Shaping the future of translation careers: Student interest and the need for curriculum reform in the AI era

Eko Setyo Humanika [a, 1], R. Yohanes Radjaban [b, 2,*]

[a, b] Universitas Teknologi Yogyakarta, Jl. Siliwangi no 1, Jombor, Mlati, Sleman, Yogyakarta, Indonesia

[1] eko.humanika@uty.ac.id; [2] ry.radjaban@uty.ac.id*

* corresponding author

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ABSTRACT

This study aims to analyze the students's interest in translation career in the artificial intelligence (AI) era and the growing need for translation curriculum reform. It is observed that the students' interest in translation carrer fluctuate due to the AI's advancement, especially in its application to machine translation. Being aware of this trend will give valuable insight to the translation education reform. A quantitative-qualitative mixed method approach was employed. This study involves 45 students from the English Literature Department at the University of Technology Yogyakarta (UTY) during the 2023-2024 academic year. Participants were selected using a stratified random sampling technique and included fourth-year students (who have taken 4 translation subjects in the curriculum), third-year (two subjects), and second-year (not yet taken any). Data collection was conducted through questionnaires and semi-structured interviews. The questionnaire assessed students' interest in translation careers and their view on translation instruction, while the interview provided deeper insight on those matters from six respondents representing the positive and negative view. The findings showed that 26,6% of respondents are interested in a translation career, 55,6% are neutral, and 15,53% are not interested. It indicated that only less than one-third of the respondents were interested in a translation career. Most of them were students from higher level. It is also found that more than a half of the respondents were undecisive; most of them were from the second and third-year. It is typical because students from fourth-year tend to focus more on career planning. The study also highlights the need to reform translation curricula by integrating machine translation into classroom instruction, as a computer assisted as well as automatic. The findings of this study suggest the need for further research on developing an AI-based model for teaching translation.

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1. Introduction

Translation is often oversimplified as a simple task of converting a message from one language (the source language) to another (the target language), which anyone fluent in both languages can handle. However, many individual start translating confidently, only to realize that producing an appropriate final product is more challenging than expected. As the saying goes, translation is like chopping an onion: at first, it seems manageable, but before long, the difficulties become apparent.

To translate effectively, one must possess what is known as 'translation competence,' which consists of several sub-competences. Albir et al. (2019), citing the PACTE group, identified five essential sub-competences: bilingual, extra-linguistic, translation-specific knowledge, instrumental, and strategic. Mastery of these elements is essential to ensure that the final product is accessible and accurate for the target audience. In other words, a translator must not only be proficient in both the source and target languages but also possess an understanding of the subject matter, knowledge of appropriate translation techniques, and cultural sensitivity.

Translation, as a form of cross-linguistic communication, has a long history. From the creation of Rosetta Stone in 196 BC to the dissemination of religious texts during the medieval period and through the Renaissance to the colonial era, when translation flourished due to global exploration, the field has evolved significantly. And in the 20th and 21st centuries, technological advancements have reshaped translation practices (O'Keeffe, 2023; Rokan, 2021).

The history of translation as a profession is also rich and multifaceted. As explored in Lange, et al. (2024), this profession has existed since ancient civilization, with early examples of evidence found in Assyria, Egypt, Israel, China, Greece, and Rome. In this period, translators mostly worked on religious or administrative texts, indicating the importance of translation in facilitating communication across cultures and languages. In the Medieval period, the translator played a crucial role in transmitting knowledge, particularly in the context of the Islamic Golden Age, where scholars translated Greek philosophical and scientific texts into Arabic. In the Renaissance era, this profession gained recognition and was acknowledged for its contribution to literature and scholarships. During the Enlightenment era, translators played a valuable role in spreading ideas and facilitating cultural exchange.

The professionalization of translation began in the early 20th century with the establishment of international organizations like the International Association of Conference Interpreters (AIIC) and the rising demand for interpreters in global institutions such as the United Nations. In Indonesia, the translation profession gained official recognition in 2014 when the Indonesian Minister of Administrative and Bureaucratic Reform issued Regulation Number 49 on Translator's Functional Position in Government Bodies. This regulation delineated four professional levels: junior expert, associate expert, senior expert, and principal expert, providing a clear career pathway for translators within governmental departments.

