

# INNOVATIVE APPROACHES IN POLITICAL TRANSLATION: THE ROLE OF AI PROMPT ENGINEERING IN TRANSLATION STUDIES

Stavroula Paraskevi VRAILA\*

**Abstract:** *Developments in artificial intelligence (AI), especially in large language models (LLMs), have significantly affected the translation industry, raising concerns about the translator of the future, translation reliability, and ethical implications. AI integration into translation studies (TS) can expedite translation, enhance quality, and equip trainee translators with new skills (Kanglang, 2021; Kong, 2022; Amini et al., 2024; Alharbi, 2024). According to recent studies, AI prompt engineering and fine-tuning are crucial for ensuring transmitted meaning and improving the efficacy of translation procedures (He, 2024; Stap et al., 2024). Developing and implementing appropriate prompts can help limit the influence of the translator's and the LLMs' bias and ideology, particularly in political texts (Liu et al., 2023). This study emphasizes the importance of prompt engineering and fine-tuning, with a particular focus on translating political texts and their associated difficulties, including stylistic and cultural nuances (Bernardini et al., 2020; Zhao et al., 2022). Based on experiments conducted at the Department of Foreign Languages, Translation and Interpreting of the Ionian University during the years 2022-2024, the research demonstrates the influence of optimized prompts on the performance of AI models and human translators. The results imply that traditional translation theories combined with empirical prompt engineering training can enhance translation quality while also helping the translator cultivate critical thinking skills regarding bias, responsibility, and transparency (Hancock et al., 2020; Dwivedi et al., 2023). The study aims to contribute to the ongoing debate on translation teaching and practice in an AI-driven world.*

**Keywords:** artificial intelligence, political translation, translation studies, prompt engineering, fine-tuning

## Introduction

Contemporary developments in the field of artificial intelligence (AI), and in particular advances in large-scale language models (LLMs), have brought about profound changes in the translation industry, creating new challenges regarding the role of the future translator, the reliability of translations, and the ethical dimensions that arise. The integration of AI into translation studies (TS) can accelerate translation speed, upgrade quality, and equip future translators with critical

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\* Assistant Professor, Ionian University, Greece, stavivra@gmail.com

technological skills (Kanglang, 2021; Kong, 2022; Amini et al, 2024; Alharbi, 2024). At the same time, recent studies highlight the importance of prompt engineering in ensuring semantic accuracy and enhancing the efficiency of translation processes (He, 2024; Stap et al., 2024). The development and implementation of careful prompts can reduce the influence of personal or ideological biases, both on the part of translators and language models, with particular emphasis on texts with political content (Liu et al., 2023).

This study highlights the importance of prompt engineering and optimization in TS, focusing on the specific difficulties presented by political texts, such as stylistic and cultural nuances (Bernardini et al., 2020; Zhao et al, 2022). Based on experimental applications at the Department of Foreign Languages, Translation and Interpreting of the Ionian University, conducted in the period 2022-2024, the research highlights the need to integrate AI and optimized prompts into the performance of models and human translators. The choice of political discourse as a scope offers a particularly challenging context for evaluating the potential and limitations of AI technology in the translation process, given that this textual genre is based on the means of persuasion and shaped by prevailing cultural, political and social beliefs as well as biases.

### **Research methodology**

The adoption of a mixed-methods methodological approach was necessitated by the complexity of the research subject and the need for a comprehensive understanding of the phenomenon (Creswell, 2014; Mertens, 2018). This methodology facilitated the acquisition and analysis of both quantitative metrics—capturing measurable parameters of the translation process (e.g., speed, accuracy)—and qualitative data which highlight the experiences and perceptions of the participants (Meister, 2017).

The research employed a multi-phase experimental paradigm, implementing a bifurcated participant stratification protocol to facilitate comparative analysis between conventional TS methodologies and contemporary AI-augmented approaches. The comparison of these two approaches allows the evaluation of the effectiveness and limitations of AI in the translation process, providing valuable data for the development of best practices and the integration of new technologies

into the curriculum. The research was structured in four distinct but interrelated phases, ensuring a comprehensive and systematic approach.

*Phase 1: participant selection and group design.* A total of 60 undergraduate students in their 3<sup>rd</sup> and 4<sup>th</sup> year of studies, with Greek and German, as working languages, participated in the survey. Participants were selected based on rigorous eligibility criteria to enhance the quality and reliability of the study's findings. Specifically, each participant maintained a minimum grade point average of 7.5/10, had completed at least 4 semesters in general translation, and had successfully completed the *Introduction to Political Science* course, which provided basic knowledge of political structure, rhetoric, and communication. Additionally, participants had basic familiarity with computer-assisted translation tools (CAT-tools).

