

# Topical and modern trends in translation studies, use of digital technologies in translation, and related research

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**Abstract:** This review explores the significant shifts in translation studies caused by the integration of artificial intelligence and digital tools. Focusing on the period from 2020 to 2025, the paper analyzes key trends such as Neural Machine Translation (NMT), the use of Large Language Models like ChatGPT, and the rise of Machine Translation Post-Editing (MTPE). Based on more than 50 recent scholarly sources, the study finds that while AI tools can match junior translators in speed, they still struggle with creative and cultural nuances. The paper concludes that the future of translation requires a balanced approach, combining technological proficiency with deep human linguistic expertise.

**Keywords:** artificial intelligence, neural machine translation, ChatGPT, machine translation, Large Language Models, applied translation research

## Introduction

The concept of “Digital Translation Studies” has emerged as a defining framework for contemporary translation research (Jiménez-Crespo, 2020). The 2024 International Conference on Translation Education focused on digitization as a technical methodology for studying translation and its conceptual connection to digital humanities, marking what scholars term the “technological turn” in translation studies (Yu & Liu, 2024). This shift represents more than merely incorporating technology into existing practices; it signals a fundamental reconceptualization of translation as an activity deeply embedded within digital ecosystems. The transformation reflects what scholars describe as a new ontology of translation, where previously separate sub-domains converge and human and machine translation co-evolve (Kenny, 2022). The field now encompasses diverse areas including video game localization, multimedia translation, and collaborative online translation platforms.

## The Rise of NMT Systems

Neural Machine Translation (NMT) has become a cornerstone of modern translation workflows. Recent developments in translation technologies have enabled NMT to generate high-quality translations, fundamentally altering how translation services operate (Koponen et al., 2021). The transition from statistical machine

translation to neural networks represents a qualitative leap in machine translation capabilities (Toral et al., 2018).

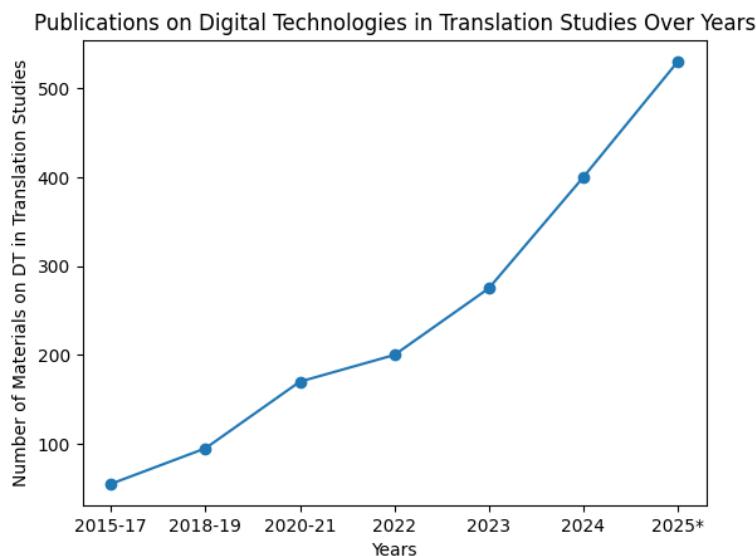


Figure 1. Growth trend of scientific publications on digital technologies in translation studies (2015-2025). The figures represent approximate publication counts estimated from thematic searches in Google Scholar, reviews in international journals, and industry reports on digital technologies in translation studies.

#### Post-Editing Productivity and Performance

Research using the DivEMT dataset found that post-editing is consistently faster than translation from scratch, though the magnitude of productivity gains varies widely across systems and languages (Sarti et al., 2022). Research on student translators found that both perceived post-editing self-efficacy (PESE) and machine translation quality affect cognitive effort and post-edited quality (Peng et al., 2024). The complexity of post-editing work has led to sophisticated analysis of editing patterns. Research at Toppan Digital Language identified many repetitive editing actions in both high-effort and low-effort post-editing tasks, with repetitive work increasing PE effort and negatively impacting post-editors' enjoyment (Terribile, 2024; Moorkens & O'Brien, 2015). This finding has practical implications, with proposals for automating up to 46% of repetitive actions through specialized algorithms like the AREA (Automating Repetitive Editing Actions) algorithm (Terribile, 2024).

