across the reviewed studies, GenAI was introduced through multiple pedagogical roles, including translation assistant, feedback provider, revision scaffold, post-editing aid, and interactive learning partner. Reported outcomes were distributed across several domains, with relatively more positive findings in translation performance and structured feedback or post-editing tasks, and more mixed findings in learner experience, AI literacy, and process-related domains.

Compared with the pre-GenAI era, when translation technologies such as CAT tools

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were more often treated as external resources, supports, or objects of instruction within the curriculum, translation education following the GenAI turn increasingly positions GenAI as a pedagogical actor that participates in drafting, commenting, revising, simulating, and structuring learning activities, while still requiring human-in-the-loop oversight, evaluation, and judgment. Therefore, the current literature has moved beyond previously dominant constructs such as tools, metrics, and assessment, and increasingly foregrounds feedback uptake, engagement, cognitive effort, trust, information-seeking, and AI literacy as central dimensions of inquiry.

The review also highlights several cautions. Approximately 73.3% of the empirical studies explicitly focused on ChatGPT, which suggests a risk of overly narrow, platform-centered pedagogy. If GenAI literacy is reduced to ChatGPT familiarity, students may gain tool fluency without developing the broader evaluative and workflow-based capacities that remain professionally valuable. Moreover, an academic-industry gap has been identified, and pedagogical contexts, therefore, may need to be more diversified to prepare students for differentiated use.

In summary, this review shows, on the basis of the empirical evidence currently available, that GenAI is neither a simple pedagogical solution nor merely a passing technological disruption, but part of an ongoing reorganization of translation education. A limitation of the review is that the available empirical evidence remains relatively limited, given the short time span covered, from 2023 to March 2026, which does not yet support a meta-analysis or formal quality appraisal. As the body of empirical research grows, a

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systematic review and meta-analysis with quality appraisal may become feasible to provide a clearer and more robust assessment of GenAI's educational effects.

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Appendix

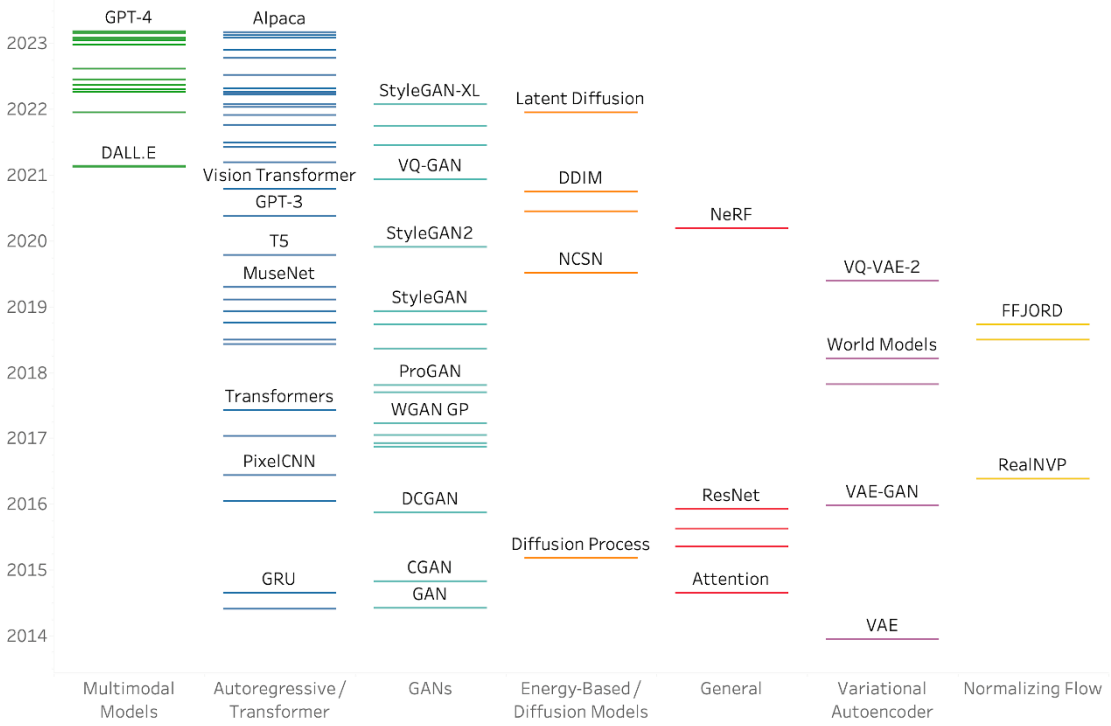

Figure A1. Timeline of generative models by type (Peñalvo & Ingelmo, 2023).

