



Comparing Human and Machine Translation in Facilitating Comprehension of English Political News Articles in Arabic

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مقارنة الترجمة البشرية والآلية في تسهيل فهم المقالات الإخبارية السياسية الإنجليزية باللغة العربية

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Abstract:

This study addresses the critical gap in understanding how machine translation (specifically Google Translate), affects the comprehension of political discourse compared to human translation (HT). As political news is usually full of historical metaphors and cultural nuances, the study aims to evaluate the effectiveness of Google translate (GT) in facilitating the comprehension of English political news articles for translation students. The significance of this work is centred in examining the machine's ability to achieve communicative success, not just surface analysis of grammatical errors. The study was conducted at the Libyan Academy of Postgraduate Students- Al Baida, in which a mixed-method approach was employed to capture a comprehensive data set. Quantitatively, the study used web-based survey design via Google Forms featuring Likers-scale questions across three selected political articles. Qualitatively, a manual linguistic analysis of 20 political terms was conducted to identify the literalism in GT's output. The study concludes that while GT demonstrates a high level of proficiency in translating context, it consistently fails in translating individual terms and idiomatic expressions.

Keywords: Google Translate, Libyan Academy, Political Discourse.

المخلص:

تركز هذه الدراسة على المقارنة بين تأثير الترجمة الآلية (وتحديدًا ترجمة جوجل) والترجمة البشرية على فهم الخطاب السياسي. ولأن الأخبار السياسية عادةً ما تكون غنية بالاستعارات التاريخية والفروق الثقافية الدقيقة، تهدف الدراسة إلى تقييم فعالية ترجمة جوجل في تسهيل فهم المقالات الإخبارية السياسية الإنجليزية لطلاب الترجمة. تكمن أهمية هذا العمل في دراسة قدرة الآلة على تحقيق التواصل الفعال، وليس مجرد تحليل سطحي للأخطاء النحوية. أجريت الدراسة في الأكاديمية الليبية للدراسات العليا - البيضاء، حيث استخدم منهج البحث المختلط لجمع بيانات شاملة. كميًا، استخدمت الدراسة تصميم استبيان إلكتروني عبر نماذج جوجل يتضمن أسئلة مقياس ليكرز على ثلاث مقالات سياسية مختارة. نوعيًا، أُجري

تحليل لغوي يدوي لعشرين مصطلحًا سياسيًا لتحديد مدى حرفية الترجمة الآلية. وتخلص الدراسة إلى أنه في حين أن برنامج الترجمة الآلية يظهر مستوى عالٍ من الكفاءة في ترجمة السياق، إلا أنه يفشل باستمرار في ترجمة المصطلحات الفردية والتعبيرات الاصطلاحية.

الكلمات المفتاحية: ترجمة جوجل، الأكاديمية الليبية، الخطاب السياسي.

Introduction:

The use of machine translation in international communication in recent years has increased. Reference [1] states that machine translation refers to "computerized systems responsible for the production of translation with or without human assistance". It is also described as the field of computational linguistics that aims to bridge the linguistic gaps by expressing the cognitive process of translation through algorithm approaches [2]. The main goal of these systems is to facilitate the vast shifting of information through language boundaries. While early machine translation applied simple word-for-word translation, the current MT tools evolved to translation engines that include semantic coherence in the process of translation across various language pairs.

Understanding political news articles poses a significant challenge for Arab readers who rely on English political sources. Many of the political decisions are made in English-speaking countries, and many documents are published in English first. Political language usually expresses information through loaded terminology that requires advanced levels of linguistic knowledge in order to interpret them correctly [3]. According to Baker [4], political language often includes words with no equivalence, in which the English political term describes a specific institutional procedure or a democratic that lacks a direct counterpart in the TL.

Google Translate (GT) was initiated in 2006 as a machine translation system developed by Google Inc, and has been the most widely available and accessible form of machine translation. The tool has emerged as the most influential translation engine in the world that is able to exhibit access to multilingual information [5]. Its significance is highlighted by its ability to support low-source languages making it vital for everyday communication [6]. However, there are still concerns regarding Google Translate precision and effectiveness in accurately conveying nuances of political language compared to human translation. Despite improved influence, scholarly concerns continue regarding the machine translation precision of lexical equivalents in specialized fields like politics [7].

