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An Intelligent Large Language Model Framework for Context-Aware Translation of Natural-Phenomenon Connotations from English into Arabic

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Abstract

The role of connotations as cultural and emotional associations that extend beyond their literal meaning, can present challenges in cross-cultural translation. This study investigates whether computer-assisted translation can accurately convey the English connotations of natural phenomena in Arabic. Large language models were used in the study to achieve the best possible outcome, "Google Translate, DeepL and Translate Modern" to translate culturally bound expressions. The findings revealed that the Large Language Models (LLMs) consistently failed to translate English culture-bound expressions appropriately into Arabic, scoring 0% cultural equivalence, showing largely dependence on literal translation and paraphrasing, which weakens the idiomatic function of cultural expressions' resonance. This confirms previous studies' findings.

Keywords : connotation, cultural nuances, English–Arabic translation, translation strategies, LLMs

I. INTRODUCTION

Connotation adds depth and richness to language by conveying cultural and emotional associations that go beyond the literal meaning of words. In literary texts, idioms and everyday expressions, connotations often shape interpretation and reflect cultural identity. When members of a particular group use connotations, they reflect the emotions of individuals and rely on their cultural backgrounds as a resource. This is understood within that group, but those outside it cannot understand it unless they acquire that group's cultural competence.

Connotations used among certain groups reflect people's emotions, supported by their cultural background. Individuals within a group can easily understand the connotations in their own language, but outsiders may find it difficult unless they possess cultural competence. Translating connotations across languages is therefore a complex task, requiring not only linguistic competence, but also cultural awareness. In English–Arabic translation, connotation poses particular challenges because the two languages belong to different families and reflect distinct cultural contexts. Expressions involving natural phenomena—such as rain, sun, wind, and clouds—carry symbolic meanings in English that may not have direct equivalents in Arabic. For example, "on cloud nine" connotes extreme happiness, while "make hay while the sun shines", conveys urgency and opportunity. Literal translation of such expressions often fails to capture their figurative and cultural resonance.

Previous studies have highlighted the difficulties translators face when dealing with culturally bound expressions, idioms, and figurative language. However, limited attention has been given to how university students, as novice translators, approach connotative expressions of natural phenomena. Understanding their strategies and errors can provide valuable insights into translation pedagogy. It is crucial that university students are equipped with valuable instruction to assess their translation using AI in the translation process. This study therefore investigates the effectiveness of machine translation. The study seeks to answer the following questions:

1. Are translation machines effective at translating connotations?
2. To what extent is the hybrid approach effective in improving the quality of machine translations?

II. LITERATURE REVIEW

Computer-aided translation (CAT) is widely regarded as one of the most significant developments in the modern translation industry. Translation work has evolved from a purely manual process to a digitalized workflow in which linguistic resources are managed and quality is controlled via CAT tools (Aluthman, 2024; Golovatska & Tereshchuk, 2024; Alqahtani & Al-Ahdal, 2025). Designed to support rather than replace human translators, CAT tools offer features such as Translation Memory, term-based management and consistency control (Kornacki, 2018).

Several studies have shown that large language models (henceforth LLMs) can improve the quality of translations in terms of grammatical accuracy, resolution of lexical ambiguity, and semantic adequacy when translating from English into Arabic (Ait Elfqih, 2025; Mohammed, 2025; Nomanet al., 2025). This makes it a suitable topic for research in the context of translator education and training (Ebbert-Hübner & Maas, 2017; Mohammed et al., 2018). The vocabulary and meanings of 'natural phenomena' include scientific terms such as 'earthquake' and 'hurricane', as well as figurative uses and pragmatic expressions in which these phenomena carry psychological, social and moral connotations. The success of LLMs in this area depends on the availability of suitable linguistic resources, as well as on using tool functions to support the translator's decision-making process, rather than replacing semantic understanding with mechanical matching.

Translation memory is built by storing source and target segment pairs, and these are suggested when similar segments appear again, supporting consistency and speed in repetitive or technical texts. The value of terminology management as a complementary function to TM becomes evident when it comes to terms related to natural phenomena. In the Arabic context, some researchers such LLMs is portrayed as professionally indispensable, yet adoption and effective use in Arab settings remain constrained by a recurring "knowledge-practice" gap, limited training infrastructure, and usability shortcomings (Aluthman, 2024; Alqahtani & Al-Ahdal, 2025).

Evidence from Saudi professionals indicates relatively high translation-memory uptake and strong perceived value of terminology management and quality-assurance functions, but also a demand for more user-centered, feature-rich QA tools (Aldossary, 2023). In parallel, studies of Saudi higher education and pan-Arab translator samples identify inadequate applied CAT and LLMs training, limited labs/software, and instructor readiness as key barriers, while usability research highlights learnability/helpfulness deficits and the need for stronger Arabic support (Mahdy, et al., 2020; Mohammed, 2023; Awadh, 2023; Alowedi & Al-Ahdal, 2023). Experimental findings further suggest that post-editing LLMs output can yield overall quality comparable to translating from scratch, supporting the integration of LLMs and post-editing competencies into curricula and professional development (Al-Ahdal, et al., 2017; Alsaif & Aluthman, 2024).

A. Problematic Areas in Translation

Ghazala (2008) defines a translation problem as any difficulty that arises and forces the translator to stop working in order to find an appropriate solution. Snell-Hornby (1988) highlights the key issues surrounding translation problems. She regards the source language text as forming the basis of the translation process. She forces the translator to find a solution based on:

1. The current state of the text: content, format and any associated information.
2. The recent context: text type and translation communication medium (written or spoken), and the development of the text.
3. The message function. (translation's core purpose)

The concept of 'reproducing', which involves the insertion of equivalent characteristics into the target language, was introduced by Nida (1964). Two modes of reproduction are recognized: The first point to consider is that of closure, and the second is that of naturalness. Nida's 'dynamic equivalent' is audience-oriented, communicative, and respectful of the target language (TL) culture.

English – Arabic Translation Problems: English – Arabic Translation Problems: In the context of Arabic-English translation and vice versa, two distinct challenges emerge, as indicated by Hofstede (2011), who categorizes these two cultures as follows: 'Cultural dimensions: English and Arabic cultures display clear characteristics.' This classification stems from the recognition of two problematic areas. English culture is characterized by an emphasis on the individual, and is perceived to exhibit lower levels of power distance. In contrast, Arabic culture is regarded as being more collective in nature, and is often perceived to exhibit higher levels of power distance. The differences give rise to a

number of salient issues, including cultural references, idioms, connotations, figurative meanings, synonyms, figurative meanings, words and polysemy. The following categories are to be considered:

1. Compound words and phrasal verbs
2. Literary translation as poetry
3. Irony
4. Sarcasm
5. Humorous texts

The concept of connotation: Manifests itself in a variety of contexts, including idioms and the process of literary translation. The presence of significant cultural differences between the English and Arabic languages has been identified as a key factor contributing to the challenges associated with translating connotation between these two languages. This is a salient issue among university students when undertaking translation work. They encounter difficulties in overcoming the cultural obstacles inherent in the communication process between two different cultures. The aforementioned cultural obstacles are the result of the different connotations that words and phrases imply.

