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RESEARCH ARTICLE

Exploring the Impact of Prompt Formulation in AI Chatbots on the Translation of English-to-Arabic and Arabic-to-English Idioms: A Case Study

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ABSTRACT

This research investigated the impact various prompt formulations in AI Chatbots can have on the quality of the translation of English idioms into Arabic and Arabic idioms into English. The authors reviewed the literature on English-to-Arabic translation, strategies for translating idioms in both directions, educational software for idiom translation use, and the role of AI and chatbots in this process. In this study, 20 proverbs were translated by GPT-4 and Claude-2, then analyzed and evaluated based on Baker's (1992) strategies for translating idioms. The study revealed that the most challenging aspects for English to Arabic translators (and vice versa) are content and organization, followed by writing mechanics, syntax, vocabulary, and grammar. Moreover, this study contributes significantly to translators and translation students of English and Arabic by providing those struggling with idiom translation with insights that can help them find idiomatic equivalents in both Arabic and English. The results show a preference for literal translation with a secondary emphasis on meaning. Further research is recommended into the efficacy of AI in translating idioms.

INTRODUCTION

As AI technology advances, the use of chatbots for translation tasks has become more frequent. Nevertheless, idioms still pose significant challenges for accurate translation. Larson (1984) defines an idiom as "a string of words whose meaning is different from the meaning conveyed by the individual words" (p. 20). Hence, idiom translation is not about the literal translation of the individual words but rather about capturing the imagery and meaning behind the idiom. In light of the progress in AI, especially chatbots, translators can utilize this technology by researching the closest equivalents found in the cumulative data amassed by AI.

Nowadays, AI often refers to machine programs that can mimic human conversation. This concept implies a machine's capability to function like a human in various situations. Today's AI also refers to "machine learning" or "deep learning," where algorithms learn to identify patterns from data (Du-Harpur et al., 2020). This advancement allows automated translation systems to handle complex elements such as idioms and cultural references, challenging older, rule-based systems. As these AI systems analyze extensive multilingual data, their accuracy progressively increases, thus enhancing their use for professional and everyday translation requirements. This transition in AI translation shifts from literal, word-for-word translations to more contextually accurate results, thereby improving cross-cultural communication.

Eliciting responses from AI chatbots, also known as "prompting," impacts the responses generated. The effects of prompt design in AI chatbots on English-to-Arabic and Arabic-to-English idiom translation is an essential area of research, with the potential to improve language translation and support cross-cultural communication. For instance, Almaaytah (2022) proposed enhancing machine translation from Arabic to English by developing a system that can distinguish idioms from regular phrases and then classify and accurately translate these idioms, using artificial intelligence to ensure both naturalness and correct meaning, especially when direct equivalents are not available.

However, using AI for idiomatic translation does present its own distinct challenges and opportunities. Idioms often have meanings that do not match their literal words, so preserving cultural and linguistic nuances is important during translation. Thus, AI can help by using large datasets to understand and interpret idioms better. Furthermore, instead of giving word-for-word translations, AI chatbots can capture the intended meaning or find equivalent expressions in the target language. Access to detailed resources like multilingual corpora and parallel text databases is critical to making this process effective. These resources enable chatbots to produce contextually and culturally appropriate translations that preserve the original meaning of the idioms.

Moreover, by providing prompts with specific instructions, translators and translation students may help AI chatbots use culturally specific language and therefore translate idioms more accurately. Thus, this study aims to investigate the use of different formulations of prompts that elicit chatbots to translate idioms more effectively; that is, how chatbots are prompted may influence the quality of the AI translation of idioms. The significance of this study lies in its contribution to assisting translators in general and supporting translation students who frequently encounter difficulties with translating idioms.

Study Objective

The first objective of the study is to examine the impact of prompt formulation in AI chatbots on the translation of English-to-Arabic and Arabic-to-English idioms through a case study. The second objective of the study is to investigate how various prompt types can enhance the effectiveness of idiom translations by examining the potential impact of prompting chatbots on the quality of AI translations.

