

Open
AccessCheck for
updates

RESEARCH ARTICLE

Section: *Literature, Linguistics & Criticism***Translating culture through AI: Evaluating the performance of ChatGPT and Gemini in rendering Arabic and English proverbs**

Eman Alshammari

¹Department of English Language and Translation, University of Hail, SA*Correspondence: ema.alshammari@uoh.edu.sa**ABSTRACT**

The use of artificial intelligence in various areas is a growing phenomenon. Translation is a field that has long been associated with machine assistance and automation. This study examines AI translation tools' abilities to adequately transfer meaning culturally and functionally beyond word replacement. For this purpose, a sample of 50 proverbs was selected due to their cultural non-literal sense. The prominent AI tools, namely Gemini and ChatGPT, were selected as translation programs due to their growing use, especially in translation. The analysis worked with Arabic and English, each serving as both source and target languages. The results showed that the translation program and translation direction influenced the outcomes. Additionally, the quantitative analysis showed that among literal translation, paraphrasing, and cultural substitution, GPT was most likely to employ the first strategy while Gemini showed a tendency for the last. Furthermore, GPT showed a more balanced distribution of strategies even across languages. Meanwhile, Gemini's strategy use varied especially when comparing the use of paraphrase in each direction. The qualitative analysis indicated that Gemini outperformed ChatGPT. The analysis also showed that cultural substitution has the highest potential in recreating the function of the ST, while literal translation was most likely to cause translation loss. Moreover, the programs, especially ChatGPT, could still commit translation errors that modified sense even when employing strategies like paraphrase and cultural substitution as they lack cultural nuance and critical thinking skills. The study recommends the development of parallel corpora that contain culturally equivalent idioms based on usage, so people do not rely on programs that may fall short in transferring meaning.

KEYWORDS: translation, artificial intelligence, ChatGPT, Gemini, idiomatic expressions, proverbs, translation strategies, English, Arabic

Research Journal in Advanced Humanities

Volume 7, Issue 2, 2026

ISSN: 2708-5945 (Print)

ISSN: 2708-5953 (Online)

ARTICLE HISTORY

Submitted: 04 January 2026

Accepted: 30 March 2026

Published: 09 April 2026

HOW TO CITE

Alshammari, E. (2026). Translating culture through AI: Evaluating the performance of ChatGPT and Gemini in rendering Arabic and English proverbs. *Research Journal in Advanced Humanities*, 7(2). <https://doi.org/10.58256/gr2cyp24>



Published in Nairobi, Kenya by Royallite Global, an imprint of Royallite Publishers Limited

© 2026 The Author(s). This is an open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. Introduction

Proverbs are brief, popular sayings which compress the wisdom of the community (Shuhaiber & Haider, 2023). They have themes such as wisdom, love, and family. Proverbs serve as windows into a culture, providing insight into how people think and live (Jibreel, 2023; Madani, Abusalim, & Rayyan, 2023). Proverbs express common values and worldview, which can be conveyed through metaphor or allegory (Bachrun, 2023; Khelf, 2021). Their meaning may depend on the context and different languages.

Translation is not only linguistic, but should make an attempt to portray the cultural connotation and conceptual nuances of the original text (Farghal & Al-Hamly, 2015; Thalji & Dweik, 2015). Metaphorical language, regional variation and dependence on context hamper the translation of the Arabic proverbs, especially literal ones, which are often inadequate (Abu Rumman et al., 2023; Al-Hamzi et al., 2023; Farghal, 2020).

Even with the developed machine translation tools, these difficulties still remain (Al-Darabee & Farghal, 2025; Bex, 2025; Bui, 2025; Darwish et al., 2025). Although the topic of AI-powered translation attracts growing attention, there is little research that compares the AI-powered machine translation of proverbs between Arabic and English (Fadhel, Alyami, & Almahasees, 2025; Filip & Pavol, 2025; Kwok et al., 2025; Shalevska et al., 2025). This study examines whether AI-generated translations of proverbs tend to rely on word-to-word translations and ignore culturally relevant translations, which leads to the misinterpretation of meaning.

This study attempts to answer the following research questions:

- What translation strategies do ChatGPT and Gemini employ when translating proverbs?
- How effectively do these strategies convey the cultural meanings and nuances embedded in the source language?

2. Theoretical Framework

2.1 Artificial Intelligence (AI) and Translation

Artificial Intelligence (AI) has become a transformative force in the field of translation, reshaping both theoretical perspectives and professional practices (Al-Darabee & Farghal, 2025; Fadhel et al., 2025; Filip & Pavol, 2025; Shalevska et al., 2025). Early machine translation systems relied on rule-based approaches that attempted to encode linguistic knowledge explicitly; however, these systems were limited in handling linguistic variability and contextual nuance (Mirzoyeva, 2023; Öner Bulut & Alimen, 2023; Son & Kim, 2023; Yamada, 2023). The shift toward data-driven paradigms, particularly statistical machine translation and later neural machine translation, marked a significant evolution by enabling systems to learn patterns from large corpora rather than relying solely on predefined rules (Almahasees, 2018, 2021; Almahasees, 2017). This transition reflects a broader movement in translation studies toward recognising the role of probabilistic modelling and large-scale language data in shaping translation outputs.

Recent scholarship on AI-mediated translation and audiovisual localization highlights persistent cultural and linguistic challenges, particularly in rendering idioms, humor, and culturally bound expressions across English and Arabic contexts (Ahmad, Haider, & Saed, 2025; Akasheh et al., 2024; Al-Momani et al., 2025; Alquda et al.; Debbas & Haider, 2020; Haider & AlKhatib, 2025; Haider et al., 2025; Haider, Saideen, & Hussein, 2023; Haider & Shohaibar, 2024; Obeidat et al., 2024; Saed et al., 2024; Saideen et al., 2024). Collectively, these studies demonstrate that while AI tools such as ChatGPT and Gemini show growing competence in translation and subtitling, they still struggle with culturally nuanced content, requiring human intervention to ensure accuracy, audience acceptance, and cultural sensitivity.

The emergence of neural machine translation (NMT), powered by deep learning architectures, has significantly enhanced the fluency and coherence of automated translations. Unlike earlier approaches, NMT systems process entire sentences or sequences, allowing them to capture contextual dependencies and produce more natural-sounding target texts (Almahasees, 2018, 2021; Almahasees, 2017). Models based on transformer architectures have further improved performance by enabling attention mechanisms that weigh the importance of different elements within a text. As a result, AI-driven translation systems are increasingly capable of approximating human-like language production, particularly in high-resource language pairs (Al-Salman & Haider, 2024; Chan & Tang, 2024; Haider et al., 2024; Rane, Choudhary, & Rane, 2024). However, these advances also raise important questions regarding consistency, interpretability, and the handling of culturally embedded meanings.

Recent developments in large language models (LLMs) have extended the capabilities of AI in translation beyond sentence-level processing to more flexible and adaptive forms of text generation (Mohsen, 2024). These models can perform translation tasks alongside other linguistic operations, such as summarization, paraphrasing, and stylistic adaptation. Their ability to incorporate broader contextual information and respond to prompts has opened new possibilities for dynamic translation practices, including the customisation of outputs for specific audiences or dialectal variants (Haider et al., 2024). This shift challenges traditional distinctions between translation and other forms of language mediation, suggesting a more integrated and multifunctional role for AI in language processing.

Despite these advancements, the integration of AI into translation raises critical theoretical and ethical concerns. One key issue involves the representation and reproduction of cultural meanings, as AI systems are trained on existing textual data that may reflect dominant ideologies or biases (Campeato, 2024; Chan & Tang, 2024; Donthi et al., 2024; Farghal & Haider, 2024). Consequently, translations generated by AI may inadvertently perpetuate stereotypes or fail to adequately account for cultural specificity. Additionally, the opacity of many AI models complicates efforts to evaluate their decision-making processes, making it difficult to assess the reliability and accountability of their outputs. These concerns highlight the need for ongoing critical engagement with AI technologies within translation studies.

2.2 Translation Strategies

Conveying the meaning between languages is a complex task. Translation as a process will generally involve different translation strategies, depending on a whole lot of contextual factors, such as text type, audience, and author. Sometimes translators face quite serious difficulties in bringing across a message from one language into another because of cultural, linguistic, and social differences between the two languages. Therefore, they resort to translation strategies, which are translation methods used to address the challenges that occur. Several studies have explored the subtitling of culture-bound expressions using various approaches and strategies, including literal translation (complete or partial), paraphrasing, cultural substitution, and omission.