The latest progress has shown that technology has a significant role in translation. With technology, translation methods have transformed drastically, moving from conventional manual operations counting on translators' expertise to more technology-assisted and automated methods. Technological innovations have had a notable impact on the translation industry. One of the most significant developments in translation technology is the integration of artificial intelligence (AI), particularly through deep learning and neural techniques in machine translation (MT). This integration has substantially improved translation accuracy and efficiency (Mohamed, 2024). It offers faster, more accessible, and affordable solutions for language conversion. These tools can process large volumes of text within seconds, offering real-time translation in multiple languages.

In more detail, Steigerwald et al. (2022) and Datta et al. (2023) highlight the advantages of AI-based machine translation, as follows.

1. Neural systems employ deep learning techniques, which involve multiple processing layers to analyze and generate language. This approach has significantly improved the fluency and accuracy of the translation.

2. The systems use a data-driven approach that utilizes a vast amount of previously translated texts to train AI models. These models learn patterns and relationships in language, allowing them to generate contextually relevant and grammatically correct translations.

3. These systems can continuously improve as they are exposed to more data. By incorporating user feedback and new translations, these systems can adapt and refine their outputs over time, making them more effective for specialized fields, including scientific literature.

4. They can be trained specifically in scientific jargon and terminology, which is crucial for accurately translating texts in specialized fields. This requires access to high-quality, domain-specific training data.

5. The flexibility, performance, and ability of neural machine translation (NMT) systems to handle complex linguistic features, including in low-resource languages, further highlight their advantages.

6. Many AI-powered translation tools, such as Google Translate and DeepL, are designed to be user-friendly and accessible, allowing researchers and the general public to utilize them easily for translation tasks.

Seeing the impressive advancement of AI-based machine translation, a concern emerges on whether MT will replace human translators in the future, just as the impact of robots taking over numerous jobs in manufacturing industries. AI's ability to translate quickly, accurately, and without fatigue has raised questions about whether human translators are still needed. Indeed, AI systems are becoming increasingly proficient, and in certain contexts, they may outperform human translators. With these facts, the above concern is reasonable.

However, despite advancements in machine translations, machine translations have limitations in some ways (Chen, 2024). First, the complexity of natural languages—with their irregularities, ambiguities, and rich expressive potential—poses a significant challenge for AI. Capturing the full range of linguistic nuances, subtleties, and contextual meaning remains difficult for current machine translation systems. Second, AI lacks a true understanding of context and culture, which are essential for accurately interpreting implicit meanings and cultural nuances. As a result, machine-generated translations may suffer from misinterpretations or a loss of meaning. Third, while AI systems can generate translations, human involvement is still necessary for pre- and post-editing to ensure accuracy and quality. Thus, current machine translation technology cannot fully replace human translators. The most effective approach appears to be the integration of machine translation tools that assist, rather than replace, human translators.

Research has shown that combining AI with human intelligence can significantly improve translation quality. Herbig et al. (2019) argue that AI-based MT offers a strong starting draft as its output, enabling translators to concentrate on refining the draft. This initial AI-generated draft is generally of high quality, which allows human translators to focus on enhancing clarity, flow, and specific nuances. They also note that AI can lessen the cognitive demands on translators, allowing them to concentrate on more complex aspects like context and nuance that are crucial for top-quality translations. Hiebl and Grosmann (2023) further support this, highlighting that while AI boosts speed and efficiency, human translators bring essential skills, such as contextual insight, cultural awareness, and subjective judgment, which are invaluable for maintaining translation quality.

Given these developments, AI's implication in classroom translation instruction is inevitable. Yuxiu (2024) confirmed that translation technology can enhance translation education by (1) serving as an effective teaching tool that offers students a more efficient, accurate, and practical translation experience, (2) providing clear advantages and new opportunities for translation teaching, and (3) improving translation efficiency, thus improving translation teaching quality and standards. Furthermore, Kanglang and Fazzal (2021) suggested that educational institutions consider the implications of AI in translation instruction to ensure that human translators continue developing their skills and maintaining relevance in a changing industry. And, Caukin et al. (2024) reinforce the idea that AI can create a more inclusive, adaptable, and engaging learning environment for translation students.

Recent development has convinced that in an era where artificial intelligence is reshaping industries, integrating AI into translation training is no longer optional—it is imperative. By equipping future translators with the skills to navigate AI-driven tools, we ensure their relevance and adaptability in a rapidly evolving field.

This research contributes to translation studies by exploring students' interest in translation careers and the need for curriculum reform driven by the rapid advancements in artificial intelligence. It provides valuable insights for curriculum developers to align translation programs with the current realities of the translation industry.

