Translation Quality of Artificial Intelligence and Machine Translation Vs. Human Translation Utilizing MTPE Skills (An Empirical Study on Allusion Translation)

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Abstract:

Allusion is one of the culture-bound expressions that need careful consideration while translating. Machine translation (MT) and human translators (HTs) encounter difficulties in dealing with them. This study compares Translation Quality (TQ) of MT and Artificial Intelligence (AI) to HTs utilizing MTPE focusing on identifying the MTPE skills to keep HT in favor of MT and AI.

A quantitative and qualitative mixed method was adopted using a test of 30-item in-context English-to-Arabic allusions translated by Google Translate and ChatGPT and then given to a random sample of 40 HTs. The TQ of AI, MT and HT target texts were assessed following O'Brien's (2012) model. The participants wrote reports on MTPE skills and were involved in a focus group discussion to determine the MTPE skills used. *One-Sample t-Test*, *One-Way ANOVA* and POST HOC Test were used. Results show HTs utilizing MTPE are of *Moderate Quality* (60%), and MT and AI-based translations are of *Low Quality* (44.44% & 42.22%). HTs employ some MTPE skills and strategies that resulted in statistically significant differences between HTs of allusions compared to MT and AI in favor of HTs. The study recommends enhancing MTPE skills among translation students and implementing training for further developing translators.

Keywords: *Allusion translation, Artificial Intelligence (AI), Human Translation (HT), Machine Translation (MT), MTPE & Translation Quality (TQ).*

مقارنة جودة ترجمة الذكاء الاصطناعي ومحركات الترجمة الآلية مع ترجمة الإنسان: الحاجة إلى مهارات التحرير اللاحقة (دراسة تطبيقية على ترجمة الإشارات الضمنية (التلميح)

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الملخص:

تعد الإشارات الضمنية (التلميحات) أحد التعبيرات المرتبطة بالثقافة والتي تحتاج إلى مزيد من الاهتمام أثناء الترجمة. إذ تواجه الترجمة الآلية والمترجمون صعوبات في التعامل معها. تقارن الدراسة جودة ترجمات الترجمة الآلية والذكاء الاصطناعي مع ترجمة الإنسان مستفيداً من مهارات التحرير اللاحقة مع التركيز على تحديد هذه المهارات لإبقاء ترجمة الإنسان أعلى جودة من ترجمة الآلة والذكاء الاصطناعي. اتبعت الدراسة المنهج المختلط مستخدمةً اختباراً مكونا من 30 إشارة ضمنية في جمل سياقية لترجمتها من الإنجليزية إلى العربية أولاً بواسطة Google Translate و ChatGPT ثم تقديمها لعينة من 40 مشاركًا لترجمتها مستفيدين من مهارات التحرير اللاحق مع كتابة تقرير عن المهارات والاستراتيجيات والمصادر التي استفادوا منها، كما شاركوا في مجموعة نقاش مركزة. تم تصحيح النصوص الناتجة عن ترجمة الذكاء الاصطناعي و الآلة وتحليلها لتقييم جودة الترجمة وفقًا لنموذج O'Brien (2012). تم استخدام اختبار t لعينة واحدة، والتباين الأحادي، واختبار المقارنات البعدية المتعددة. تظهر النتائج أن ترجمة الانسان مستفيدا من مهارات التحرير اللاحق جاءت بجودة متوسطة (60٪)؛ بينما جاءت الترجمات الآلية والذكاء الاصطناعي ذات جودة منخفضة بنسبة (44.44٪ و42.22٪). استخدم المترجمون مهارات تحرير لاحقة أدت إلى فروق دالة إحصائية بين ترجمة الانسان مقارنة بترجمة الآلة والذكاء الاصطناعي. توصي الدراسة بتعزيز مهارات التحرير اللاحقة بين طلبة الترجمة وتدريب المترجمين عليها للمزيد من التطوير.

الكلمات المفتاحية: ترجمة الإشارات الضمنية، الذكاء الاصطناعي، ترجمة الإنسان، ترجمة الآلة، مهارات التحرير اللاحق، جودة الترجمة.

