English Teaching and Linguistics Journal (ETLiJ)
Vol. 6. No.2, 2025, pp. 62 - 72
E-ISSN: 2716-0831

Exploring Semantic Equivalence in the Translation of the Putri Hijau Legend

Putri Rizki Syafrayani[1], Meisuri[2], Riska Ayunda[3], Merry Luz Molina[4]
[1,2,3,4]English Applied Linguistics Postgraduate Program, Universitas Negeri Medan
email: prizkisyafrayani@gmail.com (correspondence email)

ARTICLE INFO

Received
13/03/25
Revised
24/06/225
Accepted
09/08/25

Keywords:
Culturally embedded terms, idiomatic expressions, metaphors, neural machine translation (NMT), Putri Hijau legend

ABSTRACT

This study investigates the capabilities of neural machine translation (NMT) tools, Google Translate and DeepL, in translating culturally rich texts, with a focus on the Putri Hijau legend. Using Newmark's Semantic Translation Theory, the research evaluates the translation of idiomatic expressions, metaphors, and culturally embedded terms to determine the semantic fidelity and cultural appropriateness of each tool. The findings reveal that DeepL outperforms Google Translate in preserving contextual and pragmatic nuances, particularly in idiomatic expressions and culturally specific terms, aligning more closely with semantic translation principles. However, both tools face significant challenges in translating metaphors, often resorting to literal interpretations that fail to capture the symbolic and poetic elements of the original text. The study highlights the limitations of current NMT tools in rendering complex cultural and figurative content accurately and underscores the importance of cultural understanding in translation. While DeepL demonstrates greater effectiveness, the research concludes that NMT tools should be used as supplementary aids rather than standalone solutions for culturally significant texts. Recommendations include further refinement of AI models to enhance their ability to handle figurative language and cultural nuances. These findings provide valuable insights for improving NMT technology and its application in translating culturally sensitive materials.

How to cite: *Syafrayani, P, R., Meisuri, Ayunda, R, Molina, M, L.* (2025). Exploring Semantic Equivalence in the Translation of the Putri Hijau Legend. *English Teaching and Linguistics Journal, 6*(2), 62-72.

I. INTRODUCTION

Globalisation is creating a more interconnected world in which the ability to communicate smoothly and effectively across different languages and cultures is becoming increasingly important. AI-driven language translation has created new opportunities for bridging cultural gaps and enhancing cross-cultural interactions (Mohamed et al., 2024). As a large and diverse country, Indonesia is estimated to be home to 10% of the world's languages (Lauder, 2006). According to recent estimates, approximately 700 distinct languages are spoken in Indonesia, making it the second most linguistically diverse country in the world, after Papua New Guinea (M, 2022). These figures demonstrate the necessity of translation as a means of overcoming the barriers that exist between Indonesia and the wider world, as well as facilitating connections between Indonesia and the global civilising process.

Nevertheless, the incorporation of artificial intelligence into the domain of translation has emerged as a topic of considerable interest and debate among a diverse array of stakeholders (Khasawneh & Al-Amrat, 2023). There is a divergence of opinion among stakeholders as to the potential of AI as an innovative technology with the capacity to revolutionise the field of translation (Asscher, 2023). Artificial Intelligence (AI) has revolutionized the field of language translation, offering capabilities that were once unimaginable. Modern AI translation technologies, particularly Neural Machine Translation (NMT), utilize deep learning algorithms to deliver translations with remarkable accuracy and contextual understanding (Stahlberg, 2020). These advancements have opened new avenues for cross-cultural communication, facilitating more seamless and productive interactions.

The advent of machine translation (MT) systems, including Google Translate and DeepL, has revolutionized the field, offering instant translations across numerous language pairs. However, questions remain regarding the accuracy and reliability of these tools, especially for complex language pairs like English and Indonesian, which exhibit significant linguistic and cultural differences. English and Indonesian differ in syntax, morphology, and semantics, with cultural nuances adding further complexity (Auni & Manan, 2023). Accurately translating these subtleties requires advanced algorithms capable of handling not only literal meanings but also cultural context and idiomatic expressions (Charles-Kenechi, 2024). Despite the rapid advancements in neural machine translation (NMT) technology, there is a persistent need to evaluate these systems' effectiveness in translating culturally significant texts, such as legends, which often contain idiomatic expressions, metaphors, and cultural allusions.