2.2.1 Literal Translation

Literal translation is also known as direct or word-for-word translation. It is the transference of a text from the SL into the TL as closely as possible, without adhering to the SL structure. According to Newmark (2003), this strategy is the first strategy performed by translators in the early stages of the translation. However, literal translation is not always successful, as there is a clear linguistic gap between languages, and each one has its own unique words and expressions that cannot be translated into another language simply by using equivalent words (Tanjour, 2011). Shen (1989) notes that the literal translation strategy is “Word translation plus syntax transplantation, imposing source language’s peculiar syntax on translation language words, treating translation language as a syntactically unpatterned system.” While taking into consideration the linguistic conventions of the target language, literal translation ignores the semiotic, pragmatic, and contextual connotations of text structure (Shiyab, 2017). Li et al. (2024) similarly affirmed that literal translation may cause translation loss, especially when working with non-literal source texts such as idioms.

2.2.2 Paraphrase

Translators use the paraphrase strategy to support linguistic naturalness and provide a high level of accuracy while maintaining the meaning. It is defined by Danielsson (2007) as a statement, phrase, or single word that is expressed in other words. This strategy is also known as translation and explanation (Yang & Wang, 2019). According to Bailey (2003), the goal of paraphrasing is to keep all the meaning of a text while drastically altering it from the original. Paraphrasing is used when a translator chooses to preserve and convey the core meaning of the source text to its closest equivalent in the target text, even at the cost of altering its form. Baker (2018) classifies paraphrases into translation by paraphrase using a related word and translation by paraphrase using unrelated words.

2.2.3 Cultural Substitution

Cultural substitution involves the replacement of an item or expression in the SL with another in the TL. It is

defined by Halliday and Hasan (2014, p. 89) as “A relation within the text. A substitute is a sort of counter used in place of the repetition of a particular item”. By using this strategy, the TL audience is presented with a concept that they can relate to and find familiar. Nida (1975) argues that substitutions are correct if the substitution in question serves to identify the same constituent without introducing contradictory or additional features not already implied in the original context. However, Hoang and Oanh (2025) note that this strategy should be avoided, as it could result in overgeneralizations or simple misunderstandings, and the audience might suspect an error occurred in translation (Xia, Amini, & Lee, 2023).

2.3 Empirical Studies

In a study that considered the translations of Arabic proverbs and poetry using Google Translate and Systran, Malika (2016) concluded that the two systems did not succeed in maintaining the stylistic elements, the sentence structure, and the unspoken meanings, and tended to misinterpret cultural content. Equally, Al-Al-khresheh and Almaaytah (2018) examined the translation of English to Arabic proverbs in the machine translator and discovered that the ambiguity of lexical meaning and the structural variation in two languages led to poor and unnatural translation, which requires the involvement of human beings.

In translating proverbs between Arabic and English, Jibreel (2023) analysed five machine translators online and realised that Bing was able to give a fairly acceptable translation, whereas all the systems did not satisfy the intended cultural meaning and mostly produced flawed or poor structures. Musaad and Al Towity (2023) evaluated three machine translation systems when translating idiomatic expressions in press releases and concluded that Bing was more accurate than the other systems, but none were consistently accurate, and all systems handled idioms without taking the context into account. Similarly, Qassem and Aldaheri (2023) investigated the translation of dialogue acts between English and Arabic and discovered that machine translation systems experienced a challenge in grasping intended meaning especially when idiomatic expressions and contextual clues were factored into the issue.

Mohammed, Ghassemiazghandi, and Jamal (2023) studied the neural machine translation (NMT) in Arabic literary texts translations and discovered that NMT systems could not sufficiently translate idiomatic and cultural meanings, thus post-editing was conducted by humans to control accuracy and fluency. In the same fashion, Mughal et al. (2024) conducted a corpus-based research on the translation of idioms into various languages and discovered that AI systems often turned to literal translation principles, especially with culturally bound expressions, and could not distinguish between contextual and cultural appropriateness, though they correctly translated more transparent phrases.

Shalevska et al. (2025) compared the performance of ChatGPT, Gemini and DeepSeek when translating Macedonian idioms and discovered that, despite the better language accuracy, the models were over-reliant on literal or explanatory translations and could not generate an idiomatic equivalent, especially in situations with polysemy and stylistic characteristics. A study by Darwish et al. (2025) analyzed the translation of Jordanian idioms through ChatGPT and observed that the vast majority of results were relatively literal with few figurative and culturally relevant translations, but the system demonstrated excellent grammatical and efficiency.

In a comparison of Google Translate and Gemini when translating Arabic idiomatic expressions into English, Tannous and Haider (2025) discovered that both systems had a high likelihood of literal translation with a rather low number of culturally modified or figurative translations. Another finding of the study is that the users admitted that AI tools were more convenient, but that they did not think that they could deal with culturally sensitive language, which means that AI translations have to be corrected by people to ensure their accuracy and cultural suitability.

3. Methodology

3.1 Why Arabic and English proverbs?

Arabic and English were selected as they provide a highly context-rich and contrasting testbed in investigating how AI can process culturally embedded expressions. Arabic is an ancient Afro-Asiatic language and has approximately 319 million native speakers; it is the language of the Qur'an and the lingua franca of North Africa and the Middle East. Its tradition of proverbs is over fourteen centuries old, and contains dozens of dialects; these sayings are repositories of the experience of the people and cultural values. Their translation

into the English language is not easy since Arabic and English are linguistically unrelated and vastly different in terms of vocabulary, grammar and style. English is, on the other hand, the lingua franca of the world, having approximately 379 million first-language speakers and over 700 million second-language speakers all over the world. English proverbs are brief, popular sayings that express general truths; scholars remark that they keep cultural wisdom and help to understand one another. Their proverbs are a perfect match to the study of translation as the idioms used in both languages are extremely context-dependent and cannot be translated literally to retain their meaning, and, as a result, translators (and AI models) have to overcome cultural references and the differences in sentence-structure and dialect of the languages. An analysis of the Arabic and English proverbs thus emphasises general themes of humanity and the challenges that AI has encountered in the process of balancing two significant global languages.

3.2 Data Selection

In this work, the dataset includes 50 Arabic (25 of them are proverbs in Arabic and 25 in English) and 25 English proverbs, which were chosen to reflect the proverbs that are commonly known and used in both cultures. The source of the Arabic proverbs was large collections and thematic lists (such as 1,001 Arabic Proverbs with English Translation of AramcoWorld and the cross-dialect collection of Industry Arabic). The editors of the AramcoWorld opine that Arabic proverbs are fourteen hundred years old; they also comprise the classical and modern dialects, and they serve as reservoirs of group experiences and common sense, and hence, they must be succinctly and wittily expressed to become popular. The collection of Industry Arabic also notes that proverbs are found in similar forms in all Egyptian, Levantine, Moroccan, Iraqi and Gulf Arabic, indicating the similar cultural background of the Arab world. In order to capture this heterogeneity, the 25 Arabic proverbs in our data set were chosen based on books, scholarly research, and mainstream blogs, so that various dialects and themes were represented. In the case of the English component, we gathered 25 proverbs from good dictionaries and lists. An English proverb can be described as a brief, popular saying which conveys a commonplace truth or practical thought. According to scholars, proverbs are a special linguistic phenomenon which has a role in spreading wisdom and moral values and enhancing language as well as understanding other cultures. The final corpus offers a balanced and cross-cultural collection of idioms and proverbs by gathering popular examples through diverse sources, which can be used to assess the translation of culturally embedded language by AI models.

3.3 Investigated AI tools

3.3.1 ChatGPT (GPT)

ChatGPT is an open AI created by OpenAI that is based on the GPT line of large language models. The model is trained on a combination of supervised fine-tuning and human feedback with the help of reinforcement learning, where the model is allowed to dialogue and respond to follow-up questions, make mistakes and deny inappropriate requests as well. In more recent versions (e.g. GPT-5.2), information-seeking and translation abilities were improved, and the answers given are more context-specific and clearer to technical writing and language translation problems. Empirical evidence suggests that ChatGPT could be more successful in the translation of culturally specific phrases than the usual machine translation systems: in a study on Palestinian idioms published in 2025, ChatGPT achieved an average score of approximately 70 per cent accurate translations of idioms, versus 48 per cent on Google Translate, although the translation of idioms is difficult and usually requires human post-processing. All these characteristics render ChatGPT a topical resource to study the way AI treats cultural idioms and proverbs.

3.4 Gemini

Gemini is a set of multimodal AI models at Google aimed to process text, image, audio and video inputs. The flagship Gemini Ultra model, as mentioned in the technical report of Google, has state-of-the-art performance on language tasks, including machine translation, it ranked higher in the WMT 23 benchmark with higher BLEURT scores on both high and low resource languages. In December 2025, Google merged the best translation features developed by Gemini into Google Translate, allowing Google Translate to experience translation of text more naturally, better interpretation of idioms and slang, and speech-to-speech translation in real time via headphones.

