



POST-EDITING MACHINE TRANSLATION OF ENGLISH-INDONESIAN BY EFL STUDENTS: A STUDY ON GRAMMATICAL COHESION IN ABSTRACT TRANSLATION

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ABSTRACT

Machine translations offer several features that simplify the translation process. These include the ability to automatically adjust grammar and vocabulary from the source language to the target language, store word banks, and tailor the target language to specific fields. However, machine translation outputs still contain errors. Therefore, it is essential to perform post-editing to ensure grammatical and lexical cohesion and alignment between the source and target languages. This research aims to observe the quality of Google Translate and the result of Post-editing machine translation by EFL learners in terms of grammatical cohesion. This study used a descriptive qualitative. This study applied purposive sampling to choose the data. Three abstracts from three different Translation and Interpreting classes were chosen for the data. Then, the data were analysed by using the theory of grammatical cohesion and translation quality assessment. The result of the study shows that the grammatical cohesions found are mostly reference and conjunction. This study also finds that the quality of post-editing is better than the result of Google Translation as machine translation. The samples of data provides that mostly the score of post-editing is better observed from translation acceptability and readability. This study is restricted to the translation result of three abstracts only and the students' post-editing effort which means that the findings may not fully represent the overall quality of translations from a grammatical cohesion. Future research could delve deeper into this topic by expanding the data sources and incorporating machine translation tools other than Google Translate.

Keywords: *abstract translation, Google Translate, grammatical cohesion, post-editing machine translation*

ABSTRAK

Terjemahan mesin menawarkan beberapa fitur yang menyederhanakan proses penerjemahan. Hal ini mencakup kemampuan untuk secara otomatis menyesuaikan tata bahasa dan kosa kata dari bahasa sumber ke bahasa sasaran, menyimpan bank kata, dan menyesuaikan bahasa target ke bidang tertentu. Namun, hasil terjemahan mesin masih mengandung kesalahan. Oleh karena itu, penting untuk melakukan penyuntingan dari hasil terjemahan mesin untuk memastikan kohesi secara gramatikal dan leksikal serta keselarasan antara bahasa sumber dan bahasa sasaran. Penelitian ini bertujuan untuk melihat kualitas terjemahan dari Google Terjemahan dan hasil penyuntingan dari mahasiswa dalam hal kohesi

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gramatikal. Penelitian ini menggunakan metode deskriptif kualitatif. Penelitian ini menggunakan *purposive sampling* untuk memilih data. Data dalam penelitian ini adalah tiga abstrak dari tiga kelas *Translation and Interpreting*. Kemudian, data dianalisis dengan menggunakan teori kohesi gramatikal dan penilaian kualitas terjemahan. Hasil penelitian menunjukkan bahwa kohesi gramatikal yang ditemukan sebagian besar adalah *reference* dan *conjunction*. Penelitian ini juga menemukan bahwa kualitas penyuntingan dari terjemahan mesin lebih baik dibandingkan hasil terjemahan Google Terjemahan. Sampel data dalam penelitian ini menunjukkan bahwa sebagian besar nilai penyuntingan lebih baik dilihat dari keberterimaan dan keterbacaan terjemahan. Penelitian ini terbatas pada hasil terjemahan tiga abstrak saja dan upaya penyuntingan yang dilakukan oleh siswa, yang berarti bahwa temuan-temuan yang ada mungkin tidak sepenuhnya mewakili kualitas terjemahan secara keseluruhan dari segi kohesi gramatikal. Penelitian lebih lanjut dapat menggali lebih dalam topik ini dengan memperluas sumber data dan menggunakan alat penerjemahan mesin yang lain selain Google Translate.

Kata Kunci: *Google Terjemahan, kohesi gramatikal, penerjemahan abstrak, penyuntingan hasil terjemahan mesin*

INTRODUCTION

Translation practices have drastically changed today from two three decades ago. During that period, translators used printed bilingual dictionaries as the only assistance tool to overcome their problems in translating dealing with vocabularies (Harto et al., 2022; El-Sayed & Siddiek, 2013). This “traditional” method definitely takes more time and requires more efforts to produce high quality translation output. Nowadays, the role of translation machines is increasingly shifting from initially only being an additional tool to now becoming the main instrument that is really needed in the world of translation (Sugiarto & Siregar, 2023; Sipayung, 2023) It can even be said that the level of dependence on machine translation is significantly increasing. This can be seen from the proliferation of translation applications appearing, both paid and free. Some examples are Google Translate, DeepL, Microsoft Translator, Yandex, Amazon Translate, etc. The utilization of these machine translations definitely save more time and energy in the works of translations.