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Introduction

In the rapidly evolving translation industry, the integration of technology has sparked considerable debate regarding the quality of translations produced by artificial intelligence (AI) and machine translation (MT) systems compared to those produced by human translators, particularly when enhanced by machine translation post-editing (MTPE) skills. Machine Translation (MT) utilizes algorithms to render the source text from one language to another, leveraging vast databases of linguistic patterns and structures. While MT has significantly improved in recent years, its limitations become pronounced when tasked with translating non-technical texts, especially those rich in cultural references such as allusions. For Hutchins & Somers (1992), it is nearly impossible for MT systems to manage and predict all the necessary contextual information and background knowledge to accurately determine the meaning (and translation!) in every situation. Considering these issues, there were calls suggesting to use MT with human assistance. For them, human involvement can move between machine-aided human translation (MAHT) and human-aided machine translation (HAMT). In the former, the translator implements the translation and refers to e-sources to revise, edit, correct or improve. In the latter, the translator uses MT to perform the translation and helps to improve it. These two concepts were referred to as (CAT) tools.

Human translation (HT), on the other hand, inherently possesses the capacity for contextual understanding and cultural sensitivity, traits that are often critical in producing high-quality translations, Pym (2013). Recently, the incorporation of MTPE allows human translators to utilize MT as a preliminary tool, combining machine output speed with the nuanced understanding of human cognition. Despite the promising potential of this hybrid approach, the literature review may have overlooked a systematic comparison of translation quality across these methods, particularly in the realm of allusion translation.

Previous studies have often focused on the technical aspects of MT and AI, evaluating their performance in straightforward translation tasks without adequately addressing their effectiveness in conveying culturally embedded meanings. This gap highlights the need for a focused empirical study to specifically examine the intricacies involved in allusion translation to critically analyze the translation quality of AI and MT against that of human translators utilizing MTPE skills, focusing on the MTPE skills required to render allusions effectively.

Aims of the Study

Mainly, this study aims to compare the TQ of MT, AI-based translations with human translations utilizing MTPE with regard to the translation of Allusions.

Specifically, the following are sub-aims:

1. to determine whether there are significant differences among the mean scores of the translation quality resulting from MT, AI & HT utilizing MTPE for allusion translation.
2. to identify error types and the strategies used to render allusions from English into Arabic.
3. to specify the MTPE skills needed for translating allusions effectively.

Literature Review

Allusion Definition, Types & Translation

Generally speaking, Huges (2009) defined allusion as "something said or written that mentions a subject, person etc indirectly". Precisely, an allusion, "culture bump" as described by Leppihalme (1997), is a figure of speech that indicates intertextuality. According to Abrams (1957), an allusion is a brief reference to a person, place, event, or another literary work without explicitly identifying it. Leppihalme argues that understanding allusions requires more than just explicit knowledge; it requires familiarity with the specific culture. Allusions are considered culture-specific elements and can be challenging to translate successfully without the translator's knowledge of their references.

Academically speaking, allusions enhance the quality of writing serving as literary expressions that add ambiguity or exaggeration. Sometimes, as in social or political constraint situations, they help writers as hedging devices when direct speech is not feasible. Allusions hold a significant influence in convincing readers to accept the author's viewpoints, particularly when referencing religious texts or well-known literary works.

One of the prominent divisions of allusion is that of Leppihalme (1997). She divided them thematically into four types including religious allusions, historical allusions, literary allusions, mythological allusions and popular cultural allusions. The first type comprises images and passages from religious texts; the second includes historical events and historical periods; the third deals with figures, events and images from popular myths; and the fourth discusses recent historical and popular cultural moments. Bahrami (2011) adopted the classification of Leppihalme (1994) who attempted to systematize the strategies of key-phrase (KP) allusions and Proper noun allusions (PN) following specific translation strategies, in the form of a hierarchical decision process. For him, adopting a more creative and reader-oriented transliteral role would offer more variety of translation strategies and decrease 'culture bumps' in translations.

Several studies have investigated the translation of allusions such as Leppihalme (1997), Bahrami (2012), Tao (2013) and Samir & Moallemi (2023). They conclude that the translation of allusions needs literal or direct translation with rephrasing to explain the annotative meaning and the translator may need some strategies that help to refer to the exact meaning. In addition, Wakelin (2007) compares two

anonymous classical translations of De Consulatu Stilichonis by Claudian and Knyghthode and Bataile by Vegetius. Both poems seem to reflect the dynastic troubles and 'Wars of the Roses' of the mid-15th century. In both translations, there is an intellectual vagueness of the translation of allusion and how it leads to unpredictability of the reading process, essential to translation; complicate or transform 'propaganda'.