3.4.1 Prompt

The translation task had one common prompt in both AI systems to minimise the variation and guarantee the reproducibility. Each proverb was brought out one by one with the prompt: “*Translate the following proverbs into Arabic (or English)*”. In the case of the 25 Arabic proverbs, English was the target language, and Arabic was the target language in the 25 English proverbs. The prompt did not include any cultural or contextual cues, such that the responses of the models were influenced by their internal interpretation of the proverb as opposed to any information provided by the researcher. This strategy is based on recent research in machine-translation that found that using simple and general prompts could give an objective evaluation of the baseline translation capacity of an AI model.

3.4.2 Study procedures

The procedures in this study are as follows:

- Collecting 25 popular English proverbs and 25 Arabic proverbs from different websites and resources.
- Translating the collected data using ChatGPT and Gemini.
- Analysing the translation output in terms of three strategies: literal, paraphrase, and substitution.
- Comparing the performance of ChatGPT and Gemini in terms of whether they are close to the target culture.

4. Data Analysis

4.1 Quantitative Analysis

This section displays and discusses the frequency of the use of the three translation strategies by Gemini and ChatGPT in both translation directions, from English to Arabic and from Arabic to English. Table 1 contains the number of times the strategies were used in each category, as well as the percentage this number represents of the total. Below the table, the frequencies are compared, and their implications are discussed.

Table 1: Strategy frequency by program and translation direction

Strategy	Gemini Count (Eng→Ar)	Gemini %	Gemini Count (Ar→Eng)	Gemini %	GPT Count (Eng→Ar)	GPT %	GPT Count (Ar→Eng)	GPT %
Literal Translation	5	20%	9	36%	9	36%	10	40%
Paraphrase	8	32%	3	12%	9	36%	8	32%
Cultural Substitution	12	48%	13	52%	7	28%	7	28%
Total	25	100%	25	100%	25	100%	25	100%

Literal translation is the most straightforward strategy for translation, as it works with the words and structures of the ST. This strategy produces renditions based on the semantic aspects of the components of the text. As a result, the quality of the renditions employing this strategy can be attributed to the directness of the ST and the overlap between source and target languages and cultures. These qualities of literal translation make it unsuitable for non-literal cultural expressions in most cases. However, its direct nature also increases its use, especially in machine translation. AI systems are more advanced and should be able to employ more diverse strategies.

The data showed that the use of this strategy by the two programs ranged from moderate to frequent. The table shows four categories based on the program and translation direction. In three of these categories, literal translation was used in 9-10 examples, making up 36-40% of all the translations. GPT’s Ar-Eng renditions displayed the highest use of this strategy. Additionally, in both translation directions, the data indicated that literal translation was the most used strategy by ChatGPT.

For Gemini, other strategies exceeded literal renditions in use. This is especially noticeable in its Eng-Ar renditions, where it was only used 5 times, making up just 20% of the renditions. These numbers make it the least common strategy in this category.

The data therefore indicates that both program and translation direction influence translation strategies, with translation direction having a bigger impact in Gemini for this strategy.

Literal translation prioritises the wording of the ST, matching style even if sense is sacrificed. On the other side of the spectrum, paraphrasing prioritises sense even if that requires altering the wording or abandoning the original phrasing altogether.

With Gemini, this strategy was used more than literal translation when translating from Eng-Ar, yet less frequently when translating from Ar-Eng. Gemini paraphrased 8 of the examples, or 32% in its Eng-Ar renditions. Gemini paraphrased only 3 examples, or 12%. These statistics indicate that while Gemini employs paraphrasing moderately in the first direction yet avoided it in the second.

Meanwhile, GPT showed more consistency between both directions, employing it 9 times (36%) in its Eng-Ar renditions and 8 times (32%) in its Ar-Eng renditions.

The final strategy that can be utilised for the rendition of idioms is cultural substitution. This strategy aims to recreate the impact and function of the ST, retaining both sense and idiomatic nature. Like paraphrasing, this strategy does not prioritise ST wording; however, it is characterised by its cultural adaptation of the text, which reduces the stylistic and translational loss that occurs in paraphrasing. As a result, this strategy is considered the strongest when rendering idiomatic expressions.

Gemini employed this strategy in nearly half of the examples. In the Eng-Ar renditions, it was used in 12 examples (48%), and in the Ar-Eng renditions, it was used in 13 examples (52%). These numbers indicate that this was the strategy most used by Gemini, suggesting high capabilities in idiom translation.

In contrast, for both languages, GPT only used this strategy 7 times (28%). This indicates that GPT is at a lower level when it comes to idiomatic translations that recreate the nuances of the ST.

The quantitative data, therefore, suggest some findings. The first is that each program showed different tendencies regarding the frequency of the employment of each strategy. Gemini employed cultural substitution at the highest rate while GPT used literal translation most frequently. The results also showed that GPT had higher consistency in strategy use, employing the different strategies at a mostly balanced rate. The results also showed that translation direction influenced strategy frequency. This influence was more prominent in the renditions of Gemini. This suggests that the training and data of GPT are more consistent among these languages, while for Gemini, the strengths in this area vary.

4.1 Qualitative Analysis

Idioms contain two types of meanings: the literal semantic meaning of their components, which often does not reflect the reason for the idiom’s usage, and an intended meaning that reflects its function based on cultural usage. As a result, there are multiple approaches to the translation of idioms, including literal translations, paraphrases, and cultural substitution. This section discusses the quality of renditions produced by these strategies.

4.2 Gemini English-Arabic

Table 2 shows examples of Gemini’s use of literal translation, which reflects the surface meaning of the idiom by translating the components of the ST. The analysis below discusses the effectiveness of such renditions in translating idioms for the target culture.

Table 2: Gemini literal renditions Eng-Ar

#	English Sentence	Arabic Translation
1	During the meeting, the professor reminded the students that knowledge is power.	بالظلا روس يفوربال ركذ ، عامتجال لال خ قوق مل عمل ناب
2	We solved the issue quickly because two heads are better than one.	نم ريخ ناي ار نال عرسب فل كشمل ان لل ح دحاو ي ار
3	The teacher reminded the students that necessity is the mother of invention.	عارتخال ام ةجال ناب بالظلا مل عمل ركذ

Example 1 contains the idiom “knowledge is power” that uses a metaphor to convey the benefit of knowledge and education. Gemini rendered this expression literally without any modifications or substitutions. The resulting rendition is understandable as the metaphor is simple. Yet, the line could still sound unnatural to the target audience and may require some cognitive effort to decipher. Arabic contains the idiom “knowledge is

light”, which also employs metaphor to convey the benefit of knowledge. Though the exact metaphor differs in the two idioms, both function similarly in their cultural contexts. This example shows the difference between literal and functional equivalence.

Example 2 showcases how literal translation can increase naturalness through slight modification while mainly adhering to the ST wordings. The idiom suggests that collaborative cognitive effort can produce better outcomes than the limited perspective of one individual. Instead of directly using the term “opinion”, the idiom employs metonymy, representing thought with “heads”. In its rendition, Gemini retained the structure and terms of the ST faithfully, with one distinction, the substitution of the metonymy with its intended sense. By prioritising connotation over denotation, the text is adequately rendered for the target audience without the introduction of confusing and unfamiliar elements. This issue of unfamiliarity is absent from the ST due to the fixed form of idioms, which removes the need for analysis by the receiver. This example thus displays how cultural adaptation may be applied even within literal renditions, improving the effectiveness of the strategy. Example 3 shows an instance where literal and cultural renditions overlap. Gemini directly transferred “necessity is the mother of invention” without any modification. Yet, since this idiom is used regularly in both languages, the rendition is culturally appropriate.

These examples indicate that there is variation in the acceptability, clarity, and naturalness of literal renditions. This is determined by the degree of alignment and mismatches of linguistic and cultural elements between the source and target items. As a result, some renditions may require modification while others may benefit from it. Finally, some idioms may be translated directly and still resonate with the target audience.

While literal translation focuses on the wording of the ST, paraphrasing provides a means to reflect the second meaning type found in idioms by breaking free from ST structures and conveying the intended meaning of the idiom. Table 3 and the analysis below show how Gemini used this strategy.