Research Questions

How do AI chatbots translate English-to-Arabic idioms using the prompt “Translate”?

What are other possible prompts to elicit AI chatbots to translate idioms?

How do the different prompt formulations impact the effectiveness or accuracy of the translation?

LITERATURE REVIEW

In preparing the current study, the authors investigated sources related to English-to-Arabic translation, strategies for translating idioms from English to Arabic and Arabic to English, the use of education software for translating idioms, and the use of AI and chatbots in translating idioms from English to Arabic and vice versa. Notably, the practice of using education software for teaching idiomatic expressions to students; ways AI can be used to improve translation; the use of language learning algorithms in prompt formation and idiom translation, including the translation of idioms from Arabic to English; the effectiveness of using human translators; the use of chatbots in foreign language education; and challenges with developing a chatbot for Arabic idiomatic language are highlighted in the following literature review.

Akki and Larouz (2021) studied the challenges of English-to-Arabic translation by comparing the difficulties EFL students face when translating in both directions. Their research highlights the linguistic, semantic, and pragmatic differences between the two languages, emphasizing their translation complexities. This study uses a quantitative and descriptive design to compare English-to-Arabic and Arabic-to-English translation abilities. The study included 47 Moroccan university EFL undergraduates who had taken English-to-Arabic and Arabic-to-English translation courses. The results showed that students performed better on a translation test in English-to-Arabic translation

than in Arabic-to-English translation, with English-to-Arabic translation averaging at 10.44 and Arabic-to-English translation averaging 9.14. This indicates that the English-to-Arabic translation skills of the pupils are better than their skills in Arabic-to-English translation. The research also indicated that English-to-Arabic translators struggle most with content and organization, then writing mechanics, syntax, vocabulary, and grammar. Conversely, Akki and Larouz (2021) say syntax is the most challenging aspect of Arabic-to-English translation, followed by writing mechanics, grammar, content, organization, and vocabulary. Additionally, the research also compared the bidirectional translating ability of the students. According to the results, translation across languages with considerable linguistic and cultural differences, like English and Arabic, is challenging, emphasizing EFL students' unique challenges and the necessity for customized teaching. This study's empirical methodology gives valuable data about EFL student translation problems. It highlights disparate issues by comparing translation directions. This data can inform EFL curriculum and teaching methods. However, the study does not elaborate on the linguistic and cultural factors that cause the constraints. Further study of these issues may illuminate the challenges faced by EFL students.

Adelnia and Dastjerdi (2011) identified several categories of idioms, including colloquialisms, proverbs, slang, allusions, and phrasal verbs. Each category has specific characteristics related to formality, function, and cultural context:

- **Colloquialisms**: informal expressions used in everyday language, often tied to a specific region or group.
- **Proverbs**: common sayings that offer wisdom or moral lessons, often metaphorical and rooted in cultural traditions.
- **Slang**: very informal language, often humorous or related to taboo topics, which lowers the formality of communication.
- **Allusions**: references to cultural, historical, or literary elements, adding depth by relying on shared knowledge.
- **Phrasal verbs**: phrases made up of a verb and a preposition or adverb, creating meanings that differ from the individual words.
- Understanding these types of idioms is crucial for translation. Baker (1992) describes several strategies for translating idioms:

1. **Using an idiom of similar meaning and form**: finding an idiom in the target language that matches both meaning and structure.
2. **Using an idiom of similar meaning but different form**: using an idiom with the same meaning, even if its structure or wording differs.
3. **Translation by paraphrase**: explaining the idiom's meaning when no equivalent exists in the target language.
4. **Translation by omission**: leaving the idiom out when no equivalent can be found or if its inclusion would cause confusion.
5. **Literal translation**: translating word-for-word, though this often fails because idioms rely on cultural context.

These strategies highlight the challenge of balancing linguistic accuracy and cultural meaning in idiom translation.