Concerning translation strategies of allusions, we have to admit that we are translating literary-specific-cultural expressions. Thus, literal translation cannot help rendering their meaning into the TL because of cultural relational connotation. Both linguistic and extralinguistic factors that affect the text to be reproduced into another language have to be taken into account, (Al-haj et al, 2021). In general, Lawrence Venuti (1998) proposes two main approaches to translation strategies: domestication and foreignization. Domestication involves translating a text in a way that aligns closely with the cultural values of the target language, aiming for fluency, transparency, comprehension, and readability. On the other hand, foreignization focuses on preserving the cultural values and characteristics of the source language, highlighting the foreignness of the source text in the translated text. It seeks to incorporate the linguistic, stylistic, and cultural aspects of the source text into the target language.

Translation strategies still have no borders and sometimes they can be used one after another. Different terms were coined by different scholars. For Jibreel et al (2016) scholars divide translation strategies into two main types regardless of their terminological controversy. When this concept is discussed, we remember scholars like Vinay and Darblnet (1958), Newmark (1988) Venuti (1998), Pedersen (2007), Baker (1992) and Ghazala (1995).

Precisely speaking, Leppihalme (1997) proposes several strategies to translate the allusions that come in the form of proper nouns (PN) or key phrases (KP). In the former, these strategies include name retention, name replacement and omission of the name. Under each strategy, there are several sub-strategies or procedures. For the latter i.e. (KP), she suggests some strategies such as using standard translation; literal translation (minimum change); adding extra-allusive guidance to the text; providing additional information via footnotes and endnotes; introducing textual features that indicate the presence of borrowed words; replacing it with a performed TL item; rephrasing the allusion with a clear expression of its meaning; re-creating the allusion by creatively constructing a passage that reproduces its effects; and omitting the allusion completely.

MT & AI Translation

The idea of machine translation (MT) goes back to "(1949) when Weaver introduced Americans to the idea of using computers for translation", Hutchins (2003). From that time on, there have been increasing developments in MT that generate the impression that translators will be out of their jobs. This impression is now being

strengthened by AI translation technology, such as ChatGPT service. It backs into mind the idea of "the extremist concept of Fully Automatic High-Quality Translation (FAHQT)" which was dominant in "the first period of MT development", Austermuhl (2014:157). AI translation is one advanced form of the machine translation process that works utilizing intelligent behavior. As a result, it can analyze, understand and render an ST into another TL. In both services, developers try to minimize human involvement degree. However, "MT still needs to be supervised by human translators. So, what does the future hold for AI translation?", García (2022). Recently, using MT and AI in translation is characterized by its easiness, efficiency and reliability, in some wide cases.

ChatGPT is an AI model that uses natural language processing (NLP) techniques to translate text between various languages. It has evolved from early rule-based systems that relied on predefined grammatical rules and dictionaries to statistical machine translation (SMT) in the 1990s. However, it still struggles with context and fluency. The introduction of neural machine translation (NMT) marked a turning point, as it allowed models to learn to translate whole sentences rather than individual words, improving coherence and context. ChatGPT's role is to understand and generate text in multiple languages effectively, maintain context over longer conversations, and refine its translation quality through continuous interaction with users. It offers multilingual support, contextual awareness, and adaptability, making it a versatile tool for global communication. However, it faces challenges such as ambiguity and cultural nuances, which could lead to potential inaccuracies in translation. Despite these challenges, ChatGPT continues to advance in AI translation capabilities.

Machine translation and AI have become one of the threats as well as opportunities for human translators. Some voices claim that MT & AI may carry out some translation of ST in an excellent way. Recently, many scholars have focused on MT and MTPE, among them are Cholewska (2021) and Ginovart and Colominas (2020), Hutchins (2001), Hutchins (2003), Jibreel (2023), Kocmi, et al (2022), Lee and Liao (2011) and Zou (2022). Lyu, et al (2023), Qiu, et al. (2019) compared MT to HT and found a great development of MT that should be taken into consideration. For Shin and Kim (2017), the emergence of an artificial intelligence translation system with its interactive advantages that you may explain the context to it, and it can create another direction of improvement in which a human is still the dominant. In addition, Zhao, et al (2023) have attempted an evaluation of the translation quality of ChatGPT and got significant results. Moreover, Xiao (2021) compares AI translation to manual translation. They found that AI translation is challenging to quickly improve due to its reliance on sound input, making it difficult to fully comprehend and accurately translate information. In contrast, manual translation benefits from using multiple senses to comprehensively judge and analyze information, resulting in more precise and accurate translations. However, in formal occasions with high