

The Impacts and Challenges of Artificial Intelligence Translation Tool on Translation Professionals

Lan Wang*

Shandong Jianzhu University, Jinan 250101, Shandong Province, P. R. China

Abstract: Machine translation, especially translation based on neural network technology has made a major breakthrough and is increasingly accepted and widely used. The development of artificial intelligence (AI) translation has had a definite impact on translation jobs. People, even professional translators, are relying on AI translation. But There is no research on whether machine translation software is superior to professional translators in translating various types of documents.. In this study, we design an experiment to determine the advantages and disadvantages between AI translations and human translations. The result shows the impact of the development of AI on the translation industry. To achieve better translation results and output high-quality translations in the era of rapid development of AI, it will contribute to Human-AI partnerships.

1. INTRODUCTION

With the development of artificial intelligence technology, the core of computer aided translation is machine translation and translation memory [1]. With its continuous development, translation tool like Dear Translate¹, Baidu Translate², DeepL Translate³ are widely used and influential in the translation field, recognized by people. Although AI translation is widely used as an essential tool, and it brings great convenience to people, the phenomenon of people relying on AI translation has become more and more serious, has caused translation positions to be impacted to a certain extent, and there are pros and cons to professional students' training [2].

With industry characteristics as the basis for training English language talents in different directions to meet the needs of society, the training of language professionals in colleges and universities is gradually focusing on other areas of training. We can call them specialties of high-end complex talents on English [3]. Language translation is an important part of English language education and is an essential component of professionals' competencies. Culturing this competence usually requires the combination of theory and practice, such as using the theoretical knowledge acquired to translate works to improve one's translation skills. However, some English professionals still rely on AI translation in their translation practice, which is not conducive to developing their English language skills[4]. In recent years, some researchers have suggested that the rapid growth of AI translation tool could hurt English professionals [5]. Therefore, this paper will use comparative experiments

and other methods to investigate this area.

2. Literature Review

This experiment will be conducted using the principles of the Turing Test [6], in which the translations produced by the AI tool are disordered with those made by human translators without revealing information about the translators, and the research subjects are asked to rank the quality of the translations. This will determine whether the quality of the translations produced by the AI translation tool exceeds that of the human translations, yielding results on the development of AI and its recognition in people's minds.

Many scholars believe that the existing translation standards and translation criticism standards are too subjective and lack objectivity and an index system [7]. However, judging translations in terms of accuracy to the original text, linguistic style, the connotation of the source language, ideology, cultural background, and logical expression is now recognized by many English professionals[8]. A word may have multiple meanings in the translation process, so the translator needs to choose the best meaning that is faithful to the text, acceptable to the reader, and conveys the connotation and emotion that the author wants to convey. This means that translations need to meet the translation standard of Faithfulness, Expressiveness, and Elegance needs to be satisfied in the translation process.

Therefore, in this study, through a comparative experiment, English professionals and non-English professionals were selected as the study subjects, and they will evaluate different translations from the judgmental

¹ <https://fanyi.youdao.com/>

² <https://fanyi.baidu.com/>

³ <https://www.deepl.com/translator>

*Corresponding author: 1955388729@qq.com

perspectives mentioned above. English-speaking professionals are more expert in judging translations from different perspectives and criteria. Other non-specialists have also commented on the convenience of translation tools as a tool and the acceptability of the translation to them.

3. Research Design

3.1. Types and characteristics of articles

This study will conduct a comparative experiment to select different articles, namely Business texts, News reports, and Literary works. These articles have various linguistic features. Business texts are mainly used in daily work, mainly for daily social interaction. They emphasize the accuracy of language and the accuracy of technical terms. News articles are widely drawn and need to reflect accuracy and timeliness. Literary works mainly reflect the different translation styles of language and the need to understand the connotation of the text for translation. It is a good example of manual translations and AI translations.

3.2. Evaluation criteria

After selecting three articles according to the above principles, select three passages in each type of article and choose six translations for them. The six translations are classified as standard translation, high-level artificial translation, low-level artificial translation (for freshmen English majors), Dear Translate’s translation, DeepL Translate’s translation, and Baidu Translate’s translation.