The legend of Putri Hijau, a prominent piece of Indonesian folklore, offers a compelling case for such an analysis. Rich in cultural and historical significance, the text presents various challenges for machine translation systems, including the use of archaic expressions, metaphorical language, and culturally embedded meanings (Latranita et al., 2024). This makes it an ideal subject for assessing translation accuracy and evaluating the strengths and weaknesses of Google Translate and DeepL in handling English-Indonesian translations.

This study investigates the semantic equivalence of English-Indonesian translations of the Putri Hijau legend, focusing on the extent to which Google Translate and DeepL capture the semantic nuances of the source text. By conducting a comparative analysis of selected excerpts, this research evaluates the performance of these NMT systems in preserving the meaning, cultural context, and linguistic richness of the original text. The findings aim to contribute to the growing body of research on NMT technologies, highlighting their strengths and limitations in translating culturally significant texts. Furthermore, this research seeks to provide practical recommendations for enhancing the use of AI-driven translation tools in educational, professional, and everyday contexts.

Literature Review

Advancements in AI Translation Technologies

Neural Machine Translation (NMT) represents a significant leap forward in AI translation technologies. This represents a significant advance over existing techniques such as rule-based machine translation (RBMT) and statistical machine translation (SMT), marking a fundamental shift in the field of automated language translation (He et al., 2016). The advent of neural machine translation has transformed the process of translating text between languages, rendering it more seamless across linguistic boundaries (Martin, 2024).

In comparison to previous methods, rule-based machine translation (RBMT) employs the use of dictionaries and an extensive collection of linguistic rules in the generation of translations. These systems generate translations based on specified lexicons and grammatical rules for both the source and target languages (Singh et al., 2019). While RBMT is capable of producing accurate translations in areas where rules are well-defined, it frequently encounters difficulties

in handling the complexity and diversity of natural language, resulting in less fluid and contextually inappropriate translations (Okpor, 2014). In contrast, statistical models obtained from large multilingual text corpora are employed in statistical machine translation (SMT) (Babhulgaonkar & Bharad, 2017). The output of SMT systems is based on probabilistic models, which examine the frequency and patterns of word alignments in the relevant corpora (Koehn, 2010). However, these systems still have limitations in terms of their ability to capture long-range dependencies and to produce grammatically coherent translations, particularly in languages with complex syntax (Hardmeier, 2012). The foundation of NMT is based on the principles of deep learning, a subset of artificial intelligence that employs a layered approach to model intricate patterns within data sets. The advent of the sequence-to-sequence (seq2seq) framework constituted a seminal advance in NMT, enabling the end-to-end training of models capable of discerning the probabilistic relationships between source and target languages directly from bilingual corpora (Lopez, 2008).

Effectiveness of AI Translation in Multilingual Contexts

AI translation technologies have demonstrated significant potential in multilingual contexts, but their effectiveness in multicultural settings requires deeper theoretical exploration. Sociolinguistic theories, such as the Sapir-Whorf Hypothesis, highlight how language shapes perception, suggesting that AI must account for cultural and conceptual differences to avoid literal but misleading translations. Intercultural Communication Theory further emphasizes the need to adapt to high-context (implicit) and low-context (explicit) communication styles, ensuring culturally appropriate interpretations. Postcolonial translation theories reveal the power dynamics in translation, warning against AI systems that may marginalize minority languages due to biases in training data. Relevance Theory underscores the importance of conveying intended meaning rather than mere word-for-word equivalence, requiring AI to grasp cultural implicatures like idioms and humor.

Ethical considerations in AI, such as bias mitigation and inclusive design, are crucial for equitable performance across high- and low-resource languages. Cultural localization extends beyond language, requiring adaptations to norms like politeness and gender expression. Hybrid human-AI collaboration, as suggested by Actor-Network Theory, may be necessary to address nuanced cultural contexts, with human oversight refining AI outputs. Uncertainty Reduction Theory highlights the need for AI to minimize ambiguity in cross-cultural communication, fostering trust through clarity in culturally sensitive terms.

Practical challenges, such as untranslatable concepts and dialectal variations, further complicate AI translation in multicultural environments. Future advancements could involve culturally aware pretraining and community-driven AI development, integrating native speakers' insights to improve accuracy. By grounding AI translation in these theories, we can better evaluate its role in global communication while addressing its limitations in preserving cultural authenticity and inclusivity.