In their study "Translating Idiomatic Expressions from English into Arabic: Difficulties and Strategies," Ali and Al-Rushaidi (2016) investigated how Arab students translate English idioms into Arabic. Their findings suggested several ways to improve the teaching of idiom translation, emphasizing the need to raise awareness of these challenges and teach students effective strategies for conveying idiomatic meanings across languages and cultures. Furthermore, they recommended avoiding overuse of paraphrasing, utilizing idiom equivalents whenever possible, teaching students effective idiom translation strategies, using specialized dictionaries, discouraging literal translation of idioms except when preserving meaning, and incorporating idioms and culture-bound expressions into foreign language and translation instruction. As artificial intelligence translation technology advances, these approaches can be further improved by incorporating AI tools into teaching idiom

translation to students. Ying He (2021) emphasized that "outdated teaching methods and poor use of translation technologies fail to cultivate talents needed by the translation industry" (p. 1).

In their 2022 study, Aleedy et al. examined how artificial intelligence and educational technologies can improve translation learning. They support new, student-focused methods for teaching, especially in translation studies. Their research focuses on developing a machine learning-based chatbot to help language learners, especially translators, understand the Arabic translation of English sentences. The chatbot helps students learn by translating their conversations. Furthermore, bilingual corpora are preprocessed to create a sentence-based paired dataset for machine learning model training. The promising results of their prototype demonstrate the potential for translation learning via AI-driven chatbots.

Aleedy et al. (2022) carried out research on prompt formulation in AI chatbots for English-to-Arabic idiom translation and found it is vital. AI in language learning and context-specific translations by chatbots are shown in the study of idiom translation, where nuances and cultural context matter. By focusing on prompt formulation, the research addresses how instructions affect the accuracy of chatbot translation. This supports the literature on how prompts and instructions affect AI system behavior and performance. The study's strength is that it integrates machine learning with language learning to bridge the gap between traditional and modern education. Its limitations include the fact that it only studies Arabic translations of English sentences, which may limit its applicability to other languages or language pairs. According to the study, prompts play a crucial role in idiom translation by AI chatbots. Furthermore, the research also shows how both chatbots and AI are used in language education and translation learning. The study's early results are promising; however, it does not evaluate the chatbot's accuracy or effectiveness.

Likewise, Marangoz (2023) examines how artificial intelligence (AI) and machine learning (ML) are changing translation, interpretation, and other language services. These technologies are a significant step toward linguistic equality and real-time communication. AI's efficiency, accessibility, and new possibilities in various industries are shown through machine translation, speech recognition, natural language processing, and virtual assistants. The study emphasizes responsible development and deployment and examines ethical and practical issues of AI and ML in language services. Marangoz's (2023) study examines how AI chatbot prompts affect the translation of English-to-Arabic idioms. It emphasizes the complementary role of AI and human interpreters, highlighting the need for authentic communication. The study reviews the strengths and limitations of AI language models, offering insights into their use in language services. However, while it does thoroughly analyze AI and ML in translation and interpreting, including ethics and culture, it does not specifically address the translation of English-to-Arabic idiomatic expressions.

Moreover, Krishnam et al. (2023) developed a multilingual chatbot that uses AI and Natural Language Processing (NLP) to help students answer educational career questions. Additionally, educational advisors and student affairs staff can tackle overwhelming inquiries with the chatbot's English and Arabic capabilities. This innovation is important because it addresses the need of educational institutions for quick responses and accessibility. Indeed, the study transforms traditional technologies in customer interactions and the need for fast responses. Furthermore, it highlights the difficulties students face in learning about college and university policies, academic processes, and extracurricular activities caused by educational advisor and staff overload. The researchers employed a Python chatbot to help students with their questions. The common questions asked by students along with their answers comprise the chatbot's domain-specific knowledge base. It analyzes user inputs and responds with 80% efficiency in English and 75% in Arabic using AI and NLP. The study reports on student field tests of the software solution and the chatbot's real-time response accuracy, assessing the chatbot's practicality and ability to answer students' questions. The study concludes that an AI-based chatbot can meet the information needs of the students in educational institutions. It highlights the chatbot's efficiency in English and Arabic and suggests that such technologies can significantly reduce the workload of educational advisors and staff. Although the study focuses on education and shows the chatbot's effectiveness in English and Arabic, it lacks a direct connection to English-to-Arabic idiom translation, so while it provides a strong foundation for

chatbot development, it requires additional research to address idiomatic translation research questions.

