Identifying Cultural and Semantic Translation Errors in Pashto–English Proverbs Translation: A Comparative Study of ChatGPT, Gemini, and Google Translations

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ABSTRACT

Machine Translation (MT) has advanced rapidly with the emergence of neural and AI- powered systems, yet translating culturally embedded figurative language particularly proverbs continue to pose significant challenges, especially in low-resource languages such as Pashto. This study examines how accurately these three major AI translation tools such as Google Translate, ChatGPT, and Gemini interpret and translate 20 culturally rich Pashto proverbs into English. Therefore, by applying a qualitative research design supported by basic quantitative analysis, the current study evaluates the semantic, figurative, and cultural accuracy of the AI-generated translations. Moreover, the study uses Vinay and Darbelnet's (1958) Model of Translation Strategies as the analytical framework for identifying the strategies employed and the types of errors made by each tool. The analysis of the study reveals substantial variation in performance by highlighting that ChatGPT achieved the highest accuracy of 75%, effectively applying equivalence and modulation strategies to preserve figurative meaning, Gemini performed moderately with the frequency of 65% with occasional semantic shifts whereas, Google Translate showed the lowest accuracy of 15%, frequently producing literal, fragmented, or culturally inappropriate translations. The findings of the study highlighted the limitations of AI systems in handling proverbs from low- resource languages, demonstrating that figurative and culturally bound expressions require oblique translation strategies that current MT tools often fail to apply. The present study contributes to MT research by providing empirical evidence from a low resource language such as Pashto and underscores the need for culturally informed, context-sensitive AI translation models.

Keywords: *Machine translation, Google Translate, ChatGPT, Gemini, equivalence, modulation strategies.*

INTRODUCTION

Machine Translation (MT) and Artificial Intelligence (AI) have transformed the field of translation studies by providing faster, cost-effective, and widely accessible means of translating texts across languages (Koehn, 2020; Hutchins, 2005). Modern AI-powered MT tools such as Google Translate, DeepL, Gemini and ChatGPT employ neural networks to produce fluent translations for a variety of text types (Bahdanau et al., 2014; Wu et al., 2016). Despite these technological advancements in translation studies, translating proverbs remains a significant challenge. Proverbs are culturally embedded, figurative, and contextual expressions, and they often rely on idiomatic structures that do not have direct equivalents in the target

language (Mieder, 2004; Sharifian, 2017). However, only a small number of studies investigate MT performance on low-resource languages, and nearly none specifically address Pashto language, despite its rich verbal tradition and heavy reliance on metaphor, idioms, and cultural wisdom (Zia et al., 2020; Khan & Babar, 2021). Therefore, by applying qualitative approach supported by basic quantitative analysis, the current study aims to analyze how modern AI translation systems interpret and translate Pashto proverbs, identifies the nature of their errors, and evaluates the extent of semantic and cultural loss. The present study uses Vinay & Darbelnet's (1958) Model of Translation Strategies as the main framework to examine how AI translation tools handle Pashto proverbs. This framework classifies translation strategies into direct strategies including borrowing, calque, and literal translation and oblique strategies, such as transposition, modulation, equivalence, and adaptation (Vinay & Darbelnet,1995). This chapter will provide an introduction of the study by including background of the study, problem statement, research objectives, research questions, significance, limitations and overall outline of the whole study.

Machine Translation (MT) is the automatic process of converting text or speech from one language to another using different computational methods. Machine translating systems have undergone significant evolution over the past few decades, beginning with rule-based approaches, which relied on manually coded linguistic rules and bilingual dictionaries to perform translations. These systems were limited in their flexibility and struggled with complex idiomatic or figurative expressions. The advancement of statistical machine translation (SMT) allowed translation models to learn from large bilingual corpora, improving fluency and accuracy but it still faces challenges with low-resource languages and context-dependent expressions.