#### Large Language Models in Translation

The emergence of Large Language Models (LLMs), particularly ChatGPT and GPT-4, has introduced new possibilities for translation technology (Siu, 2023; Yu & Liu, 2024). Evaluation on benchmark test sets found that ChatGPT performs competitively with commercial translation products like Google Translate on high-resource European languages but lags behind significantly on low-resource or distant languages (Jiao et al., 2023). The introduction of GPT-4 marked a significant improvement over earlier versions, with enhanced factual accuracy and larger prompt

capacity (OpenAI, 2023). A systematic review of papers on GPT and translation found that translations produced by GPT are equivalent to those translated by humans and surpass the quality of neural machine translation outputs for certain language pairs and text types (Chan & Tang, 2024). However, this generalization requires qualification based on language pairs, domains, and text types. Benchmarking research revealed that GPT-4 achieves performance comparable to junior-level translators in terms of total errors, while still lagging behind senior translators (Ye et al., 2024). Unlike traditional NMT systems, GPT-4 shows less performance degradation with resource-poor languages, though challenges remain (Jiao et al., 2023). In figure 2 we tried to visualize that information.

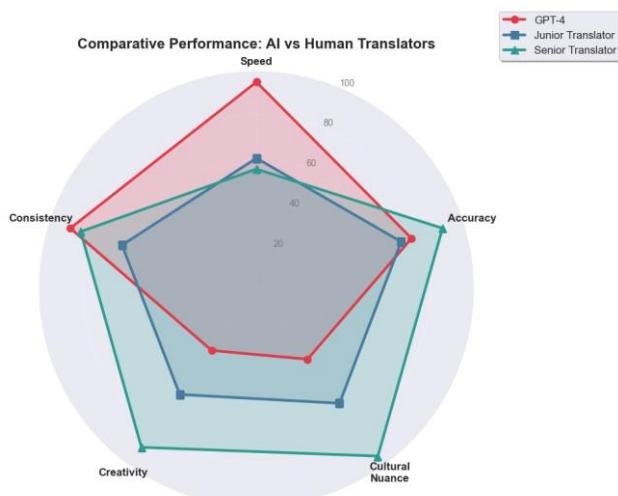


Figure 2. Comparative Performance: AI vs Human Translators.

Despite advances in AI translation technology, significant disparities persist across languages based on available training data and resources. This challenge is particularly acute for Central Asian languages, including Uzbek, which fall into the low-resource category despite growing digital presence (Figure 3).

