

From AI Output To Intercultural Competence: A Didactic Algorithm For Interpreting Semantic Loss In Proverbs And Idioms

Yusupova Mushtariy Baxtiyor kizi

Karshi State University, Doctorate (PhD) student, Uzbekistan

Received: 24 December 2025 Accepted: 16 January 2026 Published: 20 February 2026

ABSTRACT

The rapid integration of artificial intelligence (AI)-based translation systems into language education has transformed translation practices while raising concerns about the handling of culturally marked units such as proverbs and idioms. Although AI tools often ensure lexical accuracy, they frequently generate semantic loss, particularly in pragmatic, axiological, and conceptual layers. This study analyzes 100 Uzbek and English proverbs and idioms translated by three AI systems using a multi-layer cultural-marker framework to identify patterns of semantic reduction. The findings show that while denotative meaning is generally preserved, figurative imagery, evaluative nuance, and discourse-related functions are often weakened. In response, a five-stage didactic algorithm—unit selection, AI output collection, comparative analysis, semantic loss diagnosis, and adaptive reconstruction—is proposed to transform AI output into a tool for developing intercultural interpretive competence. The model positions AI translation as a diagnostic resource rather than a final authority and introduces measurable criteria for assessing cultural adequacy in translation tasks.

Keywords: Semantic loss; AI translation; proverbs; idioms; cultural markers; intercultural competence; didactic algorithm; Uzbek-English translation; linguocultural analysis; translation pedagogy.

INTRODUCTION

Artificial intelligence has rapidly moved from being an auxiliary translation aid to becoming a primary interpretive tool in language learning and cross-cultural communication. In many educational contexts, AI-generated translations are increasingly treated as reliable linguistic references, particularly for bilingual students and trainee translators. While such systems successfully provide grammatically acceptable equivalents, their outputs often conceal subtle shifts in meaning when processing culturally embedded expressions. Proverbs and idioms, as condensed carriers of collective memory, value systems, and socially regulated discourse practices, require interpretive competence that extends beyond lexical substitution. When these units are translated through statistical or pattern-based mechanisms, evaluative nuance,

pragmatic intention, and culturally specific metaphorical schemas may be attenuated or reshaped without explicit indication of loss. This tendency raises a critical pedagogical concern. If learners adopt AI outputs without analytical mediation, translation becomes an exercise in surface equivalence rather than intercultural meaning-making. Intercultural communicative competence, however, presupposes the ability to recognize implicit cultural markers, negotiate conceptual differences, and justify interpretive choices within socially situated contexts. The absence of structured classroom procedures for diagnosing and repairing semantic distortions leaves a methodological gap between technological availability and pedagogical effectiveness. AI provides results, but it does not inherently cultivate interpretive awareness. Positioned at the intersection of translation studies, linguocultural

analysis, and AI-assisted pedagogy, the present study addresses this gap by conceptualizing semantic loss not merely as a technical limitation of machine translation but as a teachable analytical category. It proposes a systematic didactic algorithm that guides learners from raw AI output toward culturally adequate reconstruction through marker-based diagnosis and interpretive justification. By reframing AI-generated translation as a starting point for critical analysis rather than an authoritative endpoint, the study advances a model for developing intercultural interpretive competence grounded in structured evaluation and strategic decision-making.

The issue of semantic loss has long occupied a central place in translation studies, particularly in discussions of figurative and culturally embedded language. Proverbs and idioms are especially complex because their meanings are rarely compositional; rather, they function as condensed carriers of collective experience, cultural memory, and value systems. Paremiological research emphasizes that such expressions operate simultaneously on multiple layers—literal structure, metaphorical mapping, pragmatic intention, and socio-cultural positioning—making their interpretation highly context-dependent and culturally mediated. Within translation theory, especially in functionalist and dynamic-equivalence approaches, adequacy is defined not by formal similarity but by the preservation of communicative effect and cultural resonance. However, in AI-based translation environments, idiomatic expressions are frequently processed compositionally, resulting in literalization, metaphor flattening, pragmatic weakening, or evaluative neutralization. In such cases, denotative meaning may be retained while axiological, discursive, or ritual layers are reduced. These tendencies are particularly visible in culturally dense or low-resource language contexts, where statistical probability often replaces culturally grounded inference. At the same time, intercultural communicative competence frameworks define language mastery as the ability to interpret, mediate, and evaluate meaning across cultural systems, extending beyond grammatical accuracy to include awareness of implicit value structures. With the increasing integration of AI tools into language education, scholars have begun to view AI-generated output as a potential mediating resource that can stimulate analytical reflection. Nevertheless, most pedagogical approaches emphasize linguistic correction or fluency development, while structured methodologies for diagnosing and repairing culturally marked semantic loss remain limited. Consequently, a methodological gap persists between

research documenting AI limitations in figurative language processing and educational practices aimed at developing intercultural competence. The present study addresses this gap by proposing a structured taxonomy of cultural markers—axiological, pragmatic, conceptual, discursive, and ritual—together with a didactic algorithm that transforms AI translation output into a systematic interpretive process. By integrating semantic-loss classification, classroom procedure, and measurable assessment criteria, the study bridges translation theory, AI analysis, and intercultural pedagogy within a unified methodological framework.

