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A Comparative Analysis of Google Translate and ChatGPT Results Based on Translation Quality Assessment (TQA)

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Abstract

The development of digital technology today has a major impact on various aspects of human life. In bridging intercultural communication, translation has a significant role that cannot be separated from the help of technology. Technology also has brought changes in the way translation is done, including helping individual translators to increase efficiency. For example, with the help of machine translation, Google Translate continues to develop transformers and AI. On the other hand, ChatGPT, built on artificial intelligence, allows translation. Both adopt NLP. This study aims to determine the quality of the translation of both based on the TQA proposed by House. In addition, it assesses the level of similarity of the translation results and errors that occur based on the translation technique used. Translation samples were selected based on purposive sampling techniques, namely from a report chapter available on the internet in English. The samples were translated into Indonesian using Google Translate (GT) and ChatGPT (CG) and then analyzed using TQA. The results show that GT and CG have high similarities and insignificant error rates. This is possible because GT and CG continue to be developed over time to respond to and translate languages that are increasingly natural and resemble human language.

Keywords: translation, quality, assessment, google translate, chatgpt, artificial intelligence

I. INTRODUCTION

The development of digital technology today has a major impact on various aspects of human life, from working, doing business, communicating, and accessing information. Digital technology, especially the internet, allows fast and practical access to information. The information previously difficult to reach now becomes accessible anywhere and anytime. In education, online learning platforms allow people to learn without geographical limitations. In other words, artificial intelligence and automation have changed how various sectors work. The presence of job automation also increases efficiency but can affect activities and reduce the role of humans (Filippi et al., 2023).

Translation plays a significant role in bridging intercultural communication, and this role cannot be separated from the help of technology (Golovatska & Tereshchuk, 2024). Technology has brought about major changes in the way translation is done, from helping individual and company translators to increasing efficiency (Benmansour & Hdouch, 2023). This has been possible for decades with the development of Automatic Machine Translation technology, such as Google Translate and DeepL.

Machine translation is also useful for those who learn languages, or seek knowledge by reading books in other languages (Yuxiu, 2024). It provides assistance in translating foreign words or phrases and improves the understanding of grammar.

Google Translate allows users to translate text in seconds and is very helpful in quick translations or "rough translations" that still require further editing for texts that require in-depth context. However, machine translation is useful as an initial aid. In recent years, artificial intelligence (AI) has presented various features that make it easier for users of ChatGPT to

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translate texts of various languages quickly. Thus, this article presented a brief the development of Google Translate and ChatGPT, which have the ability to translate languages.

A. *Google Translate*

Google Translate's machine translation tool has revolutionized global communication. It allows people around the world to talk, connect, and do business with each other. The service has introduced many innovations over the years that have made automatic translation more accessible than ever before (Schäferhoff, 2024).

Google Translate was officially launched in 2006, but has been developed since 2004 with two language pairs, Russian and English. The initial version of Google Translate was based on SYSTRAN, a form of machine translation. At that time, the translations were very inaccurate (Schäferhoff, 2024). Gradually, Google Translate managed more languages, but the development was slow and often resulted in confusing translations. One of the main reasons was that each text input was first translated into English, and then into the target language. This two-step translation often resulted in errors and awkward phrases.

Further developments began when Google Translate's version used phrase-based machine translation (PBMT). This technique breaks sentences into smaller chunks or phrases and translates them individually, rather than word by word (Aiken, 2019). PBMT uses patterns to predict the most likely translation. This method improved the accuracy of machine translation at the time. However, even though the model was trained on millions of United Nations and European Parliament documents, it still struggled with context (Schäferhoff, 2024).

In 2010, Google introduced the Android application for Google Translate, and available on iOS in 2011. This made communication in various languages more possible on smartphone devices (Schäferhoff, 2024). Then, in 2014, Google acquired Word Lens, a translation application that Google Translate is equipped with features to identify text through images (Rahmiasri, 2017). This application also supports speech translation through voice input, which enables smoother conversations.

By early 2016, Google had supported over 100 languages. Google also introduced Phrasebook to allow saving translated phrases, instant translation, the ability to correct its output, and learn more context about translated words and phrases. Google also introduced Google Neural Machine Translation (Wu et al., 2016).

