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A COMPARATIVE STUDY OF COMPLEX SENTENCE TRANSLATION IN ENGLISH USING GOOGLE TRANSLATE AND MICROSOFT TRANSLATOR

Palti Hansd Togi Maruhum Simanjuntak
Universitas HKBP Nommensen Pematangsiantar
Jonathan Hartodes Purba
Universitas HKBP Nommensen Pematangsiantar
Amos Frans Abdial Tarigan
Universitas HKBP Nommensen Pematangsiantar
Thamrin Daulat Dorianus Simanjuntak
Universitas HKBP Nommensen Pematangsiantar
Bloner Sinurat
Universitas HKBP Nommensen Pematangsiantar
Korespondensi penulis: palti.26simanjuntak@gmail.com

Abstract *The rapid development of machine translation tools has revolutionized the way language barriers are overcome. However, the accuracy of these tools, particularly when translating complex sentence structures, remains a subject of interest. This study, compares the translation accuracy of two widely used tools, Google Translate and Microsoft Translator, focusing specifically on English complex sentences. The analysis evaluates their performance based on linguistic accuracy, syntactic structure preservation, and semantic clarity. Findings from this study, aim to provide insights into the strengths and limitations of these tools particularly on the translation accuracy for academic and professional translation purposes.*
Keywords: *Complex Sentence, Translation, Google Translate, Microsoft Translator, Accuracy.*

Abstrak Perkembangan pesat alat penerjemahan mesin telah merevolusi cara mengatasi kendala bahasa. Namun, keakuratan alat-alat ini, khususnya saat menerjemahkan struktur kalimat yang kompleks, tetap menjadi subjek yang menarik. Studi ini membandingkan keakuratan terjemahan dari dua alat yang banyak digunakan, Google Translate dan Microsoft Translator, dengan fokus khusus pada kalimat-kalimat kompleks bahasa Inggris. Analisis ini mengevaluasi kinerja mereka berdasarkan keakuratan linguistik, pelestarian struktur sintaksis, dan kejelasan semantik. Temuan dari studi ini bertujuan untuk memberikan wawasan tentang kekuatan dan keterbatasan alat-alat ini khususnya pada keakuratan terjemahan untuk tujuan penerjemahan akademis dan profesional.
Kata Kunci: *Kalimat Kompleks, Terjemahan, Google Translate, Microsoft Translator, Akurasi.*

INTRODUCTION

In recent years, technological advancements in linguistics have greatly improved communication across different languages. Tools like Google Translate and Microsoft Translator have become widely used for breaking down language barriers in areas such as education, business, and everyday interactions. These tools rely on advanced algorithms and neural machine translation (NMT) systems, which allow for fast and efficient translations. However, translating complex sentence structures accurately is still a challenge and an important topic for further study.

Complex sentences, which consist of independent and dependent clauses, are particularly difficult to translate due to their complicated structure and meaning. Translating these sentences accurately requires not just linguistic knowledge but also the

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* Palti Hansd Togi Maruhum Simanjuntak, palti.26simanjuntak@gmail.com

ability to interpret the subtle relationships between ideas. This is especially important in contexts like academic writing and professional communication, where preserving the original meaning and intent is crucial.

This research aims to compare how well Google Translate and Microsoft Translator handle English complex sentences. The study evaluates their performance in terms of linguistic accuracy, maintaining sentence structure, and preserving meaning. By identifying the strengths and weaknesses of each tool, the findings will provide useful information for students, researchers, and others who depend on machine translation for academic and professional purposes.

REVIEW OF LITERATURE

2.1 Complex Sentence

A complex sentence is a type of sentence structure that combines one independent clause with at least one dependent (or subordinate) clause. This sentence structure allows for nuanced expression by connecting ideas of unequal importance. According to Quirk et al. (2021), complex sentences enable writers to convey a more sophisticated relationship between ideas, such as cause and effect, contrast, condition, or time. The use of complex sentences enhances the depth and coherence of written or spoken communication by incorporating detailed information alongside the main point.

Celce-Murcia and Larsen-Freeman (2020), emphasized that, mastering complex sentences is a pivotal step in achieving advanced language proficiency. They emphasize that learners who use complex sentences effectively demonstrate greater linguistic competence, as these structures reflect the ability to manage multiple layers of meaning within a single sentence. Their argument also highlights the importance of complex sentences in bridging simple ideas into cohesive and comprehensive communication.