2. Method

2.1. Participant

This study included 45 students from the English Literature Department at UTY, representing second-, third-, and fourth-year students from the 2023/2024 academic year. Fourth-year students have completed four translation courses as part of their curriculum, third-year students have completed two, while second-year students have not taken any. A stratified random sampling method was used to select participants, ensuring representation from three consecutive academic batches.

2.2. Data Collecting Technique

Data for this research were gathered using structured questionnaires and semi-structured interviews. The questionnaire contained 14 items, to reveal (1) the respondents' experiences with AI-based machine translation, (2) their interest in the translation profession in light of MT advancements (3) their confidence in choosing translation as one of their future careers, and (4) the need for instructional materials on translation topics within the curriculum.

Respondents were asked to indicate their level of agreement with each statement using a Likert scale, ranging from 'Strongly disagree' to 'Strongly agree'. In assessing the questionnaire's internal consistency, Cronbach's Alpha was calculated to evaluate the reliability of responses across items. The overall Cronbach's Alpha coefficient was 0.82, indicating high reliability, as values above 0.7 are generally accepted as reliable for psychological and social science measures (George & Mallery, 2021). This level of reliability suggests that the items consistently measure the intended constructs across respondents. For construct validity, item-total correlations were analyzed to determine the degree to which each item was aligned with the overall scale score. Items with correlations above 0.4 generally contribute adequately to construct validity (Field, 2024). Most items demonstrated correlations above this threshold, confirming that the questionnaire items effectively measure the constructs related to machine translation (MT) perception and interest in translation as a career.

Semi-structured interviews were conducted with 6 students, representing a mix of positive and negative views from their respective batches. These interviews aimed to gain deeper insights into students' career interests in translation and their perspectives on translation instruction within the curriculum.

2.3. Data Analysis

1) Questionnaire data

Descriptive statistics were used to analyze the questionnaire data, providing an overview of the respondents' views on the topics of interest. Inferential statistics were applied to explore potential differences in responses based on academic year, treating academic year as a variable due to the evolving nature of career choices over time.

2) Interview data

The interview data were analyzed thematically, following a six-step process outlined by Byrne, D. A. (2022): becoming familiar with the data, generating initial codes, identifying themes, reviewing those themes, defining and naming themes, and producing the final report.

Ethical approval was secured from the appropriate institutional review board. Informed consent was obtained from all participants, who were assured of the confidentiality and anonymity of their responses. They were also made aware of their right to withdraw from the study at any time without facing any consequences.

3. Findings and Discussion

3.1. Findings

The analysis of the questionnaire data indicates that 87 % of this study's respondents are familiar with translation machines, 79.5% reported regularly using the tools to carry out translation tasks, and 82.5% confirm their belief that artificial intelligence-based machine translation (AI-based MT) is a potential tool to assist them in doing their translation. These results suggest a generally positive outlook toward AI-based MT, with 81% of respondents expressing favorable views on the subject.

Further analysis of the questionnaire responses indicates that students are particularly drawn to AI-based MT due to its ability to translate quickly and efficiently, reduce repetitive tasks, and demonstrate improved accuracy. These factors appear to enhance their career interest in the translation field.

The diagram below illustrates the data on students' interest in pursuing translation careers based on their academic batch.
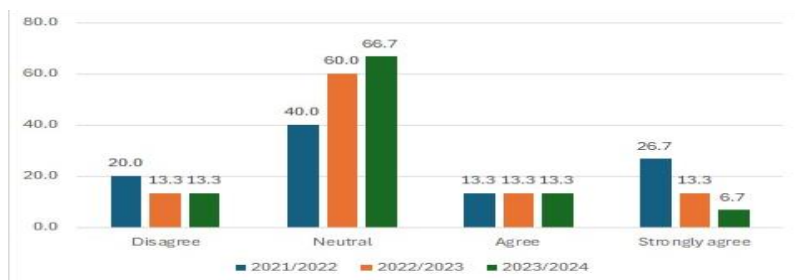

Fig. 1. Students' interest in translation career by batch

The quantitative data in the diagram above show that in batch 2021/2022, the 'Strongly disagree' and 'Disagree' responses to the statement stood at 20%. This indicates that one-fifth of respondents had a negative perspective on the statement presented in the survey. The 'Neutral' category comprised 40% of the responses, suggesting that almost half of the respondents neither agreed nor disagreed, indicating indecision or uncertainty.