Challenges in Translating Indonesia Language

Linguistic and cultural (un)translatability is a problem in translation. Indonesian and English are linguistically and culturally distinct languages, in contrast to French and English. Their language and cultural characteristics are not very similar. Nonetheless, affixes are used in both Indonesian and English lexicons. Syntactic words, word order, and suprasegmental units—stress, rhythm, and intonation—all contribute to the expression of their grammar. On the other hand, their lexicon, grammar, collocation, and cultures differ (Sumarni, 2016).

Moreover, the dynamic nature of Bahasa Indonesia, which constantly incorporates new slang and borrowed terms, necessitates that translators stay updated with current trends (Apriyanti et al., 2017). The specialized fields like law and medicine suffer from inconsistent terminology, further complicating translations (Sofyan & Rosa, 2021). Lastly, the lack of

comprehensive translation tools and resources for Indonesian languages hinders the efficiency and quality of translations, emphasizing the need for the development of specialized dictionaries and software (Isnawati & Hidayat, 2020).

II. METHODS

Research Design

The research methodology employs a qualitative approach in descriptive research. Qualitative descriptive research is a design for research questions that are focused on gaining insights about a poorly understood research area (Ayton et al., 2023). The design is to systematically examine the accuracy of AI translation in translating English texts, displaying how AI is applied to multilingual contexts and the potential impact on Indonesia's linguistic landscape. The analysis focuses on the translations of selected excerpts from the Putri Hijau legend, comparing their accuracy, fidelity, and cultural adequacy in English-Indonesian translations.

Data Source

The Putri Hijau legend, a traditional Indonesian folktale sourced from Arie Andrasyah Isa's (2002) published retelling, was selected as the primary data for this study due to its rich cultural and linguistic complexities, which present significant challenges for machine translation (MT) systems. This legend contains culturally embedded terms (e.g., "Putri Hijau," which carries mythological meaning beyond its literal translation as "Green Princess"), idiomatic expressions, and metaphors deeply rooted in Sumatran folklore—elements that often pose difficulties for MT tools like Google Translate and DeepL in preserving contextual and cultural nuances. The book's structured 11-chapter format ensures authenticity and consistency, making it a reliable source for analyzing how MT handles untranslatable concepts and cultural equivalence. By focusing on the translation of figurative language, proper nouns (e.g., "Pangeran Mambang," a spirit prince), and idiomatic phrases, this study leverages frameworks such as Jakobson's (1959) translation typology and Nida's (1964) dynamic equivalence theory to assess whether AI-generated translations can accurately convey culturally specific meanings or risk oversimplification and semantic loss. The choice of this legend thus provides a robust basis for examining the intersection of AI, linguistics, and cultural preservation in multilingual contexts.

Data Collection Method

The data collection process involved several systematic stages to ensure a comprehensive evaluation of machine translation (MT) performance. First, 10–15 key excerpts were carefully selected from the Putri Hijau legend, prioritizing passages rich in culturally specific terms, idioms, metaphors, and complex narrative structures to test the limits of MT systems. These excerpts were then input into Google Translate and DeepL, generating two sets of Indonesian translations for comparison. The raw MT outputs were documented verbatim to maintain accuracy in later analysis. Next, the translated texts were compiled and organized alongside the original English excerpts, creating a structured dataset for evaluation. This dataset was then aligned with a predefined translation quality framework—incorporating criteria such as accuracy, fluency, cultural appropriateness, and semantic equivalence—to facilitate systematic assessment. The final prepared dataset allowed for a detailed, side-by-side comparison of how each MT tool handled linguistic and cultural nuances, ensuring a rigorous analysis of strengths and weaknesses in AI-driven translation of folklore texts.

Data Analysis Method

For data analysis, the study employs Newmark's Semantic Translation Theory (1988), which focuses on preserving the meaning of the original text while adapting it to fit the cultural

and linguistic context of the target language. The analysis was based on a comparison of the translated texts, assessing how well the translations maintain semantic accuracy (i.e., preserving the literal and contextual meaning), cultural fidelity (i.e., conveying culturally specific expressions and metaphors), and contextual consistency (i.e., ensuring the relational terms and pronouns are correctly translated). The study categorized translations based on their semantic equivalence, identifying high, moderate, or low levels of equivalence in the AI-generated translations.

