

INTEGRATING AI-ASSISTED TRANSLATION TOOLS INTO FOREIGN LANGUAGE CURRICULA

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Summary

The widespread adoption of Neural Machine Translation (NMT) platforms and Generative Artificial Intelligence (GenAI), in particular Large Language Models (LLMs) such as ChatGPT, Gemini, Claude, and DeepSeek has precipitated a profound paradigm shift in the landscape of foreign language education. The article investigates the multifaceted integration of AI-assisted translation tools into modern language curricula. By synthesising empirical literature and systematic reviews published between 2021 and 2026, the analysis delineates the critical friction points characterising the contemporary educational environment. The notable behavioural divergence between student adoption and institutional resistance highlights the dynamics often defined by educators' persistent concerns about academic dishonesty, cognitive short-circuiting, and the erosion of intrinsic motivation. However, empirical evidence unequivocally demonstrates that prohibiting these ubiquitous technologies, such as attempting to engineer "AI-irrelevant" classrooms, is both practically pointless and pedagogically detrimental. Instead, this research advocates for a constructivist pedagogical model centred on the formalized development of AI Translation Literacy. By critically examining the cognitive and socio-cultural dynamics of self-regulated AI use, the report highlights that these algorithmic tools can effectively scaffold learning, provide automated corrective feedback, and significantly enhance second language (L2) acquisition outcomes when used intentionally. Furthermore, the analysis identifies the inherent risks of a "dependency trap", algorithmic bias, and cultural homogenization, arguing that modern learners must be systematically transitioned from passive consumers of AI outputs to critical, highly skilled post-editors. By establishing targeted pedagogical competencies, educators can leverage AI not as a surrogate for human cognition, but as a collaborative engine to advance metalinguistic awareness and foster autonomous, cross-cultural communication.

Key words: AI-assisted translation, foreign language curricula, AI Translation Literacy, generative AI, student competence.

DOI <https://doi.org/10.23856/7628>

1. Introduction

Nowadays, AI systems seem "visually invisible" for many human tasks, as their ubiquitous use has become commonplace (*Ali, 2020*). Concerns about the prevalence and popularity of Large Language Models (LLMs) are increasingly being heard in academia (*Romaniuk-Cholewska, 2025*). However, it is widely acknowledged that recent advancements in machine learning, natural language processing, neural machine translation, and generative AI have irreversibly transformed how languages are taught, learned, and used in academic and professional settings (*Rahman et al., 2024; Shkarban, 2026*). Foreign language education,

traditionally characterized by teacher-centred approaches and manual translation practices, is increasingly incorporating AI-powered technologies that facilitate multilingual communication and personalized learning experiences (Ali, 2020; Wang, 2024).

As AI-assisted translation platforms, such as DeepL, Google Translate, and generative models including ChatGPT, Gemini, and Mistral, approach human-machine parity in specific translational contexts, they have rapidly moved from the periphery of computer-assisted language learning (CALL) to the very centre of mainstream pedagogical practice. This technological leap has triggered a veritable explosion of research between 2021 and 2026 (Asya & Rabiatal-Adawiah, 2024; Rahman, 2026). Recent empirical evidence clearly indicates that a significant majority of undergraduate and graduate language students systematically utilise these AI-driven tools in both their academic endeavours and daily lives (Urlaub & Dessein, 2022). Despite this ubiquitous adoption, the integration of AI-assisted translation into formal foreign language curricula remains one of the most contentious issues in modern educational theory (Loock et al., 2022).

Building on these observations, the article aims to investigate the multifaceted integration of AI-assisted translation into formal foreign language curricula, with specific objectives focused on shifting pedagogical paradigms toward the formalized development of AI Translation Literacy. Furthermore, the study seeks to explore the cognitive and sociocultural dynamics of self-regulated AI use, analysing its capacity to enhance academic outcomes while mitigating the ethical risks of dependency. To achieve these objectives, the research methodology relies on synthesizing the empirical literature, PRISMA-based systematic reviews and meta-analyses published between 2021 and 2026. This comprehensive approach evaluates data from mixed-methods investigations that combine quantitative pre- and post-intervention surveys with qualitative insights from student experiential logs and focus group interviews, thereby providing a holistic evaluation of AI's impact on student competence.