Another study by Dokukina and Gumanova (2020) examined the growing role of chatbots in education, mainly foreign language learning. Chatbot technologies, their use in education, and their potential use as language learners' assistants are discussed. The article examines modern technology's shift towards visual learning, focusing on Graphical User Interfaces (GUIs), and recognizes the popularity of text messages and chat apps. Most notable by the authors is the fact that most people, especially younger ones, multitask and prefer texting to voice calls. Indeed, chatbots have grown in popularity ever since ELIZA, the world's first chatterbot (later shortened to simply "chatbot"), debuted in 1966. Today, deep learning and neural networks are used to create advanced chatbots, like Microsoft's XiaoIce, which can have natural language conversations. The research shows that Siri and Alexa are specialized personal assistants designed for specific tasks, while Mitsuki, Elbot, and Cleverbot are general chatbots that excel in fundamental text interactions. What is more, Dokukina's and Gumanova's (2020) study also mentions educational chatbots like Vasya and Duolingo, which are classified as "intelligent tutoring systems." These chatbots provide structured interactions, practice, and motivation, especially for beginners learning a language. This research is relevant to AI chatbot translations of English-to-Arabic idioms, emphasizing the importance of understanding language and context for accurate idiom translation. Thus, educational chatbots also show the potential of chatbot technology for language learning, including the ability to translate idiomatic language. According to the report, XiaoIce is capable of translating idioms. Furthermore, the article also explores how chatbots can be used to practice idiom translation skills, such as pronunciation and comprehension. While the source offers an overview of chatbot technology, its educational applications, and its benefits for language learners, it does not explain how chatbots translate idioms or how their prompts are formulated.

Additionally, an article by Alsubayhay et al. (2022) sheds light on the development and problems of Arabic chatbot development. It discussed creating and using an Arabic chatbot, specifically open and closed-domain conversation issues and techniques. It traces the evolution of chatbots from ELIZA and PARRY to A.L.I.C.E. According to the source, NLP and AI are crucial to chatbot development, which may be used for customer service and mental health help (Alsubayhay et al., 2022). The source notes that the complexity of Arabic, the paucity of corpora, and varied dialects make chatbot development difficult. These problems mirror issues with the translation of idiomatic expressions. Arabic idioms are contextual and culturally nuanced like English ones. Thus, knowing how chatbots translate idioms and cues is vital. The source also highlights pattern matching and AI/ML in Arabic chatbots. The investigation must determine how well these methods interpret idiomatic language in translation.

Prompt formulation is crucial to chatbot development and may affect the accuracy of idiom translation. The source's observations on how prompt formulations affect chatbot answers are relevant to the second and third study topics, which examine alternate prompts and translation efficacy. The source's strengths include its thorough coverage of chatbot development, applications, and Arabic-language chatbot implementation issues. It helps the literature review by explaining chatbot history and technology. However, the source also highlights the importance of pattern matching and AI/ML in evaluating and improving idiom translation algorithms. However, the source has limitations. For example, it emphasizes Arabic chatbots in open and closed domains, admits the lack of study in this field, and does not discuss idiomatic expression translation.

Design and Data Collection

This research will use a qualitative approach with a case study design to examine potential prompts and their effect on how AI chatbots translate idioms.

The researchers selected 20 proverbs—10 in English and 10 in Arabic—to be translated by two chatbots (GPT-4 and Claude-2). The researchers analyzed the chatbots' translations using various prompts and evaluated these translations based on Baker's (1992) strategies for translating idioms. The 10 English proverbs were taken from an article titled "50 Common Proverbs and Sayings"

(EngVid, n.d.) in English, and the 10 Arabic proverbs were taken from an article titled " امثال عربية مشهورة" ("Common Arabic Proverbs") (Almrsal, n.d.). The first 10 proverbs from each article were selected. The proverbs were then translated using two bots: GPT-4 and Claude-2 via Poe, which is, according to their website, "a platform that lets people ask questions, get instant answers, and have back-and-forth conversations with a wide variety of AI-powered bots" (Poe, n.d.). It is also worth noting that the chat conversations were deleted after each prompt test to minimize the chatbots relating their responses to previous data.