Machine translations have various capabilities that also make translation works easier with various advantages, such as being able to automatically adjust grammatical and lexical and source language to target language, being able to store word banks, and even being able to adjust the target language with specific fields (Haiyudi et al., 2023; Fitria, 2021; Wang et al., 2022). Machine translation can adapt language for special fields such as scientific articles, law, accounting, and so on. This of course makes translation works easier in various fields. Everyone can operate machine translations based on their needs from professional translators, teachers, and not to mention students.

However, errors are still found the machine translation outputs. Thus, it is necessary to continue to carry out the post editing process of machine translation results to ensure grammatical and lexical cohesion and conformity between the source language and the target language, especially if it is related to cultural specific terms dan language behaviour. This stage is crucial to minimize the errors and ensure that the message is delivered accordingly and the translation output is

readable to the target audience (Pudjiati et al., 2022; Alawi & Abdulhaq, 2017; Putra, 2022) Post-Editing Machine Translation (PEMT) is not new phenomena since the emergence of machine translation. PEMT can be said as the win-win situation to combine the human quality and machine efficiency in translation field (Carl, et.al, 2015). Further, Almaaytah (2022) coined that post-editing is a process that improves the output produced by machine translation (MT) software to enhance the content quality.

Paying attention to the grammatical cohesion in translation output, although post-editing in machine translation has been widely discussed in the higher education institution, little empirical evidence found regarding the quality of post editing of machine translation in dealing with academic abstracts made by students published in the scientific journal article. Many universities in Indonesia require their students to publish their scientific works in a scientific journal article whether it is as a compulsory to pass a course or as a final project before graduating. For those EFL students, the article must be in English. Although the EFL students have acquired the knowledge and skills, it is still often found that students have difficulties writing a well-structured scientific article in their own language, Indonesian, let alone in English. Many of them preferred to write a manuscript in the Indonesian language first due to lack of confidence to instantly write in English. Only after that, they utilize machine translation, Google Translate, to make the manuscript into English. This study attempts to capture the academic abstracts by students published in scientific article. Academic abstracts depict the overall content of the article. The grammatical cohesion can also be analysed from the abstracts. Thus, here the process of post editing in machine translation is scrutinized in depth to provide empirical evidence on the quality of translation output produced by EFL students in academic abstract.

Grammatical cohesion is substantial in academic writing because it can help ensure a linguistic sense in the discourse or text, aid in interpreting the message, and negotiate the meaning within the texts (Ahmad, et.al, 2019; Afrianto, 2017; Trisnaningrum et al., 2019). There are several ways to achieve cohesion in texts, and these cohesive devices are traditionally classified at the levels of lexis, grammar, and discourse or rhetoric (Thornbury, 2005). Grammatical cohesion based on Halliday and Hasan consists of reference (personal, demonstratives, comparative), Substitution (nominal, verbal, clausal), conjunction (additive, adversative, temporal, causal) and ellipsis (nominal, verbal, clausal). Therefore, the cohesiveness of grammatical can be achieved through reference (pronouns and articles), substitution of clause elements using *so*, *not*, *do/does/did*, ellipsis of clause elements, conjuncts (also linkers), comparatives, and tense (Episiasi, et.al, 2022; Ajam et al., 2023; Lulu, 2015; Trisnaningrum et al., 2019).

Several preliminary studies have discussed about post editing machine translation and grammatical cohesion translation. Adawiyah et al., (2013) examined the naturalness of post-edited translations using Google NMT and Yandex NMT by English Department students and to determine which of the two NMT tools produces a translation closest to the naturalness of a short story. Hou & Sun, (2019); and Lulu, (2015) observed the translation of cohesive devices in two different genres. Hou & Sun (2019) observed the use of cohesive devices in translation version of *The Analects of Confucius* and the quality of the translation. Then, Lulu

(2015) attempted to identify the translation techniques used to translate English grammatical cohesive markers from English into Arabic text. In addition, Sugiarto & Siregar, (2023) conducted research on manual post-editing of lexical cohesion and translation equivalence of Harry Potter and the Order of the Phoenix series from English into Indonesia. Aliurridha (2019) explored the post-editing of GT in translating informative and expressive text from English to Indonesia. Meanwhile, the studies about post-editing machine translation have been conducted in translation training class such as in Anggrina et al., (2017); Arenas & Toral, (2020); Harto et al., (2022). Anggrina (2017) investigated the way of the EFL learners used post-editing on Google English-Indonesian translation output, Arenas & Toral (2020) observed the result of machine translation, post editing machine translation and translation without aid of 88 cohort participant. The studies showed that translation without aid presented a higher creativity score if compared to post editing and machine translation. Harto, et al (2022) mentioned that post-editing process provides the students' high awareness and sensitivity to the academic text. In addition (Plaza-Lara, 2020) analysed how machine translation and post editing affect the factors that project managers must keep in mind when managing projects. It resulted to the new challenges should face by the translation industries in dealing with the translation project.