Table 3: Gemini Ar-Eng paraphrase

#	English Sentence	Arabic Translation
1	Sarah tried to finish the whole project in one night, but Rome wasn't built in a day.	،تدحاو قلي يف هلمكأب عورشملا ءاهنإ قراس تلوواح قلي لو موي يف ميظع ءيش ءان ب متي ال نكلو
2	She stopped checking her friend's messages because curiosity killed the cat.	دق لوضفلا نأل اهتقي دص لئاسر دقت نع تفقوت بع اتملا بلجي
3	The experienced engineer solved the problem quickly, proving that old is gold.	تثبت أمم ءعرسب قلكشملا لحب ري بخل سدنملا مق أمئاد لضفأال وه مي دقلا نأ

Example 1 contains the idiom “Rome wasn’t built in a day”, which indicates that high-quality results require extended effort and time and cannot just be produced spontaneously. Here, the Roman Empire acts as a stand-in for the project being discussed. Outside of this idiom, Rome is not regularly used as a semantic substitute for greatness, indicating this meaning is strictly culturally idiomatic. As a result, direct transfer is not a feasible option for a logical TT. Therefore, the idiom was paraphrased, replacing the symbolic depiction with its intended sense. This rendition thus recreates the meaning of the ST for the target audience adequately; however, its idiomatic nature is lost in the process. Additionally, “overnight” was rendered as “in a day and night” following Arabic language conventions, showing how naturalisation does not always entail the introduction of idiomatic qualities in the TT.

Example 2 warns against the unwanted consequences of curiosity. In the idiom, a cat serves as the subject, with the consequence being death. The use of this idiom refers to people and not animals, and the negative outcome encapsulates a broader sense than death alone, which is not necessarily as extreme. To transfer this meaning properly, the idiom was paraphrased as “curiosity brings about hardships”. Like the previous example, paraphrasing enabled Gemini to encapsulate sense, yet resulted in stylistic loss. To reproduce idiomatic qualities and retain sense, cultural substitution was possible with the TL idiom “لخذت نم” (Those who get involved with what does not concern them, meet what does not please them).

Example 3 contains the idiom “old is gold”, which reaffirms the quality of either an experienced individual or a tried and tested item. What is old has known properties, making it reliable, while what is new represents uncertainty; it may have potential, but it may also be ineffective. This idiom is rendered “what is

old is always better”. This rendition also emphasises the quality of the familiar and the experienced, yet differs from the ST in that it depicts the old as superior and not just reliable. This example shows that even with paraphrasing, the strategy that prioritises sense, shifts may still occur.

The final strategy is cultural substitution, which, like paraphrasing, focuses on the sense of the idiom rather than its structure and wording. What characterises this strategy, however, is its idiomatic qualities. Table 4 contains select examples of Gemini employing cultural substitutions in its English-Arabic renditions. The analysis below discusses equivalence degrees and types in relation to wording and meaning in this strategy.

Table 4: Gemini cultural substitution Eng-Ar

#	English Sentence	Arabic Translation
1	Learning a new language can be challenging, but practice makes perfect.	مَلَعِي رَارِكْتَلَا نَكَلُو، أَبْعَصْ أَرْمَأْ تَدِيدَجْ عَغْلْ مَلَعَتْ نَوَكِي دَقْ رَاطِشَلَا.
2	Losing my job helped me find a better career; every cloud has a silver lining.	لَضْفَأْ قِيْنَهْمْ قَرِيْسِمْ يَلَعْ رُوْثْعَلَا يَفْ يَتْفِيْظُوْ نَادِقْفْ يَنْدَعِاسْ. عَفَانْ قَرَاَضْ بَرَفْ.
3	The new employee kept interrupting others, and his colleague warned him that silence is golden.	إِذَا نَأْبْ مَلِيْمَزْ مَرْدَحُو، نِيْرَخْ أَلْ عَطَاقْمْ يَفْ دِيْدَجْ لَ فِظُوْمْ لَ رَمْتَسَا بِهَذَا نَمْ تَوَكْسَلَا فِ تَضْفْ نَمْ مَالِكْلَا نَاكْ.
4	When the rumor spread across the office, it proved that bad news travels fast.	رَا بَخْ أَلْ نَأْ كَلْ ذَتْ تَبْتَأْ، بَتَكْمَلَا يَفْ عَاشْ إِلَا تَرَشْتِنَا اِمْدِنَعْ مِيشْ طَلَا يَفْ رَا نَلَاكْ رَشْتِنَتْ قِيْسِيْلَا.
5	My uncle refuses to learn social media; you can't teach an old dog new tricks.	بَاشْ اِمْدَعْبْ فِ؛ يِعَامِتْ جَالَا لَصَاوْتَلَا لِيْ اَسُو مَلَعَتْ يِمَعْ ضَفْرِي بَا تَكْلَا مَوْدُو.

Example 1 contains the idiom “practice makes perfect”, which suggests that repeated attempts can be used to hone and develop skills until they reach the desired standard. To transfer this meaning of perfecting skill through practice, Gemini employed the Arabic idiom “repetition teaches smarties”. Both idioms contain a similar sentiment that suggests that improvement can be achieved by doing the same thing multiple times. There are slight differences between the two phrases. The first is the difference between “practice” and “repetition”. The first implies training, emphasising the effort put into improvement, while the second simply highlights the recurrence. In fact, there is no indication that this repetition is of an action, and it could be a repetition of words and information. The second difference is the result. In the English idiom, practice is said to produce perfection; the goal is not just improvement but mastery. Meanwhile, the Arabic idiom simply indicates that repetition facilitates learning. Furthermore, in this sentence, the personified repetition acts as the subject with the learners being the object. These learners are also described positively with a colloquial term that suggests intelligence, yet in a playful manner.

However, the two idioms carry out the same function and are used in similar contexts. Thus, despite differences in the nuance of the sense and wordings of the source and target texts, the rendition is considered of high quality as it retains functionality, naturalness, and idiomatic features. This example highlights the distinction between types and degrees of equivalence when it comes to the rendition of idioms.

Example 2 contains the idiom “every cloud has a silver lining”. This idiom uses metaphorical imagery to evoke an optimistic outlook. In this idiom, clouds represent hardship that blocks the sun, which represents positivity. The silver lining represents the slight visibility of the sun behind these clouds, indicating that hardships do not remove positivity but simply obscure it from vision. To render this phrase, Gemini substituted it with the Arabic idiom “perhaps a beneficial harm”. Both source and target idioms relate to optimistic outlooks during times of hardship. However, the Arabic idiom differs slightly from its English counterpart in its suggestion that the hardship itself may be a blessing in disguise and not a separate temporary setback. Additionally, the ST idiom employs metaphor to convey its sense, while the language of the TT idiom is literal. Nevertheless, the exact alignment of source and target language idioms is extremely unlikely as a result of cultural and linguistic differences. Therefore, this rendition may achieve the highest level of stylistic and sense-based equivalence through an approximation that emphasises cultural function.

Example 3 contains an example where there is significant alignment between source and target idioms. In both languages, the texts contain the phrase “silence is golden”. This retention is possible as this wording exists in the linguistic and cultural contexts of both the source and target texts. However, the phrase was

not transferred directly in this example, as Gemini’s rendition included an addition. Cultural substitution was employed as a result of using the longer version found in Arabic. The rendition thus contains the full version of the idiom, which contrasts silence with speech, indicating the former is better than the latter.

In example 4, the source and target text idioms refer to the fast spread of information through metaphor. The metaphors differed in the two languages, even in their type. The ST employed personification, placing the information as the active subject and agent of the sentence. The TT, on the other hand, employed a simile, likening the spread of information to the quick catching of fire. These modifications are acceptable as both texts represent the same meaning. However, the rendition is still erroneous, not in its rendition of the metaphor but in its shift of topic. The ST discusses rumours while the TT discusses bad news, altering the sense entirely. This example highlights the importance of topic and function in the rendition of idioms, showing that changing wording and metaphor entirely is acceptable while topic and function must be retained and cannot be modified without causing translational loss.

Example 5 showcases the disconnect between surface-level similarity and equivalence. The ST contains the expression “you can’t teach an old dog new tricks” which is used to express the difficulty of changing habits or acquiring new skills after said habits have already been formed. The Arabic expression also conveys such difficulties. Nonetheless, the two idioms are hardly equivalent as they vary in use and tone. The English idiom emphasises the futility while focusing on the teacher’s position, while the Arabic idiom is used to mock and discourage those who aim to learn at a later stage of life. The two idioms thus differ functionally and therefore are not accurate substitutions for one another despite apparent similarities.

The section below looks into how Gemini applied these strategies when the translation direction was switched, and Arabic served as the SL and English served as the TL. The analysis could provide insight into the influence of translation direction on translation quality when it comes to this program’s capabilities.

4.2.1 Gemini Ar-Eng

Table 5 shows examples of Gemini’s use of literal translation when working from English to Arabic, followed by an assessment of these renditions and the degree to which they reflect the ST.