The empirical corpus of the study consists of culturally marked proverbs and idiomatic expressions selected in two translation directions—Uzbek–English and English–Uzbek—based on four criteria: the presence of figurative or metaphorical structure, the encoding of culturally specific values or social norms, frequent usage in literary or public discourse, and a high potential risk of semantic loss in literal translation. The dataset includes 100 units (50 Uzbek and 50 English), drawn from canonical literary texts, explanatory and phraseological dictionaries, and widely cited proverb collections, ensuring a balanced representation of both collectivist and individualist cultural models. Each unit was translated using three AI-based systems—Google Translate, Yandex Translate, and a GPT-based large language model—selected due to their widespread use in contemporary educational and translation contexts; outputs were generated through standard translation prompts to maintain comparability. To diagnose semantic loss systematically, a multi-layer analytical framework grounded in cultural-marker theory was applied, examining each unit across five semantic layers: axiological (value-based evaluation such as honor or shame), pragmatic (communicative intention and social function), conceptual (underlying metaphorical schema), discursive (regulation of social hierarchy and norms), and ritual/religious (institutional or culturally codified meaning components). Semantic loss was identified when one or more of these layers were weakened, neutralized, or literalized in AI output. The core methodological innovation of the study is a five-stage didactic algorithm designed for classroom implementation: selecting culturally dense units, collecting AI-generated translations, conducting comparative analysis with human or lexicographic equivalents, diagnosing loss through marker-based evaluation, and constructing an interpretative or adaptive equivalent justified through intercultural explanation. To measure improvement in

intercultural adequacy, a cultural adequacy rubric was developed using a 0–2 scoring scale for each semantic layer (maximum score of 10 per unit). Evaluation was conducted through expert judgment by two specialists in translation studies and intercultural communication, and scoring consistency was ensured through consensus-based validation. By integrating systematic semantic analysis with pedagogical application and measurable assessment criteria, this methodological design operationalizes the theoretical framework and demonstrates the study’s innovation in bridging AI analysis and intercultural

translation pedagogy.

The comparative analysis of 100 culturally marked units (50 Uzbek and 50 English) revealed systematic patterns of semantic loss in AI-generated translations. Although lexical or denotative meaning was frequently preserved, deeper semantic layers—particularly pragmatic and axiological components—were often reduced or neutralized. The distribution of loss types identified through the five-layer cultural-marker framework is presented in Table 1.

Table 1. Distribution of Semantic Loss Types in AI-Generated Translations (n = 100)

Semantic Layer	Number of Units Affected	Percentage (%)
Pragmatic Loss	67	67%
Axiological Loss	54	54%
Conceptual Loss	41	41%
Discursive Loss	36	36%
Ritual/Religious Loss	22	22%

As shown in Table 1, pragmatic loss emerged as the most frequent pattern, affecting approximately two-thirds of the analyzed units. In these cases, communicative functions such as politeness mitigation, indirect warning, or social hierarchy regulation were weakened or omitted. Axiological loss was also prominent in expressions encoding culturally significant values such as honor, dignity, shame, and reputation, particularly in Uzbek concepts like *nomus*, *obro‘*, and *uyat*, and English notions such as *face* and *dignity*. Conceptual metaphor flattening

occurred when figurative imagery was translated compositionally rather than interpretively, while discursive loss affected expressions regulating collective norms and interpersonal positioning. Ritual or religious reduction was most visible in units associated with ceremonial or institutional practices. These findings confirm that AI systems tend to maintain structural equivalence while frequently diminishing evaluative, figurative, and discourse-based depth. To illustrate these tendencies, selected case analyses are summarized in Table 2.

Table 2. Illustrative Examples of Semantic Loss and Adaptive Reconstruction

Expression	AI Output	Identified Loss Type(s)	Adaptive / Interpretative Equivalent
Yuzini yerga qaratmoq	to face the ground	Axiological + Pragmatic	to lower one’s face in shame
To save face	yuzni saqlamoq	Discursive + Axiological	obro‘sini saqlab qolmoq
Small talk	kichik suhbat	Pragmatic	informal relationship-building talk
Sabr kosasi to‘lmoq	the cup of patience is full	Conceptual	to reach the limits of one’s patience

In the case of “Yuzini yerga qaratmoq,” the AI-generated translation (to face the ground) literalized the expression, eliminating its axiological and pragmatic dimensions. In Uzbek culture, “face” symbolizes social honor and collective evaluation; thus, the expression refers not to

physical movement but to loss of reputation in front of the community. Through algorithm-guided diagnosis, learners reconstructed the equivalent as to lower one’s face in shame, accompanied by an intercultural explanation clarifying its socio-evaluative meaning. Similarly, the

English idiom “to save face” was rendered as *yuzni saqlamoq*, which preserved lexical structure but failed to convey reputational implications. The adaptive equivalent *obro‘sini saqlab qolmoq* restored the discursive and axiological layers. In the case of “small talk,” the literal rendering *kichik suhbat* overlooked its pragmatic function of relationship-building; interpretative reformulation captured its communicative purpose more adequately. Finally, “*Sabr kosasi to‘lmoq*” was translated as the cup of patience is full, preserving metaphor form but lacking natural conceptual mapping in English discourse; learners reformulated it as to reach the limits of one’s patience, maintaining figurative meaning within culturally conventional usage.