Then these translations are out of order without revealing the translator's information, so that English professionals or non-English professionals can choose. Let them rank the quality of translation according to translation criteria. The translations are evaluated in six areas: accuracy of the original text, linguistic style, connotations of the source language, ideology, cultural context, and logical expression. During the experiment, we can ask the experimenter whether they need to change the answer by misleading language so that they can make the answer after careful consideration and avoid the chance of the experiment. After the selection is completed, conduct relevant analysis, and inform them of the results for personal interviews to talk about the views of AI translation.

3.3. Experimental rules

This experiment is divided into five steps:

Step 1: there are three types of articles, namely Business

texts, News reports and Literary works. Each of them contains three passages which contain six translations respectively. Half of the six translations are human translations, and half are AI translations. (See Figure 1)

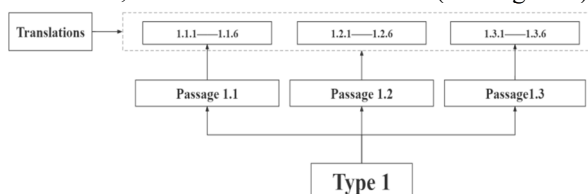


Figure 1 An example of one type of article

Step 2: The judges scored the six translations according to the rubric. The scores scored by all subjects were averaged and ranked in descending order according to the average score.

Step 3: Take the top three ranked translations and compare them. The translation with the higher percentage of the top three will win in this passage.

Step 4: Continue the process from step 3 three times to find out who has won in each passage. The one with the highest number of wins among the three passages wins in this type of article.

Step 5: The one with the highest number of wins among the three types wins the final. (See Figure 2)

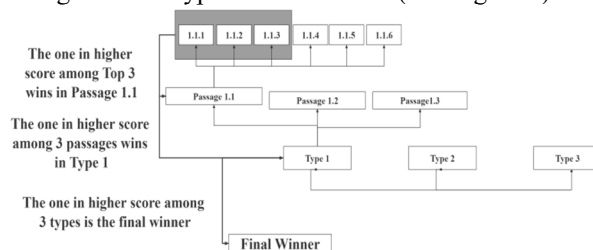


Figure 2 Experimental rules

4. Findings

4.1. Experimental results of different types

4.1.1 Experimental results of business texts

The respondents in this experiment were scored according to three criteria and each translation was ranked from highest to lowest. In the third type of article, the human translator finally won, and the AI won only once out of nine passages. For example, in Type 1, two of the top three translations in passages 1.1 under this type were AI translations, so the AI won in round 1. However, in passages 1.2 and 1.3, two of the top three translations were human translations, which means that the human won in these two passages. Therefore, the overall score was 2:1, with the human winning in this type of text, i.e., business English translation. (See Table 1).

Table 1 Experimental results of type1

#Passage	Order (Top three out of six translations)		Average Points (Full 15 points)	Round 1 (In passages)	Round 2 (In type 1)
	TOP1	TOP2			
1.1	TOP1	Dear Translate	12.2	AI wins (2:1)	Human wins (2:1)
	TOP2	Baidu Translate	11.8		

	TOP3	High-level artificial translation	10.6		
1.2	TOP1	DeepL Translate	11.2	Human wins (2:1)	
	TOP2	Low-level artificial translation	9.8		
	TOP3	Standard translation	9.2		
1.3	TOP1	Standard translation	12.6	Human wins (2:1)	
	TOP2	Low-level artificial translation	11.8		
	TOP3	Dear Translate	11.8		

For the note is that in the first passage 1.1 of Business English, Dear Translate and Baidu Translate take the top two places and score much higher than human translators. We can also see from these three translations that Dear Translate appears more frequently in the translation of business English. This shows that Dear Translate is machine translators' most popular translation tool. In addition to this, in passage 1.2, the top three translations scored a discrete 0.84 (higher than it in passage 1.1 (0.68)

and passage 1.3 (0.38). This also shows that DeepL Translate is much better than human translation in this translation.