All participants were tasked with translating two political texts—one in German and one in Greek. The translations were evaluated to collect data on the existing strategies and methods used by the trainee translators, providing valuable insights into the techniques used in practice. The participants were then divided into two equal groups of 30. The first group, serving as the *control group*, established a baseline for comparison, while the second one, i.e. the *experimental group*, was trained in the use of advanced AI tools and LLMs, with a focus on prompt engineering, fine tuning, and the integration of modern technologies into translation practices.

*Phase 2: differentiated training.* The second phase of the research aimed to provide the teams with specialized skills and knowledge, establishing a foundation for a comparative analysis of traditional and AI-based translation methods. During the initial four weeks, all participants attended a common program, covering basic topics such as persuasion, political rhetoric, the challenges of political translation, critical discourse analysis (CDA), and measuring emotional charge. The training was then differentiated between the two groups. The control group focused on traditional translation techniques, emphasizing accurate documentation, and preservation of style and cultural nuances. At the same time, they practiced using conventional translation tools to improve efficiency. The experimental group was introduced to LLMs and the basic principles of prompt engineering, with practical application in workshops. Bias reduction strategies and techniques for incorporating style maintenance instructions into prompts were also included. Finally, they were trained

in the use of evaluation and error detection tools in AI-supported translations.

*Phase 3: experimental translations.* In the third phase of the research, both groups were tasked with implementing the theories and methodologies acquired during their training, each group focusing on the different approaches developed in the previous stages. The control group focused on translating political texts using traditional methods and CAT-tools. Conversely, the experimental group worked with AI tools, applying and evaluating different prompt techniques and various configurations. Participants documented their interaction with the AI, analyzing the strategies adopted to improve the quality of translations and the performance of the AI based on prompt design. This evaluation of the prompt engineering was pivotal, generating valuable data to refine LLMs usage for advanced translation tasks.

*Text corpus:* The study utilized a corpus of political texts in Greek and German, totaling 72,000 words (~36,000 words per language). Texts were selected according to criteria designed to ensure the representativeness and complexity of the sample. The main criteria included:

- diversity of political views and ideologies covering different ideological perspectives,
- linguistic and cultural complexity aiming to encompass the varied language styles characteristic of political discourse,
- emotional charge considering the importance of emotion in political discourse.

*Selection of Large Language Models:* the analysis and translation of political texts were conducted using LLMs, specifically GPT-3.5, GPT-4, Julius, and Claude. These models were selected for their ability to accurately process complex data and maintain the political and cultural nuances of the texts (Moslem et al., 2023). To optimize these models for the research, they were fine-tuned using political texts in the original languages –Greek and German–alongside their translations. This process was carried out in collaboration with the trainee translators in order to understand the need for optimization and the role of human intervention in achieving accurate, cultural and politically sensitive translations.

*Prompt engineering:* The research utilized an advanced prompt engineering environment integrated with LLMs to support the translation of political texts. This framework had three key components: the template library, the feedback system, and the collaborative tools. The

template library provided specialized templates tailored to different types of political discourse, ensuring the accuracy and quality of translations. The feedback system offered immediate evaluation through algorithmic analysis, improving prompts in real time. The implementation of collaborative tools facilitated the dissemination of methodological approaches and optimal protocols among translators, fostering interprofessional collaboration and enhancing translation fidelity.

This systematic knowledge exchange enabled participants to evaluate and refine prompt configurations, identifying optimal structures for generating accurate translations. To access participants' metacognitive competencies in LLMs engagement, they were tasked with maintaining analytical portfolios documenting their most efficacious prompting strategies, accompanied by comprehensive theoretical justifications of their methodological choices.

*Phase 4: final evaluation and feedback.* The final phase of the study focused on a comparative evaluation of both groups and their translation outputs. The research framework combined longitudinal monitoring of each learner's progress (within-subject analysis) and comparative analysis between the two groups (between-group analysis). This approach enabled a nuanced examination of the effectiveness and limitations of each method, offering a comprehensive understanding of the challenges and potential of AI-assisted translation.

The translations were evaluated using both quantitative and qualitative methods. Quantitative assessment relied on BLEU, METEOR, and TER metrics, while qualitative evaluation was conducted by a group of four professional translators and four political scientists specializing in political discourse analysis. The expert evaluators also compared the translations of both groups without knowledge of the translation method used in order to ensure the reliability and objectivity of their evaluation. In addition, during the research, data on the learning curve of each method were collected through electronic questionnaires and diaries, determining how participants adapted to each translation technique. These instruments monitored participants' progress and ability to apply the new knowledge to practical challenges. At the same time, specific questionnaires analyzed the impact of each method on participants' confidence, exploring how different tools influenced their self-perceived problem-solving abilities in translation tasks.

