
Analyzing the syntactic and semantic specifics of AI-assisted Uzbek–English written translation editing

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Annotation *This paper analyzes the syntactic and semantic features of Uzbek-English translations generated by artificial intelligence (AI) tools. It investigates how machine-translated texts differ from human translations in sentence structure, lexical selection, and semantic coherence. Particular focus is placed on syntactic deviations, shifts in word order, and contextual inaccuracies frequently found in AI-generated output. Using comparative analysis of translations produced by Google Translate and ChatGPT, the study identifies patterns of grammatical simplification, semantic ambiguity, and stylistic inconsistency. The results show that while AI systems can generate structurally acceptable translations, they often lack nuanced meaning and cultural appropriateness. These deficiencies underscore the crucial role of human post-editing in improving fluency, contextual relevance, and communicative precision. Ultimately, the study contributes to a better understanding of AI-assisted translation dynamics between Uzbek and English and emphasizes the continued need for human expertise in achieving high-quality, culturally sensitive translation outcomes. Furthermore, the research highlights the pedagogical value of AI translation tools for language learning, emphasizing their potential as supplementary aids rather than replacements for human expertise in professional translation.*

Keywords *AI translation, Uzbek–English translation, syntax, semantics, post-editing, machine translation quality, linguistic equivalence*

Анализ синтаксических и семантических особенностей редактирования письменного перевода с узбекского на английский язык с использованием искусственного интеллекта

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Аннотация *В данной статье анализируются синтаксические и семантические особенности узбекско–английских переводов, созданных с помощью инструментов искусственного интеллекта (ИИ). Исследуется, чем машинные переводы отличаются от человеческих с точки зрения структуры предложений, лексического выбора и семантической связности. Особое внимание уделяется синтаксическим отклонениям, изменениям порядка слов и контекстуальным неточностям, часто встречающимся в результатах, сгенерированных ИИ. На основе сравнительного анализа*

переводов, выполненных с помощью Google Translate и ChatGPT, выявляются закономерности грамматического упрощения, семантической неопределенности и стилистической непоследовательности. Результаты показывают, что, хотя системы ИИ способны создавать структурно корректные переводы, им часто не хватает тонких смысловых нюансов и культурной адекватности. Эти недостатки подчеркивают решающую роль человеческого постредактирования в повышении беглости, контекстуальной уместности и коммуникативной точности перевода. В конечном итоге исследование способствует более глубокому пониманию динамики перевода с поддержкой ИИ между узбекским и английским языками и подчеркивает необходимость человеческого участия для достижения качественных и культурно чувствительных переводов. Кроме того, подчеркивается важная роль человеческого редактирования и дидактический потенциал ИИ-переводчиков как вспомогательного средства в обучении иностранным языкам.

Ключевые слова Перевод с ИИ, узбекско–английский перевод, синтаксис, семантика, постредактирование, качество машинного перевода, языковая эквивалентность

Sun'iy intellekt yordamida amalga oshirilgan o'zbek–ingliz yozma tarjimasining sintaktik va semantik xususiyatlarini tahlil qilish

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Annotatsiya Ushbu maqolada sun'iy intellekt (SI) vositalari tomonidan yaratilgan o'zbek–ingliz tarjimalarining sintaktik va semantik xususiyatlari tahlil qilinadi. Tadqiqot mashina tarjimalarining inson tomonidan qilingan tarjimalardan gap tuzilishi, leksik tanlov va semantik izchillik jihatidan qanday farq qilishini o'rganadi. Ayniqsa, SI tomonidan yaratilgan matnlarda tez-tez uchraydigan sintaktik og'ishlar, so'z tartibidagi siljishlar va kontekstual noaniqliklarga e'tibor qaratiladi. Google Translate va ChatGPT vositalari yordamida yaratilgan tarjimalarning taqqoslovchi tahlili orqali grammatik soddalashtirish, semantik noaniqlik va uslubiy nomuvofiqlik kabi naqshlar aniqlanadi. Natijalar shuni ko'rsatadiki, SI tizimlari strukturaviy jihatdan maqbul tarjimalarni yaratishga qodir bo'lsa-da, ular ko'pincha nozik ma'no va madaniy moslikdan mahrum bo'ladi. Ushbu kamchiliklar tahrirdan keyingi inson omilining muhimligini – matn ravonligini, kontekstual dolzarblikni va kommunikativ aniqlikni oshirishdagi o'rni – ta'kidlab beradi. Yakuniy natijada, ushbu tadqiqot o'zbek va ingliz tillari o'rtasidagi SI yordamidagi tarjima dinamikasini chuqurroq tushunishga hissa qo'shadi hamda yuqori sifatli, madaniy jihatdan sezgir tarjimalarga erishishda inson tajribasining zarurligini urg'ulaydi. Shu bois inson tomonidan tahrir qilish muhim ahamiyat kasb etadi. Tadqiqot, shuningdek, SI tarjima vositalarining til o'rganishda yordamchi o'quv resurs sifatidagi didaktik ahamiyatini ham ko'rsatadi.