Based on the aforementioned studies, the previous researches have not elaborated the post-editing machine translation (PEMT) in academic abstract done by EFL learners. Therefore, this study tried to complement the previous research related to PEMT in grammatical cohesion as it is crucial in academic text. This research emphasises on grammatical cohesion in the post-editing of machine translations by students, an area that has not been extensively explored in previous studies. While past research has examined cohesive devices, lexical cohesion, and general post-editing practices, there has been limited focus on how students address grammatical cohesion issues in machine-translated texts during post-editing. By evaluating the enhancements made to grammatical cohesion markers and identifying the challenges students encounter, this study fills a significant gap in both PEMT and grammatical cohesion research. Furthermore, it provides practical insights for translation training, suggesting pedagogical strategies to improve student proficiency in post-editing and translating academic text. Thus, this research would like to observe the quality of Google Translate and the result of PEMT by EFL learners.

METHOD

This study employed descriptive qualitative approach to identify the grammatical cohesion in the source text, Google Translate, and Post Editing result by EFL students and to explain the quality of the Google Translate and post-editing result. The results of students' post editing and Google Translate (GT) of English abstracts were the data in this study. The students edited the GT's result of abstract which published in *Metathesis: Journal of English Language, Literature and Teaching*. This study applied purposive sampling to choose the data as the researchers identified what information needed and found out individuals who could provide the information based on their knowledge or experience (Tongco, 2007). The researcher chose three abstracts from three different Translation and Interpreting

classes. The three abstracts were chosen from the students who got higher score in doing the post-editing machine translation project.

Subsequently, the data were analyzed by using the theory of grammatical cohesion by Halliday & Hasan (1976) which include reference, substitution, ellipsis, and conjunction. Moreover, the data were also analyzed by using the translation quality assessment observed from acceptability and readability aspects. The criteria for assessment were taken from Winiharti et al., (2021) as written in the following table.

Table 1. acceptability scale (modified based on Nababan, Nuraeni, and Sumardiono, 2012)

Grades	Description
5	Translation is natural; the technical terms used are common and are familiar to the readers; phrases, clauses and sentences used are in accordance with Indonesian rules.
4	Generally, the translations are natural; however, there is a slight problem on the use of technical terms, or a slight grammatical error occurs.
3	Translation is quite natural, but there are many unusual uses of technical terms or there are many grammatical errors.
2	Translation is not natural; the translation sounds like a translated work. There are quite a lot of technical terms that are not common; the use of phrases, clauses and sentences are not in accordance with the rules of the target language.
1	Translation is very unnatural, or the translation sounds very much like a translated work; the technical terms used are not common and are not familiar to the readers; phrases, clauses and sentences used are not in accordance with the rules of the target language.

Table 2. readability scale (modified based on Nababan, Nuraeni, and Sumardiono, 2012)

Grades	Description
5	Clear and intelligible; has no or very few non-standard words, expressions or grammar. Readers can easily understand the words, technical terms, phrases, clauses, sentences or translated texts.
4	Mostly clear and intelligible; contains some non-standard words, expressions or grammar.
3	Generally intelligible; contains many non-standard words, expressions or grammar. In general, readers can easily understand the translation; but certain parts must be read more than once to understand it.
2	Generally unintelligible; contains many non-standard words, expressions or grammar.
1	Unintelligible; dominated by non-standard words, expressions or grammar. Readers are difficult to understand the translation.

To assess the translation quality, this study used three raters from different background: two were the translation practitioners in Central Java and the rest was the lecturer of translation in one of university in Central Java. The result of the assessment was then calculated and analyzed to describe the quality of GT result and post editing result.

FINDINGS

The finding shows the quality of google translate and students' post-editing related to grammatical cohesion in academic abstract. Below are the samples of the data.