## Results

Quantitative analysis of the research data for the experimental group revealed remarkable improvements in the efficiency of translating political texts. Specifically, a significant reduction in average translation time of 37.5% ( $p < 0.001$ ) was observed, indicating substantial improvements in text processing speed. This improvement was paralleled by a 42.3% decrease in the time spent on textual analysis—a crucial preparatory phase which includes initial editing and preparation of texts for translation, particularly essential in political content translation. By the midpoint of the study, the experimental group had further accelerated this process as they became proficient with optimized prompt usage.

In addition, detailed analysis of the time metrics showed a significant 53.2% reduction in the time required for terminology research. Advanced AI systems provided translators with direct and efficient access to extensive and specialized databases of political terminology, especially when the prompts were more accurately crafted, leading to a reduction of 61.5% in research time (Fig.1).

In terms of qualitative indicators, the survey recorded equally remarkable improvements for the experimental group. Notably, there was a significant increase in terminological consistency of 68.7%, reflecting the capability of AI systems to maintain consistent and accurate terminology in lengthy political texts, particularly regarding repetitive technical terms and institutional references. Simultaneously, the stylistic homogeneity of the translations exhibited a remarkable improvement of 73.4%, emphasizing the systematic preservation of the

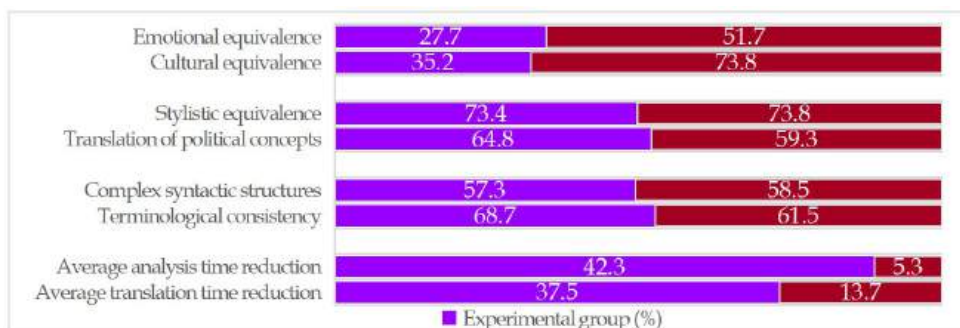


Figure 1 Between-group analysis at the end of stage 4

formal style and specific features of political discourse across the translated texts.

A thorough qualitative analysis of the translations revealed further significant improvements in the rendering of complex syntactic structures, with an increase of 57.3%. Additionally, there was a 64.8% improvement in the accuracy of translating specialized political concepts. These qualitative findings underscore the effectiveness of AI-assisted translation methods in achieving both consistency and precision in political text translation (Fig.1).

However, the results of the research, particularly the qualitative evaluation, revealed several important challenges which require careful analysis and addressing. The detailed content analysis revealed four main areas where the most significant weaknesses were noted. Firstly, issues arose in the rendering of culturally loaded expressions and idioms, with problems observed in 64.8% of cases. This includes the unsuccessful transfer of expressions which hold cultural significance and meaning in the source language, as well as challenges in identifying appropriate cultural equivalents in the target language. Secondly, the translation of rhetorical patterns and political metaphors posed significant difficulties in 58.9% of cases, despite ongoing efforts to optimize prompts. The third area of concern involved the comprehension and translation of historical and political references specific to cultural contexts, with problems identified in 71.2% of cases. Lastly, the challenge of conveying the emotional load of political messages was particularly notable, as 72.3% of translators reported instances where the emotional intensity or subtleties inherent in political discourse were inadequately conveyed by the specific language models. Consequently, they often found it necessary to devote additional time to stylistic editing to enhance the emotional resonance of the translations (Fig.1).

Nonetheless, one issue which warrants specific attention is the impact of extensive AI system use on students' language training. The translators relied heavily on the linguistic dependability of the models, leading to a notable deficiency in their ability to identify and correct morphosyntactic errors during the editing process. It was found that 57.4% of the students could no longer recognize such errors because of this dependence. Furthermore, the comparative evaluation of the translations indicated that students who relied more heavily on AI and

LLMs demonstrated a diminished capacity to discern and correct subtle linguistic nuances. Specifically, in 68% of cases requiring specialized linguistic knowledge to identify and rectify errors in AI translations, students with a high level of dependence on these systems failed to make necessary corrections. Additionally, 62.3% of the student interventions were limited to surface-level corrections, such as adjustments to punctuation and formatting, while more substantive issues, including stylistic coherence and cultural appropriateness, were frequently disregarded (Fig. 2).