Google Neural Machine Translation (GMNT) uses deep learning techniques, specifically neural networks. This technology processes and translates entire sentences, rather than breaking them down into smaller phrases like PBMT. This approach is much more context-aware, more accurate, and fluent (Bentivogli et al., 2016) (Wu et al., 2016). In addition, GMNT allows the tool to translate directly into the target language, rather than first translating into English. NMT systems are trained on vast datasets of multilingual text, learning to recognize patterns and relationships between words and phrases. And as the system is exposed to more data, it learns and becomes more proficient (Tan et al., 2020).

In 2020, Google is preparing for the next big leap in machine translation. GMNT is being phased out, and replaced with a more modern neural network model based on transformers (Chirag, 2024). Transformers are a substantial improvement over previous neural network architectures (Loss, 2024). Transformers use a mechanism called self-attention. This mechanism allows the model to consider the relative importance of different words in a sentence relative to each other (Merritt, 2022). It also improves context sensitivity and the ability to perform accurate predictions even further.

Transformer is able to analyze entire sentences or even documents in a way that captures the nuances and context of the text more effectively. Google Translate is also powered by artificial intelligence (AI). As a result, translations are much more natural and closer to human-level fluency (Moneus & Sahari, 2024). This is seen in increased accuracy, context awareness, and translation with voice and images.

B. *Chat Generative Pre-trained Transformer (ChatGPT)*

ChatGPT is a highly sophisticated text-based computer program that has been built using the latest technology in the field of NLP (Ray, 2023). ChatGPT was developed by OpenAI, an artificial intelligence research company based in San Francisco, California, United States, in 2020 and was officially introduced to the public in 2021.

Volume 04, Issue 01, January-June 2025
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Natural Language Processing (NLP) is a branch of computer science and artificial intelligence that focuses on the interaction between humans and machines using human language. The goal is to make computers or machines able to understand, analyze, process, and produce human language in a way that is similar to how humans do (Zohuri et al., 2022). NLP involves complex language processing such as syntax, semantics, and pragmatics. Syntax refers to the grammatical rules used to construct sentences. Semantics involves understanding the meaning of words and phrases in sentences, while pragmatics involves understanding the context and purpose of a conversation (Olujimi & Ade-Ibijola, 2023).

The application of NLP is very broad, including chatbot systems, language translation, sentiment analysis, text classification, information extraction, speech recognition, and many more. NLP is used in general human language processing such as document processing, research, and education. In its development, NLP uses various techniques such as statistical analysis, machine learning, deep learning, and neural networks (Zohuri et al., 2022). In recent years, advances in computing technology have enabled the development of more complex and accurate NLP models. Thus, more and more applications can use NLP as part of their technology (Supriyono et al., 2024).

ChatGPT is another transformer-based model focused on language generation. ChatGPT is widely used in various applications such as chatbots, and virtual assistants, or even as a tool in research and development. ChatGPT can understand the context of a conversation and provide realistic responses, so it can provide an experience similar to talking to a real human (Dwivedi et al., 2023).

ChatGPT is developed based on the previous deepest generative language model, GPT-3. ChatGPT is further developed by designing using previously developed transformer technology and improving its performance by developing new techniques that are more efficient and resource-saving (Ray, 2023). It allows ChatGPT to generate realistic responses by considering the context of a conversation, thus providing an experience similar to talking to a real human (Supriyono et al., 2024).

Interestingly, transformer technology is a method in natural language processing (NLP) developed by Google. Transformer is a very sophisticated and effective neural network architecture in producing generative natural language models. This technology has been widely used in several NLP applications, including ChatGPT developed by OpenAI (Dwivedi et al., 2023).

In the transformer approach, the model is learned to understand and process natural language through several layers and trained using techniques such as backpropagation and gradient descent to improve the predictive and generalization capabilities of the model (Roumeliotis & Tselikas, 2023). This approach has proven to be very effective in producing very sophisticated and realistic NLP models, including the development of ChatGPT which can imitate the way humans speak and provide realistic responses in a conversation.