Table 3. Data 2 Abstract 1 (Grammatical cohesion)

Source Text	Google Translate	Post-editing
This study aims to investigate the difficulties experienced by EFL students in speaking.	Penelitian ini bertujuan untuk menyelidiki kesulitan yang dialami oleh siswa EFL dalam berbicara.	Penelitian ini bertujuan untuk menyelidiki kesulitan yang dialami oleh siswa EFL dalam kemampuan berbicara.

The grammatical cohesion shown in the table above is demonstrative reference and verbal ellipsis. The translated version of the word 'this' in GT or Post-editing is '*ini*', meanwhile the demonstrative reference 'the' is not translated by GT or in post-editing version since it has no equivalence meaning in Indonesia. It can be translated into '*itu*', '*ini*', '*sesuatu*' or not translated based on the context of the sentences. Verbal ellipsis is shown in the passive sentence 'the difficulties experienced by EFL students in speaking'. The ellipsis is seen from the omission of 'is'. The translation version of that sentences is equivalence because GT and post editing version translated it into passive voice which is marked with '*di*' in Indonesian. In line with the accuracy and readability quality, the result from the three raters is elaborated below.

Table 4. Data 2 Abstract 1 (assessment result)

Source Text	Google Translate	Post-editing
This study aims to investigate the difficulties experienced by EFL students in speaking.	Penelitian ini bertujuan untuk menyelidiki kesulitan yang dialami oleh siswa EFL dalam berbicara.	Penelitian ini bertujuan untuk menyelidiki kesulitan yang dialami oleh siswa EFL dalam kemampuan berbicara.
Acceptability average score	3,67	4
Readability average score	3,67	4,67

The table above shows that the acceptability of GT is in the score of 3,67 which means that translation is quite natural, but there are many unusual uses of technical terms or there are many grammatical errors. Although there is no problem in grammatical cohesion translation, there is a slight grammatical error as seen in "in speaking" which is translated into "dalam berbicara". Moreover, the result of GT also contains non-standard abbreviation in the word "EFL", which is not explained further. In post-editing, the raters give the score 4 which means that generally, the translations are natural; however, there is a slight problem on the use of technical

terms, or a slight grammatical error occurs. The result of post-editing from students shows the naturalness of translation although it contains non-standard abbreviation in the word 'EFL'. Furthermore, the readability of GT is 3,67 and the post-editing result is 4,67. It proves that the result of post-editing is mostly clear and intelligible in spite of containing some non-standard words.

Table 5. Data 6 Abstract 1 (Grammatical cohesion)

Source Text	Google Translate	Post-editing
Then , eight students were interviewed to dig deeper into the data from the completed questionnaire.	Kemudian , delapan siswa diwawancarai untuk menggali lebih dalam data dari angket yang telah diisi.	Selanjutnya , delapan siswa diwawancarai untuk mendapatkan pemahaman yang lebih mendalam untuk melengkapi kuesioner.

The temporal conjunction 'then' explains the time sequence relationship which exists between sentences. It is translated into 'kemudian' in GT and then post edited into 'selanjutnya'. There is no translation problem in Indonesian as those words are synonymous. In addition, the grammatical cohesion of comparative reference is emerged from the use of the word 'deeper' which is translated into 'lebih dalam' in GT and 'yang lebih mendalam' in post-editing result. The translation result of GT is not natural as it use the unusual terms 'lebih dalam data'. If it is compared to the result of post-editing, the result are more natural. Below is the average quality score from the raters.

Table 6. Data 6 Abstract 1 (assessment result)

Source Text	Google Translate	Post-editing
Then , eight students were interviewed to dig deeper into the data from the completed questionnaire.	Kemudian , delapan siswa diwawancarai untuk menggali lebih dalam data dari angket yang telah diisi.	Selanjutnya , delapan siswa diwawancarai untuk mendapatkan pemahaman yang lebih mendalam untuk melengkapi kuesioner.
Acceptability average score	3,67	4
Readability average score	4,3	4,3

The acceptability average of post-editing result is higher that GT, therefore it means that the post-editing result performs better translation result, though it has slight problem in the phrase 'to dig deeper into the data from the completed questionnaire' which is translated into 'untuk mendapatkan pemahaman yang lebih mendalam untuk melengkapi kuesioner'. In connection with readability, it has the same score.