Meanwhile, the positive response to the statement comprised 40%, with 13.3% of participants expressing agreement and 26.7% strongly agreeing. This suggests a more moderate level of positive sentiment toward the statement, as only a third of the respondents expressed a favorable opinion.

In the 2022/2023 batch, there is a little difference in sentiment compared to the previous batch. The combined 'Strongly disagree and 'Disagree' answers decreased to 13.3%, which indicated a reduction in the number of respondents expressing negative opinions. This suggests that fewer participants disagreed with the statement, indicating a potential decline in opposition. However, the 'Neutral' category notably increased, from 40% to 60%. This increased neutrality indicates a growing sense of indecisiveness or uncertainty among the respondents. The combined 'Agree' group remained at 26.6%, with equal distributions of 13.3% expressing agreement and strong agreement. This decrease from the previous year implies a little decline in overall positive sentiment towards the statement.

In the most recent batch, 2023/2024, the data reveals interesting changes. The combined 'Strongly disagree' and 'Disagree' groups remained stabil at 13.3%, indicating a continued lack of significant opposition. However, the proportion of neutral responses increased dramatically to 66.7%, making it the dominant sentiment among the respondents. This significant increase in neutrality indicates a notable change towards indecision or uncertainty.

The combined 'Strongly agree' and 'Agree' group experienced a decline to 20%, with 13.3% of respondents expressing agreement and 6.7% strongly agreeing. The reduction in strong agreement reflects a decrease in the intensity of positive sentiment, while the overall level of agreement also decreases.

The qualitative data from the interviews revealed several interesting findings. Respondents who agreed noted that their experience with AI-based MT provided them with valuable insights into the translation process. It allowed them to concentrate on the fundamental challenges of translation while leaving technical matters to the machine. This enabled them to finish their translation tasks more quickly and with fewer or no minor errors like mistyping and misspellings.

However, these respondents also believe MT cannot fully replace human translators. They noted that while MT performs well in academic and technical contexts, it struggles with cultural and literary translations. One respondent mentioned, "In our Literary Translation course, we found that machine translation fails to capture the nuances from the source language into the target language." Another respondent confirms: "One example is when machine translation is asked to translate *Berakit-rakit ke hulu, berenang-renang ke tepian. Bersakit-sakit dahulu, bersenang-senang kemudian*. The translation is very literal. The meaning has been transformed but not the rhyme. This reflects a belief that human translators are still essential for texts requiring a high degree of cultural and literary sensitivity.

These respondents also highlight an urgent need to integrate MT into translation sessions within the classroom. Currently, most translation activities follow a traditional approach, primarily focusing on text analysis, transfer, and restructuring. In this conventional procedure, students begin their translating by analyzing the source text to understand its core message. They then transfer this message by identifying equivalent expressions and restructuring the text according to the target language's grammatical rules and contextual nuances.

As technology has provided the instrument to help translators do their job, this study's respondents recommend using machine translation in classroom sessions. It can be in the form of a Computer-Assisted Translation (CAT) tool or even automatic translation. They know that professional translators have used MT to do the job. Keeping students away from MT in the classroom activity means keeping them in distance from the real world of the translation industry.

A different argument emerges from the respondents who disagree with the statement in the question. These disagreeing respondents foreshadow the future threat of machine translation for humans. One of the respondents claims:" The quality of Google Translate improves significantly from time to time. It used to produce bad translations, but now it has performed impressively in translating text. In many cases, human interference to revise or edit the translation is unnecessary. Google Translate is more than enough for the readers who only want to know the message." Another respondent quoted a machine translation vendor who claimed that their product could achieve 90% translation accuracy, suggesting that the remaining 10% improvement is merely a matter of time

With these considerations, they do not choose translation as one of their career options in the future. They believe that the number of job opportunities in the translation field in the future will decrease significantly because clients can already account for machine translation. They do not want to take the risk.

Despite different views on translation careers, respondents generally agree on the value of integrating MT into classroom translation sessions. They see the potential use of machine translation as a CAT tool and a form of automatic translation. By familiarizing them with these tools, the classroom could better prepare them for the realities of the translation industry, where proficiency with technology is increasingly essential.

