Optimization of English Learning Mode under the Influence of Artificial Intelligence Translation

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With the development of social science and technology, artificial intelligence has been applied to many fields, and artificial intelligence translation has provided great help for language learners. This paper analyzes the necessity of artificial intelligence translation for English learning, explores the influence of artificial intelligence translation on English learning, and proposes optimized English learning modes which provide help to the people involved.

1. Introduction

With the continuous development of social technology, machine translation has become more and more mature and intelligent, which has brought great convenience to the current English teaching; however, many teachers and students are increasingly dependent on high technology. In this regard, English professors and learners should see this more clearly. With the help of the big data advantages of artificial intelligence, we can rationally use artificial intelligence translation, optimize learning modes, and promote the improvement of teaching quality.

2. The Development of Artificial Intelligence Translation

Language is a tool for communication between people, not only containing semantics but also carrying culture, emotions, and so on. Translation serves as a tool for normal human communication. There are structural, cultural, and other differences between different languages, so it is not easy to accurately express the source text. Machine translation is the study of how computers can be used to translate one language into another. “Machine translation, also known as automated translation or computer translation, has undergone more than 60 years of development since its introduction in the 1940s and has gradually transformed from the early optimistic fully automated high-quality machine translation to the more realistic and feasible computer-assisted translation” [1]. The computer-aided translation is dominated by human translation, using computer data as an auxiliary tool, and the computer data here is the corpus that translators build in their own translation work. The core technology of computer-aided translation is the extraction of translation memory technology [2], and the quality of the translation is controlled by the translator, which emphasizes human-computer collaboration in translation. Machine translation started out with phrases and statistics and then gradually evolved to be based on neural networks (Figure 1). The quality and efficiency of translation in neural machine translation methods have been greatly improved [3].

In 2017, the artificial intelligence translation box appeared, and the bilingual translation of everyday language using the product was amazingly fast and accurate. At the 2018 Boao Forum for Asia, Tencent simultaneous interpretation made its debut simultaneous interpretation at a large conference, setting a precedent of not using human translation and relying only on machines for translation. Artificial intelligence translation has become a hot topic. In simultaneous interpretation, speech-to-text speech...
translation problems are more challenging than traditional text-to-text machine translation problems (Figure 2). First of all, there is a cross-modal language mapping between source-side speech and target text, and the difference between the two languages further increases the difficulty in learning this mapping. At present, the end-to-end speech translation model has received more and more attention, and the context information that is dependent on long distances can be compressed into an enhanced memory bank, which provides convenience for streaming decoding under low-latency conditions [4]. At present, most simultaneous interpreting decodes signals with the Wait-k strategy (Figure 3). Artificial intelligence translation relies on big data to extract and use the corpus contained in the database. The translation is fast and accurate, and the repetitive work is replaced by machines.

Artificial intelligence translation has the characteristics of high quality and high efficiency, but it also has its own limitations. It does not have human emotions and thinking, and there are still certain differences with the translation of human translators. [5] For example, as to the more common diplomatic style, which has a lot of unspoken meanings, vague language, etc., it is difficult to achieve the desired effect relying on machine translation. What cannot be denied in the translation process is the dominant position of man. Language is the carrier of culture, expressing human emotions, and these humanistic activities are by no means repetitive labor. Current AI is not yet competent for creative labor. Therefore, although the era of artificial intelligence is anticipated, it is still necessary to learn foreign languages.

3. The Necessity of Artificial Intelligence Translation

Machine translation could be viewed in this way; a language $s$ is distorted due to passing through a noise channel and appears as another language $t$ at the other end of the channel. The translation problem is actually how to recover the most likely language $s$ according to the observed language $t$. Language $s$ is the input in the sense of channel and the target language in the sense of translation; language $t$ is the output in the sense of channel and the source language in the sense of translation [6].

From this point of view, any sentence in one language may be the translation of some sentences in another language, but the possibilities of these sentences are different. Machine translation is to find the sentence with the greatest possibility, that is, to calculate the one with the greatest probability for all possible target languages $s$, as the translation of source language $t$. Due to the huge number of $s$, the stack search method can be used. The main data structure of trestle search is the table structure, in which the most promising $s$ corresponding to $t$ is stored. The algorithm keeps cycling, and each cycle expands some of the most promising results until the table contains an $s$ whose score is significantly higher than other results. Trestle search cannot guarantee the best results, and it will lead to wrong translation, so it is only a suboptimization algorithm. It can be seen that the task of a statistical machine translation system is to find the sentence with the greatest probability as the translation result in all possible sentences of the target language (target language in the sense of translation, that is, source language in the sense of noise channel model). Its probability value can be obtained by using the Bayes formula ($t$ in the formula is the target language in the sense of translation, and $s$ is the source language in the sense of translation):