Table 7. Data 8 Abstract 1 (Grammatical cohesion)

Source Text	Google Translate	Post-editing
Some of the explanations identified by this research include a lack of English vocabulary, a lack of confidence while speaking English, and nervousness	Beberapa penjelasan yang diidentifikasi oleh penelitian ini antara lain kurangnya kosakata bahasa Inggris, kurangnya rasa percaya diri saat berbicara bahasa Inggris,	Beberapa permasalahan yang didapat dari penelitian ini antara lain, kurangnya kosakata dalam bahasa Inggris, kurang percaya diri saat berbicara bahasa Inggris,

about receiving negative criticism from colleagues or lecturers.	dan rasa gugup menerima kritik negatif dari rekan kerja atau dosen.	dan rasa gugup jika menerima kritik negatif dari teman kuliah atau dosen.
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Demonstrative reference is found in the sentences above like 'the', 'a', 'this'. Furthermore, conjunction additive 'and', 'or', and conjunction temporal 'while' are appeared on the sentences. The grammatical cohesion of demonstrative reference 'the' and 'a' identifies a particular individual or subclass within the class designated by noun, in addition demonstrative reference 'this' elucidates a scale of proximity of the noun modified. Meanwhile, the grammatical cohesion of conjunction additive 'and', 'or' contributes to giving additional information without changing information in the previous clause or phrase. Further, temporal conjunctions 'while' in the data above indicates the time sequence relationship between sentences. The ellipsis found in the 'some of the explanations identified by this research' explain the passive meaning that omit the word are and it is translated smoothly into passive in Indonesian.

In fact, there is no translation problem of the grammatical cohesion in the data above. The GT tries to translate all the grammatical cohesion smoothly so it does not need to be post-edited, However, the problem of translation produced by GT occurs in choosing the word such as in '*diidentifikasi*', '*berbicara Bahasa Inggris*' and '*rekan kerja*'. Compare to the post-editing, all raters claimed that it is better than GT, even though there is slight problem on the use of expression in *berbicara Bahasa Inggris*. The addition of conjunction '*jika*' in post-editing provides the naturalness of translation result. Hence, the result of post-editing has the higher readability score than GT. The table below explains the quality scores of GT and post-editing result.

Table 8. Data 8 Abstract 1 (assessment result)

Source Text	Google Translate	Post-editing
Some of the explanations identified by this research include a lack of English vocabulary, a lack of confidence while speaking English, and nervousness about receiving negative criticism from colleagues or lecturers.	Beberapa penjelasan yang diidentifikasi oleh penelitian ini antara lain kurangnya kosakata bahasa Inggris, kurangnya rasa percaya diri saat berbicara bahasa Inggris, dan rasa gugup menerima kritik negatif dari rekan kerja atau dosen.	Beberapa permasalahan yang didapat dari penelitian ini antara lain, kurangnya kosakata dalam bahasa Inggris, kurang percaya diri saat berbicara bahasa Inggris, dan rasa gugup jika menerima kritik negatif dari teman kuliah atau dosen.
Acceptability average score	3,67	4,6
Readability average score	3,67	4,3

Furthermore, the grammatical cohesion of adversative conjunction, additive conjunction, comparative reference, demonstrative reference, and personal reference are seen from the table below.

Table 9. Data 3 Abstract 2 (Grammatical cohesion)

Source Text	Google Translate	Post-editing
Yet , limited studies have been attempted too deeply delineate and unravel its implication to culture and the online learning environment.	Namun , penelitian yang terbatas telah mencoba menggambarkan dan mengungkap implikasinya terhadap budaya dan	Namun , hanya sedikit penelitian telah menggambarkan dan mengungkap implikasinya terhadap budaya dan

lingkungan pembelajaran online secara terlalu mendalam .	pembelajaran daring secara mendalam .
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The adversative conjunction found in the data above is 'yet' and translated into 'namun' that shows contrary to expectation. The Google Translate provides a good choice of word in target language, therefore, it does not need to be edited by student. The additive conjunction 'and'/'dan' represents additional information of the previous information about the research conducted. Personal reference is emerged from the word 'its' which is translated into 'nya'. This personal reference defines the reference of 'limited studies'. The translation result of those grammatical cohesion indicated to be good since the meaning is equivalence with the source text. However, the problem of GT result is occurred on the comparative reference of 'too deeply' which is translated into 'terlalu mendalam' then is edited into 'secara mendalam' by student. The following is the result of the score.

