



Analysis and Formulation of Ethical Guidelines for the Use of Artificial Intelligence for Arabic Translation

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Abstract This study aims to minimize the risks and potential errors associated with students' use of AI for translation. It employs a literature review method to gather qualitative data from previous studies. Syntactic, morphological, and semantic errors were identified in translations produced by several AI models. These findings highlight the need to formulate guidelines and operational rules regarding the ethics of AI usage for translation purposes.

Keywords *Artificial Intelligence; Arabic Translation; Ethical Guidelines*

تهدف هذه الدراسة إلى تقليل المخاطر والأخطاء المحتملة المرتبطة باستخدام الطلاب للذكاء الاصطناعي في الترجمة. وتستخدم الدراسة منهجية مراجعة الأدبيات لجمع بيانات نوعية من الدراسات السابقة. وقد تم تحديد أخطاء نحوية وصرفية ودلالية في الترجمات التي أنتجتها عدة نماذج للذكاء الاصطناعي. وتسلط هذه النتائج الضوء على الحاجة إلى صياغة مبادئ توجيهية وقواعد تشغيلية تتعلق بأخلاقيات استخدام الذكاء الاصطناعي لأغراض الترجمة.

ملخص البحث

الذكاء الاصطناعي؛ الترجمة العربية؛ المبادئ التوجيهية الأخلاقية

كلمات أساسية

The era of Society 5.0 introduces the concept of a human-centered society supported by technological innovations that offer various forms of assistance and support. This transition from Industry 4.0 to Society 5.0 demonstrates that human focus has shifted beyond merely developing advanced technology to creating solutions that address societal challenges and enhance the quality of life (Sari & Purwanta, 2021). Under this concept, technology is no longer the ultimate goal, but rather a bridge to maximize the potential for simplifying human life. In Society 5.0, technology is integrated with human values, wherein all analyzed data is processed into meaningful information to be applied in the real world and serve to improve various aspects of human life (Pratiwi & Yunus, 2024). Undoubtedly, these advancements demand that humans adapt to technological progress. Rather than remaining passive and allowing their roles to be entirely replaced, humans must be capable of collaborating with the rapid evolution of technology (Ramadiani et al., 2023). This shift in orientation drives humans to integrate technology into all aspects of life. In the process, this integration transforms how individuals acquire, process, and generate information.

One of the rapidly developing digital technologies with extensive utilization is artificial intelligence (AI). AI is a branch of computer science whose systems are structured to mimic human cognitive abilities, such as thinking, pattern recognition, and decision-making (Wahyudinarti et al., 2025). The utilization of this technology continues to expand in line with rapid advancements. AI is capable of automating complex systematic tasks, allowing humans to focus on endeavors that require creativity, empathy, and morality (Oktavian et al., 2024), (Tuningsih & Wahyuningsih, 2025). In the era of Society 5.0, artificial intelligence (AI) has penetrated various domains of life, one of which is education. Through its diverse processing systems, AI helps both educators and students save time on complex, systematic tasks. AI is no longer merely an optional auxiliary tool; rather, it has become a fundamental competency that both educators and students must master in order to remain competitive and keep pace with relevant developments in the academic world.

With the rapid development of AI technology in generating responses, providing information, and understanding patterns, these capabilities bring AI increasingly closer to the younger generation, including fulfilling their learning needs. AI can serve not only as a passive assistive tool but also function as an active co-teacher capable of enhancing learning effectiveness (Hs & Purba, 2025). In the field of linguistics, the utilization of AI has also expanded into translation. However, the application of AI in translation is inevitably prone to potential errors, particularly in identifying grammar and/or contextual nuances. Therefore, the role of humans in supervising, evaluating, and

revising AI outputs is crucial. This role is termed Human-in-the-Loop (HITL), which is a collaborative approach combining artificial intelligence systems with human judgment and decision-making processes (Kalyan Pavan Kumar Madicharla, 2025).