C. *Previous Research*

Since the development of computer programs in the field of translation, investigations into the quality of machine translation have been widely conducted. This research can provide input for developers of machine translation programs. The comparison of the translation quality of Google Translate and ChatGPT has recently also attracted the attention of students and academics in the field of language. For example (Afifah et al., 2024), (Faris & Abdurrahman, 2023), (Putri & Tatang, 2024), (Rao et al., 2024), (Rusadi & Setiajid, 2023), (Alzain et al., 2024).

D. *Research Aim and Question*

In line with the previous explanation, Google Translate and ChatGPT are sophisticated technologies that offer accurate translation capabilities, can understand context, and resemble human capabilities because they both use NLP technology. The question of this study is 'how is the translation quality of Google Translate and ChatGPT? For this reason, a study was conducted that aims to analyze the quality of the translation results of Google Translate and ChatGPT based on the Translation Quality Assessment proposed by Juliana House.

This article presents the analysis and results of the quality assessment of Google Translate and ChatGPT translation results. This investigation is important to see the extent of the differences in translation results because these two technologies have been used worldwide, and the impact continues to grow along with advances in artificial intelligence (AI) and machine learning.

Volume 04, Issue 01, January-June 2025
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II. METHODS

The material in this study which is the source of data is the Introduction Chapter pages 7 to 9 of the book "Reimagining Our Futures Together - A New Social Contract for Education". This part of the book is a source of text to be translated using Google Translate and ChatGPT. The data collection technique used in this study is document analysis with a note-taking technique. In the note-taking technique, the researcher collects relevant data to be classified (Mahsun, 2017).

A. Sample

The sample of this research is the material taken from the Introduction Chapter, which consists of four pages. The four pages that are the source of this text consist of 17 paragraphs and 68 sentences, or 1,546 words in English.

B. Instrument and Procedure

The research procedure involved arranging the text sources into a table based on the paragraph sequence. Then, each paragraph was translated into Indonesian using Google Translate and ChatGPT. The translations produced by both types of translation technology were collected and placed in a separate column next to the source text before being analyzed.

C. Instrument and Procedure

The analysis of the translation quality is performed using the Translation Quality Assessment (TQA) method proposed by Juliane House Each sentence in the target text paragraph is compared with the source text and then marked to identify the accuracy, readability, and acceptability (House, 2015). In addition, the errors in the translation are also analyzed based on too-literal translation, additions, deletions, substitutions, or shifting in meaning. After analysis, the results are tabulated in a table that presents the percentage and number of deviations of Google Translate and CHatGPT translation results. The comparison results are depicted in graphs.

III. RESULTS AND DISCUSSION

Machine translation is very popular among both professional translators and users around the world because it offers a fast and affordable solution to the challenges of cross-language communication. However, in certain situations, human intervention is still important to ensure the accuracy and sensitivity of the machine translation.

A. Results

There are at least two languages involved in the translation process, they are the source text language and the target text language. In this study, the criteria for the source language text were presented below:

TABLE I
SOURCE TEXT STATISTICS

Title	REIMAGINING OUR FUTURES TOGETHER A New Social Contract For Education
Chapter	Introduction
Page	7 – 9
Paragraph	17
Sentences	68
Words	1546

Based on the data above, the source language derived from Unesco's report is available on unesco.org. The sample size is the Introduction Chapter, pages 7-9 which consists of 17 paragraphs or 68 sentences. The selection of this sample uses purposive sampling so that the data is not too large, but can reflect the overall features of the report and the language style used.

Translation quality assessment (TQA) is a process that evaluates the accuracy, readability, and acceptability of a translation against the source material. It is a critical step in the translation process to ensure the final product meets the intended audience and purpose. The following table presents the results of an analysis of the quality of translation using Google Translate (GT) and ChatGPT (CG) reviewed from Juliane House's opinion on accuracy, readability, and acceptability.