Table 10. Data 3 Abstract 2 (assessment result)

Source Text	Google Translate	Post-editing
Yet , limited studies have been attempted too deeply delineate and unravel its implication to culture and the online learning environment.	Namun , penelitian yang terbatas telah mencoba menggambarkan dan mengungkap implikasinya terhadap budaya dan lingkungan pembelajaran online secara terlalu mendalam .	Namun , hanya sedikit penelitian telah menggambarkan dan mengungkap implikasinya terhadap budaya dan pembelajaran daring secara mendalam .
Acceptability average score	3,6	4,6
Readability average score	3,3	4,6

The result of the score denotes that the acceptability result of GT is quite natural, but there are many unusual uses of technical terms. It can be seen from the phrase of 'terlalu mendalam' which is too literal to be applied in translation. Besides, the GT still use 'online' instead of 'daring' that is the standard language in Indonesian. Seeing from readability, the result of GT is generally intelligible; however, it contains many non-standard words. Hence, it makes the readers read the sentence more than once to understand it.

The student then edits the phrase 'terlalu mendalam' into 'secara mendalam'. Furthermore, the student also edits the phrase 'penelitian terbatas' into 'hanya sedikit penelitian'. The post-editing creates better understanding of the sentence and the readability is mostly clear and intelligible. Consequently, the acceptability and readability of post-editing result is better than GT result.

Table 11. Data 5 Abstract 2 (Grammatical cohesion)

Source Text	Google Translate	Post-editing
This study also suggests an analysis and comparison of CP in the different cultural backgrounds as a promising study especially in Indonesia with its abundant cultural diversity.	Kajiannya juga menyarankan analisis dan perbandingan CP pada latar belakang budaya yang berbeda sebagai kajian yang menjanjikan khususnya di Indonesia dengan	Kajian ini juga menyarankan analisis dan perbandingan pada prinsip Kerjasama dalam latar belakang budaya yang berbeda sebagai kajian yang menjanjikan, khususnya di

keragaman budaya yang melimpah.	Indonesia dengan keragaman budaya yang melimpah.
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The grammatical cohesion emerged in the data above is demonstrative reference such as 'this', 'an', 'the' and 'a'. The demonstrative reference 'the', 'a', and 'an' is not translated by GT or in post-editing version since it has no equivalence meaning in Indonesia. The demonstrative reference 'this' is translated into 'nya' in GT which change the grammatical cohesion into personal reference. This shift produces quite natural translation, however, the reader must read the sentence more than once. This, the student edits the translation result of GT into 'ini' that make the translation natural and the readability is clear. Then, the personal reference 'its' is not translated in GT or in post-editing as it has not influence the meaning in Indonesian. The result of quality assessment is as follows.

Table 12. Data 5 Abstract 2 (assessment result)

Source Text	Google Translate	Post-editing
This study also suggests an analysis and comparison of CP in the different cultural backgrounds as a promising study especially in Indonesia with its abundant cultural diversity.	Kajiannya juga menyarankan analisis dan perbandingan CP pada latar belakang budaya yang berbeda sebagai kajian yang menjanjikan khususnya di Indonesia dengan keragaman budaya yang melimpah.	Kajian ini juga menyarankan analisis dan perbandingan pada prinsip Kerjasama dalam latar belakang budaya yang berbeda sebagai kajian yang menjanjikan, khususnya di Indonesia dengan keragaman budaya yang melimpah.
Acceptability average score	3,3	4,3
Readability average score	3,3	4,67

In addition to grammatical cohesion problem, the raters explain that the translation result of GT is not comprehensive. It does not explain the CP which stands for Cooperative Principle so that it makes reader must read more than once or back to read the previous sentence to understand CP. The post-editing done by student to translate CP into '*prinsip kerjasama*' in Indonesia shows the far-reaching result of translation, for this reason the acceptability and readability of post-editing is better that GT result.

Table 13. Data 4 Abstract 3 (Grammatical cohesion)

Source Text	Google Translate	Post-editing
Fifty students' questionnaire answers and the interview of ten lecturers are grouped and analyzed to identify their real needs.	Jawaban angket lima puluh mahasiswa dan wawancara sepuluh dosen dikelompokkan dan dianalisis untuk mengidentifikasi kebutuhan nyata mereka .	Lima puluh jawaban kuesioner mahasiswa dan wawancara dari sepuluh dosen dikelompokkan dan dianalisis untuk mengidentifikasi tentang apa yang sebenarnya mereka butuhkan.

The grammatical cohesions obvious in the data above are additive conjunction 'and', demonstrative reference 'the' and personal reference 'their'. Both Google Translate and Post-editing provides natural and intelligible translation of grammatical cohesion. The quality score of GT and post-editing is elaborated on the table below.