The unmeasured and unguided use of AI can pose risks to the intellectual development of students and the younger generation in general (Yani, 2024). Without clear and definitive guidelines regulating its usage, the high adoption rate of AI can lead to an academic integrity crisis (Anisa et al., 2026). Aside from causing over-dependency, the use of AI in translation activities can lead to errors when the system fails to comprehend specific contexts, structures, or meanings within the text (Hadi & Qohar, 2025). Especially in the Arabic language, which possesses complex linguistic characteristics and meanings that often cannot be derived solely from lexical definitions. In their study, Yaqin et al. state that Arabic is recognized as one of the most linguistically complex languages due to its morphological richness, extreme diglossia, and unique writing system (Muhammad Ainul Yaqin et al., 2025). Therefore, guidelines are required to explicitly regulate the procedures for AI utilization among students, particularly in Arabic text translation activities.

These guidelines do not merely regulate the permission or prohibition of AI use, but rather dictate how students utilize AI responsibly, particularly in Arabic translation applications. Since AI cannot serve as an absolute source of truth, users must possess the awareness to verify the information they receive and take accountability for the output (Anisa et al., 2026). Furthermore, AI is not yet capable of distinguishing between objective facts and subjective opinions found in online media, resulting in outputs that remain excessively biased (Yani, 2024). In translation activities, this means that AI only assists in comprehending the text, rather than completely replacing the human brain's capacity for independent thought. Learners must still actively engage their cognitive abilities, as the habit of directly copying AI outputs will diminish students' intellectual involvement and problem-solving skills. In the long run, this practice will weaken human cognitive resilience and the quality of education (Wahyudinarti et al., 2025). In line with this, Abdurrahman (Rifqi Abdurrahman et al., 2024) state in their study that the increasingly widespread adoption of AI makes learners' cognitive and critical thinking challenges increasingly severe. Therefore, the study emphasizes that educator supervision strategies and the strengthening of ethics-based educational policies are crucial.

Not all students possess the same capacity and awareness to evaluate and verify AI outputs; therefore, the role of educators is indispensable in guiding AI usage. Teacher supervision is necessary to prevent learners from relying solely on instant answers, thereby

maintaining their active engagement in comprehending the material (Pratiwi & Yunus, 2024). In the context of Arabic text translation, this necessity becomes even more crucial to ensure that AI usage does not replace students' engagement in comprehending the structure, context, and meaning of texts. Educators do not merely act as content providers; within an AI-integrated learning environment, an educator must serve as a mentor who directs AI usage. Rifky explains that although the role of educators shifts with the emergence of AI adoption in learning, their roles as facilitators, motivators, and companions to learners remain vital for a holistic learning experience (Rifky, 2024). As a facilitator, educators do not prohibit the use of AI, but rather guide students on when AI can be utilized and when it should not be. The objective is not to halt the use of AI, but to recognize and understand the boundaries of AI capabilities.

Reviewing various previous literature, research regarding ethics and the utilization of AI in learning has been growing. However, guidelines specifically regulating the use of AI as a translation tool, particularly for Arabic, remain limited. This research aims to minimize the risks and potential errors of AI output in Arabic translation. This objective is achieved through two main focuses: (1) analyzing the capabilities of several AI models in translating Arabic; and (2) formulating guidelines for AI usage in classified translation.

METHODES

This study employs a literature study approach, utilizing a literature review as the method to address the research problems. In the literature review, the researcher focuses on collecting, analyzing, evaluating, and synthesizing various scholarly works relevant to the topic under discussion (Pratiwi & Yunus, 2024). Methodologically, literature study is a type of descriptive qualitative research whose primary locus of study consists of relevant literature or publications pertaining to the discussed topic (Yani, 2024). Through the literature review, the author navigates a series of research stages encompassing topic selection, problem formulation, literature collection, data identification, discussion, and the synthesis of findings. Regarding the topic of AI capabilities in Arabic text translation, the researcher searches for various literature discussing AI translation performance, noting the specific classical texts or reference materials utilized as test cases in those studies. Following data collection, the results are subsequently compared and evaluated based on the accuracy of semantics (meaning), morphological alignment (sharf), and syntactic correctness (nahwu).