Table 5: Gemini Ar-Eng literal

#	Arabic sentence	English Translation
1	ريخ هياقو مبرد نأل هضاي رلا هسرامم يلع صرحي ج.الع راطنق نم	He is keen on exercising because an ounce of prevention is worth a pound of cure.
2	بردلا يلع راس نم نأل أي موي هبي ردت لصاو لصو.	He continued his daily training because he who follows the path will arrive.
3	هي خأل هزرفح رفح نم؛ لشف هنكل لمي مز ع ادخ لواح اهيف عفو	He tried to trick his colleague but failed; he who digs a pit for others falls into it.

Example 1 contains the idiom “an ounce of prevention is worth a pound of cure,” which correlates with the English idiom “a stitch in time saves nine”. Despite rendering this English idiom into this Arabic idiom when working in the opposite translation direction, Gemini employed the weaker literal strategy in this case. This implies that translation direction influences translation strategies and qualities while also showing that the connection between idiom parallels within the program’s databases is not absolute.

Example 2 shows another case where Gemini employed literal translation despite the availability of a TL parallel. This idiom contains simple language; thus, the literal rendition “he who follows the path will arrive,” which removes the idiomatic qualities of the text, oversimplifies the text and causes meaning loss. This generic language would not have a similar effect on the target audience as it lacks cultural context. Instead, the idiom “Where there is a will, there is a way” would better represent the positive effects of effort on achieving a desired outcome.

Similar issues can be found in example 3, where “What goes around comes around” would have been a stronger rendition than “he who digs a pit for others falls into it.” Both phrases represent the idea of karma reflecting negative consequences back to those who wish to harm others. While there are slight differences in the nuances of the two phrases, their usage overlaps significantly. Thus, this alternate rendition would better resonate with the target audience than the unfamiliar metaphor presented in the literal translation.

Table 6 contains examples of paraphrasing produced by Gemini, showing how the wording of idioms can be modified to reflect the sense of the TT.

Table 6: Gemini Ar-Eng paraphrase

#	Arabic sentence	English Translation
1	لكل نأل عامتجالا يف يمسر بولسأب ري دملأ شذحت لأقم مأقم	The manager spoke formally in the meeting because every situation has its own proper speech.
2	رومألا ريخف؛ مسفن قهرأ نود دجب لمعلا ررق امطسوأ	He decided to work hard without over-exhaustion; moderation is the best way.
3	بلط نم نأل ليلا لاوط ناحتمال بل اطلأ دعسا يلايلا رسالعا	The student prepared for the exam all night because success requires burning the midnight oil.

Example 1 uses an idiom to indicate that setting and situation should be reflected in a speaker's tone and register. The TT paraphrases this sense, conveying sense in a manner understandable to the target audience by dropping the ST's stylistic form.

Example 2 portrays moderation positively and thus encourages listeners to choose it over extremes. The paraphrase retains this by stating that moderation is the best way, conveying the sense of its superiority suggested in the ST.

In example 3, the Arabic idiom emphasises the necessity of effort for success by stating that those who want glory stay up through the nights. Gemini paraphrased this phrase yet retained the figurative qualities of the ST. This paraphrasing may thus fall short in conveying the sense naturally for the target audience. The idiom could have been substituted with a cultural equivalent, such as “no pain, no gain”, to retain sense and idiomatic quality at once. This example showcases how paraphrasing is only successful if sense and naturalness are prioritised.

Table 7 shows examples of Gemini's employment of cultural substitution, a strategy which focuses on sense as well as cultural impact.

Table 7: Gemini AR-Eng cultural substitution

#	Arabic Sentence	English Translation
1	فراض بر؛ دي دج عورشم عدبل قصر ف تنالك لمعلا متراسخ ةعفان	Losing his job was an opportunity to start a new project; every cloud has a silver lining.
2	بئاصملاف؛ مويلا سفن يف هفتاه رسخو مترايس تلطعت يدارف يتأت ال	His car broke down and he lost his phone on the same day; it never rains but it pours.
3	لدو لق ام مالكلأ ريخ نأل زاجي اب ري دملأ شذحت	The manager spoke briefly because brevity is the soul of wit.
4	يلع رويظلاف؛ تامامتهال فكراشي نمل أقي دص حبصأ عقت امل الكشأ	He became friends with those who share his interests; birds of a feather flock together.
5	هناونع نم أرقى باتكلاف؛ لوألا اقللأ ذنم بولسأ مهبجأ	They liked his style from the first meeting; you can judge a book by its cover.

Example 1 contains the Arabic idiom “perhaps a beneficial harm,” which was rendered as the English idiom “every cloud has a silver lining”. These idioms also appeared coupled in the Eng-Ar renditions, with the source and target texts switching places. This indicates that the program has paralleled these idioms as equivalents within its database.

Example 2 contains idioms in the source and target languages that are used to describe a combination of unfortunate things or circumstances. The Arabic ST idiom uses simple direct language, while the English TT idiom includes metaphor. This is an example of how familiarity with idiomatic expressions can heighten understanding even when direct language is replaced with figurative expressions.

In example 3, the source and target texts both contain idioms that positively depict brevity in speech. In the ST, a brief and informative speech is depicted as superior amongst all speeches. In the TT, a brief speech is depicted as a sign of intelligence. The ST attributes positive qualities to the speech itself, while the TT attributes positive qualities to the speaker. While in most cases this would be seen as a shift in translation, the idiomatic nature of the two texts overshadows such issues. Since both texts present expressions used in similar situations,

high equivalence and acceptability are achieved.

Example 4 shows an instance where similar metaphors were found in the source and target idioms; there were differences in wording and format. This example distinguishes between the direct translation and transfer of figurative language and cultural substitution. Despite the alignment of figurative imagery, what truly connects the ST and TT is the use of the phrase as well as their idiomatic nature. This is certified by the fact that a literal translation would not have produced a TT with identical functionality and naturalness. Nevertheless, the example suggests that some idioms may have a cross-cultural reach in their imagery, even in cases where they were not adopted directly.

Example 5 contains another pair of idioms that use similar metaphors in the ST and TT. Both idioms discuss judgment based on appearances and first impressions. This is achieved by comparing the thing or person to a book where the cover, which contains the title, is visible, yet the book’s full content is not. Despite the metaphor aligning perfectly in the two languages, there is a significant cultural distinction that stops the two from being equivalent. The English idiom discourages making assumptions, emphasising that more lies behind the cover. In contrast, the Arabic idiom suggests that the title provides insights into what the book’s content will be, implying titles are indicators of what is hidden beneath, encouraging making these judgements. This example highlights the importance of function above all equivalence types when it comes to idioms.

The following sections conduct a similar analysis of the renditions of ChatGPT, assessing how the three translation strategies are employed in both translation directions. Discussing different programs can provide insight into whether the quality of AI translation is standard or if there are variations.

4.2.2 GPT English-Arabic

Table 8 contains examples of ChatGPT’s use of literal translation when working from English into Arabic. The analysis below discusses the features of these renditions as well as their acceptability.

Table 8: GPT Eng-Ar literal translation

#	Arabic sentence	English Translation
1	We solved the issue quickly because two heads are better than one.	لقد عزمنا لضفأ نيلق ع نأل ع عرسب قل كشملا انلله ح دح او
2	When Ahmad saw his friend cheating, he decided to speak up because honesty is the best policy.	نأل ملكتي نأل ررق، شغبي قويدص دم ح أأر امدن ع قس ايس لضفأ وه قدصل
3	After the mistake spread across the office, everyone realized that a lie has no legs.	نأل عي م جلا كرددأ بتكلملا يف أطخل راشتنا دعب لجرأ امل سيل تبذلكلا

Example 1 contains the idiom “two heads are better than one”, which is used to suggest collaborating to produce ideas and exploring multiple perspectives is better than relying on one’s thoughts alone. GPT rendered this idiom literally with slight modification. The term “head” was rendered as “mind”, better encapsulating the intended meaning with this word choice.

In example 2, GPT translated the idiom literally, providing an understandable yet awkward rendition.

This is because while the ST is simple and direct, the naturalness of the idiom stems from familiarity, which is absent in different cultures. To retain naturalness, the ST idiom could have been substituted with the target text idiom “عاجنم قدصل” (honesty is a lifeline).

Example 3 shows the worst possible outcome of literal rendition, which is completely meaningless or confusing target texts. The ST idiom is not direct, and the figure of speech does not transfer naturally in the target language and culture, resulting in an unacceptable rendition. Instead, cultural substitution could be used to produce “ري صرق بذلك لبح”, which is the cultural equivalent of the ST.

Table 9 includes examples of ChatGPT’s use of paraphrasing in its English to Arabic renditions. The analysis discusses the effectivity of GPT’s attempts.