Strategies to Overcome Translation Problems: According to Newmark (1988), strategies are distinguished from methods in the context of translation by the manner in which they contribute to the process of text translation. Translators employ translation methods to address the entirety of a text; however, they restrict translation strategies to the problematic 'smaller units' within the text in order to resolve translation issues that arise. The following strategies have been employed: The first method is the direct translation method. This is where translation is carried out by using literal translation between languages that belong to the same language family, for example English and French. This can be explained by the translating the following sentence: 'The baby is laughing' is translated into French as 'Le bébé rit'. 'Le' is the French equivalent of the English article 'the', whereas 'bébé' is the French equivalent of the English word 'baby'. The French verb 'rit' is used instead of the English verb 'laughing'.

The second method is oblique. Translation Strategies: In the context of translation between languages that are distant from one another, particularly those that are not closely related, such as English and Arabic, indirect translation methods are employed. This necessity arises from the inherent differences between the two languages in terms of their structure and sociocultural background. The following methods are employed: The process known as transposition involves the alteration of the grammatical category of a word class. To illustrate this concept, consider the following example: The infant is observed to be in a state of joviality. The translation of this is *يضحك الطفل*. In instances where a transposition strategy is employed, the translation may be rendered as 'the child laughs'. The position of the word *يضحك*, which signifies 'to laugh' in the Arabic present tense, is modified into another Arabic word class, namely the predicate *خبر*. This modification, undertaken by the translator, entails a shift in the author's intended point to preserve the impact of the message. To illustrate, the original phrase 'He was silent' is translated in Arabic as *لم ينبس بكلمة*.

In the third method, which is known as reformulation or equivalence, the translator rewrites the equivalence of the target language (TL), which has the same effect as with idioms and proverbs. For instance, the expression 'diamonds cut diamonds' is translated as *لا يقل الحديد إلا الحديد*. The fourth method is Adaptation: the translator adapts the content to make it relevant and understandable to the target audience: e.g. Romeo and Juliet = *قيس وليلى*. The fifth method is Compensation by which the translator employs this strategy when a particular element of the source language text cannot be translated. In order to preserve the meaning, the translator tends to compensate for the loss by introducing a similar element. A variety of translation techniques are employed in the field of English-Arabic translation. One such technique is reduction, whereby the translator elects to excise superfluous words from the source text. "It is my privilege to convey my profound gratitude and appreciation for the boundless support you have so generously provided".

The translator has elected to employ expansion, that is to say the addition of words with a view to maintaining the meaning, as opposed to reduction. For example, the phrase "flush shoot" is a team sport. The team performs a synchronized shooting action directed at targets composed of clay. The subsequent Arabic translation is deemed appropriate for this text: "An athletic event in which a number of individuals engage in a collective activity (consisting of a maximum of four participants) and are engaged in a single session."

"The objective of this event is to attain victory."

إطلاق النار المباشر رياضة جماعية يقوم فيها الفريق (الذي يتكون غالبا من أربعة اشخاص) يطلقون النار جميعا في وقت واحد على اهداف طينية (يتم عادة ضبط هذه الاهداف لمحاكاة اللعبة)

B. Illustration Strategy

Translators employ visual aids to elucidate characters or events, thereby providing a representation of concepts or an adaptation that serves to clarify a particular nuance. For instance, drag hunting, a practice in which canines are utilized to hunt foxes, is exemplified by the image below. This activity, which is engaged in by farmers in the United Kingdom, involves the use of dogs to locate and kill foxes. The strategy is elucidated by the image (1), which was introduced by <https://www.historic-uk.com/CultureUK/Fox-Hunting-in-Britain>.

Illustration strategy: The translators explain characters or events by displaying visuals to represent concepts or adaptation to clarify a certain nuance. e.g. Activities like drag hunting, which indicate using dogs to kill foxes –(an activity practiced by farmers in U. k.) This can be translated in Arabic as follows: 'تستخدم الكلاب للتعرف علي الثعالب بشم رائحتها' 'السحبها من مخابئها وقتلها'

Current Translation Approaches: Nowadays, there are two main ways to approach translation: human translation and machine translation. Both approaches have their pros and cons, but combining human and machine translation can produce high-quality results quickly.

C. Translation methods

Translation methods evolved from ancient Sumerian techniques, which were then adopted by the Greeks and Romans. These methods were used until the mid-20th century. Then came the revolutionary period led by Nida and the German functionalists Vermeer and his colleagues. Human translation methods are ordinary translation methods, which keep their prominent features, such as the ability to wander between literal and free translation, or sub-methods between them (Al-Wasy & Mohammed, 2024). Translation, as a cultural approach, is considered to be a change in translation studies from linguistically-oriented approaches to culturally-oriented ones. A 'cultural turn' means that culture, not language, is what is translated (Al-Wasy & Mohammed, 2024).

There are eight methods of translation: 1) word-for-word translation, 2) literal translation, 3) faithful translation, 4) communicative translation, 5) semantic translation, 6) adaptation, and 7) free translation. Newmark's model emphasizes the relationship between the source language (SL) and target language (TL). These methods fall into two groups: four focus on the source language (SL) (word-for-word, literal, faithful and semantic) and four focus on the target language (TL) (adaptation, free, idiomatic and communicative), demonstrating their range from SL to TL emphasis, which led the translator choices towards two directions:

1. Text type, e.g. legal and literary.
2. Audience, e.g. their culture and age. (Newmark, 1988, p. 45)

D. Criticism of Human Translation

Scholars have noted the limitations of human translation. Bassnett and Lefevere (1992) suggest that human translation is affected by many factors, such as the transfer process from the source language to the target language, the characteristics of the target language, the cultural context, and the individual abilities of the translator.

Machine Translation: Initially, machine translation meant translation done by a machine, without any human input. Some scholars admire machine translation as it has several advantages. Agustina et al. (2023) consider MT to be a valuable tool that facilitates cross-language communication. It is highly efficient and fast, translating large texts in a short time, which enables the quick exchange of information in the digital era. These machines can translate multiple languages to overcome the complexity caused by linguistic diversity among the world's population.

Computer-assisted translation (CAT): Bowker and Fisher (2010) state that 'computer-aided translation (CAT) involves the use of computer software to assist a human translator in the translation process'. The term applies to translation that remains primarily the responsibility of a person, but involves software that can facilitate certain aspects of it.' They differentiate between computer-assisted translation and machine translation, which they define as translation achieved essentially by computers without any human help, such as pre- or post-editing. Bowker and Fisher (2012) & Lee (2020) assert that CAT tools are usually aided by a stored translation memory containing previous sources and target translations for easy reference while working. These machines are also provided with terminology grammar as an integral part of the translation process. This grammatical terminology helps translators to develop their bilingual skills in their subject fields. According to Lee (2020), the results demonstrate that MT assists students in reducing errors related to lexicon-grammar and enhancing the quality of their revisions. Using MT for revisions also positively affected student writing strategies and helped them think of writing as a process. CAT tools are helpful materials for translators in the modern age due to their ability to enable high-speed, high-quality translation and mass production (Lee, 2020).