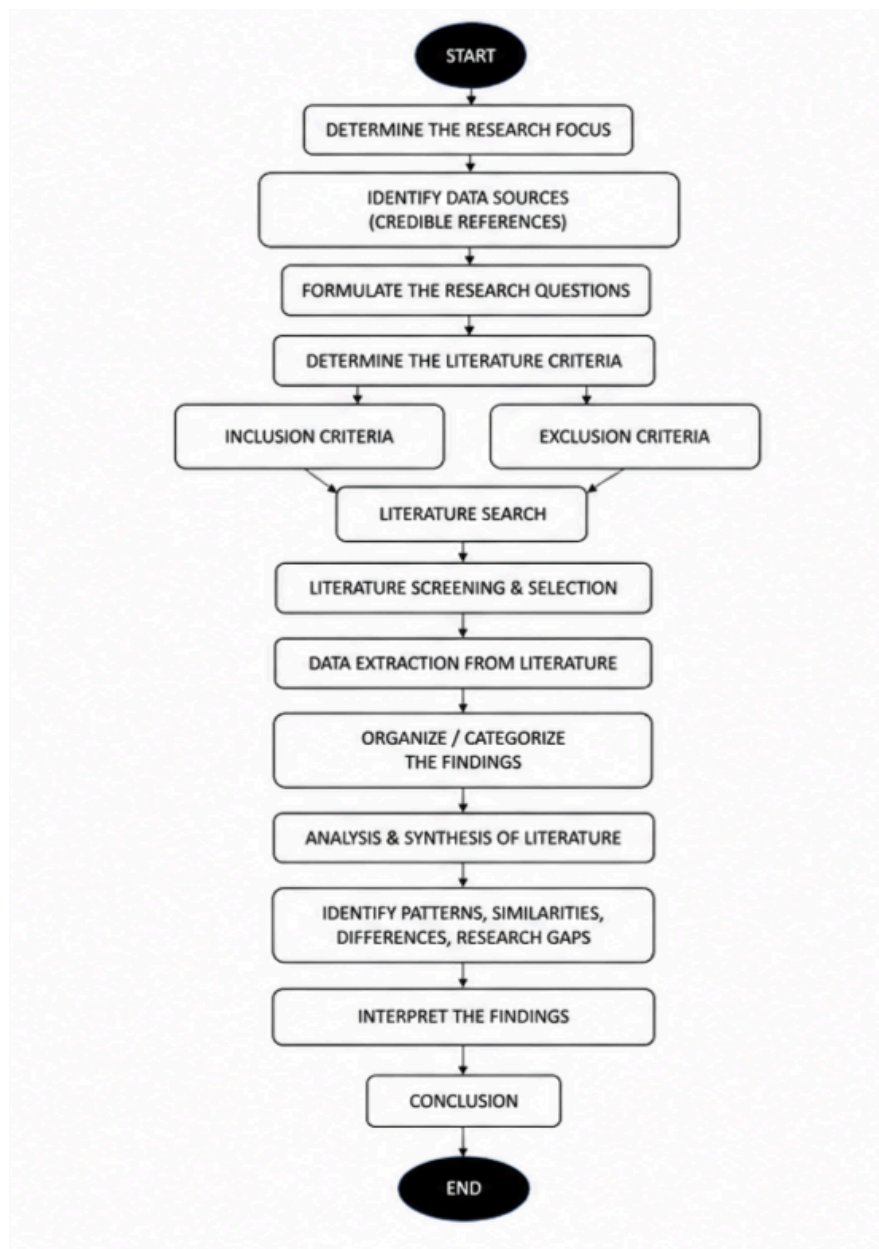


Image 1. Research method stages

Meanwhile, the second research question concerning the urgency of formulating guidelines for AI utilization is addressed through a review of academic articles related to the subject. The reviewed literature encompasses research on AI translation standardization, guidelines for AI use within educational settings, the urgency of utilizing AI as a translation tool for learners, and the role of educators in providing guidance and supervision regarding AI adoption in learning, particularly for Arabic. The collected sources are subsequently analyzed by being identified, classified, and synthesized to establish the foundational basis for formulating ethical AI usage as a tool for translating Arabic texts. The synthesis results are then structured to align with the most crucial data

discovered regarding forms of risk, verification requirements, and educator confirmations.