With the development of Artificial Intelligence (AI) and neural networks, modern MT tools such as Chat GPT, Gemini, Gemini etc now employ deep learning techniques to model language patterns and context, resulting in more natural and fluent translations. AI-based MT can process large volumes of text, handle complex syntactic structures, and generate context-aware translations. However, despite these advancements in translation studies, translating figurative language and, such as proverbs, remains a major challenge. AI systems often rely on literal translations or statistical patterns, which can fail to capture idiomatic meaning, cultural references, or nuanced semantics, especially in low-resource languages such as Pashto, where training data is limited. This study builds on this background to explore the capabilities and limitations of AI translation tools such as Chat GPT, Google Translate and Gemini in handling Pashto proverbs, focusing on how meaning and cultural nuances are preserved or lost, using Vinay & Darbelnet's (1958) Model of Translation Strategies as the analytical framework

Problem Statement

Machine Translation and Artificial Intelligence have transformed translation, with AI- powered Machine Translation (MT) tools using neural networks to provide faster, more accurate, and cost-effective translations than traditional methods. It has been observed that the goal of MT is to automate the translation process, thereby reducing the time and cost associated with human translation. Despite these advancements in AI and MT, the translation of proverbs remains a major challenge due to their figurative nature, cultural specificity, and non-literal meaning. Pashto, being a low-resource language, is underrepresented in MT, which increases error rates in translating culture-loaded expressions. Therefore, the current study aims to explore how AI systems translate Pashto proverbs, the types of errors produced, and the extent of cultural and semantic loss. This gap necessitates a systematic comparative study to understand the performance of different AI tools and their limitations with respect to low-resource languages.

Research Objectives

1 To highlight the deficiencies in the translations of ChatGPT, Gemini and Google Translate of selected Pashto proverbs.
2 To explore the extent to which these translations preserve the semantic content and cultural meaning embedded in the original proverbs.

Research Questions

1 What types of deficiencies occurred in the translations of ChatGPT, Gemini and Google Translate of the selected Pashto proverbs?
2 How much these translations preserve the semantic content and cultural meaning embedded in the original proverbs?

Significance

This findings of this research contributes to the growing field of MT evaluation for low- resource languages such as Pashto. It highlights the linguistic and cultural challenges AI tools still face despite being accurate and fluent in their fields. It provides insights into Pashto-English proverbs translations by different AI tools and their errors. This research can help support future developers, linguists, translators, and educators in improving culturally sensitive translation technologies. Additionally, it strengthens the academic literature in Pashto linguistic studies, an area with limited MT-focused research and offers practical insights into the limitations of relying on AI for culturally loaded translation tasks.

Overview of Methodology

The current study uses Qualitative approach supported by basic quantitative analysis. The researcher has collected 20 Pashto proverbs from the book MATALOONA PUKHTO PROVERBS and translated by Akbar S Ahm. These proverbs will be translated by AI tools like Chat GPT, Google Translate and Gemini. Furthermore, this paper also highlighted the extent of semantic and cultural loss in comparison to original proverbs.

Limitations

This study only explores the AI Translation of Pashto-English proverbs translation which may not represent all varieties of translations of low resource languages. While this study discusses the broader concept of Machine Translation, it is only limited to three AI tools such as (Google Translate, ChatGPT, Gemini).

Chapterization of Research

This research study is divided into six sections. Section 1 includes an introduction of the study, outlining the problem statement, research objectives, research questions, significance of the study, overview of methodology, and limitations. Section 2 includes the review of relevant literature and the research gap. Section 3 includes the research methodology, research design, framework, population, sample, sampling technique, data collection, data analysis procedure and ethical considerations. Section 4 includes data analysis, results and discussion. Section 5 includes conclusion and lastly chapter 6 includes references.

LITERATURE REVIEW

Machine Translation (MT) has undergone rapid transformations over the past many years, evolving from rule-based systems to statistical and recently, neural network-based AI translation systems. Modern AI-powered MT tools, such as Google Translate, DeepL, and ChatGPT, Gemini etc offer fluent and contextually aware translations. Despite these advancements in Machine Translation, translating culturally loaded and figurative language, including idioms and proverbs, remains a significant challenge (Naveen, 2024; Alqohfa & Sanad, 2025). Proverbs, as contextually bound expressions with figurative meanings, often lack direct equivalents in target languages, creating difficulties for both human translators and AI translating systems.

Several studies have previously focused on the evaluation of AI in proverb and idiom translation. Wang et al. (2025) analyzed large language models' ability to translate proverbs and found that while LLMs often surpass traditional NMT systems in fluency, standard evaluation metrics such as BLEU fail to capture semantic and cultural accuracy. Similarly, Romaniuk- Cholewska (2024) examined AI translation of English-Polish proverbs using tools including Google Translate, DeepL, and ChatGPT, reporting that literal translation errors, cultural substitution failures, and semantic distortions were common in those languages. These findings highlighted the challenges of preserving both the literal and figurative meanings of proverbs in AI translation, which is central to the current research study.

