Application Effect and Optimization Strategies of AIGC Tools in Translation Teaching

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Abstract: This paper focuses on the application of AIGC tools in translation teaching. Based on the elaboration of the development of AIGC technology and the current status of translation teaching, it deeply explores its application effect in the translation of Chinese medicine. Through theoretical analysis, current application status, comparative experiments, and case studies, it was found that the AIGC tool effectively improves teaching efficiency and improves students' translation ability. However, there are also problems such as students' over-reliance on the tool and insufficient professionalism in translation. To this end, optimization strategies such as improving teachers' abilities, innovating teaching models, rationally selecting and integrating tools, and establishing standardized management mechanisms are proposed, aiming to promote the effective application of AIGC tools in translation teaching and provide a reference for cultivating translation talents that can adapt to the needs of the times.

1. Introduction

In the digital age, artificial intelligence-generated content (AIGC) technology has made breakthrough progress, and its application field has been continuously expanded, which has had a profound impact on the education industry. As a key link in cultivating professional translation talents, translation teaching is facing the dilemma that traditional teaching models are difficult to meet the rapid development needs of the industry. With its powerful language processing and generation capabilities, AIGC tools provide new ideas and methods for translation teaching. In-depth research on the application effect of AIGC tools in translation teaching and exploring optimization strategies will not only help promote the innovation of translation teaching theory, but also effectively improve the teaching quality, cultivate translation talents with practical ability and innovative spirit, and better adapt to the development and changes of the language service industry. This study comprehensively uses literature research methods to sort out relevant theoretical achievements; adopts case analysis methods to deeply analyze actual teaching applications; through survey research methods, collects application data from different colleges and universities, and comprehensively and systematically analyzes the application of AIGC tools in translation teaching.

2. Theoretical Basis of Translation Teaching and AIGC Tool

2.1 Translation Teaching Theory and Traditional Model

Translation teaching has a rich theoretical foundation. The functional equivalence theory emphasizes that translation should pursue equivalence in language form and meaning so that readers of the translated text can get feelings similar to those of the original text. For example, in the translation of literary works, it is necessary not only to accurately convey the semantics of the original text, but also to preserve the style and emotional color of the original text as much as possible. The translation adaptation and selection theory emphasize the translator's dominant position in the translation process, and believes that translation is the translator's adaptation and selection activities

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in multiple dimensions, such as language and culture [1].

The traditional translation teaching model is mostly teacher-centered in terms of teaching methods, using the methods of explanation, practice, and correction. The teacher teaches translation skills and theoretical knowledge in class, while students reinforce their learning through after-class exercises. The teacher subsequently corrects the homework and provides feedback. Although this method enables students to learn translation knowledge systematically, it is difficult for students to give full play to their initiative and creativity. Regarding course setting, the course content often focuses on teaching language knowledge and basic translation skills, and less on industry practice and new technology applications. The evaluation system is mainly based on test scores and homework completion, and it isn't easy to comprehensively evaluate students' translation ability and comprehension quality. For example, examining students' translation thinking and cross-cultural communication ability is not in-depth enough. These shortcomings limit the cultivation of students' translation practice ability and make it difficult for students to adapt to the challenges brought about by industry technological changes.

2.2 AIGC Tool Principle and Function

The core principles of AIGC technology are based on deep learning and natural language processing. Deep learning allows computers to automatically learn features and patterns from large amounts of data by building multi-layer neural networks. Natural language processing is dedicated to enabling computers to understand and generate human language. In AIGC tools, these technologies work together to enable the tool to process and generate high-quality text. Figure 1 illustrates the impact of AIGC tools on social dynamics in collaboration [2].

Fig 1. The impact of AIGC tools on social dynamics in collaboration

There are various types of AIGC tools suitable for translation teaching. Translation assistance software such as SDL Trados and MemoQ has powerful terminology management and translation memory functions. The software can automatically identify repeated texts and provide previous translation memories during translation, greatly improving translation efficiency. Text generation models like ChatGPT and ERNIE Bot can be used in various translation teaching scenarios. They can perform automatic translation and quickly give translations when students enter text to be translated. They also have the function of translation polishing to optimize the language expression of the translation to make it more in line with the habits of the target language. In terms of terminology recommendation, it can accurately recommend appropriate professional terms based on the context to help students improve the professionalism of translation. For example, when translating scientific and technological literature, it can accurately recommend professional vocabulary in related fields to ensure the accuracy of the translation.

3. Current Status of AIGC Tool Application in Translation Teaching

3.1 Application Scenario Analysis

In the written translation teaching system, the AIGC tool, with its unique functions, is deeply

integrated into multiple key links such as classroom teaching, after-class learning, and translation project training, bringing new vitality and changes to teaching activities.