Table A1. Studies included in the review.

No.	Author	Article title
1	Abu-Rayyash (2023)	Revolutionizing translator training through human-AI collaboration: insights and implications from integrating GPT-4
2	Sahari et al. (2023)	A Cross-sectional Study of ChatGPT in Translation: Magnitude of Use, Attitudes, and Uncertainties
3	Andrade and González (2024)	Integrating ChatGPT and Generative IA apps in Specialized Text Translation and Post-Editing: An Exploratory Study
4	Bilous and Saiko (2024)	Beyond the Dictionary: Redefining Translation Education with Artificial Intelligence-Assisted App Design and Training

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5	Cui et al. (2024)	Profiling Chinese Student Interpreters' Usage Intention of ChatGPT-assisted Translation by Q Methodology Based on Technology Acceptance Model
6	Li and Tian (2024)	Translation Practice and Competence Enhancement in the Age of AI: Applying ChatGPT to Translation Education
7	Sun and Han (2024)	Chinese Students' Perception and Demand on AI Assisted Interpretation Technology and Its Implication on Education of Interpreters
8	Tian (2024)	Personalized translator training in the era of digital intelligence: Opportunities, challenges, and prospects
9	Zhang and Zhao (2024)	Has generative AI opened a new era for machine translation? A quality comparison study and reflections on translation education
10	Abdelhalim et al. (2025)	Artificial intelligence tools and literary translation: a comparative investigation of ChatGPT and Google Translate from novice and advanced EFL student translators' perspectives
11	Aleedy et al. (2025)	Designing AI-powered translation education tools: a framework for parallel sentence generation using SauLTC and LLMs
12	Alghamdi and Alotaibi (2025)	Using AI in Translation Quality Assessment: A Case Study of ChatGPT and Legal Translation Texts
13	Preciado and Vallejo (2025)	Self-Efficacy and Perception in the Use of GAI Tools in the Translation Classroom
14	Angelone (2025)	Using think-aloud, screen recording, and questionnaire data to gauge translation student application and perception of ChatGPT
15	Bodart et	Empowering future language professionals: Findings from a

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	al. (2025)	classroom experiment on MT Quality Evaluation in collaboration with DGT
16	Brashi (2025)	AI Adoption in Legal Translation: A Study of Intrinsic Motivation among Saudi Students
17	Buendía-Castro (2025)	Dictionaries vs. AI-Based Resources: Preferences of Trainee Translators
18	Cai and Tian (2025)	Student translators' web-based vs. GenAI-based information-seeking behavior in translation process: A comparative study
19	Cai et al. (2025)	LitTransAI 1.0: A DeepSeek-Powered Literary Translation Platform with Integrated Machine Learning Algorithms
20	Cao and Zhou (2025)	Exploring the Efficacy of ChatGPT-Based Feedback Compared With Teacher Feedback and Self-Feedback: Evidence From Chinese-English Translation
21	Duarte (2025)	I, Translator: Rethinking Pedagogy in Times of Gen-AI
22	Guo and Lin (2025)	Generative AI as a Catalyst for Data-Driven Learning: Efficacy, Equity, and Engagement in Translation Education
23	Han and Mo (2025)	Integrating Generative AI into Translation Pedagogy: Personalized Feedback and Adaptive Learning
24	Jiang (2025)	Rethinking "Elaborate Equals Effective": Unpacking the Impact of Feedback Complexity and Text Type on Learner Engagement With GenAI's Feedback
25	Jiao et al. (2025)	To eat or to feed: can large language models provide useful feedback in translation education?
26	Kornacki and Pietrzak	Hybrid Workflows in Translation: Integrating GenAI into translator training