Table 9: GPT Eng-Ar paraphrase

#	Arabic sentence		English Translation
1	a	Learning a new language can be challenging, but practice makes perfect.	نكل ،ابَّعص ارمُ اًتديج ةغل ملّحت نوكي دق انقتي ناسنإل لعجت قسرامملا
	b	After losing several matches, the coach reminded the team that practice makes perfect.	قيرفلا بردملا ركذ ،تايرابم ددع قراسخ دعب نأقتإل إلإ يدوت قسرامملا نأب
2	She stopped checking her friend’s messages because curiosity killed the cat.		انأل امتقي دص لئاسر دقت نع تفقوت بعاتملا ببسي دق لوضفلا نأ تركذت
3	When the team finally finished the difficult project, the manager reminded them that all’s well that ends well.		،أريخأ بعصللا عورشمل قيرفلا هأ امدنع لك لعجت ةديعسل اهنلا نأب ريدملا ماركذ انديج ءيش

Example 1A and Example 1B both contain the idiom “practice makes perfect” in the ST and similar paraphrases in the TT. Yet, example 1A still contains issues in its rendition “practice makes a person master it” as the structure is awkward and unnatural, especially since the referent of the pronoun is unclear, especially in its use of subject and object. The rendition in 1b presents the same sentiment more naturally through grammatical transposition, resulting in “practice leads to mastery”. This example emphasises that rewording the sense alone does not necessitate a high-quality outcome. Additionally, it shows that AI programs like GPT may show inconsistent quality in their renditions.

In example 2, GPT uses a paraphrase to convey the sense of the ST idiom in direct everyday language, removing the allegory presented in its wording. This allows the target audience to understand the intended meaning without confusion.

In Example 3, GPT paraphrases the idiom “all’s well that ends well” as “a good ending makes everything good.” This rendition adequately translates the ST, yet is lengthy and wordy. An alternate translation that could increase readability and naturalness would be the cultural substitution “ميتاوخلا ب قربعلا” (the moral is in the ending). This rendition would have also retained the idiomatic nature of the text. The example shows how cultural substitution can outperform paraphrasing even when it comes to clarity.

GPT also employed cultural substitution in its English to Arabic renditions, as shown in Table 10 below.

Table 10: GPT Eng-Ar cultural substitution

#	English Sentence	Arabic Translation
1	After many failed attempts, Ali finally succeeded—where there’s a will, there’s a way.	ارخيأ يلع حجج ،فلشاف قريتك تالواحم دعب دجو دج نم —
2	When the company ignored small problems, they eventually grew bigger—a stitch in time saves nine.	قريغصل تالكشمل فكرشل تلهاجت امدنع جالعلا نم ريخ ةياقولا — اقحال تربك
3	My uncle refuses to learn social media; you can’t teach an old dog new tricks.	بش نم ؛لصاوتلا لئاسو ملعت ضفري يمع هيلع باش ءيش يلع

The idiom of example 1 is used to say that those who truly intend to do something will find a way to accomplish it, indicating that success can be achieved through determination. GPT successfully finds a cultural substitution in “who works hard finds (success)”. This example highlights how the implication and intended sense of idioms are the core aspect of their rendition, allowing substitution based on their function and use.

Example 2 contains an idiom used to state that taking preventative measures is better than fixing larger errors that could grow in the future as a result of neglect. The target text presents an Arabic idiom used for the same purpose. While the imagery is shifted, the functions and idiomatic natures of ST and TT align, making the renditions successful. What is notable about this example is that the rendition states “prevention is better than repair,” while the full idiom states “an ounce of prevention is better than a ton of repair”. This indicates a capability to adequately use shortened forms and break away from fixed idiom structures.

In example 3, the source and target texts contain idioms which relate to the difficulty of changing habits. However, the rendition is still faulty as it sounds unnatural as a result of a lack of cohesion with the remainder of the sentence. The English idiom focuses on the difficulty of acquiring new skills, while the Arabic idiom focuses on the difficulty of letting go of established habits. Therefore, the Arabic idiom does not work in the

context of the sentence, which discusses an unwillingness to learn something new. This example highlights the lack of critical and contextual thinking in such AI systems.

4.2.3 GPT AR-ENG

This section examines GPT’s renditions when working from Arabic to English, beginning with its literal translations displayed in Table 11 below.

Table 11: GPT Ar-Eng literal translation

#	Arabic sentence	English Translation
1	نم ريخ ةياقو مهرد نأل قضايرلا قسرامم ىلع صرحي جالع راطنق.	He exercises regularly because an ounce of prevention is better than a pound of cure.
2	؛مويلا سفن يف هفتاه رسخو مترايس تلطعت ىدارف يتأت ال بئاصملاف.	His car broke down and he lost his phone on the same day; misfortunes do not come alone.
3	اضرلا قمالع توكسلاف ؛رارقلا ىلع دحأ ضررت عي مل	No one objected to the decision; silence is a sign of approval.

Example 1 contains the idiom “an ounce of prevention is better than a pound of cure”, which GPT translated literally despite the idiom having a TT equivalent “a stitch in time saves nine”. When working in the other direction, GPT managed to connect the two idioms, suggesting a weaker ability when working with Arabic as the source language. Example 2 shows another case where idioms were properly treated as equivalents in the Eng-Ar direction, yet literal translation was employed when Arabic was the SL.

Example 3, “silence is a sign of approval”, was rendered literally despite the fact that a very similar idiom exists in the TL. “Silence means consent” can be seen as a direct literal translation while also being a TL idiom. GPT failed at reaching this rendition even when it only required moderate changes.

Table 12 contains paraphrasing that was done in GPT’s Arabic to English renditions.

Table 12: GPT Ar-Eng paraphrase

#	Arabic sentence	English Translation
1	نادت نيديت امك نأ نمؤي منأل عيجمجلا عم أفبيطل ناك.	He was kind to everyone because he believes that as you treat others, you will be treated.

Example 1 contains the idiom, “what you lend, you are lent”, which is used in similar contexts as the idiom “what goes around comes around.” The idioms are used to suggest that a person’s actions will come back to them. GPT paraphrased this sense as “as you treat others, you will be treated.” This rendition captures the general sense but lacks the nuance that could have been achieved with the cultural substitute.

Table 13 displays examples of GPT’s use of cultural substitution in some of its Arabic to English renditions.

Table 13: GPT Ar-Eng cultural substitution

#	Arabic sentence	English Translation
1	قيديصللاف ؛يلمع تدقف امدن ع يبن اجب فوق قبيضلا تقو.	He stood by my side when I lost my job; a friend in need is a friend indeed.
2	؛تامامتهالاه كراشي نمل أقيديص حبصأ عقت امل الكشأ ىلع رويطللاف.	He became friends with people who share his interests; birds of a feather flock together.
3	؛ديج عورشم عدبل قصر ف تنالك لمعلل متراسخ ةعفسان قراض بر.	Losing his job became an opportunity to start a new business; every cloud has a silver lining.

In example 1, GPT substitutes the Arabic idiom “The friend is in the time of hardship” with its English counterpart “a friend in need is a friend indeed”. Since the sense of the idiom is somewhat straightforward, it could have been rendered literally with some transposition as “a true friend is there in times of hardship”. However, GPT managed to avoid this simple option to provide the strongest equivalent that retains style and sense. Example 2 contains another ST idiom that shares similarities with its TT counterpart, which GPT adequately substituted. Example 3 contains an example of substitution where the function of the ST and TT idioms align, yet the texts diverge completely when it comes to wording and literal sense. The example highlights the main aims of cultural substitution, which is the recreation of ST impact in the TT rather than ST fidelity.

5. Conclusion

The study looked into how prominent AI systems like ChatGPT and Gemini handle nonliteral cultural speech, such as idioms and proverbs, when prompted to translate these phrases. The study revolved around English and Arabic as source and target languages and worked in both translation directions. The analysis showed that both programs utilised a multitude of strategies, including literal translation, paraphrase, and cultural substitution. This shows that AI systems have surpassed the issue of limitations to literal renditions based on the wording of the ST, which have traditionally been associated with automatic translation. The data, however, indicated that these strategies were used at different rates across both programs and translation directions. Gemini was more likely to resort to cultural substitution, while GPT was more likely to resort to literal translation, even though it used paraphrasing often as well. The data also showed that translation direction was more influential on strategy frequency among Gemini's renditions. The qualitative analysis indicated that cultural substitution was the strongest strategy as it recreated ST function while also retaining stylistic impact. Literal translation was the weakest strategy as it is concerned with structure and wordings, which are often unrelated to the sense of these figurative expressions. Paraphrasing retained sense when employed properly, yet led to stylistic loss. Additionally, the analysis showed there were cases where even paraphrase and cultural substitution failed at conveying the intended sense as the programs failed to decode the nuances of the ST. The study therefore recommends the creation of corpora which connect cultural equivalents, enabling translations to adequately find replacements without the need to consult experts or rely on programs that lack the nuanced cultural understanding to make these connections.