2. AI Integration Discrepancies

The introduction of advanced Neural Machine Translation and Generative AI into formal educational settings has exposed a profound chasm between how students and instructors perceive the utility, ethicality, and pedagogical value of technological assistance (Urlaub & Dessein, 2022). Understanding this behavioural divergence is crucial for eliminating the existing barriers to effective curricular integration and moving beyond the prevailing atmosphere of suspicion.

In university language departments, machine translation has been obviously regarded as “the elephant in the classroom” (Loock et al., 2022). Empirical surveys and systematic behavioural analyses consistently reveal that the vast majority of students learning a foreign language employ online translators as a routine component of their academic workflow. For instance, a seminal evaluation of undergraduate behaviour published by Loock, Léchauguette, and Holt in 2022 indicated that 83% of students used online translators systematically, often, or sometimes to aid their writing and comprehension tasks. Among these learners, specific high-performance NMT platforms such as DeepL have emerged as distinct favourites due to their perceived fluency and accuracy. The student perception of these tools is overwhelmingly positive; learners view them as essential instruments that quickly demystify complex vocabulary, provide immediate contextual translations, make a wider range of languages accessible, and actively support autonomous self-study (Loock et al., 2022; Rahman et al., 2024).

In her 2025 study, D. Romaniuk-Cholewska investigated the pedagogical potential of AI-assisted translation tools in literary translation by examining the third-year bachelor's of

English Philology with German Language and the second-year master's of English Philology and Translation Studies (University of Białystok, Poland) evaluations of translations generated by Google Gemini and ChatGPT-4o. The findings indicate that students generally acknowledge the efficiency of AI systems and their value as supportive resources in the translation process, particularly in generating preliminary drafts and facilitating comprehension of source texts. At the same time, participants identified several significant limitations, including difficulties with contextual interpretation, translation of culture-specific references, rendering of idiomatic expressions, and the overall reliability of machine-generated outputs. Effective translator training should therefore emphasize critical analysis, post-editing competence, and revision strategies that allow students to evaluate, refine, and improve AI-generated translations (Romaniuk-Cholewska, 2025). Such an approach fosters the development of higher-order cognitive skills and prepares future translators to work effectively within increasingly technology-mediated professional environments. The findings contribute to a growing body of research advocating for the pedagogically informed integration of AI-assisted translation tools while maintaining the central role of human expertise, creativity, and intercultural competence in translation practice.

However, instructors have historically maintained a pervasive and deeply entrenched scepticism toward these technologies. Consequently, the application of an online translator is frequently equated with academic dishonesty, plagiarism, or intellectual laziness (Loock *et al.*, 2022). This institutional anxiety has given rise to the defensive pedagogical strategy known as the “AI-irrelevant classroom”, in which instructors deliberately design assessment tasks that are theoretically immune to AI intervention. In a desperate effort to prevent the illicit use of translation software during independent study at home, instructors are increasingly forced to relocate critical L2 literacy tasks, in particular written compositions and complex essays, into the physical classroom under strict, exam-like invigilation. By allowing the fear of AI to dictate curriculum design, educators inadvertently hollow out the communicative foundations of language learning, sacrificing conversational fluency in a vain attempt to secure written authenticity (Urlaub & Dessein, 2022).