Volume 04, Issue 01, January-June 2025
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TABLE 2
TRANSLATION QUALITY ASSESSMENT

Paragraph	Sentences	TQA (%)						Similarities
		Accurate		Readability		Acceptability		
		GT	CG	GT	CG	GT	CG	
1	3	100	100	100	100	98	95	96
2	3	100	100	100	100	95	100	85
3	4	100	100	100	100	97	100	97
4	4	100	100	100	97	100	97	95
5	4	98	100	100	100	98	98	98
6	3	100	99	100	100	100	100	98
7	4	98	100	98	100	98	100	95
8	3	100	99	98	98	98	98	96
9	2	100	100	100	100	100	100	99
10	10	100	100	100	100	98	99	96
11	3	100	98	100	100	99	98	93
12	5	100	98	100	100	100	98	96
13	4	100	100	100	99	100	98	95
14	5	100	98	100	100	100	98	94
15	3	96	98	100	100	96	98	89
16	5	100	98	100	99	100	97	87
17	3	100	100	99	100	98	99	99
Total	68	99,53	99,29	99,71	99,59	98,53	98,41	89,17

Based on the results shown in Table 2 above, the average percentage of Google Translate translation accuracy is 99.5%, while ChatGPT is 99.29%. Google Translate's readability level is 99.29%, while ChatGPT is 99.71%. Judging from the level of acceptance of the translation results, Google Translate is 98.53%, while ChatGPT is 98.41%.

The three TQA indicators are shown in the following graph:

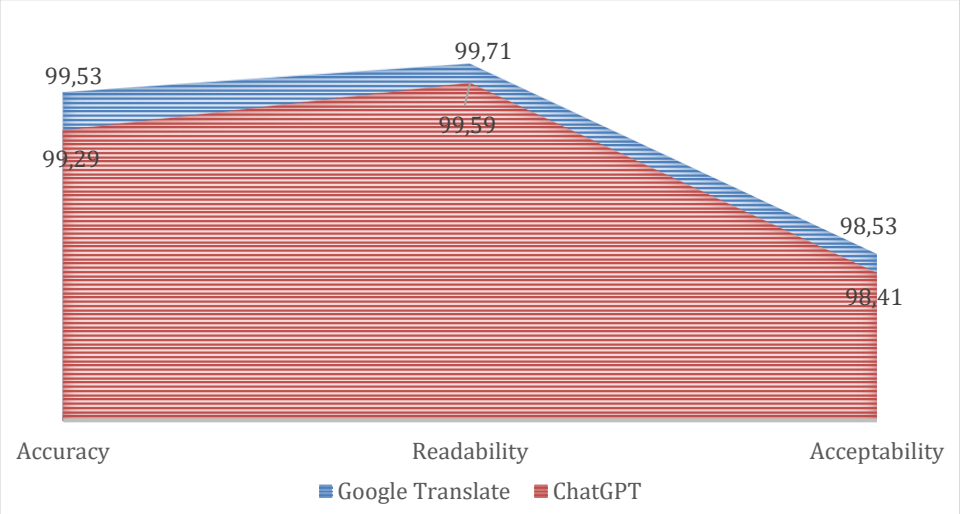

Figure 1. Translation Quality Assessment Google Translate (GT) and ChatGPT (CG)

Based on Fig. 1, in terms of accuracy, Google Translate has a higher result than ChatGPT by 0.24%; in terms of acceptability, Google Translate is 0.12% higher than ChatGPT, while in terms of acceptability, Google Translate is 0.12% higher than ChatGPT. In addition to the level of translation quality, the similarity level of the following translation results is influenced by the techniques in the translation process. The shifts are in the form of additions, deletions, substitutions, and shifts as stated in the following table:

Volume 04, Issue 01, January-June 2025
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DOI: 10.55299/ijere.v4i1.1175

TABLE 3
SIMILARITIES AND DIFFERENCES BASED ON TRANSLATION TECHNIQUES

Paragraph No.	Sentences	Similarities (%)	Translation Techniques									
			Literal		Addition		Deletion		Substitution		Shift	
			GT	CG	GT	CG	GT	CG	GT	CG	GT	CG
1	3	96		3								
2	3	85	1						1	1		
3	4	97	2		1							
4	4	95	1	1						1		
5	4	98	2				1					
6	3	98								1		
7	4	95	1						1	1		
8	3	96	2	2		1						
9	2	99										
10	10	96	2	2								
11	3	93	2	2					1		1	
12	5	96	1								1	
13	4	95	1	1								
14	5	94	1	1		1						
15	3	89	1			1	1		1	1	1	
16	5	87	3	2							1	
17	3	99	1	1						1		1
Total/ Average	68	89,17	21	15	1	3	2	0	4	6	4	1

Based on Table 3, the average similarity of the translation results of Google Translate and ChatGPT is 89.17%. The differences that occur are caused by the translation techniques used in the translation process.