III. RESULT AND DISCUSSION

Result

The findings of this study provide a comprehensive analysis of how AI-driven translation tools, specifically Google Translate and DeepL, handle the translation of culturally rich texts, with a particular focus on the Putri Hijau legend. By examining key excerpts from the legend, the research evaluates the degree of semantic equivalence in the translated texts, highlighting the challenges AI systems face when dealing with idiomatic expressions, metaphors, and culturally embedded terms. The analysis, based on Newmark's Semantic Translation Theory, identifies the strengths and weaknesses of these AI tools in maintaining both semantic fidelity and cultural appropriateness. The following sections present the detailed results of the comparative analysis, offering insights into the effectiveness of neural machine translation systems in rendering culturally significant texts across languages.

Idiomatic Expression

Table 1 below presents the finding of idiomatic expression found in the Putri Hijau Legend Book. The table shows several idiomatic expressions found in the book and being translated by both Google Translate and DeepL.

Table 1. Idiomatic Expression Found in the Legend of Putri Hijau

Original Text	Target Language	
	Google Translate	**DeepL**
Hamba mohon pamit	Servant please goodbye	Please take your leave
Selamat jalan	Happy road	Goodbye
Hati berdebar-debar	Heart palpitations	Heart palpitations
Mimpi bukan, melihat cantiknya putri	Dream no , see beautiful daughter	It's a dream isn't it, to see the beautiful princess
Hamba tak mudah percaya dengan laki-laki	Servant not easy believe with man	I don't trust men easily

Idiomatic expressions pose a significant challenge for machine translation systems, as they often require contextual and cultural understanding.

Hamba mohon pamit (Servant please goodbye / Please take your leave)

Google Translate: "Servant please goodbye" is a literal translation, which fails to convey the formal and respectful tone embedded in the phrase.

DeepL: "Please take your leave" better reflects the semantic and pragmatic function of the idiom, aligning closer to the intended meaning in formal contexts.

Selamat jalan (Happy road / Goodbye)

Google Translate: "Happy road" is a literal, word-for-word translation that fails to capture the idiomatic meaning of "Selamat jalan," which is a polite way to say "Goodbye."
DeepL: "Goodbye" captures the idiomatic meaning effectively, adhering to the principle of semantic equivalence.

Hati berdebar-debar (Heart palpitations / Heart palpitations)
Both tools translate this phrase literally. While the translation is accurate semantically, it lacks the emotive and figurative nuance of heightened excitement or nervousness inherent in the original text.

Mimpi bukan, melihat cantiknya putri (Dream no, see beautiful daughter / It's a dream isn't it, to see the beautiful princess)
Google Translate: The fragmented structure makes the phrase difficult to understand. The word order and lack of context distort the meaning.
DeepL: This translation captures the interrogative nuance and poetic tone of the phrase, maintaining semantic fidelity.

Hamba tak mudah percaya dengan laki-laki (Servant not easy believe with man / I don't trust men easily)
Google Translate: The translation is literal and misses the implied sense of distrust and the cultural weight of "hamba."
DeepL: This version provides a more natural rendering, preserving both the semantic content and idiomatic meaning.

Metaphors

Table 2 below presents the finding of metaphors found in the Putri Hijau Legend Book. The table shows that there is only four metaphors found in the book and being translated by both Google Translate and DeepL.

Table 2. Metaphors in the Legend of Putri Hijau

Original Text	Target Language	
	Google Translate	**DeepL**
Cahaya hijau dari dalam tubuh hamba	Light green from in body servant	Green light from within the servant body
Demi bulan purnama	For the moon full moon	For the full moon
Ranting pohon ditangkai dahan, ditiup angin menari-nari	Twigs stalked branch , blown wind dancing	The tree branch on the branch, blown by the wind dances
Naga pengecut	Cowardly Dragon	Cowardly dragon

Metaphors often require a deeper cultural understanding to convey their implied meanings effectively.
Cahaya hijau dari dalam tubuh hamba (Light green from in body servant / Green light from within the servant body)
Google Translate: The literal translation, while understandable, sounds awkward and misses the mystical tone of the original.

DeepL: While slightly more fluid, it still lacks the cultural and narrative depth suggested by the metaphor.

Demi bulan purnama (For the moon full moon / For the full moon)
Both tools translate the phrase literally but fail to capture its poetic and cultural resonance, potentially signifying a vow or an act under the full moon.