E. Cultural competence

Deardorff (2006) defines cultural competence as the ability to interact culturally. This interaction is effective and appropriate across cultures and is based on knowledge, skills and attitudes. Stressing the concept of cultural competence is crucial in today's diverse cultural world. In other words, Cultural competence (intercultural competence) as a set of cognitive, linguistic, affective and behavioral skills that enable people to communicate effectively and appropriately with people of different cultures.

Mayer et al. (2024) suggest four stages that are essential to acquiring cultural competence. They are as follows:

1. Awareness of and knowledge about one's own culture;
2. Awareness of one's cultural worldview — a basic step in understanding the differences between one's own culture and others, and in developing one's own cultural identity;
3. Knowledge of different cultural practices, e.g. traditions, attitudes, and values;
4. Effective and respectful interaction across cultures.

In the multicultural world in which we now live, translators must be ready to overcome linguistic borders and join different cultural communities, practicing their role as bilingual mediators. The factor that determines the effectiveness of a translation is the acquisition of cultural competence. Cultural diversity between human societies stems from various resources that shape human experience, such as religion, food, clothing, folklore, marriage and death. Bell (1991) asserts that 'the translator, as a communicator, must possess the knowledge and skills common to all communicators, but in two languages' (pp. 35–36)

Nida and Taber (1974) define the connotation as the emotional or cultural associations that a word or phrase carries beyond its literal or dictionary definition. This differs from denotation, which is the direct, literal meaning. Connotations can vary based on individual experiences, cultural background and the context in which the word is used. In everyday language, connotations are little more than 'associations', 'non-truth-conditional aspects of meaning' and 'intension'. Nida and Taber (1974) distinguish between two types of meaning: 1. Referential meaning = denotative = symbol; 2. Connotative meaning: what is suggested by the word.

According to Cruse (2006), connotation is a psychological and social aspect of expressive meaning. His definition reflects the feelings of language users towards a certain issue or thing. Newmark (1988) believes that all texts have connotations and that the 'radiance of ideas and feelings' is shadowed by the words used (p. 16). The Arabic term for 'connotation': Almaany online English–Arabic dictionary introduces many Arabic terms as equivalents of the word 'connotation', for example:

إيحاء؛ دلالة؛ فحوى؛ مدلول؛ مغزى؛ مفهوم؛ محتوي؛ مفاد؛ مؤدّى؛ معنى، مفهوم التضمين؛ إيحاء؛ <https://www.almaany.com/en/dict/ar-en/connotation>. Table 1 shows Arabic Terms for Connotation Translated into English.

TABLE 1 Arabic Terms for Connotation Translated into English

Arabic Terms	Back Translation
علاقة تضمينية؛ دلالة معنى أو مفهومة	Connotation
إيحاء	Suggestion
مغزي	a-Significance -b-meaning- c-signification- d-Sense-import
مدلول	Significance
محتوي	Content
مفاد	Meaning
معنى	Meaning
مفهوم التضمين	Concept of signification

Differences between Connotation and Denotation: The Merriam-Webster Dictionary differentiates between the denotation and connotation of a word as follows: Denotation is the word's direct and plain meaning — its definite, not ambiguous, meaning. On the other hand, the connotation of a word is what the word indicates, i.e. the nuances, meaning and shades carried by the word. <https://www.merriam-webster.com/thesaurus/shade>

Considering the denotations and connotations of colors, e.g., white denoting purity, peace, and innocence, and red denoting blood and love, when paired with a heart image, given the heart's position as the primary container of blood. Saussure points out the relationship between the signifier and the signified. He considers the signifier to be the clear form of the sign, while the signified is the concept or idea the signifier indicates (Saussure, 1974). Traffic signals clearly show this.

Human factors influence connotation: Three factors influence connotation variations:

1. Individual experiences,
2. Cultural backgrounds.
- 3- The context. (Saussure, 1974, pp. 91–94)

Taking the word 'dog', it denotes a mammal, a pet animal that barks, growls, whines, and wags its tail. When this animal is mentioned, different images will come to mind for different hearers. For example, a person who has been attacked by a dog will have an image of a monster, whereas a person who has had a lovely, helpful dog will have an image of a gentle, obedient dog. The connotations of the term 'dog' differ between Arabic and English, depending on the context. In English, it has a positive connotation when referring to a playful dog, for example, 'He is a puppy', meaning he is gentle and fun. In English, the term 'dog' has positive connotations when the context displays loyalty and faithfulness.

Chomsky's (2002) Views on Language and Connotation: He displayed human language as a surface structure, which is what is said or pronounced, and a deep structure, which indicates human knowledge or the store from which humans draw meaning from what they hear. Surface structure is what is said or produced (verbal and non-verbal language). According to Chomsky (2002), surface structure is a combination of three elements: 1) images, 2) words and 3) gestures. The surface structure is what is said or used (images or gestures), see Table 2. by the speaker. Deep structure = connotation. He suggests that the nuances and connotations of the source text will be influenced by the surface structure of the target language. Furthermore, the deep structure springs from values, culture, feelings, ideas and attitudes. The surface structure will take three forms: plain words, images, or gestures.

Types of Connotations: In general, there are three types of connotations:

1. Positive: a good image, favored for its high values, such as bravery, generosity and wisdom.
2. Negative: a bad image, such as stinginess and cunning.
3. Neutral: in which the denotation and connotation are equal. There are three types of Arabic connotation.

These types are slightly different to the English ones:

- Connotation of a described noun, e.g. My city is paradise
- Connotation of a description, e.g. bravery, cunning
- Connotation attributed to something, e.g. the heart is the home of horror

In the English language, the word 'skinny' carries a negative connotation as it means 'too thin' or 'having very little flesh on the body', which is a neutral connotation. Lithe: slim and elastic (positive connotation). Cultural influences on connotations: There is a strong connection between culture and connotation. The Merriam-Webster Dictionary defines culture as 'customs and beliefs practiced by members of a society which spring from their religion or are inherited from their predecessors'. This definition leads to a variety of connotations that identify a certain society or group. English and Arabic people have their own cultural connotations, found between one people rather than the other. Differences in beliefs, such as Christianity and Islam, as well as inherited, deeply rooted customs and different waves of civilization that have affected both peoples, have led to the development of different cultures for English and Arabic people. Even the differences in weather and geography have played a part in shaping their cultures.

Historical Change of Connotation in English: According to Wikipedia, the free encyclopedia, language change always leads to changes in the meaning of words. This usually affects primary meanings over time, a phenomenon known as semantic change. Important factors responsible for this change include cultural shifts and technological development, which began with the Industrial Revolution. This phenomenon exists in both the English and Arabic languages. See Table 3.