The contemporary research landscape reveals a gradual transition from restrictive approaches toward the cautious acceptance and strategic integration of AI-assisted technologies in language education. Evidence from recent systematic reviews and meta-analyses suggests that educational linguists increasingly acknowledge the pedagogical affordances of AI-driven tools, particularly those based on large language models (Jolley & Maimone, 2025). In contrast to conventional translation systems that primarily provide static output, LLM-based applications offer interactive and contextually responsive learning support, enabling learners to receive individualized feedback, explore alternative linguistic constructions, and engage in reflective language practice (Al-Obaydi *et al.*, 2025). Such features align with socio-constructivist and scaffolding-oriented approaches to language learning, positioning AI systems as complementary educational resources that can support the development of linguistic proficiency, learner autonomy, and digital literacy (Wang, 2024). Nevertheless, the literature consistently emphasizes that the educational value of these technologies depends on their critical and pedagogically informed use rather than on their unrestricted adoption.

Recent research highlights the growing role of artificial intelligence in foreign language education. Studies indicate that AI technologies, including intelligent tutoring systems, natural language processing tools, adaptive learning platforms, and AI-powered chatbots, effectively support the development of writing, reading, vocabulary, and pronunciation skills while promoting personalized and interactive learning experiences (Rahman *et al.*, 2024: 107).

AI-driven learning environments have also been shown to enhance learner engagement, autonomy, and language proficiency through individualized feedback and adaptive instruction (*Kır & Tekin, 2025*). At the same time, scholars emphasize the importance of maintaining a balance between human pedagogy and technological support, as the increasing use of AI raises concerns related to data privacy, algorithmic bias, equity, and cultural sensitivity (*Jolley & Maimone, 2025*). Collectively, these findings suggest that AI is evolving from a supplementary educational resource into a significant pedagogical tool capable of transforming both the practices and objectives of contemporary foreign language education. Thus, the central challenge facing the modern language curriculum is no longer how to defeat AI, but how to radically re-engineer instructional paradigms to leverage its vast capabilities while actively mitigating its inherent risks.

3. Cognitive, Sociocultural, and Ethical Dynamics

The integration of AI-assisted translation tools into foreign language learning is not merely a superficial technological implementation; it represents a profound alteration of the cognitive mechanisms and sociocultural environments in which L2 acquisition occurs. Deeply understanding this complex, interlocking dynamics is essential for designing forward-looking curricula that enhance, rather than inadvertently suppress, student competence (*Wang, 2024*).

Recent empirical studies investigating the specific use of DeepL and ChatGPT in academic EFL (English as a Foreign Language) writing consistently demonstrate that these algorithmic platforms significantly enhance text quality, writing accuracy, structural coherence, and the sophisticated use of passive voice. By temporarily offloading the lower-level cognitive burden of vocabulary translation and basic syntactic structuring to the artificial intelligence, students successfully preserve vital cognitive resources for higher-order tasks such as generating complex ideas, organizing persuasive arguments, and refining stylistic tone (*Rahman, 2026: 986*). Research rigorously assessing the pre- and post-test outcomes of university students using AI-driven technology reveals significant, measurable improvements in language skills, particularly in academic writing (*Al-Obaydi et al., 2025*). Students explicitly report that AI assistance actively aids in self-reflection and provides interactive, non-judgmental feedback, aligning perfectly with constructivist learning strategies (*Wang, 2024*). When students use an AI tool to translate a highly complex, abstract thought that they currently cannot articulate in the target language, they are immediately exposed to advanced linguistic structures, often referred to in applied linguistics as comprehensible input that is typically tailored to be just slightly above their current independent proficiency level, effectively allowing the student to operate optimally within their zone of proximal development (*Asya & Rabiatal-Adawiah, 2024*).

Although algorithmic assistance offers considerable cognitive and efficiency-related benefits, these advantages are accompanied by significant educational and ethical concerns. One of the most prominent risks is the development of a “dependency trap”, whereby excessive reliance on automated systems may hinder originality of ideas and the development of an authentic authorial voice (*Rahman, 2026: 988*). If learners uncritically accept AI-generated translations without engaging in the deep, analytical process of review and post-editing, they entirely forfeit the cognitive friction that is biologically necessary for deep neural encoding and long-term memory retention. Teachers legitimately and accurately warn that the NMT’s remarkably high fluency can artificially inflate a student’s perceived competence, masking underlying grammatical deficiencies and potentially reducing the intrinsic motivation required to master the mechanical foundations of the language independently (*Rahman, 2026*).