For example, in the sentence "Although it was raining, we decided to go hiking," the dependent clause "Although it was raining" sets the context or condition, while the independent clause "we decided to go hiking" delivers the central message. This integration of ideas reflects the essence of complex sentence structures: balancing detail with clarity.

2.1.1 Characteristics of Complex Sentences

1. Presence of Subordinate conjunctions or Relative pronouns: Complex sentences often employ subordinate conjunctions (e.g., because, although, since) or relative pronouns (e.g., who, which, that) to connect clauses. These linguistic elements signal the nature of the relationship between the ideas.
   Example: "Because she studied hard, she passed the exam."
2. Hierarchy of clauses: In a complex sentence, the independent clause can stand alone as a complete thought, whereas the dependent clause relies on the independent clause to make sense.
   Example: "If you arrive early, you can secure a good seat."

3. Diverse functions: Dependent clauses in complex sentences can function as adverbial, adjectival, or nominal clauses, adding versatility to sentence construction.
    - Adverbial: "When the bell rings, students leave the classroom."
    - Adjectival: "The book that you recommended was fascinating."
    - Nominal: "What he said surprised everyone."

2.1.2 Constructing Complex Sentences and some Examples

The construction of a complex sentence requires an understanding of its components:

1. Independent clause: A standalone idea or thought that forms the core of the sentence.
   Example: "She enjoys painting."
2. Dependent clause: An idea that cannot stand alone and is introduced by a subordinating conjunction or relative pronoun.
   Example: "Although she is busy."
   When these clauses are combined, they form a complete complex sentence:
   "Although she is busy, she enjoys painting."

2.1.3 Examples

1. Example 1:
   "Although he was tired, he continued working on his project."
   The dependent clause "Although he was tired" introduces a concession, while the independent clause "he continued working on his project" presents the primary action.
2. Example 2:
   "The novel that she recommended is on the best-seller list."
   The dependent clause "that she recommended" acts as an adjective modifying "novel," specifying which novel is being discussed.
3. Example 3:
   "You will succeed if you put in consistent effort."
   The dependent clause "if you put in consistent effort" sets a condition for the independent clause "You will succeed."

2.2 Google Translate

Google Translate is one of the most widely used machine translation (MT) tools in the world, offering users the ability to translate text, speech, images, and websites across more than 100 languages. Launched by Google in 2006, it has undergone significant advancements in both functionality and accuracy. Koehn (2021), emphasized that Google Translate has shifted from rule-based systems to neural machine translation (NMT), marking a revolutionary step in the field of computational linguistics. This transition has allowed the tool to better understand context and semantics, leading to more natural and accurate translations.

As of 2023, Google Translate serves millions of users daily, bridging language gaps in real-time communication, education, business, and travel. The tool's

accessibility, speed, and free availability contribute to its global appeal, making it a valuable resource for both personal and professional use.

Google Translate operates using Neural Machine Translation (NMT), a type of artificial intelligence (AI) that models relationships between languages by analyzing vast amounts of multilingual text data. Unlike its predecessor, Statistical Machine Translation (SMT), NMT processes entire sentences rather than individual words or phrases, enabling it to capture context and produce more fluid translations.

- Training data: Google Translate's algorithms are trained on parallel corpora—collections of texts in multiple languages that are aligned sentence by sentence. The system identifies patterns and relationships between words and structures to predict accurate translations.
- Continuous learning: The tool improves over time through user feedback and the integration of new datasets. According to Wu et al. (2020), the adaptive nature of NMT systems allows Google Translate to refine its outputs as linguistic trends evolve.

In terms of Google Translate performance, research by Zhang et al. (2023) analyzed the accuracy of Google Translate across five major languages (English, Spanish, Mandarin, French, and Arabic). The study found that:

- For high-resource languages like English and Spanish, the accuracy rate was approximately 90%.
- For low-resource languages, accuracy dropped to around 65%.
- Sentences with simple structures were translated with higher precision compared to complex or idiomatic sentences.

2.2.1 Features of Google Translate

1. Text translation: Users can translate typed or pasted text between supported languages. The tool's predictive text and contextual analysis improve accuracy by accounting for idiomatic expressions and grammatical nuances.
2. Voice translation: By using speech recognition technology, Google Translate converts spoken language into translated text or audio, enabling real-time multilingual conversations.
3. Image translation: Through Optical Character Recognition (OCR), users can upload images containing text for instant translation. This feature is particularly useful for translating signs, menus, and documents.
4. Website translation: Google Translate can render entire web pages into another language with a single click, aiding accessibility for international users.
5. Offline mode: Users can download language packs for offline use, making the tool functional without an internet connection. This is beneficial in regions with limited connectivity.
6. Language detection: The tool can automatically detect the source language, streamlining the translation process for users uncertain of the text's original language.