The role of idiomatic and figurative expression in AI translation has also been explored in other languages expect for low resource languages. Baziotis et al. (2023) proposed an automatic evaluation metric to measure idiom translation accuracy in NMT, demonstrating that literal translations often fail to capture the intended meaning of the language. Dankers et al. (2022) further examined Transformer-based models, exploring that these systems frequently rely on compositional strategies that are inadequate for figurative language. Li et al. (2023) further introduced the use of idiom knowledge bases (IdiomKB) to improve the semantic fidelity of AI translations for idiomatic expressions, emphasizing the importance of strategy selection in accurate translation.

Furthermore, studies examining low-resource languages, which are particularly relevant to Pashto, indicate additional challenges. Faheem et al. (2024) demonstrated that neural machine translation for low-resource languages can be improved through monolingual and non-parallel corpora, but culturally specific content, such as proverbs, remains difficult to translate effectively by Ai tools. The NLLB team (2024) also emphasized that scaling neural MT to low-resource languages can require careful consideration of data scarcity and semantic-cultural preservation. These valueable insights underline the relevance of examining AI translations for Pashto, a language with limited MT resources.

The cultural dimension of translation has been highlighted by several scholars discussed below. Alqohfa & Sanad (2025) and Sharoufi (2025) noted that AI translation often fails to capture socio-cultural nuances, leading to loss of cultural meaning or misrepresentation of meaning. Donthi et al. (2024) further highlighted that the inclusion of contextual information and prompt engineering could improve AI translation outcomes for idioms, suggesting that AI strategy selection directly affects cultural fidelity. These studies collectively suggest that evaluating AI translations requires a framework that is capable of categorizing translation strategies, assessing errors, and understanding the cultural implications of translation choices.

Based on these findings, the current research study adopts Vinay & Darbelnet's (1958) Model of Translation Strategies as an analytical framework. This model categorizes translation strategies into direct strategies (borrowing, calque, literal translation) and oblique strategies (transposition, modulation, equivalence, adaptation), providing a structured method for identifying translation choices and errors in AI-generated tools. This framework is particularly suitable for

analyzing culturally rich languages and figurative expressions, as it allows the study to systematically evaluate which strategies AI systems apply, how they handle semantic and cultural content, and the effectiveness of these strategies in preserving the meaning of Pashto language proverbs when translated into English.

The above literature demonstrates that while AI translation tools have advanced significantly, challenges remain in translating figurative and culturally embedded expressions, especially in low-resource languages. Existing studies indicate frequent semantic, cultural, and idiomatic errors, and highlight the importance of the translation strategy selection. By combining insights from previous AI translation evaluation studies, idiom and proverb research, and low- resource language MT studies, the current research addresses a clear gap, by evaluating the translation strategies and errors of AI tools (ChatGPT, Gemini and Google Translate) for low resource language such as Pashto and its proverbs by using a theoretically grounded framework.

Research Gap

Although many studies have examined machine translation and idiom or proverb translation in high-resource languages, but little to no research focuses on how AI tools handle figurative and culturally embedded expressions in low-resource languages such as Pashto. Previous existing studies rarely analyze Pashto proverbs, offer limited comparisons of modern AI tools, and do not apply a structured theoretical model such as Vinay & Darbelnet's (1958) framework to evaluate translation strategies. Moreover, there is also no empirical evidence comparing the accuracy, cultural fidelity, and semantic preservation of ChatGPT, Gemini, and Google Translate for Pashto proverb translation. Therefore, this present study fills a clear gap by systematically examining these tools' performance on Pashto proverbs using a recognized translation strategy model.

RESEARCH METHODOLOGY

Research Design

This study employs a descriptive research design, supported by elements of comparative analysis and error analysis. The purpose of this study is to systematically describe how selected AI-based machine translation tools (Google Translate, ChatGPT, Gemini) translate Pashto proverbs into English, and to identify the errors, distortions, or cultural losses that occur during this translation process.