3.2. Discussion

The data analyzed in this study shows that 79.5% of respondents are familiar with MT and often use it for translation assignments. This finding is in line with recent studies and surveys. Hellmich and Vinall (2023) claim that MT tools are commonly used by students learning foreign languages, with around 70% reporting frequent use of services like Google Translate. Bindels and Pluymaekers (2022) report in their study conducted with first-, second-, and third-year translation undergraduate students in the Netherlands that 65% of their respondents use MT in their tasks. In France. Loock and Lèchhauguette (2021) conducted a survey of 89 students enrolled in a translation course at the University of Lille and found that 83% of them used online MT tools for their homework assignments.

Almost a similar phenomenon is seen in Spain. A survey conducted by Pastor (2021) to the students of the Translation Program of the University de València identified that 72% of her respondents reported resorting to MT as a problem-solving tool when faced with text fragments containing especially difficult sentences or complex syntactic structures. It is also reported that 100% of her respondents believe that MT can help them to translate under certain conditions. In Turkey, Çakir and Bahyan (2021) reported in their study to English Language and Literature students at a state university in Turkey that 87% of their respondents use MT (53% every day and 34 % sometimes). Another review by Lee (2023) highlights that MT has become an integral part of foreign language education, with usage rates increasing post-pandemic due to greater reliance on digital resources in remote learning environments. Students prefer using MT for its accessibility and immediate feedback, particularly for writing, translating complex texts, and facilitating understanding in a second language.

These findings confirm the widespread use and integration of MT tools among students, with many relying on them for their translation tasks. The respondents in this study also recognized the advantages of MT—such as speed, efficiency, and reduced monotony—which have sparked their interest in translation as a career. Many students highlighted that MT's ability to enhance translation

accuracy and productivity has positively impacted their view of the profession, suggesting that the convenience offered by MT tools is contributing to their career interest.

Research that explored whether the convenience and advantages of MT encourage students to pursue careers in translation indicates mixed impacts, as MT introduces both benefits and challenges in the field. In his study to 35 second-year students of Taras Shevchenko National University, Ukraine, Bakhov et al. (2024) found that using AI-assisted tools in translation education can significantly improve students' academic performance and translation quality. This enhancement in their skills increases their confidence and interest in pursuing a career in translation.

Other studies explore the positive response to the issue. Tian et al. (2023), in their study of 108 grade 2021 students selected from three Chinese universities, highlighted that future work self-elaboration positively relates to students' exhibition of translation technology. In line with the above studies, García-Escribano and Díaz-Cintas (2023) observed that integrating MT in audiovisual translation training has sparked interest in post-editing careers.

However, when considering career options, data in this study disclose that most respondents are generally neutral about pursuing a career as a translator. As seen in Figure 1, 55.56% of the respondents expressed no strong opinion, 28.86% showed interest, and 15.53% opposed the idea. The data also indicates that uncertainty is higher among students from Batch 2022/2023 (60%) and 2023/2024 (66.7%) compared to the more decisive students in Batch 2021/2022 (40%). Additionally, Batch 2021/2022 students show more career clarity, with 60% already set on their career options, compared to 33.3% in Batch 2023/2024. Such determination is typical, as students in higher semesters often become more focused on specific career decisions than those in lower.

The data also reflect broader trends observed in translation programs worldwide. Hao and Pym (2022) reported that only around one-third of translation program graduates pursue work as translators or interpreters. Various studies illustrate this trend with specific figures: for example, among Swansea University graduates in 2020 (sample of 29), 34.48% were employed in translation services. An EMT survey with 1,138 graduates found 49.03% working as translators or interpreters, while a study by Schmitt, Gernstmeyer, and Müller reported that 67.29% of 1,278 graduates held translation or interpreting positions. Meanwhile, in Indonesia, Husein and Bahar (2020) conducted a survey with 45 students from the University of Muhammadiyah Gorontalo, which revealed that respondents had a moderate interest in pursuing careers as translators.

As indicated in the findings, respondents of this study see the profession from two perspectives. The agreeing group perceives it with optimism. They see new possible opportunities in the emergence of AI-based MT. Meanwhile, respondents confirming disagreement stated their concern about MT's threat to the human role in translating jobs. They are concerned that job opportunities will significantly decline due to the advancements in machine translation.

The results of this study align with those of Kirov and Malamin (2020), who found that translators generally perceive the impact of AI on their profession with a mix of concern and optimism. While many see AI as a potential threat, they also recognize that these technologies can help reduce repetitive tasks, allowing them to focus on editing machine-translated text and provide a new opportunity: machine translation post-editing (MTPE).