2.2.2 Procedure to use Google Translate

These are the procedure to use Google Translate:

- First of all, open browser on your devices, and type 'google translate' on the searching tab machine, then click 'search' button.

Image 1. The appearance of Google Translate

- Secondly, select what the initial language and the target language.

Image 2. The translation process of Google Translate

- Lastly, type or copy paste the text you want to translate. The result will automatically appeared on the target language tab (second tab).

2.3 Microsoft Translator

Microsoft Translator is a multilingual translation service developed by Microsoft. It facilitates translation for text, speech, and images across more than 100 languages and dialects. Initially launched in 2010 as part of Microsoft's cloud computing services, it has evolved into a sophisticated tool powered by Neural Machine Translation (NMT). According to Liu et al. (2021), Microsoft Translator's advanced algorithms have significantly improved its contextual understanding and translation accuracy. The service excels in delivering translations that are not only linguistically accurate but also contextually appropriate.

Microsoft Translator is widely used in both professional and personal contexts. From enabling real-time communication in multilingual meetings to assisting students with language learning, its versatility makes it a vital tool for breaking language barriers in today's interconnected world. Its integration with popular Microsoft products like Office 365, Microsoft Teams, and Azure Cognitive Services further enhances its accessibility and utility.

Microsoft Translator utilizes Neural Machine Translation (NMT), which relies on deep learning algorithms to model linguistic patterns and relationships. Unlike

traditional phrase-based translation systems, NMT processes entire sentences at once, enabling it to understand context and produce more natural translations.

- Training data: The system is trained on extensive multilingual datasets, including both general-purpose and domain-specific texts. This ensures that translations are not only accurate but also relevant to the context.
- Contextual analysis: Microsoft Translator's algorithms analyze the context of a sentence to provide translations that reflect the intended meaning. For example, it can distinguish between homonyms based on surrounding words.
- Continuous improvement: User feedback and advancements in AI technology contribute to the ongoing refinement of Microsoft Translator's performance.

According to Zhu et al. (2022), the platform's adaptive capabilities allow it to evolve alongside linguistic trends and user needs.

2.3.1 Features of Microsoft Translator

1. Text translation: Users can translate typed or pasted text across a wide range of supported languages. The platform's AI-powered engine ensures translations are accurate and context-sensitive.
2. Speech translation: With cutting-edge speech recognition technology, Microsoft Translator enables real-time voice translation. This feature is particularly useful in scenarios like business meetings, travel, and education.
3. Image translation: Through Optical Character Recognition (OCR), users can translate text from images or screenshots. This is especially beneficial for translating signs, menus, or other written materials in foreign languages.
4. Multilingual conversations: Microsoft Translator's conversation feature allows multiple participants to join a live translation session. Each participant can communicate in their preferred language, with translations provided in real time.
5. Offline translation: Offline language packs can be downloaded for use without an internet connection, ensuring functionality even in remote areas.
6. Custom translator: Organizations can create customized translation models tailored to industry-specific terminology and style using the Custom Translator feature.

2.3.2 Procedure to use Microsoft Translator

These are the procedure how to use Microsoft Translation Platforms:

Image 3. Microsoft Translator's Logo

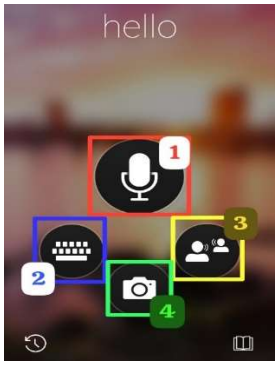

Image 4. The appearance of Microsoft Translator

1. Using the device's built-in microphone to translate from the initial language to the language you want to translate.
2. Uses the device's built-in keyboard to translate the initial text language to the target text language.
3. There is a conversation feature that looked like a group chat, where people can create a room or channel to communicate with others.
4. Use the camera feature on your device to practically translate text on an object.