Framework

The present study adopts Vinay & Darbelnet's (1958) Model of Translation Strategies as the framework to examine how AI translation tools translate Pashto proverbs. Vinay & Darbelnet, (1995) classifies translation strategies into direct strategies including borrowing, calque, and literal translation and oblique strategies, such as transposition, modulation, equivalence, and adaptation. Direct strategies are typically used for

straightforward or literal translation, while oblique strategies are more appropriate for idiomatic, figurative, or culturally bound expressions, which are common in Pashto proverbs. By applying this framework, this present study systematically analyzes the AI-generated translations to identify which strategies are employed, the resulting errors, and the extent to which semantic meaning and cultural nuances are preserved or lost. This approach provides a structured and theoretically grounded method for evaluating AI tools performance in translating culturally rich, figurative but low-resource language.

Population

The population of the study is 20 Pashto proverbs from the book MATALOONA PUKHTO PROVERBS and translated by Akbar S Ahm.

Sample

The sample for this study consists of 20 Pashto proverbs selected from reputable Pashto proverb collections and linguistic sources. These proverbs were purposefully chosen because they of their strong figurative, metaphorical, and culturally bound features that typically pose challenges for machine translation systems.

Sampling Technique

The present study uses a purposive sampling technique to select Pashto proverbs for analysis. This sampling technique because the goal is not to gather a statistically representative dataset, but to intentionally select proverbs that are rich in cultural meaning, metaphorical depth, and figurative language features that commonly challenge AI-based MT tools.

Data Collection

Data for this study was collected from the book MATALOONA PUKHTO PROVERBS and translated by Akbar S Ahm. A set of 20 culturally rich Pashto proverbs were identified and selected using purposive sampling.

Analysis Procedure

The collected AI-generated translations of 20 Pashto proverbs were analyzed using Vinay & Darbelnet's (1958) Model of Translation Strategies, which categorizes translation techniques into direct (borrowing, calque, literal) and oblique strategies (transposition, modulation, equivalence, adaptation). Each proverb was first interpreted for its literal, figurative, and cultural meaning. The AI translations from Google Translate, ChatGPT, and Gemini were then examined to determine which strategies were applied, and errors were categorized into semantic, cultural, literal translation, omission, and over-generalization. Comparative analysis across the three tools allowed identification of patterns in strategy usage and effectiveness, particularly in conveying figurative and culturally specific content.

Ethical Considerations

Ethical considerations were strictly observed; proverbs were handled with cultural sensitivity. All sources were properly credited AI translations were recorded without manual modification, AI tools were accessed lawfully, no personal or identifiable data were used.

ANALYSIS

This chapter contains the detailed analyses of the first two proverbs followed by the table of each proverb highlighting the strategies used in translations by the Ai tools and then compares the made deficiencies of each tool i.e. ChatGPT, Gemini, and Google Translate according to Vinay & Darbelnet's translation strategies i.e. (Direct: Borrowing, Calque, Literal; Oblique: Transposition, Modulation, Equivalence, Adaptation). Here is the list of the 20 Pashto Proverbs and their translations by ChatGPT, Gemini and Google Translate.

Table of Selected Pashto Proverbs and their Translations

Original Proverbs	ChatGPT Translation	Gemini Translation	Google Translate
Da bad kaar anjaam bad vee	A bad beginning makes a bad ending.	A bad deed has a bad end.	This bad deed is bad
Zwani lewanay vee	Youth is reckless.	Youth is crazy.	Young wolves
Sta kho peenza waara gotey pa ghwaro ke dee	Your bread is buttered on both sides.	All five of your fingers are in butter.	Your thumb is the best.
Daroghjan au lafajan wroona dee	A boaster and a liar are cousins.	A liar and a boaster are brothers.	Darughjan and Lafajan are brothers.
Rishwat har zay ke lara wobasi	A bribe will enter without knocking.	A bribe finds a way everywhere.	The thread is always on the way.
Kha khaza jannat dey	A good wife is paradise.	A good wife is paradise.	Kha Khaza is paradise.
Kha da che da khar khkar nishta	Better that a donkey has no horns.	It is good that the donkey's scratch is not there.	There is no such thing.
Che sanga plaar hum haghasay zwey vee	Like father, like son.	As the father is, so is the son.	Che Singha Father Hum Haghase Son
Dost hagha che pakar rashi	A true friend is one who helps in need.	A friend is one who comes in need.	You need a friend.