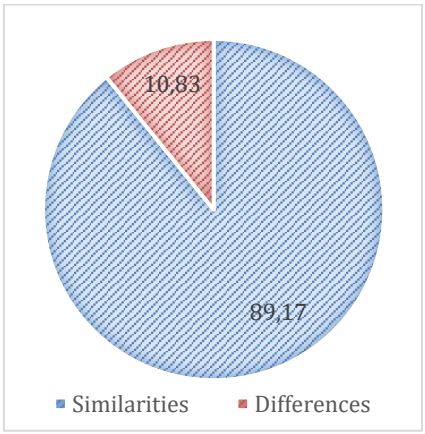

Fig. 2. Translation Similarities

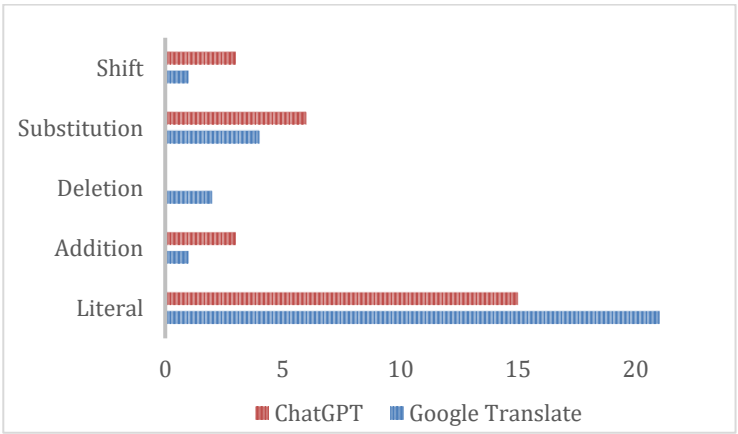

Fig. 3. Translation Techniques Occurences

The overall high level of similarity is depicted in Fig.2. For example, in paragraph 9 text consisting of 2 sentences and 35 words in the source text, the translation result similarity is 99% shown in the following translation pair:

TABLE 4
EXAMPLE OF TRANSLATION SIMILARITY

Par	Source Text	GT	CG
9	We face multiple, overlapping crises. Widening social and economic **inequality**, climate change, biodiversity loss, resource use that exceeds	Kita menghadapi berbagai krisis yang saling tumpang tindih. Ketimpangan sosial dan ekonomi yang semakin melebar, perubahan iklim, hilangnya keanekaragaman hayati, penggunaan sumber daya yang melampaui	Kita menghadapi berbagai krisis yang saling tumpang tindih. Ketidaksetaraan sosial dan ekonomi yang semakin melebar, perubahan iklim, hilangnya keanekaragaman

Volume 04, Issue 01, January-June 2025
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	planetary boundaries, democratic backsliding, disruptive technological automation, and violence are the hallmarks of our current historical juncture.	batas-batas planet, kemunduran demokrasi, otomatisasi teknologi yang mengganggu, dan kekerasan merupakan ciri-ciri dari titik sejarah kita saat ini.	hayati, penggunaan sumber daya yang melebihi batas planet, kemunduran demokrasi, otomatisasi teknologi yang mengganggu, dan kekerasan adalah ciri dari titik sejarah kita saat ini.

The difference in translation results is caused by the translation techniques used. As depicted in Fig. 3, the Google Translate translation results consist of 21 too-literal translations, 1 addition, 3 deletions, 4 substitutions, and 4 shifts. ChatGPT translation results consist of 15 too-literal translations, 3 additions, 0 deletions, 6 substitutions, and 1 shift. A source text can be translated accurately, but there are other components that need to be considered, such as in the following text pair.