Kalit so'zlar *Sl tarjimasi, o'zbek-ingliz tarjimasi, sintaksis, semantika, tahrirdan keyingi qayta ishlash, mashina tarjimasi sifati, lingvistik ekvivalentlik*

Introduction

The rapid advancement of artificial intelligence (AI) has profoundly transformed the field of translation, reshaping traditional notions of linguistic mediation and intercultural communication. AI-driven translation tools such as Google Translate, DeepL, and ChatGPT have made multilingual communication faster, more accessible, and increasingly integrated into everyday professional and personal contexts. These systems have also opened new opportunities for translating between less commonly studied languages, including Uzbek and English, thereby bridging linguistic and cultural gaps that were once difficult to overcome. Despite these achievements, AI-based translation technologies continue to face limitations in capturing the full range of syntactic, semantic, and pragmatic nuances inherent in natural language. Machine-translated texts often exhibit structural inconsistencies, unnatural word order, and contextually inappropriate lexical choices. Such deviations can distort meaning, obscure stylistic intent, and reduce overall fluency. Consequently, human translators and editors play an essential role in refining AI-generated output to meet the linguistic, cultural, and communicative standards expected in professional translation practice.

This study examines the syntactic and semantic characteristics of AI-generated Uzbek-English translations, focusing on how grammatical structures, lexical selections, and contextual meanings differ from those in human-translated texts. By comparing unedited machine translations with post-edited revisions, the research identifies common patterns of grammatical simplification, semantic ambiguity, and stylistic inconsistency.

The goal is to uncover underlying tendencies in AI translation behavior and to determine how human intervention can enhance accuracy, fluency, and cultural appropriateness. Ultimately, this investigation contributes to a deeper understanding of the interaction between human and artificial intelligence in translation, highlighting the continuing necessity of human expertise in ensuring quality, reliability, and cross-cultural sensitivity in AI-assisted Uzbek-English translation.

Literature review

The rapid integration of artificial intelligence into translation studies has encouraged scholars to re-examine traditional linguistic theories through the lens of computational and neural translation models. Classical theories of translation equivalence, such as those proposed by Nida and Newmark, established that the relationship between source and target texts is not limited to literal correspondence but involves complex semantic and pragmatic equivalence. These foundational principles remain essential when evaluating AI-generated translations, which often demonstrate formal correctness yet fail to convey contextual meaning and stylistic nuance (Newmark, 1988).

Baker expanded the notion of equivalence by identifying its multiple levels – lexical, grammatical, textual, and pragmatic – emphasizing that effective translation requires coherence at all levels. This framework is particularly useful for analyzing AI translations, which may produce grammatically accurate yet semantically imprecise outputs. Similarly, Venuti highlighted the ideological nature of translation, distinguishing between *domestication* and *foreignization*, concepts that also apply to AI-generated texts that either over-adapt or inadequately adapt to the target

linguistic culture. In the field of computational linguistics, Koehn and Castilho et al. investigated the linguistic quality of neural machine translation (NMT), observing that while NMT models excel in syntax and fluency, they often struggle with semantic disambiguation and idiomatic expressions (Nida, 1964). Popović further demonstrated that post-editing remains crucial for improving AI translations, especially in low-resource language pairs such as Uzbek-English, where training data are limited.