RESULT

Error Analysis of Several AI Models for Translation Needs

To fulfill the objective of this research, ChatGPT, Gemini, and Google Translate were selected as the three AI models as the object of analysis for translation into Arabic and vice versa. Through a literature study approach on previous research journals deemed relevant, it was found that ChatGPT, Gemini, and Google Translate still exhibit several errors in Arabic translation. Below is the AI accuracy data for Arabic translation across these AI models:

No.	Model	Kesalahan Penerjemahan
1.	ChatGPT (Zahra et al., 2026)	The study <i>Haqq at-Tilawati</i> found: - 37 linguistic errors, in which semantic errors dominated with 28 data points (76%) - 6 data points (16%) of syntactic errors resulting from translating verbal sentences (<i>jumlah fi'liyah</i>) very literally - 3 data points (8%) of morphological errors
2.	Gemini (Afriani, 2023)	- Tends to be less accurate and non-comprehensive - Frequently misses several words - Mistranslates words (e.g., <i>al-'alim</i> translated as "world", whereas it should be "scholar" or "scientist") - Adds words that are not present in the original text
3.	Google Translate	Possesses a fatal flaw in translating word-for-word without understanding

	(Dillah Nur Syafanah et al., 2025)	semantic context, ignoring meaning relationships between paragraphs, and struggling with polysemous terms, idiomatic expressions, or complex Arabic morphological conjugations.
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Table 1. AI Accuracy in Arabic Translation

Formulation of Classified AI Usage Guidelines for Arabic Translation

Literature search results reveal that the international community has established standardization in professional translation practices to serve as a benchmark for quality assurance in both the translation process and its outcomes. (Nitzke & Hansen-Schirra, 2021). Among these standards is the International Organization for Standardization (ISO) number 18587 of 2017 (Nitzke & Hansen-Schirra, 2021) dan nomor 5060 tahun 2024 (Kayano & Sugawara, n.d.). These data support the establishment of guidelines for utilizing AI as a translation assistant focused on the Arabic language.

□ Guidelines for Using AI as an Arabic Translation Tool

No	Activities	Goal
1.	Copy the text you want to translate into the AI (ChatGPT, Gemini, DeepL)	Providing an overview (structure and meaning)
2.	Identifying ambiguous terms and sentence structures from the initial translation output	Improving translation accuracy according to the correct context; training students' critical thinking skills (through identification)
3.	Comparing translation results across multiple AI models and performing back-translation	Verifying structural and meaning errors based on initial identification; training critical thinking
4.	Drafting the translation without AI assistance by carefully weighing contextual appropriateness	Fostering critical thinking and preserving originality

5.	"Specify the extent of AI's role (AI usage declaration text)"	Transparency; facilitating learner assessment
6.	Verbally explaining the translation results with a strong understanding of context and linguistics	Fostering critical thinking; student assessment through practical application.

Table 2. Guidelines for Using AI in Arabic Translation

DISCUSSION

The Limitations of AI in Arabic Translation

Based on several tested AI models, data indicates that using AI for Arabic translation still requires review due to misinterpretations in morphology, syntax, and semantics. Every AI model has been identified as having shortcomings in specific translation aspects. ChatGPT exhibits weaknesses in the form of a lower semantic accuracy rate (~77.9%) and tends to add excessive information (hallucination) or summarize the original content (Humolungo et al., n.d.). Gemini AI is considered less comprehensive and inaccurate because it often misses important words in the original text, fails to detect implied meanings (figurative language/figures of speech), and frequently adds adverbs that are not present in the source Arabic text (Afriani, 2023). Google Translate is very weak in recognizing complex Arabic morphological and syntactic patterns, such as word conjugation based on gender, time quantity, and adverbs, and fails to connect the semantic relationships between paragraphs (Dillah Nur Syafanah et al., 2025). Based on the above discussion, the use of AI as a translation tool remains prone to meaning distortion and context misunderstanding at the complex Arabic linguistic level (Hadi & Qohar, 2025). Users need to pay attention to the classification of the risk level of Arabic texts before translating them using AI assistance.