TABLE 5
EXAMPLE OF DIFFERENCES IN TRANSLATION RESULTS

Par	Source Text	GT	CG
17	The choices we collectively make today will determine our shared futures. Whether we survive or perish, whether we live in peace or we allow violence to **define** our lives, whether we relate to the Earth in ways that are sustainable or not, are questions that will be **profoundly shaped** and decided by the choices we make today and by our capabilities to achieve our common goals. Together, we can change course.	Pilihan yang kita buat bersama hari ini akan menentukan masa depan kita bersama. Apakah kita akan bertahan hidup atau binasa, apakah kita akan hidup dalam damai atau kita akan membiarkan kekerasan menentukan hidup kita, apakah kita akan berhubungan dengan Bumi dengan cara yang berkelanjutan atau tidak, adalah pertanyaan-pertanyaan yang akan dibentuk dan diputuskan secara mendalam oleh pilihan-pilihan yang kita buat hari ini dan oleh kemampuan kita untuk mencapai tujuan bersama. Bersama-sama, kita dapat mengubah arah.	Pilihan yang kita buat bersama hari ini akan menentukan masa depan kita yang bersama. Apakah kita bertahan hidup atau binasa, apakah kita hidup dalam perdamaian atau membiarkan kekerasan mendefinisikan hidup kita, apakah kita berhubungan dengan Bumi dengan cara yang berkelanjutan atau tidak, adalah pertanyaan yang akan sangat dipengaruhi dan diputuskan oleh pilihan yang kita buat hari ini dan oleh kemampuan kita untuk mencapai tujuan bersama. Bersama-sama, kita dapat mengubah arah.

For example, in the translation results of paragraph 17 above, the translation accuracy level was 100%. Yet, on the other hand, the readability and acceptability for Google Translate are 99% and 98% respectively.

Another cause of the differences in translation identified was due to additions to the translation. For example, one incident of the addition technique by Google Translate was found, namely in paragraph 3. While the addition by ChatGPT occurred 3 times, namely in paragraphs 8, 14, and 15.

TABLE 6
EXAMPLE OF ADDITION TECHNIQUE IN TRANSLATION RESULTS

Par	Source Text	GT	CG
14	But the risks are **many**: learning can narrow as well as expand in digital spaces;	Namun, risikonya banyak**:** pembelajaran dapat menyempit sekaligus meluas di ruang digital;	Namun, risikonya *sangat* banyak**:** pembelajaran dapat menyempit maupun meluas di ruang digital

In the ChatGPT translation, the word '*sangat*' is added, even though the superlative word is not found in the source language, but only the word many which means many. In addition, deletion can also be the cause of differences in translation results. For example, 2 cases of deletion techniques were found by Google Translate, namely in paragraphs 5 and 15. While deletions by ChatGPT were not found.

TABLE 7
EXAMPLE OF DELETION TECHNIQUE IN TRANSLATION RESULTS

Par.	Source Text	GT	CG
15	Our uncritical **embrace** of technology too often pushes us dangerously apart, truncates conversation and unravels	Sikap kita yang tidak kritis terhadap ___ teknologi terlalu sering membuat kita semakin terpisah, menghambat percakapan, dan merusak pemahaman	**Penerimaan** teknologi yang tidak kritis sering kali menjauhkan kita dengan cara yang berbahaya, memotong percakapan, dan meruntuhkan pemahaman timbal

Volume 04, Issue 01, January-June 2025
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	mutual understanding, despite a potential to accomplish the opposite.	bersama, meskipun ada potensi untuk mencapai yang sebaliknya.	balik, meskipun ada potensi untuk mencapai sebaliknya.

In Google Translate, the word 'embrace' is omitted. Thus it is considered an omission, while in ChatGPT, it is translated as '*penerimaan*'.

Differences in translation due to substitution were also found in both translations. There are 4 occurrences of substitution found in Google Translate and 6 occurrences of substitutions found in ChatGPT. Examples of substitution presented in following table:

TABLE 8
EXAMPLE OF SUBSTITUTION TECHNIQUE IN TRANSLATION RESULTS

Par.	Source Text	GT	CG
2	We urgently need to **reimagine** our futures together and take action to realize them.	Kita perlu segera menata ulang masa depan kita bersama dan mengambil tindakan untuk mewujudkannya.	Kita sangat perlu membayangkan kembali masa depan kita bersama dan mengambil tindakan untuk mewujudkannya.
7	It posits that the main purpose of thinking about futures in education is **to allow us** to **frame** the present differently, to identify trajectories that might be emerging and attend to possibilities that might be opening or closing to us.	Laporan ini menyatakan bahwa tujuan utama memikirkan masa depan dalam pendidikan adalah untuk memungkinkan kita membingkai masa kini secara berbeda, untuk mengidentifikasi lintasan yang mungkin muncul, dan memperhatikan kemungkinan yang mungkin terbuka atau tertutup bagi kita.	Laporan ini mengemukakan bahwa tujuan utama memikirkan masa depan dalam pendidikan adalah agar kita dapat melihat masa kini dengan cara berbeda, mengidentifikasi jalur yang mungkin sedang muncul, dan memperhatikan kemungkinan yang terbuka atau tertutup bagi kita.