Though the sample covered common proverbs, it only covered 50 examples (25 Arabic and 25 English), a sample that hardly represents the thousands of proverbs that are in existence in the various parts of the world and the various dialects. Since Arabic itself is the only language with Classical and Modern Standard and approximately 25 regional dialects, numerous culturally specific expressions were bound to be overlooked, meaning that the research cannot claim to generalise to the Arabic-speaking planet. The Arabic sentence structure, word order and morphology (verb-subject-object) and their differences with English (subject-verb-object) are also complex. The assessment of the translation was based on a basic, context-free prompt and conventional automatic measures. It has been found that idioms are very much grounded in the cultural context and that rewording them deprives them of the ability to be emotional; therefore, context-free prompts are potentially dangerous in terms of missing out on the nuances and cultural allusions. In addition, recent research findings also assume that the application of automatic measures by itself is not reliably able to evaluate figurative translations, and in most cases, it is not suitable to evaluate semantic and contextual accuracy, making them reliant on human post-editing to produce high-stakes translations. Lastly, the study investigated ChatGPT and Gemini exclusively; there is no guarantee the research will replicate with other LLM models or updated models. Further studies would need to increase corpus size and range, as well as the number of dialects and languages, in order to represent cultural and linguistic variation. Since idioms are a cultural phenomenon, it is recommended that prompts contain some short contextual information or that they specify whether a literal translation or a similar proverb is required; research indicates that the context of conversation and prompt structure affect the performance of the LLM on proverb translation. Assessments ought to be an integration of various automatic measures with qualitative and human-rated measures. Lastly, since idioms and proverbs are archives of shared experience that frequently cease to have meaning once translated literally, culturally aware training data and reinforcement learning that focus on pragmatic equivalence more than word-for-word accuracy may be beneficial in encouraging such models to learn when to paraphrase and when to provide an equivalent proverb.

References

- Abu Rumman, R., Haider, A. S., Yagi, S., & Al-Adwan, A. (2023). A corpus-assisted cognitive analysis of metaphors in the Arabic subtitling of English TV series. *Cogent Social Sciences*, 9(1), 2231622. doi:<https://doi.org/10.1080/23311886.2023.2231622>
- Ahmad, M., Haider, A. S., & Saed, H. (2025). Assessing AI-driven dubbing websites: Reactions of Arabic native speakers to AI-dubbed English videos in Arabic. *Research Journal in Advanced Humanities*, 6(1), 1-20. doi:<https://doi.org/10.58256/64dz1c72>
- Akasheh, W. M., Haider, A. S., Al-Saideen, B., & Sahari, Y. (2024). Artificial intelligence-generated Arabic subtitles: insights from Veed. io's automatic speech recognition system of Jordanian Arabic. *Texto Livre*, 17, e46952-e46952. doi:10.1590/1983-3652.2024.46952.
- Al-Darabee, M., & Farghal, M. (2025). Veed. AI Arabic subtitling of English taboo expressions in the movie *The Wolf of Wall Street*. *Babel Revue internationale de la traduction / International Journal of Translation*, 71(2), 1-25. doi:<https://doi.org/10.1075/babel.24193.far>
- Al-Hamzi, A. M. S., Nababan, M., Santosa, R., & Anis, M. Y. (2023). The simile and metaphor in translation of Yemeni spoken Arabic common names of animals and supernatural creatures into English: A socio-pragmatic approach. *Cogent Arts and Humanities*, 10(1), 2223816. doi:<https://doi.org/10.1080/23311983.2023.2223816>
- Al-khresheh, M. H., & Almaaytah, S. A. (2018). English proverbs into Arabic through machine translation. *International Journal of Applied Linguistics and English Literature*, 7(5), 158-166. doi:<https://doi.org/10.7575/aiac.ijalel.v.7n.5p.158>
- Al-Momani, A., Haider, A. S., Dagamseh, M., & Akasheh, W. M. (2025). Audience Responses to Cultural and Linguistic Gaps in English–Arabic Auto-Subtitles on YouTube. *Research Journal in Advanced Humanities*, 6(3). doi:<https://doi.org/10.58256/x3sten23>
- Al-Salman, S., & Haider, A. S. (2024). Assessing the accuracy of MT and AI tools in translating humanities or social sciences Arabic research titles into English: Evidence from Google Translate, Gemini, and ChatGPT *International Journal of Data and Network Science*, 8(4), 2483-2498. doi:<https://doi.org/10.5267/j.ijdns.2024.5.009>
- Almahasees, Z. (2018). Assessment of Google and Microsoft Bing translation of journalistic texts. *International Journal of Languages, Literature and Linguistics*, 4(3), 231-235. doi:<https://doi.org/10.18178/ijlll.2018.4.3.178>
- Almahasees, Z. (2021). *Analysing English-Arabic Machine Translation: Google Translate, Microsoft Translator and Sakhr*. London: Routledge.
- Almahasees, Z. M. (2017). Machine Translation Quality of Khalil Gibran's *The Prophet*. *AWEJ for translation & Literary Studies*, 1(4), 151-159. doi:10.2139/ssrn.3068518
- Alquda, I., Al Saideen, B. M., Obeidat, M. M., Haider, A. S., Al-Abbas, L. S., & Dagamseh, M. (2025). One Story, Two Cultures: Readership Responses to the Cross-Cultural Translation of *Jane the Virgin* and *El-Anisa Farah*. *Research Journal in Advanced Humanities*, 5(4), 1-12.
- Bachrun, N. A. (2023). *Metaphors of Animal Lexeme Dog in English and Indonesian Proverbs: A Comparative Study*. (PhD). Universitas Gadjah Mada, Indonesia.
- Baker, M. (2018). *In other words: A coursebook on translation*: Routledge.
- Bex, F. J. (2025). AI, Law and beyond. A transdisciplinary ecosystem for the future of AI & Law. *Artificial Intelligence and Law*, 33(1), 253-270. doi:<https://doi.org/10.1007/s10506-024-09404-y>
- Bui, H. T. (2025). Examining the effect of AI advertising involvement disclosure on advertising value and purchase intentions. *Journal of Research in Interactive Marketing*, 1-20.
- Campeato, O. (2024). *Google Gemini for Python: Coding with Bard*: Stylus Publishing, LLC.
- Chan, V., & Tang, W. K.-W. (2024). GPT for translation: A systematic literature review. *SN computer science*, 5(8), 986.
- Danielsson, P. (2007). *In other words: Using paraphrases in translation*. Paper presented at the Proceedings of Translating and the Computer 29.
- Darwish, N., Haider, A., Rummana, B. T. R. A., Alantari, D., Saed, H., & Dagamseh, M. (2025). A Reception Study of AI-Translated Idioms and Proverbs between Arabic and English. *Research Journal in*