Ranting pohon ditangkai dahan, ditiup angin menari-nari (Twigs stalked branch, blown wind dancing / The tree branch on the branch, blown by the wind dances)
Google Translate: The literal output is disjointed and grammatically flawed, failing to reflect the poetic imagery.
DeepL: "The tree branch on the branch, blown by the wind dances" is more fluid but still misses the metaphorical beauty of natural harmony.

Naga pengecut (Cowardly Dragon / Cowardly dragon)
Both tools produce a semantically accurate translation. However, they fail to account for any potential cultural or symbolic meaning of "Naga" within the context of the legend.

Culturally Embedded Terms

The provided contexts contain several culturally embedded terms that reflect the social norms, values, and practices of the characters' society.

Table 3. Culturally Embedded Terms in the Legend of Putri Hijau

Original Text	**Target Language**	
	Google Translate	**DeepL**
Putri Hijau	Daughter Green	Princess Green
Sultan	Sultan	Sultan
Wazir	Vizier	Vizier
Makam	Grave	Tomb
Cahaya	Light	Light
Kemenyan	Incense	Frankincense

Preserving culturally embedded terms often involves balancing fidelity with comprehension for the target audience.
Putri Hijau (Daughter Green / Princess Green)
Google Translate: "Daughter Green" is literal and does not reflect the title or cultural significance of "Putri."
DeepL: "Princess Green" appropriately conveys the intended meaning while maintaining cultural integrity.

Sultan / Wazir / Makam / Cahaya
Both tools generally perform well in translating these terms, as they are either loanwords or have direct equivalents in English. However, "Makam" as "Grave" by Google Translate may lack the solemnity or cultural connotation of "Tomb" as rendered by DeepL.

Kemenyan (Incense / Frankincense)
Google Translate: "Incense" is accurate but generic.
DeepL: "Frankincense" is more specific and contextually appropriate, especially if the term refers to a particular type of incense used in cultural rituals.

Overall Analysis Using Newmark's Semantic Translation Theory

Google Translate tends to rely on word-for-word, literal translations, often resulting in a loss of cultural and idiomatic nuances. This aligns with Communicative Translation, which aims for accessibility but often sacrifices semantic depth. DeepL, on the other hand, demonstrates a better grasp of Semantic Translation, maintaining closer fidelity to the source text's meaning and tone. While not perfect, it better preserves cultural and contextual nuances, particularly in idiomatic expressions and culturally embedded terms. Both tools struggle with figurative language, particularly metaphors, where deeper contextual and cultural understanding is necessary to capture the intended meaning fully.

Discussion

Evaluating AI-driven Translation using Newmark's Semantic Translation Theory

The findings of this study reveal critical insights into the capabilities and limitations of AI translation tools in handling culturally rich texts, with implications for both practical applications and theoretical frameworks in translation studies. The varying levels of success in translating idiomatic expressions, metaphors, and culturally embedded terms underscore the tension between semantic fidelity and communicative functionality, as theorized by Newmark (1988). For instance, the idiomatic phrase "*Hamba mohon pamit*" was rendered literally by Google Translate ("Servant, please goodbye"), sacrificing the formal and respectful tone, while DeepL's more nuanced translation ("Please take your leave") aligned closer with semantic translation principles by preserving pragmatic meaning. This aligns with Tang's (2020) observation that AI systems often falter with idioms due to their reliance on surface-level patterns rather than contextual depth. Similarly, Wu et al. (2019) emphasized that idiomatic accuracy requires training on culturally diverse datasets, suggesting that current AI models still lack the nuanced understanding necessary for fully context-aware translations.

Metaphors, which demand a deeper grasp of cultural and narrative context, further highlighted the limitations of both tools. For example, the metaphor "*Cahaya hijau dari dalam tubuh hamba*" was translated literally by both tools, stripping away its mystical connotations. While DeepL produced a more fluid output ("Green light from within the servant body"), it still failed to capture the symbolic richness, corroborating Ghazala's (2008) argument that metaphors often lose their aesthetic and cultural resonance in machine translation. This suggests that AI systems struggle with connotative meaning, a challenge compounded by the lack of culturally annotated training data.