To counteract the highly isolating potential of screen-based human-computer interaction, the sociocultural dynamics of the physical or virtual classroom remain paramount. In a recent mixed-methods investigation located within a Japanese higher education context, Y. Wang explored the intersection of cognitive processes and sociocultural dynamics among 79 learners enrolled in a compulsory English as a Foreign Language (EFL) course. The study operationalized self-regulated learning variables, by observing how students independently used tools such as ChatGPT and Google Translate during academic writing tasks (Wang, 2024). Quantitative data derived from pre- and post-intervention surveys demonstrated a statistically significant improvement in students' perceived editing efficacy and writing outcomes. However, the qualitative insights extracted from self-reported experiential logs revealed a profound sociocultural limitation of technology. The learners explicitly acknowledged that while the AI served as an efficient editor and cognitive scaffold, it remained entirely incapable of replicating the collocative, collaborative learning environment fostered by human peers. Furthermore, the findings unequivocally reaffirmed the irreplaceable role of the instructor not merely as a facilitator of raw language input, but as an essential guide for providing the technical training, ethical framing, and pragmatic contextualization necessary to navigate the functional limitations of generative AI models (Wang, 2024). Language is inherently a social construct designed for genuine human connection; AI models, regardless of their parameter size, lack true pragmatic intentionality and emotional resonance. Therefore, the classroom must be intentionally preserved as a dynamic, interactive arena where AI-generated texts are dissected, debated, and refined through rich human social interaction, ensuring that the technology serves as a catalyst for discussion rather than a terminal, unquestioned endpoint.

4. Pedagogical Paradigms: AI Translation Literacy and Competence

Meaningfully integrating AI into the language curriculum requires highly actionable frameworks that align with sustainable educational practices. To successfully navigate the immense opportunities and mitigate the risks associated with AI-assisted translation, higher education institutions must formally integrate AI Literacy into the core of the language curricula. AI literacy is commonly defined as a highly specialized subset of broader digital and data literacy, equipping students with the critical, analytical competencies necessary to interact with, evaluate, and manipulate algorithmic language outputs responsibly (Urlaub & Dessein, 2022).

Effective integration of AI-assisted translation tools into foreign language curricula requires developing students' AI literacy, beginning with a fundamental understanding of how NMT systems and LLMs operate. Learners should recognize that these technologies generate outputs based on probabilistic predictions of linguistic patterns rather than genuine semantic understanding. Such knowledge helps demystify AI systems and enables students to critically evaluate machine-generated content, particularly in cases involving hallucinations, biased outputs, or inaccurate translations of culturally specific expressions (Urlaub & Dessein, 2022; Romaniuk-Cholewska, 2025).

Building on this foundation, students should be trained to interact with AI tools strategically through effective prompt design and input optimization. Since the quality of AI-generated output largely depends on the quality of user input, learners need to understand how to provide sufficient linguistic and contextual information. For machine translation systems, this involves working with complete sentences or larger textual units to reduce ambiguity, at the same time for generative AI applications, students should learn to formulate prompts that encourage

explanation, reflection, and linguistic analysis rather than simply requesting completed translations or rewritten texts (Urlaub & Dessein, 2022; Look et al., 2022).

Equally important is the development of critical post-editing competence, which has become a central component of contemporary translation literacy. AI-generated translations should be treated as preliminary drafts requiring careful evaluation rather than as finished products. Students must therefore learn to assess machine outputs critically, identify grammatical, stylistic, semantic, and pragmatic inaccuracies, and verify translation choices using their linguistic knowledge and external reference resources. Through systematic post-editing practices, learners develop analytical, evaluative, and intercultural skills that enable them to use AI technologies responsibly while maintaining human oversight of translation quality and authenticity (Romaniuk-Cholewska, 2025).