Che soomra kholey, hoomra khabarey	Many mouths, many words.	As many mouths, so many words.	What is n Soumra Kholi?
Elam da kha sarhi na der kha ao da bad sarhi na der bad joravee	Learning makes a good man better, and an ill man worse.	Knowledge makes a good person very good, and a bad person very bad.	Elm, it is not too late, and it is not too bad.
khpal kaar sara kaar lara	Mind your own business.	Mind your own business.	Do your own work.
Daasey matal nishta che reekhtya na vee	There is no proverb which is not true.	There is no proverb that is not true.	There is no such thing as luck.
Wakht da har ghum dawa vee	Time softens all griefs.	Time is the remedy for every sorrow.	Time is the cure for every sorrow.
Taley wakht byarta pa laas na raazi	Time flies and is never recovered.	Past time does not return to the hand.	Time does not come out of hand.
Izzat kawa izzat ba dey kegi	He who respects will be respected.	Give respect, and you will be respected.	Respect and honor.
Kaar pa kawalo kegi	Nothing is achieved without effort.	Work is done by doing.	Work is done
Da taaqat na maharat kha dey	Skill is stronger than strength.	Skill is better than strength.	These are not skills, but skills.
Khairat da koor na shuru kegi	Charity begins at home.	Charity begins from home.	Charity is not a house.
Da ghal pa geera k khas vee.	The thief has a straw in his beard.	The thief has a straw in his beard.	This thief is special in the circle.

For the first proverb Da bad kaar anjaam bad vee, the three AI tools demonstrate noticeably different uses of Vinay & Darbelnet's translation strategies. ChatGPT employs a combination of literal translation and equivalence, by translating as "A bad beginning makes a bad ending." Although the structure is slightly adjusted, it remains close to the original meaning while adopting an English-proverb-like formulation, an example of equivalence, which is the most appropriate strategy for figurative expressions. Gemini translates it as, A bad deed has a bad end, using a mixture of literal translation and modulation in shifting the conceptual focus from "beginning" to "deed," which still preserves the moral message but changes the

viewpoint. This shift represents modulation, showing Gemini's attempt to interpret rather than just coping the structure. Google Translate, however, fails to apply any meaningful strategy and produces the flawed translation "This bad deed is bad," which reflects neither literal accuracy nor figurative understanding. It represents an unsuccessful attempt at direct translation, leading to semantic loss. Overall, the first proverb shows that ChatGPT applies the most suitable strategies, Gemini partially succeeds through modulation, and Google Translate fails to employ any effective translation strategy.

For the second proverb Zwani lewanay vee, the tools again differ significantly in strategy application and semantic accuracy. ChatGPT's translation "Youth is reckless" demonstrates a balanced use of literal translation and mild equivalence, capturing both the essence and tone of the original proverb while making it idiomatic in English. This shows ChatGPT's ability to move beyond word to word meaning toward a more natural English expression. Gemini's translation "Youth is crazy" represents modulation, as it conveys the emotional intensity of the original proverb but shifts slightly toward a stronger, more colloquial tone. While understandable, this modulation strategy risks exaggerating the cultural nuance. Google Translate's translation "young wolves" is a clear mistranslation caused by failed lexical mapping, demonstrating neither literal translation nor any oblique strategy such as modulation or equivalence. This indicates that Google Translate incorrectly interprets the proverb's structure and employs unrelated words rather than conveying figurative meaning. Therefore, the second proverb illustrates that ChatGPT produces the most contextually appropriate translation, Gemini provides a partially acceptable but semantically shifted version, and Google Translate once again fails to apply any viable translation strategy

Results of Remaining Proverbs

Below is the application of Vinay & Darbelnet's Translation Strategies Across 20 Pashto Proverbs by Three AI Tools i.e. ChatGPT, Gemini and Google Translate. This table demonstrates which proverb translation (by all the three Ai tools) uses which strategy of the model used. According to the table, C means, ChatGPT, G means Gemini and GT means Google Translate.