Application of the five-stage didactic algorithm resulted in measurable improvement in cultural adequacy scores. Units initially characterized by surface lexical preservation showed higher post-analysis adequacy ratings after marker-based diagnosis and adaptive reconstruction. The typical transformation process followed this sequence: AI literal output → Identification of lost cultural markers → Intercultural explanation → Interpretative/adaptive equivalent. The inclusion of an explicit intercultural explanation stage significantly enhanced learners’ awareness of axiological, pragmatic, and discourse-level meaning components, demonstrating the pedagogical effectiveness of structured semantic-loss analysis.

The findings are consistent with established research in figurative language studies and conceptual metaphor theory, which emphasize that proverbs and idioms rely on culturally grounded metaphorical mappings that resist purely compositional interpretation. When processed statistically, AI systems tend to prioritize surface lexical probability over culturally embedded inference, leading to metaphor flattening and neutralization of axiological and pragmatic meaning. From a dynamic-equivalence perspective, translation adequacy depends not on formal similarity but on preservation of communicative effect; however, the results indicate that AI-generated outputs often achieve structural equivalence while falling short of functional and intercultural adequacy, particularly in pragmatic, axiological, and discursive layers. These losses can be attributed to the non-compositional nature of idioms, limited parallel corpora for culturally specific expressions, and restricted contextual inference in standard translation queries. Pedagogically, however, these limitations become productive: by treating AI output as an analytical stimulus rather than a final authority, the

proposed algorithm fosters systematic semantic diagnosis, linguocultural reflection, and strategic translation decision-making. Although the study is constrained by corpus size, genre scope, and reliance on expert-based evaluation, it demonstrates that structured marker-based mediation enables learners to transform AI translations into culturally adequate equivalents, reinforcing both linguistic accuracy and intercultural competence.

CONCLUSION

The study demonstrates that although AI-based translation systems achieve substantial lexical accuracy, they systematically reduce culturally embedded semantic layers in proverbs and idioms, particularly within pragmatic, axiological, and conceptual dimensions. Figurative expressions grounded in collective values, social hierarchy, ritual practice, and metaphorical cognition are especially vulnerable to literalization and cultural flattening, resulting in preservation of denotative meaning but weakening of communicative and intercultural adequacy. In response, the proposed five-stage didactic algorithm effectively transforms AI output into a structured interpretive learning process, operationalizing semantic loss as an analytical category rather than a technical flaw. The cultural-marker framework and rubric-based assessment provide a replicable tool for evaluating not only linguistic correctness but also preservation of cultural and functional meaning, thereby bridging translation theory, AI analysis, and intercultural pedagogy. Pedagogically, the findings support integrating AI tools into classrooms as diagnostic resources that foster analytical thinking, cultural reflection, and strategic translation competence. While future research should expand the corpus and apply quantitative validation methods to strengthen reliability, the results confirm that AI-assisted translation requires structured interpretive mediation and that, when guided appropriately, AI limitations can become productive mechanisms for developing linguocultural interpretive competence.

REFERENCES

1. Baker, M. (2018). *In other words: A coursebook on translation* (3rd ed.). Routledge.
2. Byram, M. (1997). *Teaching and assessing intercultural communicative competence*. Multilingual Matters.

3. House, J. (2015). *Translation quality assessment: Past and present*. Routledge.
4. Koehn, P. (2020). *Neural machine translation*. Cambridge University Press.
5. Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. University of Chicago Press.
6. Mieder, W. (2004). *Proverbs: A handbook*. Greenwood Press.
7. Nida, E. A. (1964). *Toward a science of translating*. Brill.
8. Nida, E. A., & Taber, C. R. (1982). *The theory and practice of translation*. Brill.
9. Norrick, N. R. (1985). *How proverbs mean: Semantic studies in English proverbs*. Mouton.
10. Popović, M. (2019). Error classification and analysis for machine translation quality evaluation. *Computational Linguistics*, 45(3), 455–478.
11. Toral, A., & Way, A. (2018). What level of quality can neural machine translation attain on literary text? *Translation Spaces*, 7(1), 124–145.
12. Venuti, L. (2012). *The translator's invisibility: A history of translation* (2nd ed.). Routledge.
13. Farghaly, A., & Shaalan, K. (2009). Arabic machine translation: Techniques, challenges and future directions. *Machine Translation*, 23, 3–29.
14. Dörnyei, Z. (2007). *Research methods in applied linguistics*. Oxford University Press.
15. Chapelle, C. A. (2001). *Computer applications in second language acquisition*. Cambridge University Press.