Table 1 presents the empirical evidence and pedagogical principles underpinning the integration of AI-assisted tools into foreign language instruction. Synthesis of contemporary research suggests that effective implementation requires a structured four-phase pedagogical framework that guides learners from initial awareness of AI capabilities and limitations to the critical, collaborative, and ethical application of these technologies (Al-Obaydi et al., 2025; Urlaub & Dessein, 2022). Such an approach promotes the informed use of AI as a learning resource while fostering translation competence, critical thinking, and digital literacy.

Table 1

Practical Integration Strategies in the Classroom

Pedagogical Phase	Objective	Activities	Expected Outcomes
Introduction & Demonstration	Develop AI literacy and awareness of AI limitations.	Compare outputs from DeepL, ChatGPT, and Gemini; analyse linguistic, cultural, and pragmatic errors.	Critical understanding of AI capabilities and limitations.
Task Assignment (Educational Mode)	Develop comparative analysis, post-editing and evaluative skills.	Reflective AI portfolio; comparison and evaluation of AI-generated translations; collaborative review of AI outputs.	Enhanced translation competence, metalinguistic awareness, and critical thinking.
Input Optimization & Collaboration	Improve prompt design and contextual input.	Train students to provide context-rich prompts and engage in peer discussion.	Higher-quality AI outputs and strengthened collaborative learning.
Critical Reflection	Foster ethical and analytical AI use.	Discuss AI bias, intellectual property, academic integrity, and human oversight.	Ethical awareness, responsible AI use, and advanced post-editing competence.

The results reveal that while students recognise the efficiency and support of AI-assisted tools, they also report persistent challenges regarding contextual accuracy, specialized terminology, cultural biases, and translation reliability. The findings suggest that AI literacy and critical engagement with machine-generated translations should be integral components of translator training (Romaniuk-Cholewska, 2025). AI platforms are most effectively applied in the educational environment as collaborative instruments; this requires students to employ rigorous analytical oversight, revision strategies, and expert human validation to ensure high-quality, culturally authentic outputs.

5. Conclusions

The empirical evidence overwhelmingly suggests that AI-assisted tools, when deployed deliberately and transparently within a structured pedagogical framework, offer unparalleled opportunities to scaffold student competence. Algorithmic platforms like DeepL and LLMs like ChatGPT, Claude or Gemini can dramatically reduce extraneous cognitive load for novice learners, provide instantaneous, personalized written corrective feedback at scale, and expose learners to sophisticated, context-rich structural inputs. To successfully navigate this highly complex new reality, foreign language curricula must be radically modernized to centre explicitly on AI Literacy teaching. Educational paradigms must shift from assessing raw, unaided language generation to cultivating advanced post-editing capabilities, multi-task prompt engineering, and critical discourse analysis. The modern language learner should be systematically trained not merely to speak and write, but to intelligently direct, critically evaluate, and effectively collaborate with AI. The successful integration of AI into language education does not diminish or replace the role of the human educator; rather, it elevates it to a higher level of importance, focusing on cultural immersion, pragmatic intentionality, and collaborative meaning-making. By actively embracing AI-assisted translation as a dynamic, deeply integrated pedagogical tool, modern foreign language programs can equip students with both the sophisticated linguistic proficiency and the advanced digital AI Literacy required to thrive in a highly automated, deeply interconnected multilingual global society.

The key limitation of the current research landscape is its frequent emphasis on short-term technological adoption rather than the sustained development of AI Literacy within formal translator training. While contemporary findings reveal that students readily recognize the efficiency and cognitive support provided by AI tools, the effective use of NMT technologies requires significantly more than mere technical proficiency; it demands a robust capacity to critically assess GenAI output, accurately identify algorithmic errors, and refine translations accordingly. Consequently, AI Literacy and active, critical engagement with GenAI texts are seen integral competences of modern translator training curricula. Future research should investigate whether implementing targeted AI training modules can measurably improve students' ability to critically evaluate GenAI translations. Addressing these gaps will provide vital insights that contribute to the ongoing academic discussion regarding the evolving role of AI in translation education and its profound implications for the future of translator training.

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