TABLE 3 HISTORICAL CHANGE OF SOME ENGLISH WORDS CONNOTATION

Words	Literal Meaning	Original meaning	Contemporary usage
Awful	full of awe =fearful	1- Giving a feeling of surprise or fear 2- causing a feeling of admiration	very bad"
Terrific	inspiring terror	indicate an amazing thing	Notably good
Nice	foolish, ignorant, frivolous, senseless	Clear and accurate, careful, pleasant, cheerful	kind, thoughtful"
Naïve	natural, primitive, or native	Native	Fool
Guy	Attacks on House of Parlement Leader	Any person	Fellow, Mixture gendered

Table 3 illustrates the historical change of some English words connotation. Natural phenomena are events such as volcanoes, storms, rain, sunrises and sunsets, winds, and clouds. These are events that occur in nature without human intervention. The connotations of these phenomena are deeply connected with human culture. People have different

feelings towards these events and different attitudes or emotions towards different natural phenomena. These emotions range from appreciation of beauty to fear of harm from violent phenomena such as volcanoes, earthquakes, tornadoes, and tsunamis.

Clouds Connotation: Clouds have different connotations in English and Arabic. In English, clouds are associated with rain and have a negative connotation, as explained in Table 5. In English, clouds are associated with 'cover', such as an umbrella. The phrase 'under a cloud' expresses a lack of clarity. The English language has a number of phrases that use the word 'cloud'. One of these is 'under a cloud', which is used to talk about uncertainty or ambiguity. Another is 'cover', which is used to talk about protection, such as when you are 'covered' by an umbrella. See Table 4 and Table 5.

TABLE 4 CLOUD CONNOTATIONS IN ENGLISH

English Connotation	Meaning	Translation
When it rains, it pours!"	When something bad take place , many bad things follow it	ان المصائب لا تأتي فرادي
1-Under a cloud: 2-living under a cloud of suspicion 3-Living under a dark cloud 4-Every cloud has a silver lining 5-On cloud nine	1-Has done something bad 2-Suspected of committing something wrong 3-If someone is living under a dark cloud this means he is depressed 4-There is always hope in the hardest situations "the sun will shine after cloud' disappears	1-فعل شيء سيء 2-في دائرة الشك 3-محبط 4-كل ليل يعقبه - صباح 5-رب ضارة نافعة-

TABLE 5 CONNOTATION OF CLOUD IN ARABIC

Arabic Connotation	Meaning	Translation
سحابة صيف	A fleeting, matter that leaves no trace	1-In a twinkling of an eye- 2-like a shot-as a flash- 3-The swiftest hours, as they flew" 4-like a bat out of hell
مشي السحاب لا ريث ولا عجل	Walking calmly and steadily, neither slow nor fast.	Walking a fine line
غامت عيناها بالدموع	Her eyes filled with tears	Tear-filled eyes
سحابة حزن	A period of sadness that overwhelm a person- emotional feeling of a gloomy atmosphere surrounding a person may be related to period or experience of loss or difficulty	A cloud of sadness
استهلّت وارعدت	A cloud is followed by heavy continuous rain and thunder.	You are welcome. Your coming bring light and life to our home.

Table 4 displays the English connotation of cloud whereas Table 5 displays the connotations of the Arabic word for 'cloud'. The final Arabic expression in Table 5 (استهلّت وارعدت) reflects Arab attitudes towards clouds that bring the promise of rain. This expression, used by citizens of the Gulf, signifies generous hospitality and welcoming guests as if they were clouds that bring lightning and heavy rain, which are symbols of life and prosperity.

Wind Connotations: Wind and storm are two types of moving air. Storms usually have a negative connotation in both English and Arabic due to their disastrous aftermaths, as explained in Table 7. Breeze, another type of wind, carries a positive connotation in both languages, as indicated by the phrase 'a breeze', which describes something as easy. In English, 'breeze' can also have a negative connotation, as in 'bat the breeze', which refers to useless conversation. See Table 6.

TABLE 6 STORM CONNOTATIONS IN ENGLISH

English Connotation	Example	Translation
Strong emotion, -Upheaval	She stormed off	خرجت غاضبة ثورة -عاصفة (غضب)

To gain success or popularity, often suddenly	To take by a storm	هبت ريحه
To endure a difficult situation	Weather the storm	الصبر مفتاح الفرج
Peaceful moments which precede hard ship or chaotic situation	The calm before the storm	الهدوء الذي يسبق العاصفة
A lot of noise about a bullshit	A storm in a tea cup	زوبعة في فنجان
A group of events and circumstances that compiled to lead to a disastrous result	A perfect storm	ان المصائب لا تأتي فرادي

TABLE 7 WIND CONNOTATIONS IN ARABIC (ALMAANY DICTIONARY) [HTTPS://WWW.ALMAANY.COM/AR/DICT/AR-](https://www.almaany.com/ar/dict/ar-)

Arabic Expressions	English Translation	Connotations
كل ما هبّ وذبّ	Everything that comes and goes: from all kinds: ",Dick and Harry"	A mixture of gathered people Tom
هبت ريحه	The wind blew - he did what he wanted-He get what he planned to get	Good luck
ذهب عمله ادراج الرياح	His work was in vain, his effort was wasted in vain, without benefit or result.	Failure
ذهب مع الريح-	Gone with the Wind , disappeared and its traces were gone	A final parting
ريشة في مهب الريح	A feather in the windward - weak, helpless, without will	Hesitation in making a decision
يهب مع كل ريح	Blows with every wind	Always follow other people's opinions
يباري الريح	Competing with the wind	High speed
رجل ساكن الريح	A calm, dignified man	Calmness
زوبعة في فنجان-	A whirlwind- A whirlwind is a strong wind that spins around itself and uproots trees.	A lot of noise as a reaction of a trivial matter
ركبت ريحهم ذهب ريحهم:	The wind that wind = blows their ship stagnated	weakness and fading strength after a period of boom

Table 7 displays wind and storm connotation in Arabic. Rain's connotations: Due to geographical differences, people's attitudes towards rain and sunshine vary. As a result, rain and sunshine have different connotations in English and Arabic. In English, a rainy day is considered difficult (save for a rainy day), whereas in Arabic, a generous man is compared to heavy rainfall.

What does 'sun' connote? The Oxford Dictionary, the historical English dictionary, mentions two facts about the word 'sun' in the etymology of the English language: 1. In Old English, the word for 'sun' was 'sunne', and it was referred to as 'she'. After the mid-15th century, the sun had a masculine pronoun. The name 'sun' was first used in 1844. For English people, for whom cold weather is the norm, the sun is seen as a source of energy, heat, light and hope. The website <https://myenglishteacher.co.uk/2024/06/30/20-sun-idioms-and-expressions> displays idioms relating to the sun, such as taking opportunities, finding success, enjoying warmth, and expressing intense admiration: 'place in the sun', 'make hay while the sun shines', and 'Bask in the sun'.