$$P(T|S) = \frac{P(T)P(S|T)}{P(S)}.$$  

(1)
Since the denominator $P(S)$ on the right side of the equation is independent of $T$, finding the maximum value of $P(T|S)$ is equivalent to finding a $T$, so that the two-term product $P(T)P(S|T)$ of the molecule on the right side of the equation is the maximum, that is,

$$T = \arg \max P(T)P\left(\frac{S}{T}\right).$$  

(2)

where $P(T)$ is the language model of the target language and $P(S|T)$ is the translation model of $s$ given $t$. According to the language model and translation model, the process of solving the nearest real target language sentence $t$ given the source language sentence $s$ is equivalent to the process of decoding in the noise channel model.

For machine and human translation, although the quality of human translation is better, machine translation has attracted much attention because of its unique advantages. The efficiency of machine translation is high. A human translator can complete a translation of about 2,000 words in eight hours, and a machine translator can translate 3,000 words in one second. Therefore, for some majors with high repetition of terminology structure and strong controllability, it is possible to use machines for preliminary translation and then modify them by translators, which can reduce the work pressure of translators and improve the overall translation efficiency. Moreover, the machine is capable of mastering multiple foreign languages, which is difficult for translators to achieve. However, artificial intelligence translation also has certain shortcomings and cannot automatically verify the translated content. Therefore, the combination of man and machine can better meet the current needs of translation. Under the continuous advancement of globalization, even if it is not the translation industry personnel, such as college students and teachers, there are many occasions to deal with some foreign language materials in daily work and learning, and there are sometimes some limitations in their own ability, and artificial intelligence translation technology will provide great help. In the new era, the better use of science and technology is conducive to providing quality services for mankind.

Artificial intelligence translation technology relies on big data to achieve instantaneous translation, which has an important impact on consolidating their learning effects and improving learning efficiency for English learners. The “forgetting curve” proposed by Ebbinghaus explains the level of human memory, from which we learn that if people do not strengthen the memory of existing knowledge, they will forget the knowledge in their future learning and life (Figure 4). In short, after learning English knowledge, if students do not review the English knowledge they have learned in time, after a long time, students’ memory of English knowledge will be less and less [7] and eventually they will forget. Therefore, in the English learning activities, students need to constantly review the knowledge they have learned, repeatedly deepen their understanding of the knowledge, and realize the long-term memory of knowledge. The advent of artificial intelligence translation makes many students have unlimited expectations for English learning. With the application and popularization of mobile terminal equipment such as smartphones, tablets, and computers, convenient learning tools are provided for students to learn English. Network electronic dictionaries, network cloud translation, and other network learning tools provide a lot of help in carrying out English learning activities, effectively improving students’ learning efficiency, ensuring the quality of learning, and stimulating students’ autonomy and initiative. By carrying out English learning activities with the help of artificial intelligence translation, students can learn more quickly, query the content that is not understood in English learning anytime and anywhere, and use the timeliness of the Internet to avoid mechanical learning.

4. The Optimization of the English Learning Mode by Artificial Translation

4.1. Efficient Learning. The forgetting curve of the German psychologist Ebbinghaus intuitively reflects that people will forget if they do not strengthen their memory. In other words, if they do not review after learning, the longer the time passes, the less they will remember, or even forget. With artificial intelligence translation software, students can quickly learn and review, breaking the time and space shackles of traditional learning. In case of incomprehension or uncertainty, you can use the software to check it out, and you can review it at any time and any place. At the same time, with the help of the advantages of all aspects of the Internet, English learners can also learn more effectively and meaningfully, avoid mechanical recitation, and promote the effective improvement of students’ English level [8].
4.2. Interest-Based Learning. Some students prefer to use word lists or word books when learning English knowledge, but this learning method strips words from phrases, sentence patterns, and articles, and although students remember words, they do not use them. The use of intelligent translation to assist learning can avoid the occurrence of learning words without understanding its application. It can be faster and better to open the vocabulary barrier because intelligent translation skillfully combines words with phrases, sentence patterns, and articles, presenting learners with complete sentences instead of fragmented language. The advantages of intelligent translation can be based on big data to filter out the corpus that is closer to our lives and the corpus that is close to our favorite field to learn, which makes learning more interesting and more grounded. This is especially true for students with a slightly poor foundation. They can use translation software to make up for the personalized needs that cannot be met in the classroom, improve their interest in learning, make up for shortcomings, and let learning continue to occur [9].