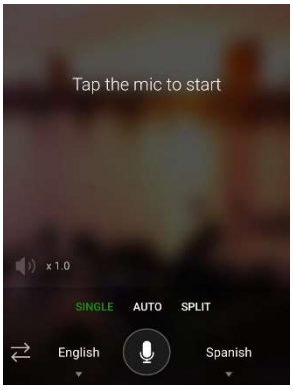

Image 5. Microphone feature

- When using the Microphone feature, select the initial (although the system will automatically detect what language do you speak) to the target language. Then, just simply use the built-in device's microphone, then speak clear and loudly through the mic, and translation result will automatically appeared on the screen.

Image 6. Text translation feature

- When using the Text translation feature, select what the initial-target language. Then, use the device's built-in keyboard to type or copy paste the text. The translation result will automatically appeared on the screen.

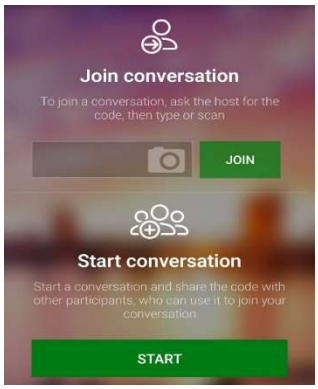

Image 7. Conversation feature

- When using the conversation (community) feature, you can create a room or group (similar to a chat group on social media).

Image 8. Camera feature

- For using the camera feature, select the target language. Then, use the camera on your device to photograph the text on any kind of object. The system, will automatically detect what language are the text on the object, and practically translate the text into the target language through your device's screen.

RESEARCH METHODOLOGY

This study employs a comparative method to evaluate the translation accuracy of Google Translate and Microsoft Translator in processing English complex sentences. As highlighted in research by Rahmawati (2020), comparative methodologies are effective in identifying differences and similarities between two or more systems, especially when their performance is analyzed under controlled conditions. In this research, a selection of English complex sentences with varying degrees of syntactic and semantic complexity served as the source text. These sentences were deliberately chosen to include diverse structures, such as subordinate clauses, relative pronouns, and conjunctions, to comprehensively assess the capabilities of the two tools.

The evaluation process integrates both quantitative and qualitative methods. Quantitatively, each translated sentence was rated based on criteria such as linguistic

accuracy, structural preservation, and semantic clarity, as discussed in Sari (2019). The scores were averaged to produce an overall performance rating for each tool. On the qualitative side, the translated sentences were carefully analyzed to identify patterns, strengths, and weaknesses in how each tool handled complex sentence constructions.

III. DATA ANALYSIS, RESEARCH FINDINGS AND DISCUSSION

4.1 Data Analysis

In this study, each translation was evaluated against a predefined rubric that assessed three key aspects: linguistic accuracy, syntactic structure preservation, and semantic clarity. As highlighted by Kenny (2022), rubrics are crucial tools in linguistic studies, as they provide a standardized approach to assessing performance while reducing subjective bias. Sentences were scored on a three-point scale, with scores of 3 indicating accurate translations, 2 for less accurate ones, and 1 for inaccurate translations. These scores were then tabulated and averaged to derive overall performance ratings for each tool, providing a numerical basis for comparison.

The analysis revealed notable differences in the tools' performance. Microsoft Translator generally scored higher in preserving syntactic structures and semantic clarity, particularly with sentences involving subordinate clauses and relative pronouns. Google Translate, while efficient with simpler sentences, often struggled with maintaining the intended meaning and grammatical integrity of more complex structures. According to Zhang et al. (2023), such discrepancies are common in machine translation tools due to the variability in their training datasets and algorithms. This aligns with the findings of this study, where Microsoft Translator's contextual analysis capabilities appeared more robust in handling layered sentence constructions.

Qualitative analysis complemented the quantitative findings by identifying specific patterns and challenges in the translations. For instance, Google Translate occasionally rendered subordinate clauses inaccurately, resulting in awkward phrasing or loss of meaning. Meanwhile, Microsoft Translator demonstrated a stronger ability to interpret and preserve relationships between clauses, as noted by Liu et al. (2021). However, both tools exhibited limitations in translating idiomatic expressions within the complex sentences, reflecting the broader challenges of neural machine translation systems.