III. METHODOLOGY

The three translation machines (Google Translate, DeepL, and Translate Modern) were used to translate twenty famous English expressions into Arabic. The machines' output was checked. The machine translations were analyzed using SPSS. The findings were used to determine the results, and then pedagogical recommendations were introduced. The majority of scholars depict translation as two possible functions one firstly as transfer of meaning from one language to another, secondly as a modification of the original meaning as posited by Catford (1965) and Newmark (1988).

According to contemporary definitions, translation is not merely linguistic equivalence; rather, the focus is on cultural and societal influences, leading to approaches such as sociolinguistic, communicative, and postcolonial theories. The most popular of these is the functionalist approach, also known as skopos theory (Schäffner 1998; Vermeer 1989/2004). The researcher asked 12 students to translate the same items using these applications and

make post editing, they did so to see the extent of the hybrid approach effectiveness in improving the quality of machine translations

IV. RESULTS AND DISCUSSION

The study employed three LLMs (Google Translate, DeepL, and Translate Modern) to translate twenty English expressions with different cultural meanings into Arabic. Then, quantitatively the systems' performance of translations was analyzed and compared with that of human. Results are explained in two steps: analyzing machines output. (Table 8 and Table 9.)

TABLE 8 THE ENGLISH EXPRESSIONS MODEL TRANSLATIONS

No	English Expressions	Arabic Equivalent	Suggestions
1	The test was a breeze and Rana got high marks.	كان الاختبار قطعة كيك بسكويت	This idiom suggests that the test was straightforward
2	-Make hay while it is shine	1- اذا هبت رياحك فاغتنمها 2- اطرق علي الحديد وهو ساخن	Seizes the opportunity
3	Chase the sun	من طلب العلاء سهر الليالي ومن طلب اللآلئ خاض البحار -اذا غامرت في شرف مروم فلا تقنع بما دون النجوم	Pursuing dreams and ambitions
4	A perfect storm	ان المصائب لا تأتي فرادي	Multiple events or circumstances happen simultaneously.
5	Not a cloud in the sky	لا مشكلة -كله تمام	Ideal conditions
6	She always rains on my parade.	7-ا. احباط الخطط ب.ا.فساد المؤامرات	Spoiling one's plans or happiness
7	Come rain or shine	على كل حال	Something will happen no matter the circumstances
8	-Every cloud has a silver lining.	رب ضارة نافعة	good even in bad situations
9	A storm in a teacup	مشكلة صغيرة مبالغ فيها	A big fuss about a small problem
10	Under the weather	يمر بوعكة صحيحة	Feeling unwell, sick, or slightly ill
11	Steal someone's thunder	سرق فكرته	To get the
12	Break the ice	كسر حاجز الصمت/الجمود	Start a conversation in an obstinate social situation
13	Have your head in the clouds	غارق في احلامه ، شارد الذهن	Think about something in a way that is not practical or sensible.
14	Weather the storm	يتحمل العاصفة / يعدي المحنة	Go through something difficult
15	On cloud nine	في قمة السعادة	Extremely happy, ecstatic, overjoyed
16	Lightning never strikes twice	الخط لا يتكرر؛ الفرصة لن تعود ثانية	it is unlikely that something bad or unusual will happen to the same person twice.
17	Bolt from the blue	مفاجأة مذهلة	Complete surprise, something totally unexpected
18	Ray of sunshine	شعاع من الامل	Cheerful person who brightens others' moods
19	Take shelter from the storm	يتوارى عن العاصفة or يحمي نفسه من المشاكل	It refers to seeking comfort, security, or emotional support during difficult, turbulent, or overwhelming times in life
20	When it rains, it pours	إذا أصابتك مصيبة تأتيك أخرى or النكبات تتتالي	when something bad happens, other, often worse, things happen at the same time or in quick succession

TABLE 9 GOOGLE TRANSLATE INPUT AND OUTPUT

No	English Expressions	LLMs Translation	Type of Translation	Accuracy 1-5
1	The test was a breeze and Rana got high marks	كان الاختبار سهلاً للغاية وحصل رانا على درجات عالية.	Paraphrasing	3

2	Make hay while it is shine-	اغتنم الفرصة ما دامت سانحة	Paraphrasing	4
3	Chase the sun	طارد الشمس	Literal Translation	1
4	A perfect storm	عاصفة كاملة	Literal Translation	1
5	Not a cloud in the sky	لا سحابة في السماء..	Literal Translation	1
6	She always rains on my parade	إنها دائماً ما تفسد عليّ فرحتي.	Paraphrasing	2
7	Come rain or shine	سواء أكان الجو ممطراً أم مشمساً..	Literal Translation	1
8	Every cloud has a silver - lining	لكل سحابة جانب مشرق.	Literal Translation	1
9	A storm in a teacup	عاصفة في فنجان شاي	Literal Translation	2
10	Under the weather	مريض	Paraphrasing	3
11	Steal someone's thunder	سرقة الأضواء من شخص آخر	Paraphrasing	4
12	Break the ice	كسر الجليد	Cultural Equivalent	3
13	Have your head in the clouds	رأسك في الغيوم	Literal Translation	1
14	Weather the storm	تجاوز العاصفة	Cultural Equivalent	4
15	On cloud nine	في قمة السعادة	Literal Translation	4
16	Lightning never strikes twice	البرق لا يضرب مرتين	Literal Translation	1
17	Bolt from the blue	صاعقة من السماء	Literal Translation	1
18	Ray of sunshine	شعاع من أشعة الشمس	Literal Translation	1
19	Take shelter from the storm	الاحتماء من العاصفة	Literal Translation	1
20	When it rains, it pours	عندما تمطر، تغرق الأرض	Literal Translation	1

the types of translation of English cultural expressions provided by Google Translate are displayed by table 10. Moreover, the accuracy of Google Translate in translating cultural expressions is shown by table 11.

TABLE 10 THE EFFECTIVENESS OF TRANSLATION GOOGLE TRANSLATE IN TRANSLATING CULTURAL EXPRESSIONS:

Translation Types	No	Percentage
Cultural Equivalent	2	10%
Paraphrasing	5	25%
Literal Translation	13	65%
Total	20	100%

The results demonstrate that Google Translate employed literal translation for translating English cultural expressions, as being noticed that 65% of the items translated literally, 25% paraphrased, and only 10% were rendered by using cultural counterparts. GT tended to use literal translation which is considered as problematic in rendered such culturally specific terms. Thus, using literal translations such as “طارد الشمس” for “Chase the sun,” and “عاصفة كاملة” for “A perfect storm,” were very poorly rendered and they look unnatural in Arabic. the researcher evaluated the accuracy of GT, he found that the overall performance of GT on a 1–5 scale was not up to expectations as 55% of the translations were evaluated as “very poor,” 10% as “poor,” 15% as “acceptable,” 20% as “correct,” and none were classified as “accurate. This result revealed that there is correlation between technique used and quality, literal translations fail to rendered CSI properly as their translations fell under the “very poor” and “poor” categories, while paraphrases and cultural equivalents techniques obtained “acceptable” or “correct”.