4.3. Multisensory Participatory Learning. Taking advantage of the voice input and the output of artificial intelligence translation software, students can learn languages better. Intelligent translation provides complete sentences, which is extremely important for learners to correctly grasp grammar and syntax. For example, the machine learning group of Microsoft Research Asia applied their research results on dual learning and deliberation networks to the machine translation systems in 2018. Dual learning utilizes the natural symmetry of artificial intelligence tasks. After a Chinese sentence in the training set is translated into English, the system will translate the corresponding English results back to Chinese and compare them with the original Chinese sentence, so as to learn useful feedback from the comparison results and revise the machine translation model.

Deliberation networks are similar to the process of continuous deliberation and revision when people write articles. Through multiple rounds of translation, constantly check and improve the translation results, so as to greatly improve the quality of translation. Its purpose is to find a balance between deep learning and natural language. Through the research of machine translation, we can further understand machine learning from the perspective of natural language, find some intuition, and then use this intuition to affect the route of machine learning research and get out of the state of blind attempt. What is the intuition that researchers get from deliberation networks? It is found that when people are doing translation, after seeing or listening to the source language, they will form a point of view in their mind, which is actually the process of coding. However, when people really speak this sentence as a target language, they actually think twice before they act. People do not jump out word by word. They will first think about how to say it. If it is text translation, they may also constantly modify it to make the sentences more smooth or beautiful. Deliberation network is the decoder or text generator and puts some human intuition into it. There are multiple layers of decoders. The decoder may not translate well if it is done first, but after the translation from beginning to end, this sentence will be thrown to the next decoder to do it again. This process can be repeated constantly, constantly modifying the complete results of the previous translation, which is actually deliberating. The result after such deliberation is much better than that after only one time. The cost of time will increase, but the result will be better.

In the learning of the whole paragraph of translation, using artificial intelligence translation software, the result we get is complete, not just a single word or fragmented sentence. Based on the results of artificial intelligence translation, you can compare your own translation results with it, find out the problems of their respective words, language, and structure to correct and improve, and learn from errors. In addition, in the comparison, we can also find each other’s highlights. We can carry forward our own highlights or borrow the strengths of the other to make up for our own shortcomings. Under the influence of the Internet and big data, language learning models need to change. Foreign language learners can no longer be limited to the learning of
words, phrases, and simple sentences but should develop more comprehensive abilities. Compared with the previous use of mobile apps to assist learning, access to web pages to improve listening or writing skills, the use of fragmented time to read English novels to improve reading ability, etc., intelligent translation is more comprehensive and effective to assist learning. Because of the use of intelligent translation, students can not only better grasp the words, but also improve their level of listening and speaking and even comprehensively train their ability to use words, grammar, syntax, and writing.

4.4. Seminar-Style Learning. The Internet is very time-sensitive, and the translation of the Internet greatly increases the probability that we will be exposed to the translation of hot words in learning, helping us to keep up with the pace of the times [10]. In the new era, English learners have been given new tasks, and foreign language learners shoulder the heavy responsibility of promoting Chinese culture abroad, requiring us not only to speak Chinese culture but also to speak well of Chinese culture, to express our views on current affairs and hot topics, and to discuss people’s livelihood and people’s feelings, so it is very important to keep up with the pace of the trend. With artificial intelligence translation software, students can conduct seminar-style learning and improve their English skills.

4.5. Critical Learning. Artificial intelligence translation is developing rapidly, and its shortcomings are obvious [11], so it is necessary for learners to have critical thinking ability and apply it reasonably. For the application of Chinese culture, the most important task is to understand the culture, to be able to define the essence and dross of culture, and to reasonably classify cultures. It is necessary for students to reasonably apply the critical learning model in English learning and view and spread cultures through critical thinking. For some mass culture and nonmainstream culture, it should not be blindly abandoned. It is reasonable to find out its highlights and actively learn from it. In this way, the role of artificial intelligence translation can be better played and the improvement of students’ English level can be promoted. Although artificial intelligence translation has its limitations, it has obvious advantages in promoting better English learning over other technologies (Figure 5).