Table 14. Data 4 Abstract 3 (assessment result)

Source Text	Google Translate	Post-editing
Fifty students' questionnaire answers and the interview of ten lecturers are grouped and analyzed to identify their real needs.	Jawaban angket lima puluh mahasiswa dan wawancara sepuluh dosen dikelompokkan dan dianalisis untuk mengidentifikasi kebutuhan nyata mereka .	Lima puluh jawaban kuesioner mahasiswa dan wawancara dari sepuluh dosen dikelompokkan dan dianalisis untuk mengidentifikasi tentang apa yang sebenarnya mereka butuhkan.
Acceptability average score	4	5
Readability average score	3,67	5

The table illustrates that the result of post-editing is better than GT in terms of accuracy and readability. The raters convey that the translation result from GT is confusing and not natural especially in the '*Jawaban angket lima puluh mahasiswa dan wawancara sepuluh dosen*'. The student attempt to edit that phrase into '*Lima puluh jawaban kuesioner mahasiswa dan wawancara dari sepuluh dosen*' which is much better than the result of GT. Furthermore, the choice of vocabulary in GT is too literal such as in '*kebutuhan nyata mereka*' which is rarely used in Indonesia. The student then tries to change that vocabulary into '*apa yang sebenarnya mereka butuhkan*'. Hence, the post-editing result shows natural translation; common and familiar technical terms and the phrases, clauses and sentences used are in accordance with Indonesian rules. In line with readability, the result of post-editing is clear and intelligible. It has no or very few non-standard words, expressions or grammar. Therefore, readers can easily understand the words, technical terms, phrases, clauses, sentences or translated texts.

Table 15. Data 8 Abstract 3 (Grammatical cohesion)

Source Text	Google Translate	Post-editing
Therefore , students need listening, structure and written expression materials, and reading skills— the essential skills to improve our structure and writing.	Oleh karena itu , siswa memerlukan materi mendengarkan, struktur dan ekspresi tertulis, serta keterampilan membaca—keterampilan penting untuk meningkatkan struktur dan menulis kita .	Oleh karena itu , siswa butuh materi mendengarkan, struktur dan ekspresi tertulis, serta keterampilan membaca—keterampilan yang penting untuk meningkatkan struktur dan kemampuan menulis kita .

The grammatical cohesion appeared on the data above is causal conjunction 'therefore' and its translation '*oleh karena itu*'. Causal conjunction indicates the relationship between reason, result, and purpose. This sentence marks the result of previous sentence which talks about the problem happened so that the researcher conducted the study. Indeed there is no translation problem on this causal conjunction so it does not need to be post-edited. Then, the demonstrative reference 'the' does not need to be translated in Indonesian as it has no equivalence form. Moreover, the grammatical cohesion of personal reference is emerged on the data above like in the 'our' which is translated into '*kita*'. However, the source text need to be checked since the personal reference is confusing.

Table 16. Data 8 Abstract 3 (assessment result)

Source Text	Google Translate	Post-editing
Therefore , students need listening, structure and written expression materials, and reading skills— the essential skills to improve our structure and writing.	Oleh karena itu , siswa memerlukan materi mendengarkan, struktur dan ekspresi tertulis, serta keterampilan membaca—keterampilan penting untuk meningkatkan struktur dan menulis kita .	Oleh karena itu , siswa butuh materi mendengarkan, struktur dan ekspresi tertulis, serta keterampilan membaca—keterampilan yang penting untuk meningkatkan struktur dan kemampuan menulis kita .
Acceptability average score	3,67	3,67
Readability average score	3,67	3,67

The result of GT and post-editing has the same quality according to the raters' assessment. Aside from grammatical cohesion which shows no crucial problem in translation, the choice of word in GT and post-editing is problematic. The word 'menyimak' is the standard translated word for 'listening' rather than 'mendengarkan'. In addition, the post-editing version tries to change the word 'memerlukan' into 'butuh' which is not proper in academic language. However, the result of GT and post-editing version should be checked and revised so that the translation is natural and the readability is clear and intelligible.