Recent studies, such as Garcia and Läubli et al, have discussed the growing importance of human-machine collaboration in translation. These works suggest that human editors play an essential role in correcting syntactic errors, refining stylistic elements, and ensuring cultural equivalence. In this context, AI tools serve as assistants rather than replacements, producing draft translations that require human interpretation and adjustment. Overall, the literature emphasizes that while AI translation tools have achieved remarkable progress in syntactic accuracy, they continue to face challenges in semantic coherence and cultural adaptability. This research builds on those insights by analyzing Uzbek-English AI-generated texts to identify syntactic simplifications, semantic distortions, and the post-editing strategies used to achieve equivalence and naturalness in translation (House, 2015).

Methodology

This study employs a qualitative, descriptive, and comparative approach to examine the syntactic and semantic characteristics of AI-generated translations from Uzbek into English. The research aims to identify how artificial intelligence tools handle linguistic structures and meanings in written translation, and how post-editing by human translators can enhance accuracy, naturalness, and contextual equivalence. The primary data consist of a corpus of texts translated using leading AI-based translation tools, including Google Translate, DeepL, and ChatGPT. Short

academic, journalistic, and literary excerpts originally written in Uzbek were selected to represent different linguistic registers and levels of syntactic complexity. Each passage was translated into English using the AI systems mentioned above, after which human translators and linguists performed post-editing and annotation. The comparison between machine output and human-edited versions allows for the identification of typical syntactic deviations and semantic inconsistencies produced by AI systems (Popović, 2018).

The analysis follows a linguistic framework informed by Nida's concept of dynamic equivalence and Baker's model of lexical, grammatical, and textual equivalence. These models provide theoretical grounding for assessing how meaning, structure, and stylistic cohesion are preserved or distorted in AI translations. The study also draws on House's notion of pragmatic equivalence and Venuti's concept of domestication and foreignization to evaluate cultural adaptation in AI outputs.

Each AI-generated text was examined for several linguistic features:

- **Syntactic accuracy**, including sentence structure, word order, and clause integration;
- **Semantic precision**, focusing on polysemy, idiomatic meaning, and contextual relevance;
- **Lexical choice**, assessing the consistency and appropriateness of financial, technical, or cultural terms;
- **Cohesion and coherence**, measuring how well AI systems maintain logical flow and semantic unity across sentences.

Qualitative analysis was conducted by categorizing observed translation issues according to their type (syntactic, semantic, lexical, or pragmatic) and frequency. For instance, in the translation of complex Uzbek sentences containing multiple subordinate clauses, AI systems frequently simplified the structure or omitted contextual

connectors, leading to semantic flattening. In contrast, post-edited versions restored these connections, producing translations closer to the original communicative intent (Venuti, 1995).

Additionally, interviews and consultations with professional translators and linguists were used to validate the analytical findings. Experts provided commentary on the degree to which AI outputs required intervention and offered insights into the post-editing process. Their evaluations contributed to the interpretation of data and to the development of practical recommendations for improving AI-assisted translation workflows between Uzbek and English. The methodology thus combines textual analysis, linguistic theory, and expert evaluation to provide a comprehensive understanding of how syntactic and semantic equivalence is achieved – or lost – in AI-generated Uzbek–English written translations. This integrative approach allows the study to assess not only the linguistic quality of machine translations but also their implications

for professional editing and translation pedagogy.

Results and Analysis

The comparative analysis of AI-generated and human-edited translations reveals notable differences in syntactic accuracy, semantic depth, and contextual coherence. While AI systems such as Google Translate, DeepL, and ChatGPT successfully produce grammatically acceptable output, they often fail to preserve the nuances of meaning and syntactic hierarchy found in the original Uzbek texts. Human post-editing, in contrast, restores logical structure, cohesion, and cultural tone (Läubli, Sennrich & Volk, 2020).