Culturally embedded terms, such as "*Putri Hijau*" and "*Kemenyan*," further illustrated the trade-offs between literal accuracy and cultural preservation. Google Translate's "Daughter Green" for "Putri Hijau" reflected a literal approach that ignored the titular significance of "Putri," whereas DeepL's "Princess Green" demonstrated better semantic fidelity. This resonates with Bania and Nur's (2022) findings that AI systems often inadequately render cultural terms due to limited contextual training. However, DeepL's comparatively superior performance in such cases hints at progress in semantic translation algorithms, though gaps remain in cultural localization.

When compared to broader research, these findings suggest that while AI translation tools have advanced in handling denotative meaning, they still struggle with connotative and culturally specific nuances. Studies like those of House (2015) on intercultural pragmatics and Katan (2014) on cultural frames further support the need for hybrid human-AI approaches to preserve cultural authenticity. The implications are clear: for AI translation to achieve true semantic and cultural equivalence, it must integrate deeper contextual frameworks, possibly through collaborative models that combine machine efficiency with human cultural expertise. This would not only enhance translation accuracy but also ensure that cultural narratives retain their original richness in cross-linguistic communication.

Implications for Newmark's Semantic Translation Theory

The findings affirm Newmark's assertion that semantic translation is superior for culturally rich texts, as it prioritizes meaning and contextual integrity over readability. DeepL demonstrates a stronger alignment with semantic translation principles, especially in idiomatic and culturally embedded terms. However, both tools exhibit a tendency to default to literal translations for metaphors, indicating a gap in their ability to handle figurative language. This study contributes to ongoing research in neural machine translation (NMT) by highlighting the limitations and potential of AI tools in translating culturally significant texts. Future research could explore incorporating cultural and contextual datasets into AI training models, as suggested by Bahri and Mahadi (2023), to enhance semantic fidelity and cultural appropriateness.

IV. CONCLUSION AND SUGGESTION

In conclusion, the research highlights the strengths and limitations of Neural Machine Translation (NMT) systems, specifically Google Translate and DeepL, in translating culturally significant texts like the Putri Hijau legend. While NMT technologies have made remarkable progress in enhancing translation accuracy, particularly with the context-aware capabilities of the Transformer architecture, challenges remain in capturing the full semantic meaning and cultural nuances of complex texts. The analysis of the selected excerpts revealed that both systems struggle with metaphorical language, idiomatic expressions, and culturally embedded meanings, which are essential to preserving the richness of the original text. This suggests that while AI-driven translation tools have significantly advanced the field of machine translation, they still require refinement when it comes to handling culturally intricate content.

Given the findings, several suggestions for improving AI-driven translation systems are proposed. First, there is a need for the continuous development of specialized algorithms that better account for cultural context, metaphors, and idiomatic expressions in the translation process. Incorporating more extensive bilingual and bicultural corpora could help enhance the systems' ability to deliver culturally accurate translations. Furthermore, integrating human post-editing or collaboration between AI and professional translators may significantly improve the quality of translations, especially for complex and culturally rich texts. By addressing these challenges, AI-driven translation tools can become more effective in bridging language gaps and facilitating cross-cultural communication.

REFERENCES

Apriyanti, T., Wulandari, H., Safitri, M., & Dewi, N. (2017). Translating Theory of English into Indonesian and Vice-Versa. *Indonesian Journal of English Language Studies (IJELS)*, *2*(1), 22. https://doi.org/10.24071/ijels.v2i1.350

Arivazhagan, N., Bapna, A., Firat, O., Lepikhin, D., Johnson, M., Krikun, M., Chen, X. M., Cao, Y., Foster, G., Cherry, C., Macherey, W., Chen, Z., & Wu, Y. (2019). Massively Multilingual Neural Machine Translation in the Wild: Findings and Challenges. *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics*, 89–101.

Asscher, O. (2023). The Position of Machine Translation in Translation Studies: A Defitional Perspective. *Translation Spaces*, *12*(1), 1–20.

Auni, L., & Manan, A. (2023). A Contrastive Analysis of Morphological and Syntactic Aspects of English and Indonesian Adjectives. *Studies in English Language and Education*, *10*(1), 403–423. https://doi.org/10.24815/siele.v10i1.27401

Ayton, D., Tsindos, T., & Berkovic, D. (2023). Chapter 5: Qualitative descriptive research. In *Qualitative Research – A practical guide for health and social care researchers and practitioners*. Monash University.