Figure 1 shows the proportions of the various types of translation in the Google Translate input. Google Translate failed to find a cultural equivalent for the introduced cultural connotations, achieving only 25% of translated expressions, while achieving 37.5% paraphrasing and 62.5% literal translation. This suggests that its performance depends on the dictionaries with which it is equipped..

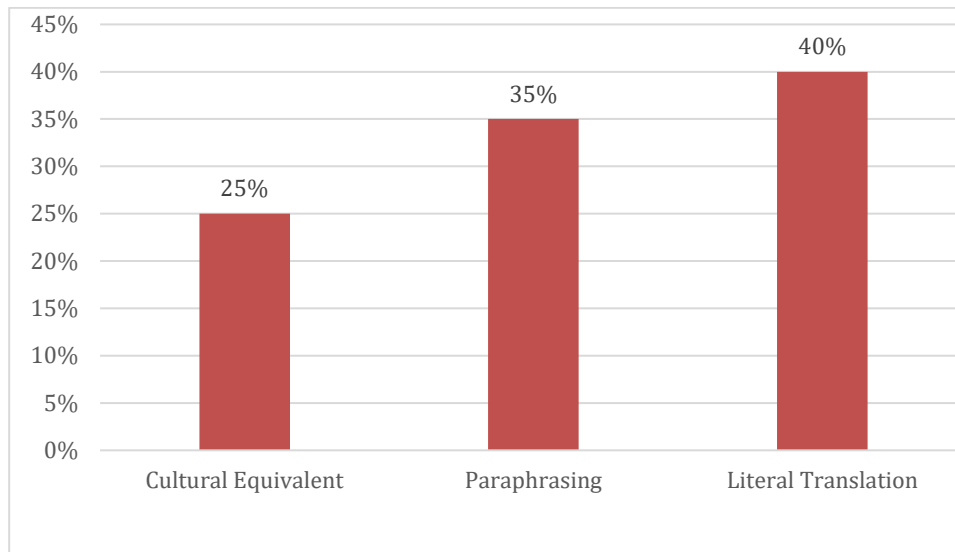


Figure 1 A Bar Chart of Percentages of Translation Types in Google

TABLE 11 THE ACCURACY OF GOOGLE TRANSLATE IN TRANSLATING CULTURAL EXPRESSIONS

Accuracy		Percentage
Very poor	11	55
poor	2	10
Accpetable	3	15
Correct	4	20
Acccurate	0	0
Mean	2	Poor

Table 12 shows the of translation of English cultural expressions provided by Deepl Translate whereas Table 13 show the percentages of translation types provided by Deepl. Table 14 display the accuracy of Deepl in translating cultural expressions. Figure 2 a bar chart showing DeepL translation effectiveness.

TABLE 12 DEEPL INPUT AND OUTPUT

No	English Expressions	DeepL Translation	Type of Translation	Accuracy 1-5
1	The test was a breeze and Rana got high marks.	كان الاختبار سهلاً وحصلت رنا على درجات عالية.	Paraphrasing	3
2	-Make hay while it is shine	اغتنم الفرصة عندما تسنح لك	Paraphrasing	4
3	Chase the sun	اصطاد الشمس	Literal Translation	1
4	A perfect storm	عاصفة كاملة-مثالية	Literal Translation	1
5	Not a cloud in the sky	..لا توجد غيوم في السماء	Literal Translation	1
6	She always rains on my parade.	إنها دائماً تقسد فرحتي	Paraphrasing	2
7	Come rain or shine	مهما كانت الأحوال الجوية. سواء كان الجو مشمساً او ممطراً	Paraphrasing	1
8	-Every cloud has a silver lining.	كل سحابة لها جانب مشرق	Literal Translation	1
9	A storm in a teacup	عاصفة في فنجان شاي	Literal Translation	2
10	Under the weather	تحت الطقس	Literal Translation	1

11	Steal someone's thunder	سرقة الأضواء من شخص ما	Cultural Equivalent	4
12	Break the ice	كسر الجليد	Literal Translation	2
13	Have your head in the clouds	تحلق في السحاب	Literal Translation	1
14	Weather the storm	تجاوز العاصفة	Literal Translation	2
15	On cloud nine	في قمة السعادة	Cultural Equivalent	4
16	Lightning never strikes twice	البرق لا يضرب مرتين	Literal Translation	1
17	Bolt from the blue	صاعقة من السماء	Literal Translation	1
18	Ray of sunshine	شعاع من أشعة الشمس	Literal Translation	1
19	Take shelter from the storm	الاحتماء من العاصفة	Literal Translation	1
20	When it rains, it pours	عندما تمطر، تمطر بغزارة	Literal Translation	1

TABLE 13 PERCENTAGES OF TRANSLATE TYPES PROVIDED BY DEEPL

Translation Types	No	Percentage
Cultural Equivalent	2	10%
Paraphrasing	4	20%
Literal Translation	14	70%

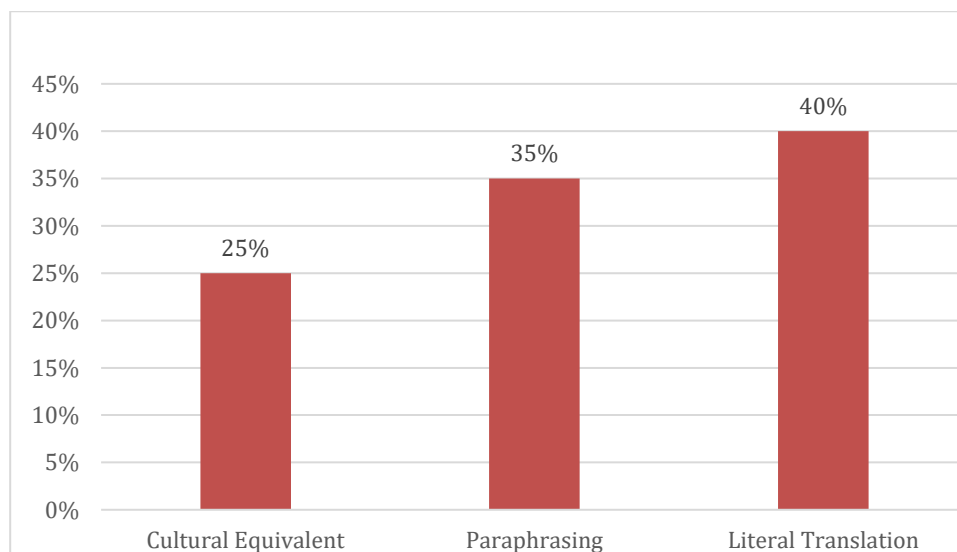

Figure 2 A Bar Chart of DeepL Translation Effectiveness

TABLE 14 THE ACCURACY OF DEEPL IN TRANSLATING CULTURAL EXPRESSIONS

Accutacy		percentage
Very poor	12	55
poor	4	10
Accpetable	1	15
Correct	3	20
Accurate	0	0