Researchers have identified that neural systems usually ignore the accuracy of facts and present the message in a readable context [8]. This leads to the consequence of a heavy reliance on literalism due to the lack of precision specifically in the context of English-Arabic political translation [9]. In other words, machine translation makes information more accessible, human translators' role is still essential for the full comprehension of political texts. "The globalized nature of news, due to its widespread electronic presence on the internet, allows it to address a wide range of audiences with multiple backgrounds [10].

Based on the aforementioned linguistic challenges of the political discourse and the technological shift in the field of MT, this study aims to empirically evaluate the effectiveness of Google Translate compared to human translation in facilitating the comprehension of political news articles. An evaluation of the translation performed by translation students at the Libyan Academy-Al Jabal Al Akhdar campus, focusing on English to Arabic translation, as well as to identify the lexical gaps of GT in translating specialized political terminology.

The problem addressed in this study focuses primarily on two main aspects: Google Translate's performance compared to Human Translation, that is, could this MT tool be considered equivalent to human translation? And to explore how Google Translate reliance on literalism (formal equivalence) affects meanings of specialized political terminology.

Research questions:

1. To what extent does human translation compared to machine translation, (Google translate), improve comprehension of political news articles considering historical references and cultural context?
2. How does the translation of specialized political terms by Google translate reflect a tension between literal (formal) and functional (dynamic) equivalence?

Objectives of the study:

1. Conducting comparison between human and machine translation (Google Translate): to compare the effectiveness of Google Translate to human translation and investigate how both translation methods improves comprehension of political news articles considering the cultural context and historical references.

2. Analysing the linguistic tension of Google Translate: to conduct analysis of specialised political terms to investigate the linguistic tension between formal and dynamic equivalents in Google translate (GT).

Material and methods:

Research design:

To investigate the comparative differences between human translation (HT) and machine translation (MT) in improving comprehension of English political news articles in Arabic, the present study conducted a sequential explanatory mixed-methods approach. Establishing a quantitative proof regarding comprehension performance was the main object of choosing the design as well as providing qualitative evidence to discuss the observed differences.

Data collection:

English political articles for the quantitative data were carefully selected from Fikra forum; an online news website published by The Washington Institute for Near East Policy. Those articles consisted of complex vocabularies, historical and cultural references with similar length and thematic relevance. GT versions of the articles were prepared besides the human translated version which was provided by the news website itself.

While the qualitative phase focuses on the existence of literalism (formal equivalence) in rendering the specialized political terms, in which a sample of 20 specialized political terms that represents the unique linguistic characteristics of English political discourse, were selected from the Dictionary of Politics and Government [11], in order to be utilized in the qualitative component of the study.

Population and Sample:

Participants of the study were 30 translation students enrolled at the Libyan Academy in Al Beida city, who have spent 3 years studying the field. The selection of translation students wasn't a random decision. The difficulty of political news usually requires a high degree of linguistic competence. The crucial historical events, cultural references and metaphorical language requires practical individuals in the field to ensure the full comprehension of the articles.

Data analysis:

Quantitative analysis: (Questionnaire):

The questionnaire by which the quantitated data were collected was implemented through two groups. The first group completed a questionnaire in which the three articles were generated by Google translate GT, while the second group completed the version of the questionnaire where the articles were translated by human. This quantitative data was processed and analyzed by using SPSS Statistics (version 26).

Moreover, to determine if there was a statistically significant difference between the comprehension scores of Human Translation (HT) and Google Translate (GT), the researcher conducted a Paired-Sample T-test. This inferential statistical procedure was chosen to compare the means from the same participants set through the two methods of translation. The questionnaire internal consistency was verified by utilizing Cronbach's Alpha ($p < 0.05$) in order to ensure the questionnaire reliability.

Qualitative analysis:

The analysis of GT translation of the 20 political terms was conducted through a micro linguistic analysis of each term involving the source term, the GT output, and the authoritative dictionary definition. The researcher compared the dictionary meaning of the term to the GT's output to determine the literalism (formal equivalence) in the Google Translate.