4.1.2 Experimental results of news

In the second type of article, in the end, the humans won with a score of 3:0. (see Table 2)

Table 2 Experimental results of type2

#Passage	Order (Top three out of six translations)		Average Points (Full 15 points)	Round 1 (In passages)	Round 2 (In type 2)
2.1	TOP1	Standard translation	11.6	Human wins (2:1)	Human wins (3:0)
	TOP2	Low-level artificial translation	11.4		
	TOP3	Dear Translate	11.2		
2.2	TOP1	Standard translation	13.8	Human wins (3:0)	
	TOP2	High-level artificial translation	12.4		
	TOP3	Low-level artificial translation	11.4		
2.3	TOP1	Standard translation	12.6	Human wins (3:0)	
	TOP2	High-level artificial translation	11.4		
	TOP3	Low-level artificial translation	11.0		

From passage 2.1, although the AI translation came in third, it scored highly at 11.2. And the dispersion of the top three was 0.16, the smallest of all the discrete data. This suggests that in this translation, Dear Translate's translation is not as professional as the standard translation, but the experimental subjects also recognize the translation. In both passages 2.2 and 2.3, the top three were all human translations. Thus, we can see that in translations of news topics, AI is not as good as human translation due to the need for rigorous logic, and accuracy and conciseness of language wording in this category.

4.1.3 Experimental results of literature works

Similarly, in the literature theme, we can see that in passages 3.2 and 3.3, the top three are all human translations. Among the texts in this category, only DeepL Translate's translation was ranked in the top three with a score of 11.6 in passage 3.1. Thus, in the literature category, human translations are more likely to be accepted by readers, as humans can better appreciate the meaning of the text and the author's emotions. (See Table 3)

Table 3 Experimental results of type 3

#Passage	Order (Top three out of six translations)		Average Points (Full 15 points)	Round 1 (In passages)	Round 2 (In type 3)
3.1	TOP1	Low-level artificial translation	12.4	Human wins (2:1)	Human wins (3:0)
	TOP2	High-level artificial translation	11.8		
	TOP3	DeepL Translate	11.6		
3.2	TOP1	High-level artificial translation	12.0	Human wins (3:0)	
	TOP2	Standard translation	10.6		
	TOP3	Low-level artificial translation	10.0		
3.3	TOP1	High-level artificial translation	12.0	Human wins (3:0)	
	TOP2	Standard translation	11.2		
	TOP3	Low-level artificial translation	10.0		

4.2. The results of AI translation in three criterions

According to the experimental rules we designed, the translations were scored according to the criteria for judging the translations (see Table 4).

Table 4 Analysis of evaluation standards

Types	Logical expressions	Fidelity to the original text and accurate translation of word meanings	Language style
Type 1	Human wins	Human wins	AI wins
Type 2	Human wins	Human wins	AI wins
Type 3	Human wins	Human wins	Human wins
Final winner	Human wins (3:0)	Human wins (3:0)	AI wins (2:1)

As we can see from table 4, AI is better at grasping language style than humans. This is mainly the case for business English translations and news types. This also shows that for texts requiring a strict language style, AI translations avoid colloquial expressions and are better than human translations. However, AI translations are not as good as human translations for the translation of literary

works and emotive texts. Secondly, in terms of Logical Expression and Fidelity to the original text, and accurate translation of word meanings, we can see that humans win all three types of texts, i.e., 3:0. In other words, in these areas, AI is still lacking, and needs to be improved.

4.3. Respondents' feedback

According to our interviews with the respondents, they believe that AI translation has problems with the choice of context and the logic of the language and still needs to be improved. They believe that AI translation is now mechanized and that it is no longer able to analyze the deeper meaning of the author's message, leading to errors in translations. However, the respondents still have a positive attitude toward the development of AI translation. They also often use translation tools when consulting English literature, making their learning more efficient. So they hope that translation professionals will be able to collaborate manually with AI to ensure efficiency and improve the accuracy of their translations, complementing each other's strengths and weaknesses.

They were not surprised by the human victory of the experiment. But they still believe that the rapid development of AI has already seen some translations approach the level of human translation, so they support the development of AI translation tools. Some of them also realize the rapid growth of AI, which they believe is already a danger to their profession. They are therefore more concerned about issues such as unemployment and how to improve their own before, they are more concerned

about issues such as unemployment and how to improve their core competencies in an era of rapid AI development.

5. Conclusions

5.1. Refinements needed AI translation to improve in some areas

Because of the abstract and metaphorical nature of the Chinese language, AI translation needs to be improved in some areas. The first is about logical expression. English is linear, whereas Chinese is spiral and diverse in form. That is to say, English emphasizes the subject-predicate object, whereas Chinese sometimes does not need a subject or predicate to form a sentence. Apart from this, the logical order of language expressions is also different. For example, English prefers to use the passive voice, emphasizing the object, while Chinese prefers to use the active voice, emphasizing the subject. In translation, some logical words in English are omitted because the Chinese language usually indicates the logical relationship by the order of the sentences. This requires the study and analysis of sentences. In this regard, human beings have been trained to think a great deal. It is easier to accurately grasp the logical relationships in sentences when translating from the source language into the target language.