The mean	1.75	Poor
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The results for DeepL show a similar result of Google Translate, but with slightly lower average accuracy DeepL has stronger reliance on literal translation. regarding to the strategy used by DeepL it was revealed that it used literal translation heavily. the items translated were found to be grammatically correct but pragmatically awkward and semantically unclear in Arabic

DeepL's translation accuracy were reported to be poor, and a mean score of 1.75 which fell under "poor" category. DeepL struggles with cultural expressions very much. Literal translations often receive low ratings, while limited paraphrases are somewhat better but still not reliable. Thus, DeepL is not dependable for translating the expression from English to Arabic without human intervention, and its outputs should be viewed as rough prompts which obliges human to substantially post-edit them for meaningful paraphrasing and cultural adaptation.

TABLE 15 MODERN TRANSLATE INPUT AND OUTPUT

No	English Expressions	Modern Translate Translation	Type of Translation	Accuracy 1-5
1	The test was a breeze and Rana got high marks.	كان الاختبار نسيماً وحصلت رنا على درجات عالية.	Literal Translation	3
2	-Make hay while it is shine	اصنع القش وهو يلمع	Literal Translation	1
3	Chase the sun	طارد الشمس	Literal Translation	1
4	A perfect storm	عاصفة مثالية	Literal Translation	1
5	Not a cloud in the sky	لا غيمة في السماء..	Literal Translation	1
6	She always rains on my parade.	دائماً ما تمطر على موكبي.	Literal Translation	1
7	Come rain or shine	يأتي المطر أو يلمع..	Literal Translation	1
8	-Every cloud has a silver lining.	كل سحابة لها بطانة فضية.	Literal Translation	1
9	A storm in a teacup	عاصفة في فنجان شاي	Literal Translation	2
10	Under the weather	تحت تأثير الطقس	Literal Translation	1
11	Steal someone's thunder	سرقة رعد شخص ما	Literal Translation	1
12	Break the ice	اكسر الثلج	Literal Translation	1
13	Have your head in the clouds	الرأس في السحب	Literal Translation	1
14	Weather the storm	الصمود للعاصفة	Literal Translation	1
15	On cloud nine	على السحابة التاسعة	Literal Translation	1
16	Lightning never strikes twice	البرق لا يضرب مرتين	Literal Translation	1
17	Bolt from the blue	انطلق من العدم	Literal Translation	1
18	Ray of sunshine	شعاع من أشعة الشمس	Literal Translation	1
19	Take shelter from the storm	احتموا من العاصفة	Literal Translation	1
20	When it rains, it pours	عندما تمطر ، فإنها تصب	Literal Translation	1

TABLE 16 THE EFFECTIVENESS OF MODERN TRANSLATE MACHINES IN TRANSLATING CULTURAL EXPRESSIONS

Translation Types	No	Percentage
Cultural Equivalent	0	0%
Paraphrasing	0	0%
Literal Translation	20	100%
Total	20	100%

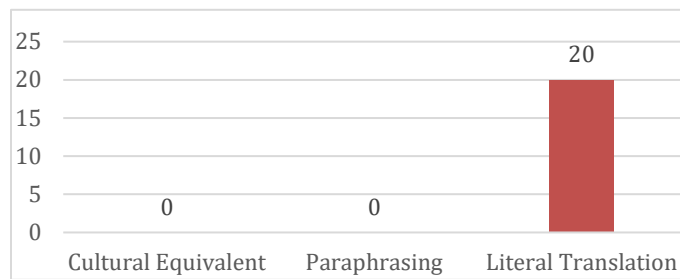


Figure 3 A Bar Chart of Modern MT Effectiveness

Figure 3 shows the effectiveness of Modern MT. This bar chart illustrates the proportions of the various types of translation in the Modern MT Translate input.

TABLE 17 THE ACCURACY OF MODERN MT IN TRANSLATING CULTURAL EXPRESSIONS

Accutacy		Percentage
Very poor	18	90
poor	1	5
Accpetable	1	5
Correct	0	0
Acccurate	0	0
The mean	1.15	Very poor

Table 17 revealed that Modern Translate had substantial difficulties with English expressions, as it regularly used literal translations. Its accuracy was very poor, with a mean value of 1.15 . Modern Translate failure to convey culture-specific meanings is due to the great dependence on literal translations. The results indicated that the short coming of these apps validate the accusation of MT models for their insufficient pragmatic and cultural understanding of figurative communications.

Concerning the accuracy of Modern Translate, 18 expressions were found to be under as "very poor," one as "poor," and just one was valued as "acceptable. Modern Translate lacks the capability for idiomatic recognition or functional adaptation.

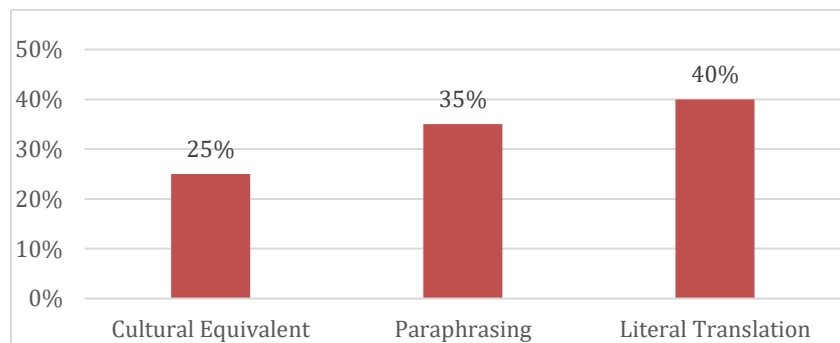
TABLE 18 TRANSLATION OF ENGLISH EXPRESSION BY EFL LEARNERS

N o	English Expressions	P 1	P 2	P3	P 4	P 5	P6	P 7	P 8	P 9	P10	P11	P12	Mean	Accurac y
1	The test was a breeze and Rana got high marks.	3	3	3	3	3	3	3	3	3	3	3	3	3.00	3
2	Make hay while it is shine	3	3	3	5	3	3	4	4	4	3	3	3	3.42	3
3	Chase the sun	4	4	4	4	4	4	4	4	4	4	4	4	4.00	4
4	A perfect storm	4	4	3	3	3	4	3	3	4	3	3	3	3.33	3
5	Not a cloud in the sky	3	3	5	3	5	4	4	4	3	3	3	3	3.58	4
6	She always rains on my parade.	3	5	3	5	3	4	4	4	3	3	3	3	3.58	4
7	Come rain or shine	4	4	4	4	4	4	4	4	4	4	4	4	4.00	4
8	-Every cloud has a silver lining.	4	3	3	3	4	4	3	3	3	3	4	4	3.42	3
9	A storm in a teacup	5	5	5	5	5	5	5	5	4	4	4	4	4.67	5
10	Under the weather	4	4	4	4	4	4	4	4	4	4	4	4	4.00	4
11	Steal someone's thunder	3	3	3	3	3	4	4	4	3	3	3	3	3.25	3
12	Break the ice	4	4	4	4	4	4	4	4	4	4	4	4	4.00	4