Results and discussion:

The quantitative analysis was conducted to determine if there is a significant statistical gap between human translation and Google Translate in the context of political articles. The researcher formulated a research hypothesis, which states that human translation would achieve higher statistical results in understanding the cultural and historical references within the political news articles compared to Google Translate. This hypothesis was derived based on the academic assumption that the complex and metaphorical nature of the political discourse requires human intervention in order to interpret their meanings and convey them more accurately. However, the empirical results derived from the paired samples T-tests through all the three articles consistently failed to support this hypothesis. The numerical differences between the two translation methods were negligible and statistically insignificant as the P-values remained above the threshold of .05 indicating that the research hypothesis is formally rejected.

Table (1): Final Consolidate Results (Quantitative analysis of participants' comprehension scores)

Article	Section	GT group (Mean)	HT group (Mean)
Article 1	Cultural understanding	79.4%	60.3%
	Historical context	83.8%	61.8%
	Total Likert mean	3.38	3.34
Article 2	Cultural understanding	69.1%	60.3%
	Historical context	67.7%	58.8%
	Total Likert mean	3.37	2.97
Article 3	Cultural understanding	72.1%	52.9%
	Historical context	70.5%	64.7%
	Total Likert mean	3.39	2.96

As shown in Table 1, GT group achieved higher means of comprehension scores in both cultural and historical contexts. This quantitative data illustrates a performance gap between GT and HT. That is, GT group showed superior ability to facilitate comprehension of English political news articles. As illustrated in Table 1, the GT group achieved its highest accuracy in the historical section of article 1 (83.8%), outperforming the HT group by 22.0%. Furthermore, in article 2, GT maintained its superiority in both cultural and historical contexts. The Likert scale data supports these results as the higher mean for participants comprehension was for GT group (M=3.39). These findings indicate that GT reduces the cognitive load for the participants.

The machine translation output was indiscernible from the human translation for the participants in this study. Consequently, these differences were not significant enough to achieve statistical significance that would lead to meaningful findings. This suggests that Google Translate has reached a level of proficiency in the political domain that enables it to provide a comprehensible output to readers.

The rejection of the study hypothesis can also be examined through the perspective of Cognitive Theory of Translation, in which it emphasizes another crucial aspect beyond the text, which is the mental process of the receptor. As cognitive frameworks view comprehension as an active process of schema activation, rather than a passive intake of words. When participants encountered the three articles, they relied on their previous knowledge of politics, that is, their existing mental schemas, to overcome the gaps of GT's literal translation.

From a cognitive perspective, the effort required to interpret the machine translated version wasn't greater than for the human one. This explains the statistically equivalent results of the T-test, as the human brain demonstrated a high efficiency in comprehending the linguistic ambiguity via the surrounding context. Consequently, participants' cognitive processing provided the coherence of the GT's output. This encourages the notion that as long as Google Translate achieves a specific threshold of comprehensibility, the mental frameworks of the human brain can compensate for the slight lexical errors, contributing to successful understanding of the overall political context.

Table (2): Translation mapping and error description of the selected political terms (Qualitative analysis of GT translation):

No.	Political term	GT output	Dynamic/ contextual meaning	Types of error (Nida's classification)
1	Dissolution	ذوبان (chemical) (melting).	legally terminating a legislative body.	Formal equivalence error; interpreted as chemical breakdown not as a legal termination of a government.
2	Dispatch box	صندوق الإرسال (shipping box).	A podium for ministers to deliver speeches.	Literal translation; the term was translated as a physical object losing its symbolic meaning of a parliamentary podium.
3	First reading	القراءة الأولى (act) (of reading).	Introducing and notifying a new law.	Functional ambiguity; translated as the act of reading instead of a formal presentation of a law.
4	white paper	ورقة بيضاء (blank) (paper).	An authoritative report issued by the government.	Formal equivalence of a metaphorical expression, led to losing the meaning of a government policy proposal

5	Floor	أرضية (physical) (surface).	A formal room for business.	Formal equivalence error; literally translated as a physical surface instead of a room for conducting businesses.
6	Abstain	الامتناع عن (general) (refusal).	Refraining from voting.	Formal equivalence; interpreted as a general refusal not as refraining from voting.