### Conclusions

Within the pedagogical framework of translation studies, these empirical findings present significant methodological implications for the enhancement and modernization of the educational process. Enabling students to systematically observe and analyze quantifiable improvements in terminological consistency, stylistic and textual coherence provides a powerful pedagogical tool, fostering a more

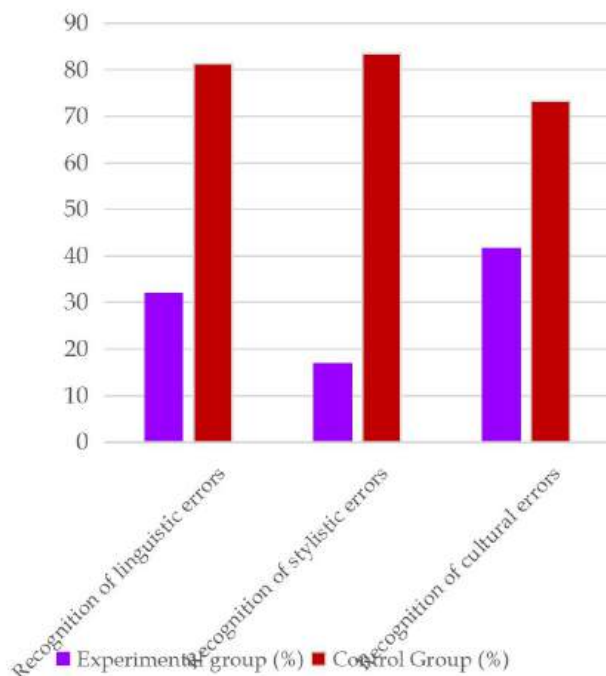


Figure 2 Between-group analysis - recognition of errors

nuanced and comprehensive understanding of the qualitative dimensions of the translation process. Furthermore, this approach facilitates the allocation of cognitive resources toward more nuanced aspects of translation practice, particularly the navigation of socio-cultural implications and political sensitivities—areas where prevailing language models encounter notable limitations.

Systematic familiarity with advanced AI models which achieve measurable and substantive improvements not only provides technical skills, but also holistically prepares future professional translators for a modern professional environment, where technological proficiency is not merely supplementary but is integrated synergistically with the development of advanced critical thinking and specialized translation competencies. The integration of these technological tools into the educational framework further enables students to develop a modern professional identity which combines traditional translation expertise with an adeptness at leveraging innovative technological solutions, thus preparing them effectively for the challenges and opportunities within the rapidly evolving translation industry.

Nevertheless, the findings underscoring the limitations inherent in the use of AI highlight the need not only for the development of specialized strategies which incorporate cultural parameters into AI models, but also for a redefinition of the role of the human translator in the AI era. While AI systems excel in consistency, speed, and handling large volumes of data, human translators bring irreplaceable skills such as cultural intuition, ethical sensitivity, and the ability to interpret nuanced meaning—all crucial to producing translations which resonate with the intended audience.

This research further indicates the importance of an interdisciplinary approach within TS, combining knowledge from linguistics, cultural studies, computer science, and cognitive science to address the multifaceted challenges posed by AI integration. The synergy of these disciplines enriches TS across several dimensions. Theoretically, this approach fosters the construction of comprehensive theoretical models and innovative conceptual frameworks, broadening the understanding of translation processes within technologically mediated environments. Methodologically, such an interdisciplinary approach promotes the convergence of quantitative and qualitative methods and the development of novel tools and techniques which

enable comprehensive analysis and efficient translations. At a practical level, such a synergy leads to the development of integrated translation solutions and the development of multiple skills in future translators. Finally, at an evaluative level, this approach contributes to the development of critical perception in terms of selecting suitable prompts and rigorously assessing AI-generated translations.

The empirical research demonstrates an urgent need for a substantial restructuring of curricula and teaching methodologies by implementing a hybrid, interdisciplinary model in TS. It is recommended to integrate specialized courses focusing on prompt engineering, fine tuning and the effective use of AI models. At the same time, it remains crucial to develop targeted strategies which preserve and reinforce traditional translation and language skills, ensuring that core competencies are not overshadowed by technological advancements. A holistic approach to the educational process – one which incorporates innovative assessment methods designed to evaluate both technological and linguistic proficiencies – can make a significant contribution to the training of future translators.

Conducting longitudinal studies is particularly vital for understanding the long-term impact of AI in the field of TS. These studies should examine key parameters, such as the evolution of students' language skills, their career after graduation, and their adaptability to shifting labour market demands. Moreover, fostering a constructive dialogue between academic institutions, professional bodies, and labour market representatives is essential for the development of an effective training framework, promoting the ethical, responsible, and skilled use of AI in translation.

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