1 3	Have your head in the clouds	3	3	3	4	4	2	4	4	3	3	3	3	3.25	3
1 4	Weather the storm	4	4	4	4	4	4	5	3	5	4	4	4	4.08	4
1 5	On cloud nine	3	3	3	3	4	4	4	2	3	3	3	3	3.17	3
1 6	Lightning never strikes twice	5	5	5	3	5	5	5	5	3	5	5	5	4.67	5
1 7	Bolt from the blue	4	4	4	4	4	4	4	4	4	4	4	4	4.00	4
1 8	Ray of sunshine	3	3	3	3	3	5	5	5	5	5	3	3	3.83	3
1 9	Take shelter from the storm	5	3	4	4	3	3	3	3	3	3	3	2	3.25	3
2 0	When it rains, it pours	5	5	5	5	5	4	4	4	4	5	5	5	4.67	5

TABLE 19 THE EFFECTIVENESS OF HUMAN IN TRANSLATING CULTURAL EXPRESSIONS

Translation Types	No	Percentage
Cultural Equivalent	5	25%
Paraphrasing	7	35%
Literal Translation	8	40%
Total	20	100%


TABLE 20 THE ACCURACY OF EFL LEARNERS IN TRANSLATING CULTURAL EXPRESSIONS

Accutacy		Percentage
Very poor	00	0
poor	00	0
Accpetable	9	45
Correct	8	40
Acccurate	3	15
The mean	3.7585	Correct

Table 18 and Figure 3 revealed that the EFL students translated the understudy expressions in an accurate manner. they performance was correct as the mean was 3.76 which fell under correct category. Regarding to the strategies as shown in Table 19, their translations ranged between cultural Equivalent, paraphrasing, and literal translation 25%, 35%, 40% respectively. they tried to grasp the pragmatic meaning of these expressions as they varied their strategies to cope with the meaning of these expressions accordingly.

The machine translation could not find a cultural equivalent for any of the expressions that were translated. No paraphrasing was achieved. The machine achieved a higher percentage in literal translation (75%), with 25% of the expressions mistranslated. The machine depends totally on the dictionaries it is provided with (Finding 3).

As for the analysis of the translation of the three machines step is concerned, Table 15 and Figure 4 illustrate the three machines translation types percentages.

Table 21 compared the translation of AI models and human translators which showed notable differences in their dealing with cultural expressions. AI models show a significant preference towards employing literal translations approach, as Modern MT used this strategy at 100%, DeepL at 70% literal, and Google Translate at 62.5%. This accused their weak performance. Comparing them with that of human translators- EFL learners, they found to apply more efficient strategies, such as cultural equivalents and paraphrasing, they only used literal translations in 8 items -40%. Regarding the accuracy, human translation was almost correct. See Figure 4.

TABLE 21 COMPARISONS OF PERFORMANCE OF AI MODELS AND HUMAN

Machine	Cultura Equivalent	Paraphrasing	Literal Translation
Google Translate	0%	37.5%	62.5%
DeepL Translate	10%	20%	70%
Modern MT	0%	0%	100%
Human	25%	35%	40%

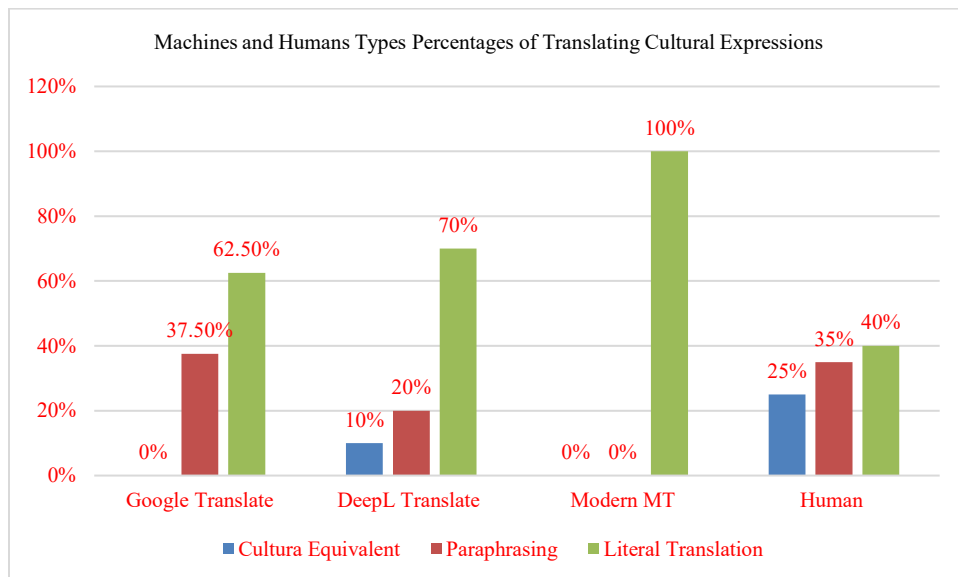


Figure 4 A Bar Chart of Machines and human Type Percentages of Translating Cultural Expressions

V. CONCLUSION

LLMs are found to have such limitation in translating culture-bound idioms whose meanings are connotative rather than compositional, as none of the systems produced an acceptable Arabic cultural equivalent. The result reports that performance of LLMs in English–Arabic idiom translation was weak. Regarding translation strategy, the systems were clustered between literal rendering and paraphrase, as these systems relied on low-risk strategies. They tend to transfer surface imagery literally or neutralizing idiomaticity via sense-based paraphrase, as these strategies tend to reduce cultural resonance and stylistic effect even when the core meaning is conveyed. Comparing between these three systems, DeepL Translate and Google Translate performed better than Modern MT system, as the latter displayed a weaker profile, producing a higher proportion of literal

translations. These outcomes make it clear that current LLMs lack the literary and cultural sensitivity needed for idioms, often yielding awkward phrasing, inaccurate figurative meaning, and diminished affect. Consequently, the results support the conclusion that these systems depend mainly on lexical associations and learned alignments rather

than robust idiom recognition or systematic cultural substitution, so human intervention or a hybrid workflow is essential for culturally accurate idiom translation.

RECOMMENDATIONS

According to the test findings, the researcher recommends the following:

English language curriculum: AI courses and cultural competence training programs are essential and must be integrated into translation courses due to their paramount importance to translators. These programs must also be comprehensively enhanced. Translating English cultural expressions into Arabic requires an understanding of English culture and the context of these expressions. Human translation skills are necessary for translation. It is necessary to revise the machine input at the pre-final stage.

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