As stated in the example above, substitution is found in the translation results of Google Translate and ChatGPT. For example, the word 'reimagine' is interpreted as '*menata ulang*' in the GT results, while the phrase to allow us to frame is interpreted as 'so that we can see' in the ChatGPT translation. However, the translation results can still be understood and accepted in the target language.

Another difference that appears in both translations can be a shift in meaning. In the Google Translate translation results, 1 shift in meaning is found, while in ChatGPT, 3 shifts in meaning are found. Examples of shifts in meaning are as follows:

TABLE 8
EXAMPLE OF SHIFT TECHNIQUE IN TRANSLATION RESULTS

Par.	Source Text	GT	CG
11	Economic models that prioritize short-term profits and excessive consumerism are tightly linked with the acquisitive individualism, competitiveness, and lack of empathy that **characterize too many of our societies** around the globe.	Model ekonomi yang mengutamakan keuntungan jangka pendek dan konsumerisme yang berlebihan terkait erat dengan individualisme yang suka mengeksploitasi, daya saing, dan kurangnya empati yang menjadi ciri banyak masyarakat kita di seluruh dunia.	Model ekonomi yang memprioritaskan keuntungan jangka pendek dan konsumsi berlebihan sangat terkait dengan individualisme yang serakah, daya saing, dan kurangnya empati yang mencirikan terlalu banyak masyarakat kita di seluruh dunia.

In the ChatGPT translation above, the translation results were found to be too literal so that the meaning of the phrase from the source text "characterize too many of our societies" was translated as "*mencirikan terlalu banyak masyarakat kita*" which resulted in its meaning being unclear. Based on the findings above, there are differences in the translation results of Google Translate and ChatGPT even though the translation quality measured based on the accuracy, readability, and acceptability level of the two translations is very high and has a high level of similarity.

B. Discussion

Based on the results, Google Translate and ChatGPT translations produce a high level of accuracy, namely above 99.2%. In addition, the readability level is above 99.5%, and the acceptability level is above 98.4%. The average quality of ChatGPT translation is 99.10% which can be categorized as a very high translation quality. Likewise with Google Translate. It should

Volume 04, Issue 01, January-June 2025
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be noted that Google Translate has a higher quality level than ChatGPT, namely 99.25%. However, a difference of 0.15% is not considered significant even though Google Translate has been developed as a translation machine earlier than ChatGPT.

It is recognized that the quality of translation with machine translation has currently experienced a significant increase thanks to the use of artificial intelligence (AI) and machine learning techniques, such as Neural Machine Translation (NMT). Google Translate and ChatGPT results have a similarity of 89.17%. Even so, the quality of the translation produced has quite a lot of variation depending on how much data is available in each database.

IV. CONCLUSIONS

Machine translation allows people with different language backgrounds to communicate with each other more easily, both in everyday conversation and in business or diplomatic situations. It also facilitates access to global information where people can access content in various languages around the world, such as news, articles, documents, and research that may have previously been incomprehensible due to language differences.

Machine translation is also useful for those who learn languages, or seek knowledge by reading books in other languages. It provides assistance in translating foreign words or phrases and improves the understanding of grammar. This is certainly very useful because Google Translate and ChatGPT which are used by most internet users. Both Google Translate and ChatGPT produce translations with high accuracy due to NLP and AI technology.

The advent of AI technology has improved the quality and productivity of translation. Translation accuracy has increased because AI-powered models using deep learning and neural networks have significantly reduced errors that are prone to machine translation. AI analyzes the entire sentence and broader context producing smoother translations. Advanced AI models can better understand the context of words and phrases so that the translation results can capture the intended meaning, rather than just a literal word-for-word conversion of language. As a result, machine translation feels more natural.

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