Proverbs	Borrowing C– G-GT	Claque C–G-GT	Literal C-G-GT	Transposition C-G-GT	Modulation C-G-GT	Equivalence C-G-GT	Adaptation C-G-GT
3	No No No	No No No	No No No	No No No	No No No	Yes Yes No	No Yes No
4	No No Yes	No No Yes	Yes Yes No	No No No	Yes Yes No	Yes Yes No	No No No
5	No No No	No No No	No No No	No No No	Yes Yes No	Yes Yes No	No No No
6	No No No	No No No	Yes Yes No	No No No	No No No	Yes Yes No	No No No
7	No No No	No No No	No No No	No No No	Yes Yes No	Yes No No	No No No
8	No No No	No No No	Yes Yes No	No No No	No No No	Yes Yes No	No No No
9	No No No	No No No	Yes Yes No	No No No	Yes Yes No	Yes No No	No No No
10	No No No	No No No	Yes Yes No	No No No	No No No	Yes Yes No	No No No
11	No No No	No No No	Yes Yes No	No No No	Yes Yes No	Yes No No	No No No
12	No No No	No No No	Yes Yes No	No No No	No No No	Yes Yes No	No No No
13	No No No	No No No	Yes Yes No	No No No	Yes Yes No	Yes Yes No	No No No
14	No No No	No No No	Yes Yes Yes	No No No	Yes Yes Yes	Yes Yes Yes	No No No
15	No No No	No No No	Yes Yes No	No No No	Yes Yes No	Yes Yes No	No No No
16	No No No	No No No	Yes Yes No	Yes No No	Yes Yes No	Yes Yes No	No No No

17	No No No	No No No	Yes Yes No	No No No	No No No	Yes Yes No	No No No
18	No No No	No No No	Yes Yes No	No No No	Yes Yes No	Yes Yes No	No No No
19	No No No	No No No	Yes Yes No	No No No	Yes Yes No	Yes Yes No	No No No
20	No No No	No No No	Yes Yes No	No No No	No No No	Yes Yes No	No No No

The results presented in Table 2 show a clear hierarchy in the strategic performance of the three AI i.e. ChatGPT, Gemini and Google Translate, tools across the 20 Pashto proverbs when evaluated through Vinay and Darbelnet's translation model. ChatGPT demonstrates the strongest and most contextually appropriate use of translation strategies throughout, most notably literal translation, modulation, and equivalence. These strategies are crucial for proverb translation because they allow the system to interpret figurative meaning while producing natural English translations. ChatGPT's ability to correctly employ oblique strategies such as equivalence in culturally embedded proverbs (e.g., in proverbs 1, 3, 7, 15, 19) indicates a deeper understanding of the tool in idiomatic structures and cultural implications.

Gemini on the other hand, performs moderately well, applying literal translation and modulation fairly frequently but with less consistency than ChatGPT. Gemini occasionally succeeds in adaptation (e.g., in proverb 3) and maintains acceptable accuracy when the proverb is structurally straightforward. However, its use of oblique strategies fluctuates somewhat, leading to partial or slightly distorted interpretations in more metaphorical proverbs. In contrast, Google Translate shows the weakest performance across nearly all strategies of the model. It rarely employs modulation or equivalence and relies almost entirely on literal or calque-like translations, many of which result in semantic errors or nonsensical translations. The dominance of NO across Google's column in Table 2 reflects the software's inability to handle figurative language, cultural metaphor, and non-literal meaning of Pashto proverbs. Overall, the results from the table confirm that ChatGPT is the most effective or accurate tool, Gemini performs moderately well, and Google Translate is the least suitable for proverb translation requiring nuanced cultural and figurative interpretation.

Integration of Results

The performance of the three AI tools (ChatGPT, Gemini, Google Translate) was quantified by evaluating how many of the 20 selected proverb translations fell into these categories:

- **Accurate** (meaning preserved, culturally correct)
- **Partially accurate** (meaning mostly preserved, showing minor issues)
- **Inaccurate** (literal errors, cultural loss, wrong meaning)

Table 3: The approximate performance distribution of the Ai tool (Baziotis et al., 2023; Zhu et al., 2024; Wang et al., 2025)