Risk-Based Translation Text Classification

Texts as the object of translation in this study were reviewed and selected through a risk-based classification. As a source of information

and communication tool, text translation carries its own potential risks if not conveyed correctly. Morphological and syntactic errors can have crucial consequences in the comprehension of a reading, which frequently occurs when using AI for Arabic translation. In this case, the researcher classifies these risks into three categories: low, medium, and high.

a. Low Risk

Usually in the form of general conversational text. It does not cause information fatalism that endangers the safety of policies, laws, or the reader's theological beliefs (Dillah Nur Syafanah et al., 2025). Text types in this classification generally require special review in AI translation.

b. Medium Risk

Consisting of journalistic texts capable of influencing public understanding, opinion, and beliefs across languages. Errors in complex environmental issues (such as the term 'sustainable', local geographical names) or political news (such as campaigns, legislative candidates) can trigger misinformation if not re-edited. This also includes academic documents and coursework concerning academic integrity issues (Humolungo et al., n.d.).

c. High Risk

Teks hukum dan keagamaan. Kehilangan makna penting dalam dua teks ini dapat menyebabkan munculnya ambiguitas, atau penafsiran yang menyesatkan bagi publik karena kegagalan menerjemahkan istilah spesifik serta penyimpangan teologis dan kesalahan penafsiran hukum/praktik ibadah (misalnya istilah tajwid, qira'at, talaqi, riwayat) akibat AI menerjemahkan kata sensitif secara leksikal/harfiah umum tanpa memahami konteks keilmuan Islam (Humolungo et al., n.d.).

The classification shows that not all texts carry the same level of risk in translation activities. Texts with a low risk level can be translated directly with AI assistance without special attention, as lightweight texts tend to be flexible and not bound to rigid contexts. In contrast, for medium and high risk levels, texts require deeper human involvement as well as careful attention to structure and context to avoid misinterpretation.

Therefore, the ethics of using AI in translation cannot be generalized for all types of texts. The higher the risk of fatal translation errors, the stricter the review that must be carried out by humans—through source verification, educator supervision, and independent restructuring of the translation results while paying close attention to context.

Formulating AI Usage Guidelines

This AI usage guidance model was developed based on a review of students' behavior in using AI for Arabic translation, in order to encourage their independence in maintaining the ethical boundaries of its use. According to research at STIT Pemalang, misuse of AI such as copy-pasting and plagiarism is still widespread even though the level of student awareness of the risk of plagiarism is at 61.1% (Lukman et al., 2024).

Critical thinking skills in using AI can still be maintained by paying attention to the analysis process such as identifying or comparing existing data. In this guide, students are required to identify several ambiguous words in AI translation results, compare several other translation results, then compose their own translation. This successive process is considered capable of improving thinking abilities.

Viewed from the teacher's perspective, this guideline is designed to facilitate student assessment, both directly and indirectly. It is immediately easier when these usage guidelines are integrated with a formal teacher assessment system. Even though it is not formally regulated, this guideline still indirectly supports the assessment process when applied in the classroom. Because students will be encouraged to think critically and try to understand the material well even though working with the help of AI.