DISCUSSION

The grammatical cohesions found in the three academic abstracts published in *Metathesis: Journal of English Language, Literature and Teaching* are mostly reference and conjunction. Ellipsis is only found in the passive construction and it is only a few numbers. Moreover, there is no substitution emerged in the academic abstract. Otta et al., (2022) claimed that ellipsis is often appeared in spoken language. Then, the previous studies written by Ajam et al., (2023); Setiawan, (2021) ; Dania, (2018) and Afrianto (2017) mentioned that the ellipsis and substitution are rarely found in the academic writing. (Halliday & Matthiessen, 2014) state that reference involves a relationship between entities or facts, which can be established at varying distances. Furthermore, it typically connects individual elements that serve a function within the clause. The reference mostly found the abstract since it is used to keep track of the participants that had been introduced earlier in the text. In addition, conjunction is used to create strong cohesion by the virtue of its specific meanings (Afrianto, (2017). Eggins (2004) described this cohesive pattern as the method by which writers or speakers establish and convey logical connections between different parts of a text. Therefore, the grammatical cohesion found in the abstract as the source text (ST) shows the cohesiveness of the text.

The result of this study proves that mostly there is no differences in grammatical cohesion used in the ST, GT, and PE outputs. Overall, it can be said that the ST, GT, and PE have similar levels of grammatical coherence. The study found a few numbers of problematic GT result of grammatical cohesion such as in data 6 Abstract 1 and in data 3 abstract 2. Both of them talked about comparative reference which is translated too literal by GT. Therefore, the students try to edit the result to get a better translation result. In addition, the translation problems mostly appears in word, above word, and grammatical level equivalence, instead of grammatical cohesion. Baker in Anzani et al., (2021) urged that translation should equivalence in

terms of word, above word level, grammatical and textual. The equivalence can be seen from the result of quality translation observed from accuracy and acceptability. The raters highlighted that the problem found in GT is the choice of word and grammar. Hence, the result of GT should be edited so that it can convey the meaning. Translating is more complex than merely swapping words based on their literal meanings. The goal of a translation is to convey the information in the target language accurately without altering the meaning of the source language. For that reason, translation requires a solid grasp of grammar, linguistic nuances, and a keen sense of semantic analysis (Wicaksono & Wahyuni, 2018).

From the quality finding, it is evident that the quality of post-editing is better than the result of Google Translation. The samples of data provides that mostly the score of post-editing is better seen from translation acceptability and readability. This finding is supported by Pudjiati et al., (2022) that claimed post-editing result improves the quality translation of cultural terms. Translation as an educational activity should verify students' comprehension and accuracy. Translation courses as a pedagogical assessment designed to test and strengthen grammatical competence (Cordeo, 1984). Further, Farah et al., (2017) coined that translation as an effective tool to teach English as second language in terms of clarifying new vocabulary , discussing grammatical issues , teaching idiomatic expressions , explaining reading passages , comparing and contrasting between L1 and L2 as well as checking the students' reading and listening comprehension. Accordingly, translation as second language acquisition should comply communicative approach. Communicative approach has four communicative competence such as grammatical competence, discourse competence, sociolinguistics competence, and strategic competence (Seran & Nalenan 2022). Seeing from the result of translation quality, it evinces that students perform satisfactory grammatical competence as they can construe the grammatical cohesion in target language well.

Regarding Google Translate, Yang et al., (2023) mentioned that machine translation cannot interpret semantic connotations, deep logic of sentences, as well as the tense and modality. Therefore, it needs post-editing to create a slightly better result. This study also demonstrates that post-editing machine translation (PMET) is able to find the weakness of GT by applying the assessment of quality translation. The previous research by Harto et al., (2022) said that the practice of PEMT in class has given students valuable experiences that enhance their translation skills. Furthermore, it identifies the linguistic weaknesses in GT's outputs, improve word usage accuracy, refine sentence structure in the target language, and learn how to appropriately choose and apply various translation techniques and methods.

CONCLUSION

This research underscores the grammatical cohesion of English abstract, the translation result performed by GT and manual post-editing by EFL students in Translation and Interpreting class. The study emphasized that the grammatical cohesions in source text, Google Translate, and Post-Editing are almost similar. The problematic translation result performed by GT is comparative reference which is translated too literal by GT.

Machine translation, indeed, can be used in this modern era as the translation technology is growing rapidly. However, the post-editing is needed to maintain a

good translation result. The result of the study verifies that the quality of translation result observed from acceptability and readability is lower than the post-editing ones. It means that the result of GT should be checked more than once.

This study is limited to only three abstracts and the translation result from GT and students' post editing. The result of the study may not represent the general result of the translation quality seeing from grammatical result. Thus, the future research can explore deeply about this by enlarging the source of the data and another machine translations. Further, future research is able to elaborate the translation quality of machine translation and post-editing by using another theory of translation quality as this study only explain the accuracy and acceptability of translation.

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