5. Suggestion for the Application of Artificial Intelligence Translation in English Learning

5.1. AI Translation Should Be Combined with Human Translation. Compared with human translation, some artificial intelligence translation software do have obvious advantages in some aspects, but there are some obvious disadvantages at the same time [12]. Machine translation has its basic process (Figure 6). In English learning, college students should not rely too much on machine or software translation; otherwise, the learning effect will be affected. For the scientific nature of English translation, it is necessary to ensure the accurate understanding of the translation content in the translation. Translators must have a solid foundation of foreign language knowledge and master some knowledge of stylistics, rhetoric, semantics, grammar, linguistics, and so on to achieve this requirement. Without an accurate understanding of the translation content, the translation process will be blind and random, and the ideal translation effect cannot be achieved. In addition, only when the translator understands the differences between the languages and cultures of the original text can the preservation of the flavor of the original text in the translation process and avoid the problem of “translation cavity” [13], so as to produce high-quality translation. However, the current English-Chinese translation software have not reached a high degree of intelligence, cannot think like human beings, and do not have human emotions. Therefore, English-Chinese translation software should be combined with human translation to give full play to their advantages and improve the efficiency and effect of translation, so that it can be better applied in college students’ English learning.

5.2. Basic Functions of Translation Software Should Be Strengthened. The most important function of English-Chinese translation software is the basic function of translation with its rule-based technical route (Figure 7). In recent years, with the continuous upgrading of various translation software, language appropriateness has been improved to a certain extent in terms of semantic expression and grammatical structure, but there is still a lot of room for improvement. In order to achieve further improvement for English-Chinese translation software in language appropriateness, it is necessary to conduct more in-depth research and exploration in language structures such as word order. Relevant studies show that many college students who apply English-Chinese translation software in English learning are not satisfied with the translation results and hope to combine the translation results with the corresponding cultural background to some extent. This demand of college students reflects the deficiencies of English-Chinese translation software at present. Generally speaking, it is still a problem.
of the appropriateness of sentence translation. Therefore, English-Chinese translation software should strengthen the translation base function and add more language environment and cultural background into the system and program background. In this way, the language appropriateness can be greatly improved in the process of translation, so that the translation results can be more accurate and more consistent with the practice of English application, so as to get a better application in the English learning of college students.

5.3. Diversified Services of Translation Software Should Be Enriched. At present, college students generally have a great demand for English-Chinese translation software in their English learning. Besides the need for basic translation functions, other functions are also involved. Survey results show that many college students hope that English-Chinese translation software can provide a translation error correction function, which can automatically proofread and correct the results of manual translation. This shows that students have high demand and expectation for manual translation proofreading in English-Chinese translation software [15]. Therefore, English-Chinese translation software should enrich the diversified service content of translation software based on the actual needs of college students’ English learning and constantly update and launch a variety of new functions and contents so as to meet the application needs of college students and get a better application in college students’ English learning.

5.4. Differences of Vocabulary Sentences in Different Professional Categories Should Be Distinguished. There are many polysemy phenomena in English. In different fields and specialties, the language is quite different. Even the same words or sentences may express completely different meanings. As a result, in the process of translation, the translation results of many English-Chinese software are not accurate and may even mislead college students’ English learning. Therefore, translation software should make corresponding updates for this aspect to distinguish between different professional categories of words and sentences. Before translation, students can select the professional category and field of the translation content in the English-Chinese translation software, and the translation software will translate the content according to the corresponding professional language, so as to ensure more reasonable and accurate translation results. In addition, college students of different majors have different requirements for English-Chinese translation software in English learning [16]. Therefore, the differentiation of vocabulary sentences of different professional categories can also improve the degree of individuation of translation software, which can better meet the needs of college students and thus get a better application in college students’ English learning.

6. Conclusion

Artificial intelligence translation is a double-edged sword, which has certain flaws in practical applications, but it has a positive impact on the English learning model. For the teaching of English teachers, it is necessary to use the advantages of artificial intelligence translation, so that English learning is no longer limited to the development of a certain ability, and the abilities of listening, speaking, reading, writing, and translating can be better organically integrated, so that language learning can return to the natural learning law; with the help of this, help students develop good independent learning habits and promote students to learn more effectively. At the same time, with big data, we can reasonably expand the scope of knowledge and arouse students’ interest in learning, so that students can actively participate in the learning of English knowledge and achieve improvement in English proficiency. In this process, teachers must also pay attention to the closeness to the trend information and solve the problem of lagging content and singleness of the teaching materials. Teachers should strengthen the cultivation of students’ critical thinking ability and rationally infiltrate traditional Chinese culture in order to effectively improve students’ humanistic literacy and develop students’ English language abilities.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.
Conflicts of Interest
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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