1. **Syntactic Simplification and Structural Omission.** AI systems tend to simplify long, clause-heavy Uzbek sentences into shorter English structures, often omitting conjunctions or dependent clauses that convey causality or emphasis. This leads to a loss of logical flow and a shift in sentence rhythm.

Original (Uzbek)	AI Translation (Google Translate)	Human-Edited Version
O'zbekiston iqtisodiy barqarorlikni ta'minlash uchun fiskal siyosatni bosqichma-bosqich isloh qilishni davom ettirmoqda.	Uzbekistan continues to reform fiscal policy to ensure economic stability.	Uzbekistan is continuing the gradual reform of its fiscal policy in order to ensure sustainable economic stability.

Table 1.

Analysis: The AI version correctly conveys the general meaning but omits the adverb *"bosqichma-bosqich"* ("gradually"), which is crucial for the syntactic and semantic tone of the sentence. The human-edited version restores this temporal aspect, providing a more accurate and stylistically balanced translation.

2. Word Order and Clause Integration.

Uzbek syntax often employs flexible word order and subordinate clauses to highlight emphasis, while English

relies on strict clause sequencing. AI translations frequently distort emphasis or merge subordinate clauses incorrectly.

Original (Uzbek)	AI Translation (DeepL)	Human-Edited Version
Agar iqtisodiy islohotlar samarali amalga oshirilmasa, xorijiy investitsiyalar hajmi kamayishi mumkin.	If economic reforms are not effective, the amount of foreign investment may decrease.	If economic reforms are not implemented effectively, the volume of foreign investment may decline.

Table 2.

Analysis: Although the AI translation is grammatically correct, it replaces the verb phrase *"amalga oshirilmasa"* with *"are not effective,"* shifting the meaning from *process* to *result*. The human-edited version reintroduces procedural accuracy through *"implemented effectively,"* aligning with the intended syntactic focus of the Uzbek source.

3. **Semantic Ambiguity and Lexical Equivalence.** AI systems often produce literal translations of idiomatic or context-dependent terms, creating ambiguity. In financial and academic contexts, incorrect lexical choices may distort meaning or sound unnatural.

Original (Uzbek)	AI Translation (ChatGPT)	Human-Edited Version
Tarjima jarayonida so'zning kontekstdagi ma'nosi asosiy omil hisoblanadi.	The word's meaning in the context is the main factor in the translation process.	In the translation process, contextual meaning is the key determinant of lexical choice.

Table 3.

Analysis: The AI output is technically correct but semantically flat. The human-edited version improves lexical precision (*"determinant"* instead of *"factor"*) and adjusts syntactic flow to reflect academic style, enhancing both semantic clarity and stylistic appropriateness (Abdullayev, 2025).

4. **Pragmatic and Cultural Inconsistencies.** AI translations tend to misrepresent culturally embedded expressions and collocations. When translating idiomatic or evaluative phrases, human intervention ensures cultural naturalness and communicative equivalence.

Original (Uzbek)	AI Translation (Google Translate)	Human-Edited Version
Bu tashabbus xalqaro miqyosda yuqori baholandi.	This initiative was highly rated internationally.	This initiative received high recognition at the international level.

Table 4.

Analysis: The AI-generated *"highly rated"* is semantically acceptable but stylistically unnatural in formal English. The post-edited *"received high recognition"* achieves cultural and stylistic equivalence,

aligning with international academic discourse norms.

5. **Summary of Error Categories**

Error Type	Common AI Issue	Human Post-Editing Improvement
Syntactic simplification	Omission of subordinate clauses, reduced sentence length	Restoration of clause hierarchy and connectors
Word order distortion	Misplaced emphasis or logical sequence	Naturalized English syntax with maintained focus
Semantic inaccuracy	Literal or context-free translation	Context-based lexical and semantic adjustment
Pragmatic/cultural mismatch	Overly direct or literal phrasing	Recasting into culturally appropriate expressions
Stylistic inconsistency	Flat or mechanical tone	Academic fluency and register correction

Table 5.