The English proverbs are:

1. Absence makes the heart grow fonder.
2. Actions speak louder than words.
3. A journey of a thousand miles begins with a single step.
4. All good things must come to an end.
5. A picture is worth a thousand words.
6. A watched pot never boils.
7. Beggars can't be choosers.
8. Beauty is in the eye of the beholder.
9. Better late than never.
10. Birds of a feather flock together.

The Arabic proverbs are:

1. حبل الكذب قصير .
2. عذر أقبح من ذنب .
3. مش كل مرة تسلم الجرة .
4. عصفور باليد خير من عشرة على الشجرة .
5. من شب على شيء شاب عليه .
6. إذا تفرقت الغنم قادتها العنز الجرباء .
7. اتقي شر من أحسنت إليه .
8. رب أخ لم تلده أمك .
9. إن غداً لناظره قريب .
10. لا تؤجل عمل اليوم إلى الغد

The prompts are:

1. Translate from English into Arabic.
2. Translate the following idioms into Arabic.
3. What are the equivalents of the following idioms in Arabic?
4. How do you say the following in Arabic?
5. How do you colloquially say the following in Arabic?
6. Translate from Arabic into English.
7. Translate the following idioms into English.
8. What are the equivalents of the following idioms in English?
9. How do you say the following in English?

10. How do you colloquially say the following in English?

Data Analysis and Results

This analysis compares the original proverbs with the chatbot translations using 10 prompts (five for each language combination). The prompt-response conversations are included in the appendix. Following Ali and Al-Rushaidi's (2016) recommendation to use idiomatic equivalents, the chatbots, guided by specific prompts, were able to find equivalent expressions in the target language. The study offers helpful insights for translators and students facing difficulties in translating idioms and identifying their equivalents.

The results are divided into two sections: (1) the translation of Arabic idioms into English and (2) the translation of English idioms into Arabic. The researchers evaluated how AI chatbots, mainly GPT-4 and Claude-2, performed these translations using the "Translate" prompt and analyzed the effect of different prompts on the translations and any errors. GPT-4 provided literal translations for all ten idioms, while Claude-2 did so for 8 out of 10.

To further assess the chatbots' translation abilities, we tested five additional prompts, each designed to encourage different strategies such as literal translation, paraphrasing, or finding equivalents. This helped us better understand how different prompts impact the accuracy and approach to idiom translation.

4.1 Arabic into English Analysis

The analysis of the translation outcomes based on different prompts revealed significant findings. For example, with Prompt 2: "Translate the following idioms into English," GPT-4 consistently provided literal translations and paraphrased versions, achieving a 10/10 success rate. Claude-2 produced mostly paraphrased translations (6/10), along with three literal translations and one equivalent translation. With Prompt 3: "What are the equivalents of the following idioms in English?" GPT-4 showed a strong performance in providing equivalent translations, scoring 8/10. Claude-2 had a 5/10 success rate, along with three paraphrased translations and two literal translations. Prompts 4 and 5 provided varied results. For Prompt 4: "How do you say the following in English?" GPT-4 mainly gave six literal translations, three paraphrased translations, and one equivalent. In comparison, Claude-2 leaned toward paraphrasing, with five paraphrased translations, three literal ones, and two equivalents. For Prompt 5: How do you colloquially say the following in Arabic?" GPT-4 mostly provided eight equivalents, one paraphrased translation, and one literal translation. Claude-2 focused on paraphrasing, delivering five paraphrased translations, three equivalents, and two literal translations. These results highlight the differing tendencies of the AI models in handling various prompts.