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(2025)

27 Kwok et al. (2025) GenAI as a translation assistant? A corpus-based study on lexical and syntactic complexity of GPT-post-edited learner translation

28 Li and Li (2025) Human Expertise vs AI Efficiency: A Comparative Analysis of Student and ChatGPT Post-editing

29 Long (2025) Reimagining Translation Education: Fostering Student Engagement With AI Technologies in Cultural Translation Assessment

30 Lu (2025) The effectiveness of ChatGPT-assisted Lexical-syntactic Flexibility practice for interpreting competence and quality: the case of Chinese-to-English consecutive interpreting

31 Muftah (2025) The impact of artificial intelligence (AI) on translation students' training practices: a case study of ChatGPT translation (ChatGPT-T) output

32 Nguyen and Vo (2025) The Application of ChatGPT in Translation Learning: A Case Study in Vietnam

33 Poláček and Tonková (2025) Adopting AI Tools: Implications for Technical Competence Development in Slovak Translator Education

34 Qi and Zhang (2025) Evaluating AI Translation Tools for Literary Texts in the Classroom: Technical Performance and Pedagogical Implications

35 Su et al. (2025) Adapt or adopt? Examining the efficacy of ChatGPT in providing translation feedback

36 Sun (2025) Transforming business interpretation education with AI: Perspectives from instructors and learners

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37	Tian et al. (2025)	Empowering GenAI with a guidance-based approach in MTPE learning: effect on student translators' cognitive process, final translation quality and learning motivation
38	Toto and Freeth (2025)	Student perspectives on the use and importance of generative AI in translator training at London Metropolitan University
39	L. Wang and W. Wang (2025)	An Empirical study on GenAI Use in Speech Difficulty Evaluation: Toward a human-centered application of AI in interpreting education
40	H. Wang and X. Wang (2025)	Enhancing translation accuracy and learning outcomes for low-resource languages: AI fine-tuning and learner adoption factors
41	Wang et al. (2025)	What Drives University Students to Use ChatGPT for Translation? Disciplinary and Experiential Influences
42	S. Xu, Y. Su, et al. (2025)	Investigating student engagement with AI-driven feedback in translation revision: A mixed-methods study
43	S. Xu, Y. Sun, et al. (2025)	Translation Pedagogy in the AI Era: Design and Application of a ChatGPT-Powered Platform for Training and Feedback
44	X. Xu et al. (2025)	Integrating human expertise with GenAI: Insights into a collaborative feedback approach in translation education
45	Yao et al. (2025)	Measuring translation trainees' effort in AI-assisted post-editing: a multi-method approach
46	Yu et al. (2025)	Comparing learners' engagement strategies with feedback from a Generative AI chatbot and peers in an interpreter training

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		programme: a quasi-experimental study
47	Zhang and Doherty (2025)	Investigating novice translation students' AI literacy in translation education
48	W. Zhang et al. (2025)	University students' perceptions of using generative AI in translation practices
49	J. Zhang et al. (2025)	Prompt engineering in translation: How do student translators leverage GenAI tools for translation tasks
50	Zhou (2025)	Transforming Translation Education: A Bibliometric Analysis of Artificial Intelligence's Role in Fostering Sustainable Development
51	Zou et al. (2025)	Cognitive Processes of Post-Editing Generative AI: Examining Student Translators' Interactions with ChatGPT Outputs
52	Cai and Tian (2026)	Investigating student translators' human–GenAI interaction patterns: an exploratory study using cluster analysis and epistemic network analysis
53	Fan et al. (2026)	Exploring the affordances of large language models in translation learning: an exploratory case study
54	Quan (2026)	Efficiency and quality enhancement for university business English translation teaching using generative artificial intelligence
55	Yang et al. (2026)	Translation students' perceptions of the integration of artificial intelligence in translation education: a constructivist approach
56	Yao et al. (2026)	Assistance or Distraction? A Cognitive Ergonomics Perspective on Cognitive Load During AI-Assisted Post-Editing
57	Zhang and Li (2026)	Ethical perceptions and learning engagement in AI-assisted translation: a behavioral psychology study of English learners

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