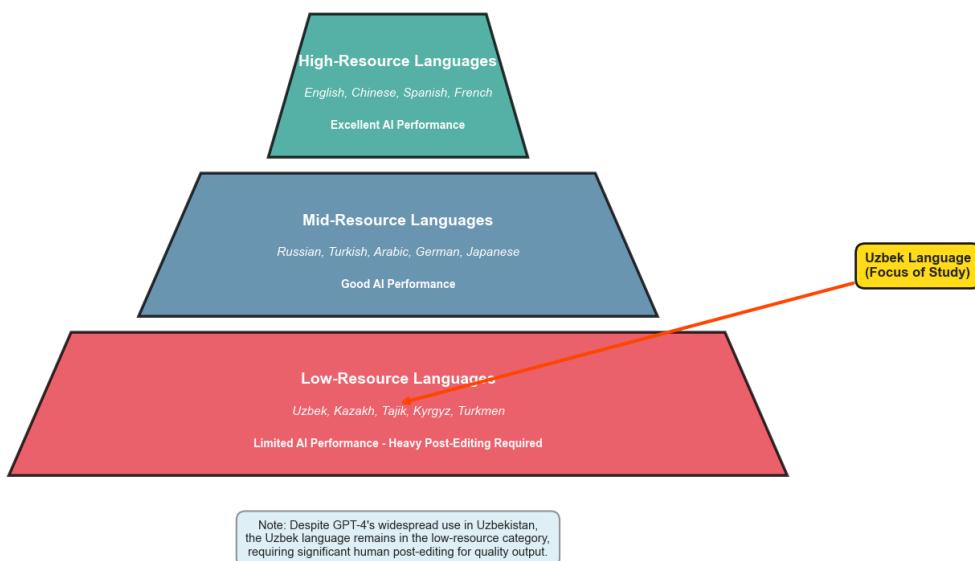


Figure 2. AI Translation Resource Pyramid by Language Category.

Research employing prompt engineering has demonstrated that linguistically informed prompts can enhance translation quality, particularly for specific language pairs and grammatical structures (Gu, 2023; Yamada, 2023). Studies on Chinese-English translation found that optimizing prompts and providing contextual information significantly improves ChatGPT's performance in specialized translation tasks (Gao et al., 2023).

### Ethical Considerations and Data Privacy

The widespread adoption of AI-powered translation tools has brought ethical issues to the forefront of professional discourse (Ramírez-Polo & Vargas-Sierra, 2023; Yu & Liu, 2024). Concerns extend beyond privacy to encompass the accuracy of AI-generated translations, handling of sensitive information, and the quality assurance of automated outputs.

Ramírez-Polo and Vargas-Sierra (2023) emphasize that establishing ethical standards for AI use in translation has become a priority, with professional translators seeking to leverage AI advantages while adhering to ethical standards and ensuring accurate, reliable service delivery. Issues such as the transparency of machine translation content, the attribution of errors, and copyright issues related to machine-generated content require the industry to reassess the ethical boundaries and responsibilities associated with AI translation (Yu & Liu, 2024). Research has identified concerns about cultural bias and gender bias in AI translation systems (Ghosh & Caliskan, 2023). Due to imbalances in training data and algorithmic limitations, AI translation systems may exhibit gender biases and reinforce stereotypical gender roles.

### Balancing Technology and Human Expertise

The fundamental challenge facing the translation profession is maintaining the essential role of human expertise while harnessing technological capabilities (Yu & Liu, 2024). While AI systems can handle many routine translation tasks efficiently, complex work involving cultural nuance, creative expression, and contextual understanding continues to require human judgment (Kenny, 2022; Lee, 2023). The future of translation likely involves sophisticated human-AI collaboration rather than simple automation or replacement.

### Conclusion

The integration of digital technologies into translation studies represents both an opportunity and a challenge for the field. Neural Machine Translation, Large Language Models, and post-editing workflows have fundamentally altered translation practice, making it more efficient while raising new questions about quality, ethics, and professional identity. Translation education has evolved to prepare students for technology-intensive careers, though gaps remain between pedagogical offerings and market demands.

Current research demonstrates that while AI-powered tools can match or approach human performance on certain tasks and language pairs, significant limitations persist, particularly with low-resource languages, creative texts, and culturally complex materials. The field is moving toward a model of human-AI collaboration that leverages the strengths of both, rather than viewing technology as either a panacea or a threat.

Future developments will likely focus on improving AI performance for underserved languages, developing more sophisticated evaluation metrics for translation quality, addressing ethical concerns around data privacy and algorithmic bias, and creating educational frameworks that balance technological proficiency with deep linguistic and cultural expertise. As the translation industry continues its digital transformation, success will depend on thoughtful integration of technology with human judgment, maintaining quality standards while embracing efficiency gains, and ensuring that technological advancement serves rather than supplants the fundamental human work of cross-cultural communication.

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