Table 1: Translations by Prompts from Arabic into English

Bot	Prompt #1	Prompt #2	Prompt #3	Prompt #4	Prompt #5
GPT-4	Literal (10)	Literal (10)	Literal (8), Equivalents (2)	Literal (6), Paraphrased (3), Equivalent (1)	Equivalent (8), Paraphrased (1), Literal (1)
Claude-2	Literal (8), Paraphrased (2)	Paraphrased (6), Literal (3), Equivalent (1)	Equivalent (5), Paraphrased (3), Literal (2)	Paraphrased (5), Literal (3), Equivalent (2)	Paraphrased (5), Equivalent (3), Literal (2)

GPT-4 applied literal translation to 74% of the idioms, showing a strong preference for direct translation, while Claude-2 used this approach for 46% of the idioms, indicating a more varied translation strategy. For finding equivalent idioms, GPT-4 used literal translation 22% of the time, showing proficiency in identifying English equivalents, whereas Claude-2 applies it 12%, indicating it used this approach less than GPT-4. In terms of paraphrasing, GPT-4 rephrased only 4% of the

selected idioms, while Claude-2 paraphrases 42%, showing a much higher tendency to rephrase while retaining the idioms' meanings.

Table 2: Statistics of Arabic into English Translation Strategies

Translation Strategy	GPT-4 Count	GPT-4 Percentage	Claude-2 Count	Claude-2 Percentage
Literal Translation	37	74%	23	46%
Equivalents	11	22%	6	12%
Paraphrasing	2	4%	21	42%

4.2 English into Arabic Analysis

When using GPT-4, the first prompt, "Translate from English into Arabic," achieved a full score of 10 out of 10 despite the heavy use of literal translation. The second prompt, "Translate the following idioms into Arabic," achieved a score of 9 out of 10, which is considered an acceptable result. The third prompt, "What are the equivalents of the following idioms in Arabic?" scored 10 out of 10. The fourth prompt, "How do you say the following in Arabic?" scored 10 out of 10. The fifth prompt, "How do you colloquially say the following in Arabic?" achieved a score of 9 out 10, which is also considered acceptable.

Using Claude-2, the first prompt, "Translate from English into Arabic," scored 9 out of 10. The second prompt, "Translate the following idioms into Arabic," also achieved a score of 9 out of 10, considered acceptable. The third prompt, "What are the equivalents of the following idioms in Arabic?" achieved a score of 9 out of 10 as well, with an additional translation technique, "translating by paraphrasing." The fourth prompt, "How do you say the following in Arabic?" achieved a score of 7 out of 10, which is the lowest result of all prompts for both models. The fifth prompt, "How do you colloquially say the following in Arabic?" achieved a score of 9 out of 10, which is considered acceptable. In the case of Claude-2, the model failed to translate the idioms correctly seven times. Most translations utilized "literal translation" and "similar meaning but dissimilar form." Translation by paraphrasing was also used, but it resulted in poor communicative translation. Overall, Claude-2 was less successful than GPT-4 in translating English idioms into Arabic.

Table 3: Translations by Prompts from English into Arabic

Bot	Prompt #1	Prompt #2	Prompt #3	Prompt #4	Prompt #5
GPT-4	Literal Translation (6), Similar Meaning, Similar Form (1), Similar Meaning, Different Form (2), Dissimilar Meaning and Form (0)	Literal Translation (7), Similar Meaning, Similar Form (1), Similar Meaning, Different Form (1), Dissimilar Meaning and Form (0)	Literal Translation (6), Similar Meaning, Similar Form (1), Similar Meaning, Different Form (1), Dissimilar Meaning and Form (0)	Literal Translation (6), Similar Meaning, Similar Form (1), Similar Meaning, Different Form (1), Dissimilar Meaning and Form (0)	Literal Translation (6), Similar Meaning, Similar Form (1), Similar Meaning, Different Form (2), Dissimilar Meaning and Form (0)

