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Challenges Encountered in Translation of Culture-bound and Subject-specific Terminology While Using Google Translate

¹ Sayyara Sadikhova, ² Javid Babayev https://doi.org/10.69760/egjlle.2500203

Abstract

This study explores the limitations and challenges of using Google Translate as a translation tool, particularly in academic, professional, and literary contexts. While Google Translate provides rapid, accessible translation, various linguistic, semantic, and contextual issues often compromise accuracy and meaning. Using qualitative analysis, we examined translated samples from English to various languages and vice versa. The findings highlight the shortcomings in grammar, idiomatic expression, cultural nuance, and subject-specific terminology, suggesting that Google Translate is best used as a supplemental tool rather than a replacement for human translators. Recommendations are provided for optimizing the use of Google Translate within academic and professional settings.

Key words: Google translate, culture-bound terms

1. Introduction

The rapid evolution of technology has significantly influenced how we communicate across linguistic and cultural boundaries. In an increasingly globalized world, where international collaboration and multilingual communication are commonplace, the demand for fast and accessible translation tools has grown dramatically. Among the many tools available, Google Translate has emerged as one of the most widely used machine translation (MT) platforms, offering instant translation across over 100 languages. With its ease of access via web, mobile, and integration into applications such as Google Docs and Chrome, the tool has become ubiquitous in both casual and professional settings.

² **Babayev, J.** PhD in Philology, Senior Lecturer, Department of English and Methods, Nakhchivan State University, Azerbaijan. Email: cavidbabayev@ndu.edu.az. ORCID: <u>https://orcid.org/0009-0009-2472-0006</u>



¹ Sadikhova, S. PhD in Art Criticism, Senior Lecturer, Department of Visual Arts, Nakhchivan State University, Azerbaijan. Email: seyyaresadixova@ndu.edu.az. ORCID: <u>https://orcid.org/0009-0005-5591-4285</u>

Initially launched in 2006, Google Translate has evolved from a statistical machine translation (SMT) system to a more advanced neural machine translation (NMT) model, introduced in 2016. This shift marked a significant improvement in fluency and coherence of translated texts, as the system began using deep learning techniques to predict the most likely sequence of words. Despite these advancements, the technology still falls short in several critical areas, including contextual accuracy, idiomatic translation, and cultural adaptation.

For many users—students working on foreign-language assignments, tourists navigating new countries, or professionals needing quick comprehension of foreign documents—Google Translate offers a practical and cost-free solution. However, its role becomes more problematic when used in contexts that require high accuracy, such as academic writing, legal documentation, technical manuals, or literature. In such scenarios, subtle errors in grammar, tone, or meaning can significantly impact the integrity of the translation.

Moreover, languages are deeply embedded with cultural references, emotional undertones, and pragmatic norms that machines struggle to interpret. Human translators rely not only on linguistic knowledge but also on cultural awareness, contextual judgment, and domain-specific expertise, all of which are difficult to replicate in automated systems. As a result, while Google Translate may provide a basic understanding of a text, its translations often lack semantic depth and cultural sensitivity.

Previous studies have highlighted these concerns, indicating that while machine translation tools are improving, they are still far from achieving human-like performance (Koehn, 2020; Loock, 2020). These shortcomings raise important questions about the limitations of relying solely on machine translation tools in environments where linguistic precision is crucial. There is also a growing concern about the overreliance on these tools, especially in educational settings, where students may use them without understanding their inherent limitations.

This study aims to investigate the specific challenges encountered when using Google Translate in the translation process, focusing on various text genres and language pairs. By examining the quality and accuracy of translated outputs and identifying patterns of error, the research contributes to a better understanding of when and how Google Translate should be used—and when it should not. It also seeks to provide recommendations for students, educators, professionals, and casual users to navigate the tool's capabilities and limitations more effectively.