While the quantitative results showed functional success of Google Translate, the qualitative analysis of the political terminology in Table 2 reveals the translation weaknesses by GT. The analysis of these 20 dictionary terms revealed that Google Translate reliance on literal translation (Formal Equivalence) becomes apparent when translating a word in isolation.

For instance, GT provided the Formal equivalence (literal meaning) of the term as ذوبان, which indicates a chemical breaking apart. While the term requires moving beyond the lexical match to interpret its functional impact to the target readers as Nida's theory [12], suggests concentrating on the intrinsic political meaning of the term rather than its direct meaning. In Arab politics, the term حل البرلمان is used frequently to refer to the end or an outgoing government. It could be considered as a dynamic equivalence of the term as Arabic readers will comprehend the intent behind this political term and preserve its contextual accuracy.

Literalism has also been applied to the term "dispatch box". This term represents a significant challenge for Google Translate. The machine translation system rendered the term literally as صندوق الارسال following the formal equivalence technique, which results in conveying the term as a physical object. It failed to capture its political meaning, as the "Dispatch box" is not just a container, it is a place designated for ministers to stand to deliver speeches. To achieve Nida's Dynamic equivalence, the functional message of the term must be conveyed. In Arabic, this could be achieved by translating it as المنبر or المنصة "منبر الحكومة" which highlights the podium role. This ensures that the target reader understands the political meaning beyond the term.

The machine translation system presented a formal word-for-word too of the term "First reading" as القراءة الأولى which is correct and widely used in Arabic legislative contexts. However, the term according to the Dictionary of Politics and Government [11], includes a more precise meaning of introducing and notifying of a new law, which in accordance with Nida's theory of equivalence [12], emphasizes the hidden meaning beyond this term. In order to achieve this dynamic effect, the translator must ensure that it is a reference to the commencement of a new law-making. According to the dictionary definition [11], it should be rendered within the context as التقديم الأولى لمسودة القانون.

While the machine translation system performed excellent in the translation of the political article as seen in the quantitative analysis as the translation was contextually supported, which indicates that the system still demonstrates limitations in translating isolated terms. In other words, the message of the source text would be comprehensible by the readers depending on the context, even if GT used awkward and literal equivalents of some words of that text.

From the perspective of Nida's theory [12], this supports the relationship between the message and the receptor. That is, Google Translate appeared to be a context-dependent translation tool which succeeded in achieving a Functional Equivalence at the paragraph level (a quantitative success), while it failed in achieving lexical accuracy at the word level (a qualitative failure). Eugene Nida [12], emphasised that the success of translation is not evaluated by matching the words to the original language (Formal Equivalence), but by the way the target audience responds to it (Dynamic Equivalence).

That is, Google Translate failed to capture the contextual meaning of the dictionary terms and consequently failed the "Formal Equivalence" test, while it rendered the three political articles clearly and comprehensively and passed the "Functional Equivalence" test. This also contributes to the rejection of the hypothesis which indicates that the Functional Equivalence can be achieved even in the absence of terminological precision.

Conclusion:

In conclusion, the study revealed that Google Translate (GT) is capable of transferring meaning and facilitating comprehension to a degree comparable to human translation when the translation is conducted within a context. However, human translation is still superior in terms of terminological precision and cultural awareness. The study aimed to compare the effectiveness of Google Translate and human translation in facilitating the comprehension of English political news articles, with focusing on cultural and historical references.

By conducting a mixed-method approach, the quantitative analysis of data concluded that Google Translate (GT) has reached a level of functional equivalence comparable to human translation, in the translation of English political news articles to Arabic. The statistical analysis of the T-test paired

samples of the three separate articles showed no significant difference in participants' comprehension of the translated articles.

This concludes that Google Translate (GT) is no longer a lexical substitution tool; it is rather evolved to a mechanism for effective message transmission. In contrast, the qualitative analysis of 20 selected political terms from a specialized dictionary revealed that Google Translate (GT) failed to achieve the dynamic equivalence, instead it applied literal translation ignoring the metaphorical nature of these terms. This demonstrates that while GT has succeeded in conveying meaning within context, it failed in translating isolated terms.

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