Claude-2	Literal Translation (4), Similar Meaning, Similar Form (1), Similar Meaning, Different Form (3), Dissimilar Meaning and Form (1)	Literal Translation (5), Similar Meaning, Similar Form (1), Similar Meaning, Different Form (2), Dissimilar Meaning and Form (1)	Literal Translation (5), Similar Meaning, Similar Form (1), Similar Meaning, Different Form (2), Dissimilar Meaning and Form (1)	Literal Translation (5), Similar Meaning, Similar Form (1), Similar Meaning, Different Form (2), Dissimilar Meaning and Form (1)	Literal Translation (5), Similar Meaning, Similar Form (1), Similar Meaning, Different Form (2), Dissimilar Meaning and Form (1)

GPT-4 used literal translation for 62% of the chosen idioms, showing a strong preference for direct translation, while Claude-2 uses it for 48%. Both models applied the "similar meaning, similar form" strategy to 10% of the translated idioms. For "similar meaning, different form," GPT-4 used this 16% of the time, and Claude-2 used it more frequently at 22%. GPT-4 paraphrased 4% of idioms, whereas Claude-2 paraphrased 10%, showing a higher rephrasing tendency. Both GPT-4 and Claude-2 used the "dissimilar meaning and form" strategy for about 10% of the selected idioms.

Table 4: Statistics of English into Arabic Translation Strategies

Translation Strategy	GPT-4 Count	GPT-4 Percentage	Claude-2 Count	Claude-2 Percentage
Literal Translation	31	62%	24	48%
Similar Meaning, Similar Form	5	10%	5	10%
Similar Meaning, Different Form	8	16%	11	22%
Paraphrasing	2	4%	5	10%
Dissimilar Meaning and Form	4	8%	5	10%

The findings indicated that both models primarily provided literal translations in response to the "Translate" prompt. GPT-4 achieved an acceptable score, as it failed to translate only twice, where it introduced translations of "dissimilar meaning and dissimilar form." GPT-4 utilized many different techniques of translating idioms, namely "translating by paraphrase," "similar meaning but different form," and "literal translation." However, most of these translations lack the communicative nature of translation. In the "translation by paraphrase" cases, the translations lack cohesion and coherence.

The results were almost similar despite the different prompts used for the two models. However, one of its strengths is introducing "translating by paraphrasing" as an additional technique in some prompts. Most prompts, however, could not introduce an entirely cohesive and communicative meaning.

Our analysis of the translation outcomes based on different prompts yielded noteworthy results. The selected prompts were expected to apply communicative, comprehensive, and cohesive translation. However, they achieved reasonable and acceptable results with rare rates of perfection. There were some occasional inaccuracies in the translations generated by both AI models. These errors were relatively minor and not of critical concern. For instance, GPT-4 provided an inaccurate Arabic-to-English paraphrase: "Time passes quickly when you're looking forward to something." In a similar vein, Claude-2 produced two inaccurate Arabic into English translations: "You can't keep going to the well" and "Beware of him from whom you have received a favor." It is important to emphasize that

these errors did not significantly impact the overall findings of our research, and they serve as cautious observations rather than significant setbacks.

In most English-into-Arabic examples that are translated in an inaccurate way, the idioms were translated with “dissimilar meaning and dissimilar form” or with “dissimilar meaning but similar form.” In addition, literal translations that gave an incomplete meaning of the idiom are another example of an error.

These findings highlight the complexity and challenges associated with idiomatic expression translation by AI chatbots, which can vary depending on the prompt chosen and the specific AI model used. Future research and advancements in AI language models may offer solutions to enhance translation accuracy for idiomatic expressions.

CONCLUSION

In conclusion, artificial intelligence (AI) and machine language (ML) translations open new opportunities for exploring how idioms can be translated between languages. As this study investigated the use of AI software in translating idiomatic expressions between English and Arabic, the results show a preference for literal translation with a focus on preserving meaning. Translating idiomatic language is difficult even for experienced translators familiar with both languages and cultures. Further research into the efficacy of using AI/ML software in translating English to Arabic idioms and vice versa is relevant, as it will deepen our understanding of AI as a tool in translation. Even as the software improves, much can be learned about using AI/ML in translation.

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