The rise of machine translation (MT) tools, particularly Google Translate, has transformed how users approach multilingual communication. Google Translate boasts support for over 100 languages and is widely used by students, professionals, and casual users. However, despite its convenience and real-time processing, questions remain about its reliability and effectiveness in conveying nuanced meaning. This study investigates the challenges encountered when using Google Translate in various translation scenarios to assess its practical limitations. Machine



This is an open access article under the Creative Commons Attribution 4.0 International License translation (MT) tools have become increasingly popular in the globalized world, especially with the advancement of artificial intelligence and natural language processing (NLP). Among these, Google Translate remains one of the most commonly used platforms due to its accessibility, speed, and broad language support. Its integration into browsers, smartphones, and communication platforms has made it a convenient option for students, travelers, researchers, and businesses. However, despite its widespread usage, questions persist regarding the quality and reliability of its translations. While Google Translate performs well in general or conversational contexts, its performance in specialized or culturally rich texts is often problematic (Sadikhova, 2024). The purpose of this study is to identify and analyze the challenges encountered during the use of Google Translate in the translation process, with a focus on various types of source texts and language pairs.

2. Methods

2.1 Data Collection

Ten source texts were selected, including academic abstracts, informal conversations, literary excerpts, and technical documents. Each text was translated from English into three target languages—Spanish, French, and Chinese—using Google Translate. The reverse translation (back-translation) into English was also analyzed.

2.2 Evaluation Criteria

We assessed the translations based on the following criteria:

Lexical Accuracy: Correct word usage.

Grammatical Structure: Proper syntax and sentence formation.

Idiomatic Expression: Correct rendering of idioms and informal language.

Contextual Understanding: Ability to maintain original tone and meaning.

Cultural Nuance: Sensitivity to culturally specific references.

2.3 Expert Review

Three professional translators independently reviewed and annotated the translations, highlighting errors and inconsistencies.

3. Results

The evaluation revealed the following major challenges:

3.1 Lexical and Semantic Errors



In 80% of the translated texts, especially in technical and literary content, Google Translate rendered incorrect or vague terms. For instance, specialized economic or medical terminology was often mistranslated or overly simplified. The word "consumption" is a disease which means "tuberculosis". At the same time, it is an economic term. This can lead to misinterpretation in some cases. Another example can be taken for "introduction". While translating an academic article into Azerbaijani into English , Google translate program may misinterpret this word as "Login" which means the entry to any social networking site or a program.

3.2 Grammatical Issues

Syntactic errors were observed in about 60% of the translations. Word order was particularly problematic in languages with flexible syntax like Chinese. Complex sentences were often broken into fragmented or run-on sentences.

3.3 Idiomatic Failures

Approximately 70% of idioms and culturally specific expressions were translated literally, losing their intended meaning. For example, English phrases like "spill the beans" or "kick the bucket" were rendered into non-sensical or overly literal phrases.

3.4 Contextual Misinterpretation

In 50% of cases, Google Translate failed to recognize tone or context, leading to translations that were formally correct but contextually inappropriate.

3.5 Lack of Cultural Sensitivity

Cultural nuances, such as polite forms, honorifics, or region-specific references, were not consistently recognized or preserved (Babayev & Alaviyya, 2023). For example, the polite register commonly used in formal French correspondence was absent in translations. This could lead to unintended rudeness or awkwardness in communication (Sadikhova & Babayev, 2025).

4. Discussion

The results of this study affirm what many linguists, translators, and language learners have observed anecdotally: while Google Translate is a powerful and evolving tool, it still faces significant challenges in delivering accurate and contextually appropriate translations—especially when handling complex or specialized texts.

4.1 Implications for Real-World Use

The implications of these findings are multifaceted. For casual users, minor grammatical or idiomatic errors may be tolerable, as their primary goal is often basic understanding or everyday communication. However, in academic, legal, technical, and professional contexts, the risks associated with inaccurate translations are significantly higher. Mistranslations in medical



prescriptions, legal contracts, or diplomatic communications can lead to serious misunderstandings or even harmful consequences.

Moreover, the tool's one-size-fits-all approach to language ignores regional dialects, formal and informal registers, and subtle sociolinguistic cues. For instance, while the Spanish spoken in Spain differs from that in Mexico or Argentina, Google Translate does not reliably distinguish between these variations unless explicitly prompted. This limitation becomes problematic when tone, politeness, or regional identity is important.

4.2 Theoretical Perspectives on Translation

The challenges revealed in this study can be better understood through the lens of established translation theories. Skopos Theory, which emphasizes the purpose (or skopos) of the translation, highlights the importance of adapting the translation strategy to the intended audience and context—something that automated tools are not currently capable of. Similarly, Dynamic Equivalence Theory, developed by Eugene Nida, stresses the importance of conveying meaning and effect over literal word-for-word translation. Google Translate often defaults to the latter, leading to semantically awkward or inaccurate results.