The six formulated stages represent the implementation of a Human-in-the-Loop approach, where AI acts merely as a tool while humans remain the primary drivers of the cognitive system. The processes of identifying ambiguous terms, checking structures, comparing translation results, and independently compiling translations are carried out to ensure that learners actively engage in the thinking process and decision-making. Learners are not only oriented toward the final translation result, but are also required to understand the decision-making process in determining the meaning that best fits the context. The oral explanation stage reinforces this orientation, because through it, learners are encouraged to truly understand the content of the translation material they have worked on so they can explain it well. Educators can identify the extent to which learners depend on AI. Students who are able to provide explanations for their choice of diction

and sentence structure, as well as take full responsibility for their translation results, demonstrate that they are using AI truly as an aid rather than as a replacement for their cognitive ability in translating texts. Conversely, students who submit translation results that look structured but are unable to explain and account for them serve as an indicator that those learners require further supervision and guidance.

By applying these guidelines, educators and learners can verify and take responsibility for the output obtained through AI assistance. The initial AI translation is not considered immediately correct, but rather serves as material for comparison, the identification of complex elements, and the contextual meaning that best suits the learners' needs. This helps make student assessment less rigidly tied solely to the final product of translation, while further maximizing the comprehension of context—from word-to-word and sentence-to-sentence, up to paragraph-to-paragraph. Learners are also trained to appreciate the value of originality in a work by avoiding a mindless copy-paste of translation results without re-verification. Thus, by prioritizing this Human-in-the-Loop principle, it not only helps students identify the most accurate answers with AI assistance and assists instructors in evaluating each individual student's ability in greater detail, but it also builds a generation that cares about intellectual property rights, values critical thinking, and avoids over-reliance on technological convenience in the era of Society 5.0.

CONCLUSIONS

To minimize the risks and potential errors in Artificial Intelligence (AI) outputs in Arabic translation, this study focuses on analyzing the capabilities of AI models and formulating guidelines for their use. Based on the findings of the literature review, it can be concluded that the three AI models analyzed—ChatGPT, Gemini, and Google Translate—still exhibit significant limitations in translating Arabic texts, particularly in morphological, syntactic, and semantic aspects.

The translations produced by ChatGPT still tend to contain semantic errors and frequently include excessive or additional information (hallucinations). Gemini AI is considered less comprehensive and often less accurate in interpreting implicit meanings. Meanwhile, Google Translate is the weakest AI model in understanding Arabic morphological and syntactic patterns, including conjugation based on gender and tense. These findings indicate that AI is not yet fully capable of translating Arabic, particularly texts with complex linguistic characteristics.

Furthermore, guidelines for the use of AI in Arabic translation were successfully formulated. These guidelines are designed for Arabic texts classified as having moderate to high levels of risk and consist of six activity steps aimed at strengthening the human role in the translation process (*Human-in-the-Loop*). Rather than completely prohibiting the use of AI, these guidelines are intended to ensure that students' cognitive abilities remain actively engaged while also supporting educators in the assessment and integration of AI into Arabic language learning.

Through this study, students are expected to develop a greater understanding of the risks of overdependence on AI and the importance of using AI responsibly in accordance with established guidelines. Educators are also expected to be able to integrate the formulated guidelines into formal learning systems. Future research is recommended to adopt an empirical approach by directly testing the guidelines within learning environments in order to validate and further refine the findings of this literature-based study.

ACKNOWLEDGMENT

All praise is due to Allah, *'Azza wa Jalla*, who, by His grace, mercy, and blessings, has enabled us to complete this scientific article in good health and as Muslims. May peace and blessings always be upon our role model and leader, Prophet Muhammad ﷺ, through whose struggle the light of faith has reached our hearts. We would also like to express our deepest gratitude to all those who have supported and prayed for us throughout the preparation of this article. We are especially grateful to our parents, who have always given us their permission and support through their prayers, encouragement, and material assistance. May Allah always protect them and shower them with His mercy and love. We would also like to thank our friends who have given their full support to both of us throughout the completion of this scientific article. Finally, we would like to thank each other for continuously supporting one another and striving to give our best in completing our first scientific article together. We hope that this article will mark the beginning of our journey toward making a meaningful contribution to education in Indonesia, particularly to Arabic language education. *May Allah always protect us both and guide us through His guidance.*

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