Babhulgaonkar, A. R., & Bharad, S. V. (2017). Statistical Machine Translation. *International Conference on Intelligent Systems and Information Management (ICISIM)*, 62–67. https://doi.org/10.1109/ICISIM.2017.8122149

Baker, M. (2018). In other words: A coursebook on translation (3rd ed.). Routledge.

Charles-Kenechi, S. (2024). Artificial Intelligence in Education: Benefits and Challenges. *Cascades, Journal of the Department of French and International Studies*, *2*(1), 5–15.

Hardmeier, C. (2012). Discourse in Statistical Machine Translation. *Discours*, *11*. https://doi.org/10.4000/discours.8726

He, D., Xia, Y., Qin, T., & Wang, L. (2016). Dual Learning for Machine Translation. *Advances in Neural Information Processing Systems*, *29*.

Isa, A. A. (2002). *Putri Hijau*. Pusat Bahasa.

Isnawati, R., & Hidayat, M. (2020). The Need for Specialized Translation Resources for Indonesian Languages. *Translation Technology Quarterly*, *9*(3), 87–104.

Khasawneh, M. A. S., & Al-Amrat, M. G. R. (2023). Evaluating the Role of Artificial Intelligence in Advancing Translation Studies: Insights from Experts. *Migration Letters*, *20*(S2), 932–943.

Koehn, P. (2010). *Statistical Machine Translation*. Cambridge University Press.

Latranita, E., Sembiring, M., & Sitinjak, V. N. (2024). The Art of Translating Indonesian Folklore: A Case Study of "Hasil Sebuah Kejujuran" by Bambang Subagyo". *Journal of Applied Linguistics*, *4*(1), 32–40. https://doi.org/10.52622/joal.v4i1.219

Lauder, M. R. M. T. (2006). Obstacles to Creating an Inventory of Languages in Indonesia: A Dialectology Perspective. In D. Cunningham, D. E. Ingram, & K. Sumbuk (Eds.), *Language Diversity in the Pacific Endangerment and Survival*. UNESCO Etxea.

Lopez, A. (2008). Statistical Machine Translation. *ACM Computing Surveys (CSUR)*, *40*(3), 1–49.

M, P. L. (2022). *Ethnologue: Languages of the World* (25th ed.). SIL International.

Martin, S. (2024). Advancements in Neural Machine Translation : Techniques and Applications. *Journal of Innovative Technologies*, *7*, 1–9.

Mohamed, Y. A., Khanan, A., Bashir, M., Mohamed, A. H. H. M., Adiel, M. A. E., & Elsadig, M. A. (2024). The Impact of Artificial Intelligence on Language Translation: A Review. *IEEE Access*, *12*(January), 25553–25579. https://doi.org/10.1109/ACCESS.2024.3366802

Newmark, P. (1988). *A Textbook of Translation*. Prentice Hall.

Nida, E. A., & Taber, C. R. (2003). The theory and practice of translation (2nd ed.). Brill.

Okpor, M. D. (2014). *Machine Translation Approaches*. *11*(5), 159–165.

O'Brien, S. (2012). Machine translation and global content strategies. In C. Sin-wai (Ed.), The Routledge handbook of translation studies (pp. 503–518). Routledge.

Pym, A. (2010). Exploring translation theories. Routledge.

Saldanha, G., & O'Brien, S. (2013). Research methodologies in translation studies. Routledge.

Singh, M., Kumar, R., & Chana, I. (2019). Improving Neural Machine Translation Using Rule-Based Machine Translation. *2019 7th International Conference on Smart Computing and Communications, ICSCC 2019*, 1–5. https://doi.org/10.1109/ICSCC.2019.8843685

Sofyan, R., & Rosa, R. N. (2021). Problems and Strategies in Translating Legal Texts. *Humanus*, *20*(2), 221. https://doi.org/10.24036/humanus.v20i2.112233

Stahlberg, F. (2020). Neural machine translation: A review. *Journal of Artificial Intelligence Research*, *69*, 343–418. https://doi.org/10.1613/JAIR.1.12007

Sumarni, L. (2016). Translation: From Theory to Practice. In *Know* (1st Editio, Vol. 7, Issue 2). Sanata Dharma University Press.

Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., & Kaiser, L. (2017). Attention is All You Need. *31st Conference on Neural Information Processing Systems (NIPS 2017)*.