AI TOOL	ACCURATE	PARTIALLY ACCURATE	INACCURATE
CHAT GPT	75%	20%	5%
GEMINI	65%	25%	10%
GOOGLE TRANSLATE	15%	20%	65%

The integrated results indicate significant variation in the accuracy and cultural fidelity of Pashto-English proverb translation across the three AI tools ChatGPT, Gemini and Google Translate. Overall, ChatGPT demonstrated the highest accuracy, correctly translating the proverbs and preserving both semantic and cultural meaning. Its ability to apply equivalence, modulation, and idiomatic English expressions made it the most effective system. Gemini also performed relatively well, though it showed occasional semantic shifts, register mismatches, or awkward literal phrasing. In contrast, Google Translate showed the weakest performance. Most of Google translate's errors resulted from literal translation, incorrect calques, lexical confusion, and broken syntactic structures, highlighting its inability to handle culturally embedded figurative language. These results confirm that MT systems vary widely in their capability to apply effective translation strategies, and figurative content from low-resource languages such as Pashto requires more advanced contextual and cultural modeling than literal machine translation can provide.

DISCUSSION

The findings strongly support the argument presented in the Introduction that proverbs being highly figurative, metaphorical, and context-bound pose translation challenges even for advanced AI systems due to their cultural embeddedness and lack of direct equivalence between languages such as Pashto and English**.** Given Pashto's status as a low-resource language with limited corpora for training MT models, AI tools tend to default to literal translation, which often fails to preserve figurative meaning. This discussion section highlights how CHATGPT, GEMINI AND GOOGLE TRANSLATE aligns with Vinay & Darbelnet's strategies:

ChatGPT shows consistent use of equivalence, modulation, and appropriate literal translation. It captures figurative meaning most effectively and produces idiomatic English equivalents (e.g., "Like father, like son", "Charity begins at home") even when the Pashto proverb structure differs significantly from English. On the other hand, Gemini uses a combination of modulation, literal translation, and occasional adaptation and performs well on culturally straightforward proverbs but struggles occasionally with metaphor depth. Lastly, Google Translate relies heavily on literal translation and incorrect calques due to weak figurative-language recognition. In this tool, Errors often stem from surface-level word mapping rather than interpreting underlying meaning showing frequent semantic distortions validate literature claims that MT struggles with idioms and figurative structures, especially in low-resource languages. Thus, this study contributes empirical evidence from Pashto proverbs, a rarely examined language in MT research confirming that contextual and cultural understanding is essential for accurate proverb translation.

CONCLUSION AND RECOMMENDATIONS

This research paper concludes that despite significant advancements in neural and AI- powered MT technologies, translating culturally embedded proverbs from low-resource languages such as Pashto still remains a major challenge. The first Ai tool, ChatGPT demonstrates the highest accuracy in handling figurative meaning, semantic nuance, and cultural implications, followed by the second tool Gemini, whereas the last tool Google Translate performs weakest due to its reliance on literal, word-based translation. The findings of the study confirm that Pashto proverbs require oblique translation strategies such as modulation, equivalence, and adaptation in order to maintain their original meaning. Literal strategies are insufficient for the figurative or culturally loaded expressions, supporting the theoretical claims in Vinay & Darbelnet's (1958) model.

Overall, Machine Translation tools currently require significant improvement when working with culturally rich, metaphor-heavy, low-resource languages either it be Pashto, Punjabi or other low resource languages. For researchers and developers, these results underline the importance of culturally aware MT design and the need to incorporate figurative-language datasets into AI training systems.

Based on the findings of this research study, several recommendations can be proposed for future researchers and the improvement of AI-based translation tools. First, developers of machine translation systems should integrate larger and more culturally diverse datasets that specifically include idioms, proverbs, metaphors, and other figurative expressions from low- resource languages such as Pashto, Punjabi and other local languages. This would enable AI models to better recognize and interpret non-literal meanings rather than relying on surface-level lexical patterns and meanings. Furthermore, incorporating culturally informed knowledge bases and context-sensitive algorithms would enhance the accuracy of translation tools involving culturally embedded concepts. For linguists and future researchers, expanding this line of inquiry to include more proverbs, dialectical variations, and other genres such as folktales, poetry, and metaphoric expressions of other languages as well as Pashto would strengthen our understanding of AI limitations. Future studies should also test additional translation systems, compare multiple theoretical frameworks, and explore how human AI collaborative translation systems approaches to bridge gaps identified in this study. Lastly, educators and translators are encouraged to treat AI translations as supportive tools rather than authoritative sources, especially when dealing with culturally loaded or figurative languages such as Pashto, and to promote critical awareness of AI limitations in academic and professional translation.

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