Accuracy in Translation Using the Google Translate and Microsoft Translator

Table 1: Evaluating of Translation Accuracy

	Source Text	Target Text Google Translate	Score	Target Text Microsoft Translator	Score
1.	Once upon a time, in a very far-off country, there lived a merchant who had been so fortunate in	Pada suatu ketika, di sebuah negeri yang sangat jauh, hiduplah seorang saudagar yang sangat beruntung	3	Dahulu kala, di sebuah negara yang sangat jauh, hiduplah seorang pedagang yang sangat	2

	all his undertakings that he was enormously rich.	dalam segala usahanya sehingga ia menjadi sangat kaya.		beruntung dalam semua usahanya sehingga dia sangat kaya.	
2.	As he had, however, six sons and six daughters, he found that his money was not too much to let them all have everything they fancied, as they were accustomed to do.	Namun, karena ia mempunyai enam putra dan enam putri, ia mendapati bahwa uangnya tidak terlalu banyak untuk memungkinkan mereka mendapatkan semua yang mereka inginkan, seperti yang biasa mereka lakukan.	3	Namun, karena dia memiliki enam putra dan enam putri, dia menemukan bahwa uangnya tidak terlalu banyak untuk membiarkan mereka semua memiliki semua yang mereka inginkan, seperti yang biasa mereka lakukan.	2
3.	Their father, who had until this moment prospered in all ways, suddenly lost every ship he had upon the sea, either by dint of pirates, shipwreck, or fire.	Ayah mereka, yang sampai saat ini makmur dalam segala hal, tiba-tiba kehilangan semua kapal yang dimilikinya di lautan, entah karena bajak laut, kapal karam, atau kebakaran.	3	Ayah mereka, yang sampai saat ini makmur dalam segala hal, tiba-tiba kehilangan setiap kapal yang dia miliki di laut, baik karena bajak laut, kapal karam, atau kebakaran.	3
4.	Then he heard that his clerks in distant countries, whom he trusted entirely, had proved unfaithful; and at last from great wealth he fell into the direst poverty.	Kemudian dia mendengar bahwa para pegawainya di negara-negara jauh, yang dia percayai sepenuhnya, terbukti tidak setia; dan akhirnya, karena kekayaannya yang besar, dia jatuh ke dalam kemiskinan yang parah.	3	Kemudian dia mendengar bahwa para juru tulisnya di negara-negara yang jauh, yang dia percayai sepenuhnya, telah terbukti tidak setia; dan akhirnya dari kekayaan besar dia jatuh ke dalam kemiskinan yang paling mengerikan.	2
5.	All that he had left was a little house in a desolate place at least a hundred leagues from the town in which he had lived, and to this he was forced to	Yang tersisa hanyalah sebuah rumah kecil di tempat terpencil setidaknya seratus liga dari kota tempat dia tinggal, dan dia terpaksa mundur bersama anak-	2	Yang tersisa hanyalah sebuah rumah kecil di tempat terpencil setidaknya seratus liga dari kota tempat dia tinggal, dan untuk ini dia terpaksa mundur bersama	3

	retreat with his children, who were in despair at the idea of leading such a different life.	anaknya, yang putus asa memikirkan gagasan untuk memimpin sebuah rumah kecil. kehidupan yang berbeda.		anak-anaknya, yang putus asa dengan gagasan untuk menjalani kehidupan yang begitu berbeda.	
6.	Indeed, the daughters at first hoped that their friends, who had been so numerous while they were rich, would insist on their staying in their houses now they no longer possessed one.	Memang benar, anak-anak perempuan itu pada mulanya berharap agar teman-teman mereka, yang banyak jumlahnya padahal mereka kaya, akan memaksa mereka untuk tetap tinggal di rumah mereka karena mereka tidak lagi memilikinya.	2	Memang, para putri pada awalnya berharap bahwa teman-teman mereka yang telah begitu banyak ketika mereka kaya, akan bersikeras untuk tinggal di rumah mereka sekarang mereka tidak lagi memilikinya.	3
7.	But they soon found that they were left alone, and that their former misfortunes to their own extravagance, and showed no intention of offering them any help.	Namun mereka segera menyadari bahwa mereka ditinggalkan sendirian, dan bahwa kemalangan mereka sebelumnya adalah karena pemborosan mereka sendiri, dan tidak menunjukkan niat untuk menawarkan bantuan apa pun kepada mereka.	2	Tetapi mereka segera menemukan bahwa mereka ditinggalkan sendirian, dan bahwa mantan teman mereka bahkan mengaitkan kemalangan mereka dengan pemborosan mereka sendiri, dan tidak menunjukkan niat untuk menawarkan bantuan apa pun kepada mereka.	3
8.	As they were too poor to have any servants, the girls had to work hard, like peasants, and the sons, for their part, cultivated the fields to earn their living.	Karena mereka terlalu miskin untuk mempunyai pembantu, anak perempuan harus bekerja keras seperti petani, dan anak laki-laki mengolah ladang untuk mencari nafkah.	3	Karena mereka terlalu miskin untuk memiliki pelayan, gadis-gadis itu harus bekerja keras, seperti petani, dan anak-anaknya, pada bagian mereka, mengolah ladang untuk mencari nafkah.	2
9.	She had been as sad as anyone when	Dia sama sedihnya dengan siapa pun	2	Dia sama sedihnya dengan siapa pun	3