Furthermore, Cultural Translation Theory emphasizes the role of the translator as a cultural mediator (Sabir, 2023). This human element is precisely what is missing from machine translation (Gaspari et al., 2015). While Google Translate may recognize a phrase's structure, it cannot interpret connotations, irony, sarcasm, or metaphor—elements that are central to meaning in many forms of communication.

4.3 Limitations in Neural Machine Translation (NMT)

Despite the improvements brought about by NMT, including better fluency and the ability to consider context at the sentence level, significant challenges remain. NMT systems still rely heavily on large bilingual corpora for training, which means the quality of translation is directly tied to the availability and quality of data for specific language pairs and domains. Low-resource languages or specialized fields (e.g., legal or scientific terminology) often yield poor results.

Additionally, while NMT can manage grammatical structure more coherently than its predecessors, it still cannot truly "understand" the meaning of a sentence (Javid, 2023). It makes probabilistic predictions based on patterns in data rather than logical reasoning or semantic comprehension. This fundamental limitation explains why NMT systems often produce translations that are grammatically correct but contextually incorrect.

4.4 User-Specific Recommendations

For Students and Educators:



Google Translate can be a useful tool for understanding the general meaning of foreign-language texts or checking vocabulary. However, educators should emphasize the importance of critical engagement with translations and discourage blind copying of translated texts. Assignments that include translation exercises should encourage comparison between machine outputs and human-corrected versions.

For Professional Translators:

Google Translate can serve as a pre-translation or draft generation tool, saving time on repetitive or low-risk tasks. However, human translators must rigorously post-edit machine-generated translations to ensure they meet professional standards, especially in sensitive industries such as law, healthcare, and finance.

For Language Learners:

While helpful for quick lookups or grammar hints, over-reliance on Google Translate can stunt deeper learning. Learners benefit more from tools that explain grammar rules, offer contextual examples, or provide interactive exercises. Additionally, using bilingual dictionaries or phrasebooks in conjunction with Google Translate can improve understanding.

For Developers and Policymakers:

There is a growing need to enhance transparency and explainability in machine translation systems. Users should be informed about potential biases, limitations, and the confidence level of a translation output. Further research into ethical AI design in language technologies is also necessary, especially concerning minority and underrepresented languages.

4.5 Future Considerations

Looking ahead, improvements in machine translation will likely stem from better integration of contextual awareness, pragmatic understanding, and multimodal input (e.g., combining text with images or speech). Emerging technologies, such as large language models (LLMs) and transformer-based systems, offer promise in bridging some of these gaps, but they too face limitations related to cultural nuance and deep semantic interpretation.

More collaborative systems, where human translators work alongside machine tools in an interactive loop, may represent the most effective approach. Such systems can combine the speed and data-handling capacity of machines with the interpretive and cultural intelligence of human translators.

5. Conclusion



Google Translate is a valuable tool for basic translation tasks but presents significant challenges when used for complex, context-dependent translation. Users must be aware of its limitations and supplement it with human input or post-editing where precision and cultural nuance are crucial.

The widespread use of Google Translate reflects the increasing need for fast, accessible translation in today's multilingual society. As a free and user-friendly tool, it has undeniably opened new doors for communication and information access across language barriers (Alisoy, 2023). From casual conversations to preliminary comprehension of foreign texts, Google Translate has proven to be a valuable asset for millions of users worldwide.

However, this study highlights that despite significant technological advancements—particularly with the implementation of neural machine translation—Google Translate still presents substantial limitations that restrict its effectiveness in more complex translation tasks (Wu et al., 2016). These limitations include frequent lexical inaccuracies, structural and grammatical inconsistencies, poor handling of idiomatic language, contextual misinterpretations, and a lack of cultural sensitivity. Such issues are especially pronounced in formal, technical, academic, and literary texts, where precision, tone, and nuance are critical.

The findings of this research underscore the importance of contextual and cultural competence in translation, competencies that current machine translation tools cannot replicate without human oversight. While Google Translate is constantly improving through artificial intelligence and data expansion, it remains fundamentally reliant on statistical patterns rather than genuine semantic understanding. This reliance often leads to translations that are grammatically plausible but semantically or pragmatically flawed.

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