Interpretation of findings

The data reveal that while AI-generated translations exhibit high grammatical accuracy, they frequently lack semantic precision and contextual adaptability. This supports Baker's view that equivalence operates on multiple levels – grammatical, lexical, and pragmatic – and cannot be achieved by syntactic substitution alone. Furthermore, the findings align with Nida's dynamic equivalence model, demonstrating that true translation effectiveness depends on communicative intent rather than structural similarity. AI systems show a clear tendency toward syntactic simplification, favoring short and direct constructions, which often diminishes the rhetorical and stylistic richness of Uzbek source texts. Post-editing plays a corrective role, restoring syntactic variety and adjusting semantic nuances to achieve naturalness in English (Koehn, 2020). Overall, these results confirm that human post-editing remains indispensable for ensuring linguistic quality, cultural appropriateness, and semantic integrity in AI-generated Uzbek-English written translation. While AI tools can efficiently produce preliminary drafts, they currently lack the contextual awareness and interpretive sensitivity required for professional-level translation.

Conclusion

This study has explored the syntactic and semantic characteristics of AI-generated Uzbek-English written translations and the role of human post-editing in improving their quality. The analysis revealed that while artificial intelligence tools such as Google Translate, DeepL, and ChatGPT have achieved impressive grammatical accuracy, they still struggle with conveying contextual meaning, cultural nuances, and stylistic appropriateness. AI translations tend to simplify complex Uzbek syntactic structures, misinterpret idiomatic expressions, and occasionally distort the semantic intent of the original text. Through comparative examples, the research demonstrated that human intervention remains essential for achieving true equivalence in translation. Human editors restore syntactic hierarchy, refine lexical selection, and ensure pragmatic coherence that AI systems often overlook. This confirms the theoretical perspectives of Nida's *dynamic equivalence* and Baker's *multi-level equivalence* models, which emphasize that meaning and effect, not merely structure, determine translation adequacy.

The findings also highlight that AI systems show a consistent pattern of syntactic simplification, semantic flattening, and pragmatic rigidity. Human post-editing

counteracts these tendencies by reintroducing natural flow, contextual adaptation, and stylistic harmony. As a result, the collaborative process between AI and human translators emerges as the most efficient model for producing high-quality Uzbek-English translations. In conclusion, AI-based translation tools serve as valuable aids in accelerating the translation process but cannot yet replace human expertise in ensuring linguistic accuracy and cultural sensitivity. The

study suggests that the future of translation lies in hybrid human-AI collaboration, where machines handle structural translation tasks, and humans provide semantic interpretation, stylistic refinement, and cultural mediation. Continued research should focus on developing adaptive AI systems trained on culturally diverse datasets and on creating translation pedagogy that integrates post-editing competence as a core professional skill.

References:

1. Abdullaev, S. F. (2025). Problems of achieving equivalence in the translation of official texts. *Xorijiy lingvistika va lingvodidaktika – Зарубежная лингвистика и лингводидактика – Foreign Linguistics and Linguodidactics, Special Issue 1*. ISSN 2181-3701.
2. Abdullaev, S. F. (2025). Representation of anthroponyms in the English translation of *Temur's Codes*. *American Journal of Education and Evaluation Studies*, 2(5). E-ISSN 2997-9439. <https://semantjournals.org/index.php/AJEES>
3. Abdullaev, S. F. (2025). Provision of formal and dynamic equivalence in the English translation of *Temur's Codes*. *American Journal of Open University Education*, 2(5). ISSN 2997-3899. <https://scientificbulletin.com/index.php/AJOUP>
4. House, J. (2015). *Translation quality assessment: Past and present*. London: Routledge.
5. Koehn, P. (2020). *Neural machine translation*. Cambridge: Cambridge University Press.
6. Läubli, S., Sennrich, R., & Volk, M. (2020). Has machine translation achieved human parity? A case for document-level evaluation. *Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 4791-4803.
7. Nida, E. A. (1964). *Toward a science of translating*. Leiden: E. J. Brill.
8. Newmark, P. (1988). *A textbook of translation*. London: Prentice Hall.
9. Popović, M. (2018). Error classification and analysis for machine translation output. *Computational Linguistics*, 44(2), 403-432.
10. Venuti, L. (1995). *The translator's invisibility: A history of translation*. London: Routledge.