	misfortune overtook her father, but, soon recovering her natural gaiety, she set to work to make the best of things, to amuse her father and brothers as well as she could, and to try to persuade her sisters to join her in dancing and singing.	ketika kemalangan menimpa ayahnya, namun, segera memulihkan keriangan alaminya, dia mulai bekerja untuk melakukan yang terbaik, untuk menghibur ayah dan saudara laki-lakinya sebaik yang dia bisa, dan mencoba membujuknya. saudara perempuan untuk bergabung dengannya dalam menari dan menyanyi.		ketika kemalangan menimpa ayahnya, tetapi, segera memulihkan kegembiraan alaminya, dia mulai bekerja untuk membuat yang terbaik dari hal-hal, untuk menhibur ayah dan saudara laki-lakinya sebaik mungkin, dan untuk mencoba membujuk saudara perempuannya untuk bergabung dengannya dalam menari dan bernyanyi.	
10.	But they would do nothing of the sort, and, because she was not as doleful as themselves, they declared that this miserable life was all she was fit for.	Namun mereka tidak mau melakukan hal semacam itu, dan, karena ia tidak separah mereka, mereka menyatakan bahwa ia layak menjalani kehidupan yang menyedihkan ini.	2	Tapi mereka tidak mau melakukan hal semacam itu, dan, karena dia tidak sesedih mereka, mereka menyatakan bahwa kehidupan yang menyedihkan ini adalah semua yang cocok untuknya.	3

Translation Category [Google Translate]

1. Accurate : 5 x 3 = 15
2. Less Accurate : 5 x 2 = 10
3. Inaccurate : 0 x 1 = 0

- 15 + 10 = 25
- $^{25}/_{10}$ = 2,5 (Mid)

Translation Category [Microsoft Translator]

1. Accurate : 6 x 3 = 18
2. Less Accurate : 4 x 2 = 8
3. Inaccurate : 0 x 1 = 0

- 18 + 8 = 26
- $^{26}/_{10}$ = 2,6 (Mid, but slightly better than Google Translate)

4.2 Finding and Discussion

In this research, the authors highlight the various capabilities of Google Translate and Microsoft Translator in translating English complex sentences. Microsoft

Translator demonstrated a good performance, particularly in maintaining syntactic structure and semantic clarity. On the other hand, Google Translate showed higher accuracy in translating simpler sentences but faced challenges when dealing with more complex structures.

Both tools faced challenges with idiomatic expressions embedded in complex sentences. This limitation points to the broader challenges faced by machine translation in achieving human-like linguistic competency and cultural context. Future research and technological advancements in machine learning could focus on bridging this gap by incorporating deeper cultural and contextual training into neural models. Moreover, selecting machine translation tools based on the complexity and context of the task is important. For users requiring precise and accurate translations of complex sentences, Microsoft Translator appears to be the more reliable option. Meanwhile, Google Translate serves as an excellent tool for general-purpose translations and real-time communication.

CONCLUSION

Google Translate and Microsoft Translator are translation tools offering similar features, including text, voice, image, and conversation translation. Based on this study, the authors concluded that Microsoft Translator is slightly more accurate in translating English complex sentences. The accuracy level of Microsoft Translator is 87%, while Google Translate's accuracy level is 83%.

The structure of a highly accurate translation is characterized by maintaining the syntactic structure and semantic clarity of the original text. Conversely, less accurate translations often exhibit errors in subordinate clauses, relative pronouns, and conjunctions, which are critical in conveying complex ideas. This research also highlights the strengths and weaknesses of both tools and provides insights into their use for translating English complex sentences. Both applications are highly useful for breaking language barriers, helping users understand text content effectively.

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