- Advanced Humanities, 6(3), 1-12. doi:<https://doi.org/10.58256/k4d6pp20>
- Debbas, M., & Haider, A. S. (2020). Overcoming cultural constraints in translating English series: A case study of subtitling family guy into Arabic. *3L, Language, Linguistics, Literature*, 26(1), 1-17. doi:<https://doi.org/10.17576/3L-2020-2601-01>
- Donthi, S., Spencer, M., Patel, O., Doh, J., & Rodan, E. (2024). Improving LLM Abilities in Idiomatic Translation. arXiv preprint arXiv:2407.03518.
- Fadhel, A. M., Alyami, N., & Almahasees, Z. (2025). Integrating AI Translation Ethics and Sociolinguistic Awareness into BA Programs at Saudi and Jordanian Universities. *Forum for Linguistic Studies*, 7(6), 161–174.
- Farghal, M. (2020). Translating Arabic metaphorical expressions into English: Mahfouz's morning and evening talk as an example. *International Journal of Arabic-English Studies*, 20(1), 105-124.
- Farghal, M., & Al-Hamly, M. (2015). Arabic proverbs in fiction translation: Girls of Riyadh as an example. *Jordan Journal of Modern Languages Literature*, 7(1), 1-20.
- Farghal, M., & Haider, A. S. (2024). Translating classical Arabic verse: human translation vs. AI large language models (Gemini and ChatGPT). *Cogent Social Sciences*, 10(1), 2410998. doi:<https://doi.org/10.1080/23311886.2024.2410998>
- Filip, K., & Pavol, L. (2025). AI and the Translation of Idioms—Challenges, Success, and a Corpus Perspective. *Jazykovedny Casopis*, 76(1), 258-267.
- Haider, A. S., Akar, R. A., Saed, H., Tair, S. A., & Ismail, H. H. (2024). AI-Powered Arabic Translation of Business and Finance Acronyms and Abbreviations: Evidence from Gemini, ChatGPT, and Google Translate. Paper presented at the International Conference on Technology and Innovation Management.
- Haider, A. S., & AlKhatib, R. (2025). Evaluating Netflix, Machine, and Artificial Intelligence Subtitling of Arabic Legal Expressions into English. *Comparative Legilinguistics*.
- Haider, A. S., Obeidat, M. M., Hamdan, Y., AlZghoul, O., & Abu-Rayyash, H. (2025). SDL Trados Live Cloud vs. Traditional Subtitling Workflows: An Empirical Evaluation of Performance. *Research Journal in Advanced Humanities*, 6(3), 1-11.
- Haider, A. S., Saideen, B., & Hussein, R. F. (2023). Subtitling taboo expressions from a conservative to a more liberal culture: The case of the Arab TV series Jinn. *Middle East Journal of Culture Communication Research*, 16(4), 363–385. doi:<https://doi.org/10.1163/18739865-tat00006>
- Haider, A. S., & Shohaibar, R. S. (2024). Netflix English subtitling of idioms in Egyptian movies: challenges and strategies. *Humanities & Social Sciences Reviews*, 11(1), 1-13. doi:<https://doi.org/10.1057/s41599-024-03327-4>
- Halliday, M. A. K., & Hasan, R. (2014). *Cohesion in english*: Routledge.
- Hoang, Q., & Oanh, T. T. K. (2025). Vietnamese-English Translation Errors Made by the Fourth-Year English Majors: A Case Study at Bac Lieu University. *Technium Soc. Sci. J.*, 67, 137.
- Jibreel, I. (2023). Online Machine Translation Efficiency in Translating Fixed Expressions Between English and Arabic (Proverbs as a Case-in-Point). *Theory Practice in Language Studies*, 13(5), 1148-1158. doi:<https://doi.org/10.17507/tpls.1305.07>
- Khelf, Y. (2021). The Semantic Meaning and the Pragmatic Function of Animal Proverbs: A Contrastive Study between Arabic and English Proverbs. *LANGUAGE ART*, 6(3), 57-68.
- Kwok, H. L., Shi, Y., Xu, H., Li, D., & Liu, K. (2025). GenAI as a translation assistant? A corpus-based study on lexical and syntactic complexity of GPT-post-edited learner translation. *System*, 130, 103618.
- Li, S., Chen, J., Yuan, S., Wu, X., Yang, H., Tao, S., & Xiao, Y. (2024). Translate meanings, not just words: Idiomkb's role in optimizing idiomatic translation with language models. Paper presented at the Proceedings of the AAAI Conference on Artificial Intelligence.
- Madani, Z., Abusalim, N., & Rayyan, M. (2023). Gender representation in animal-related proverbs: Algerian vs. Jordanian Arabic. *Frontiers in Sociology*, 8, 1145200.
- Malika, B. (2016). The Deficiencies of Machine Translation of Proverbs and Poetry: Google and Systran Translations as a case study. *Algerian Scientific Journal Platform*, 10(1), 222-240.
- Mirzoyeva, L. (2023). Machine translation shortcomings and teaching translation. *Revista Romaneasca*

- pentru *Educatie Multidimensionala*, 15(3), 232-242. doi:<https://doi.org/10.18662/rrem/15.3/764>
- Mohammed, A. S., Ghassemiazghandi, M., & Jamal, M. (2023). Post-Editing of Neural Machine Translation of the Novel "Murder of The Bookseller" from Arabic into English. *International Journal of Language Literacy and Translation*, 6(2), 102-114. doi:<https://doi.org/10.36777/ijollt2023.6.2.080>
- Mohsen, M. (2024). Artificial Intelligence in Academic Translation: A Comparative Study of Large Language Models and Google Translate. *PSYCHOLINGUISTICS*, 35(2), 134-156. doi:<https://doi.org/10.31470/2309-1797-2024-35-2-134-156>
- Mughal, U. A., Seemab, S., Zaigham, M. S., Bhatti, A., & Khan, H. (2024). The intersection of linguistics and artificial intelligence: a corpus-based study of idiom translation. *Journal of Applied Linguistics and TESOL (JALT)*, 7(4), 1453-1460.
- Musaad, M. M. A. M., & Al Towity, A. A. (2023). Translation Evaluation of Three Machine Translation Systems, with Special References to Idiomatic Expressions. *Humanities and Educational Sciences Journal*(29), 678-708. doi:<https://doi.org/10.55074/hesj.vi29.700>
- Newmark, P. (2003). No global communication without translation. *Translation today: Trends and perspectives*, 55-67.
- Nida, E. A. (1975). *Language structure and translation; essays*.
- Obeidat, M. M., Haider, A. S., Tair, S. A., & Sahari, Y. (2024). Analyzing the Performance of Gemini, ChatGPT, and Google Translate in Rendering English Idioms into Arabic. *FWU Journal of Social Sciences*, 18(4), 1-18. doi:<http://doi.org/10.51709/19951272/Winter2024/1>
- Öner Bulut, S., & Alimen, N. (2023). Translator education as a collaborative quest for insights into the re-positioning of the human translator (educator) in the age of machine translation: the results of a learning experiment. *The Interpreter and Translator Trainer*, 17(3), 375-392. doi:<https://doi.org/10.1080/1750399x.2023.2237837>
- Qassem, M., & Aldaheri, M. M. (2023). Can Machine Translate Dialogue Acts: Evidence from Translating Dialogues from English to Arabic. *3L: Language, Linguistics, Literature*, 29(4), 63-81. doi:<https://doi.org/10.17576/3l-2023-2904-05>
- Rane, N., Choudhary, S., & Rane, J. (2024). Gemini Versus ChatGPT: Applications, Performance, Architecture, Capabilities, and Implementation. *Performance, Architecture, Capabilities, and Implementation*. doi:<https://doi.org/10.2139/ssrn.4723687>
- Saed, H., Haider, A. S., Tair, S. A., & Darwish, N. (2024). Dubbing English edutainment: Localizing educational content for Arab children. *Research Journal in Advanced Humanities*, 5(3), 391-406. doi:<https://doi.org/10.58256/bh9fhj11>
- Saideen, B., Thalji, A., Lababaneh, A., Tartory, R., Haider, A. S., & Obeidat, M. (2024). Netflix English subtitling of the Jordanian movie 'The Alleys': Challenges and strategies. *Research Journal in Advanced Humanities*, 5(1), 157-177. doi:<https://doi.org/10.58256/sptxps94>
- Shalevska, E., Kostadinovska-Stojchevska, B., Janusheva, V., Janusheva, M., Stojanoska, M., & Talevska, M. (2025). AI in nonliteral language translation: Translating Macedonian proverbs and idioms. *International journal of Education Teacher*, 29, 60-66.
- Shen, D. (1989). Literalism: Non" formal-equivalence". *Babel*, 35(4), 219-235.
- Shiyab, S. M. (2017). *Translation: concepts and critical issues: Maklu*.
- Shuhaiber, R., & Haider, A. S. (2023). Strategies of Subtitling Egyptian Idiomatic Expressions and Proverbs into English. *Language Value*, 16(2), 60-99. doi:<https://doi.org/10.58256/sptxps94>
- Son, J., & Kim, B. (2023). Translation Performance from the User's Perspective of Large Language Models and Neural Machine Translation Systems. *Information*, 14(10), 574. doi:<https://doi.org/10.3390/info14100574>
- Tanjour, M. (2011). *Bridging cultural gaps in English-Arabic translation. (MA Thesis)*. University of Leeds, United Kingdom.
- Tannous, B., & Haider, A. S. (2025). Assessing the Accuracy of AI Tools (Google Translate and Gemini) in Translating Arabic Idiomatic Expressions and Proverbs into English. *International Journal on Artificial Intelligence Tools*, 34(04n05), 2550016. doi:<https://doi.org/10.1142/s0218213025500162>
- Thalji, M. B., & Dweik, B. S. (2015). *The Translation of Proverbs: Obstacles and Strategies. (MA)*. Middel

- East University, Jordan. Retrieved from https://meu.edu.jo/libraryTheses/5871fd344b5b6_1.pdf
- Xia, C., Amini, M., & Lee, K.-F. (2023). Humor translation: A case study on the loss of humorous loads in SpongeBob SquarePants. *Cadernos de Tradução*, 43, e89705.
- Yamada, M. (2023). Optimizing Machine Translation through Prompt Engineering: An Investigation into ChatGPT's Customizability. arXiv preprint arXiv:2308.01391.
- Yang, Y., & Wang, X. (2019). Modeling the intention to use machine translation for student translators: An extension of Technology Acceptance Model. *Computers & Education*, 133, 116-126. doi:<https://doi.org/10.1016/j.compedu.2019.01.015>