Responding to advancements in MT, researchers have long worked to incorporate MT into classroom translation instruction. This integration began in the 1960s but gained significant momentum in the 2010s due to rapid advancements in neural machine translation (NMT) technologies. This approach utilizes multiple processing layers to examine and produce language, that significantly enhance translation fluency and precision. In 2023, MT was incorporated into legal translation courses to enable students to gain practical skills, MTPE. This evolution highlights how MT has changed from a simple automation tool to a vital element in translation education, equipping students with essential skills for a technology-driven industry (Steigerwald et al., 2022; Cuenca, et al, 2020; Cunha, 2023).

Several approaches have been proposed for integrating MT into translation courses. For instance, Bulut (2019) suggested a six-week instructional scenario that combines human and machine translations. Students were asked to translate texts both manually and with the aid of MT, followed by a comparative analysis of their human translations versus the MT output. This approach allows

students to critically assess the strengths and weaknesses of MT, particularly in terms of context and cultural sensitivity and enhances their understanding of translation accuracy.

Another approach involves a series of automated translation activities, such as pre-editing source texts, providing prompts, and post-editing machine-generated output. Pre-editing involves modifying the source text to improve the quality of the MT output, including simplifying complex sentences and ensuring consistency in terminology (Miyata & Fujita, 2021). Prompts, which provide specific instructions to MT systems, are another tool that can refine the translation process. For example, specifying "rhyme" in the prompt when translating an Indonesian proverb results in a more creative and contextually appropriate translation. This highlights the importance of training students in the strategic use of MT prompts (White et al., 2023).

Post-editing is another key skill that translation students must develop. It involves revising and improving the MT output to ensure accuracy, coherence, and fluency. The post-editing process can be divided into several steps: initial assessment, error correction, fluency and coherence improvements, and final quality assurance (Shin & Chon, 2023). Teaching students these post-editing skills is crucial to preparing them for the demands of the professional translation industry, where MT is increasingly used in combination with human expertise.

Finally, Pastor (2021) proposed a comprehensive approach for advanced translation students, which includes practicing with different MT engines, analyzing MT errors, and engaging in post-editing tasks. This also involves evaluating MT outputs both manually and automatically, as well as exploring the professional implications of MT in the translation field.

4. Conclusion

The emergence of AI has significantly reshaped students' interest in translation careers. This study confirms that the influence could be twofold. On one hand, some students view AI as a tool that can enhance their translation skills and efficiency rather than seeing it as a threat. This technological advancement opens up new career paths within translation. On the other hand, some other students are concerned that automation might replace traditional translation jobs. The fear is that machine translations could diminish the demand for human translators, leading to fewer job opportunities in the field.

However, despite these concerns, the limitations of AI remain evident—particularly in its inability to fully capture the nuances of culturally rich texts, idiomatic expressions, and literary works. As students become more aware of these shortcomings, they are beginning to recognize the irreplaceable role of human translators. Human expertise, particularly in cultural sensitivity, emotional depth, and creative interpretation, remains essential for high-quality translations. These insights reinforce the enduring relevance of human translators in a profession increasingly influenced by technology.

Looking ahead, the future of translation careers lies in the integration of AI and human expertise. By combining the strengths of both, the translation process can be enhanced, producing high-quality outputs that improve the speed and efficiency of MT while preserving the essential qualities that only human translators can provide. The next step, therefore, is to incorporate AI tools into translation training programs in universities, ensuring that students are equipped to navigate the evolving landscape of the profession.

Future research should focus on developing AI-based teaching models for translation that effectively integrate machine translation tools. These models could provide students with practical skills in using MT alongside human judgment, preparing them for a technology-driven translation industry where proficiency in both domains is essential.

Declarations

Author contribution	:	Authors 1 and 2 collaboratively conducted the research, including proposing the topic, drafting the proposal, applying research methodologies, performing analysis, and presenting the data and discussion. Author 1 took the lead in the article's publication process and both contributed to the publication fee.
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Conflict of interest	:	I declare that there is no competing interests.
Ethics Declaration	:	As the author, I confirm that this work has been written based on ethical research principles in compliance with our university's regulations and that the necessary permission was obtained from the relevant institution during data collection. I fully support ELTEJ's commitment to upholding high standards of professional conduct and practicing honesty in all academic and professional activities.
Additional information	:	No additional information is available for this paper.

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