Secondly, there is also a need to improve the fidelity of the original language. In this experiment, we can see that of the three human-translated translations in each passage, they were all more accurate than the AI translations. We can conclude that humans can almost avoid mistakes with the help of relevant tools such as dictionaries. However, suppose a human seeks to translate a text with a relatively high accuracy rate in a short period without the use of any tool, e.g., a dictionary. In that case, he or she may be unable to beat an AI translation. We can therefore see that there are still advantages to artificially intelligent translation. It is more efficient than human translation and has higher accuracy in grasping the content of the text.

In addition to this, we can see that in terms of language style, AI translations are already readable and acceptable to readers. In business English, for example, the language used in AI translations is also very concise and formal and avoids colloquialisms to a large extent. Here we can see that AI is becoming increasingly sophisticated in language translation and is facing a significant impact on English translators.

5.2. Possibilities for collaborative human translation in a fast-paced period

English professionals and AI translators are complementary. As a bridge between the original author and the reader, the translator can dissect the connotations of the text and thus sort out its logical structure, thus compensating for the problems of AI translation at this stage. Whereas there are problems associated with the translator, AI translators can analyze through algorithms the basic grammatical errors as well as the cost of time. For English professionals, who themselves have mastered two or more languages, it is all the more important for

them as translators to have a profound grasp of the relationship between the source language and the target language, and for the translation to be faithful to the source language while allowing the target language readers to understand the original text. Today's AI translation tool is developing rapidly, but it still needs to be upgraded to meet the standard of "faithfulness and elegance[9]." Therefore, at this stage, human-machine collaboration can be used under the principle of translation efficiency.

We should first see the benefits of AI. People gradually adapt to the convenience brought by AI translation, and even AI promotes the development of English major learning, which has been widely recognized by many teachers and students in practical application [10]. However, for the future translation industry, AI translation tools should reflect its instrumental nature[11]. Using AI to efficiently translate the original text into the first version of the translation. In view of the content biased to culture or emotion in the article, we humans, as animals with feelings, should learn more about the connotation of the text, proofread the AI translation, correct translation errors, ensure smooth logic and accurate word meaning selection, and finally output high-quality translation to achieve artificial cooperation.

6. Conflicts of Interest

The author declare that the study is done and responsible for the experimental results.

References

1. Luo Qichen, Jin Enguang & Li Yafen (2022). A survey on computer-aided translation software under the background of AI--based on Youdao Dictionary. *The Computer Age*, (8), pp.43-45, 55.
2. Okpor, M. D. (2014). Machine translation approaches: issues and challenges. *International Journal of Computer Science Issues (IJCSI)*, 11(5), 159.
3. Mi Fenfang & Xu Ningjun. (2022). Employment Challenges and Countermeasures for English Majors in Universities under the New Situation. *Journal of Qiqihar University (Philosophy and Social Science Edition)*, (10), pp.149-151.
4. Bogong Jia. (2022). The Impact of Using "Machine Translation" on Chinese College Students' English Writing. [Master, Jilin University]. Jilin University.
5. Gu Yue & Zhang Jiayuan. (2020). The pros and cons of machine translation software for university students learning English. *English Square*, (28), pp.115-117.
6. French, R. M. (2000). The Turing Test: the first 50 years. *Trends in cognitive sciences*, 4(3), 115-122.
7. Rosemary, M.S. (2015). A reconsideration of translation quality and standards. *Журнал Сибирского федерального университета. Гуманитарные науки*, 8(12), 2908-2919.
8. Mandal, P. C. (2018). Translation in qualitative studies: Evaluation criteria and equivalence. *The Qualitative Report*, 23(10), 2529-2537.

9. Zhang, M. (2013). An Inquiry into Yan Fu's Translation Theory of Faithfulness, Expressiveness, and Elegance: The Beginning of China's Modern Translation Theory. *Trans-Humanities Journal*,6(3), 179-196.
10. Cao, L., & Zhu, S. (2022). Analysis of the Factors Influencing the Adaptability of College English Learning Based on AI Teaching Assistance. *Mathematical Problems in Engineering*, 2022.
11. Folaron, D. (2010). Translation tools. *Handbook of translation studies*, 429-436.