Classroom teaching is the core of translation teaching, and AIGC tools play a diverse and important role in it. Vocabulary explanation is the basis of language learning. AIGC tools can provide rich vocabulary resources and break the limitations of traditional dictionary definitions. In the sentence translation practice, AIGC tools provide students with instant feedback and opportunities for comparative learning. After students complete the sentence translation, they can use the tool to generate reference translations and conduct comparative analysis from multiple dimensions such as grammatical structure, vocabulary selection, and semantic communication. For the sentence "He is committed to promoting environmental protection and has devoted a lot of time and energy to it", the student's translation may have deficiencies in vocabulary collocation or sentence structure, while the translation generated by the tool can show more authentic expressions, such as "He dedicated himself to promoting environmental protection and devoted a great deal of time and energy to it." Through such comparisons, students can discover problems in their own translations, actively learn correct translation skills, and achieve rapid improvement in translation ability.

Translation analysis is an important part of classroom teaching. The AIGC tool can evaluate students' translations from multiple perspectives. It can not only detect grammatical and spelling errors, but also analyze the logical coherence of sentences and the consistency of language style. When students translate a narrative text, the tool can point out problems such as unclear logical relationships between paragraphs and unnatural transitions, and provide corresponding improvement suggestions to help students build a more rigorous translation logic structure.

After-school learning is an extension and consolidation of classroom teaching. The AIGC tool provides strong support for students' independent learning. Regarding homework correction, teachers can use the AIGC tool to quickly check student homework errors and improve correction efficiency. The tool can not only mark the type of error, but also provide detailed modification suggestions to help students understand the cause of the error and master the correct translation method. The tool can accurately locate and give targeted correction suggestions for common problems such as misuse of parts of speech and tense errors in translation. In independent translation, the AIGC tool can provide a reference when students encounter translation difficulties. Whether it is the translation of professional terms or the processing of complex sentence structures, students can get inspiration with the help of the tool. When translating a scientific article on the development of artificial intelligence, students may be uncertain about the translation of professional terms such as "machine learning algorithms" and "natural language processing". The AIGC tool can provide accurate and standardized translation methods. It can also provide common usage and the latest research trends of related terms in the industry to broaden students' professional knowledge horizons [3].

Translation project training is a key link in cultivating students' practical translation ability, and the AIGC tool plays an important technical support role. At the project start-up stage, students can use AIGC tools to conduct background knowledge research to understand the project's professional terminology, industry standards, and relevant cultural background. When translating international business contract projects, the tool can provide templates of various business contracts, standard translations of common clauses, and introductions to relevant international business regulations to help students familiarize themselves with project requirements.

3.2 Survey on Application Popularity

This study conducted an extensive survey of different institutions to gain a deeper understanding of the application and popularity of AIGC tools in translation teaching. The survey results show significant differences in the application of AIGC tools among institutions.

Key colleges and universities are leading in applying AIGC tools because they have rich teaching resources and advanced teaching facilities, and they attach great importance to educational innovation. These colleges and universities usually have a complete information-based teaching environment, which provides convenient conditions for teachers and students to use AIGC tools. The teaching team has high professional quality, strong acceptance of new technologies, and can actively explore the

application mode of AIGC tools in translation teaching. They widely use various AIGC tools to assist teaching in the classroom and encourage students to use them in after-school independent learning and practical projects, forming a good atmosphere for technology application [4].

In contrast, some general colleges and universities are relatively backward in applying AIGC tools. These colleges and universities may face problems such as insufficient teaching funds and slow updating of teaching equipment, which limit the promotion and use of AIGC tools. The teaching facilities of some general colleges and universities cannot meet the hardware requirements for operating AIGC tools, resulting in the inability to use the tools normally. From the perspective of major types, translation majors and foreign language majors are more common when applying AIGC tools. Students in these majors have higher requirements for translation skills, and AIGC tools can meet their needs to improve their translation skills and expand their professional knowledge. In the course setting, relevant technical application courses will also be specially arranged to guide students to learn and use AIGC tools. Although non-foreign language majors also offer translation courses, the frequency of use of AIGC tools is low due to differences in course objectives and teaching focus. Students in these majors may focus more on learning professional knowledge and pay relatively less attention to translation technology.

Teachers' concepts are one of the key factors affecting the popularity of AIGC tools. Some teachers fully realize the advantages of AIGC tools in teaching and actively integrate them into teaching practice. They continuously improve their technical application capabilities through training and self-study, and use AIGC tools to innovate teaching methods, enrich teaching content, and improve teaching quality. However, some teachers are concerned about AIGC tools, fearing that students' over-reliance on tools will affect their autonomous learning ability and the cultivation of translation thinking. This concept makes them cautious about the application of AIGC tools in teaching, and even resists their use, thus limiting the popularity of tools in teaching.

4. The Application Effect and Case Analysis of AIGC Tools in Translation Teaching

4.1 Improved Teaching Effectiveness

In order to deeply explore the impact of AIGC tools on translation teaching, a targeted teaching practice was carried out. Two classes with similar language foundation and learning ability were selected, and AIGC tools were introduced to assist teaching in translation teaching in one class, while traditional teaching methods were used in the other class.

In the teaching process, students in the class that uses AIGC tools to assist teaching have more convenience in translation practice. For example, when translating a scientific article, when encountering the professional term "quantum entanglement", students use the AIGC tool to not only quickly know its accurate translation, but also obtain relevant background knowledge, understand the common expression of this concept in the international scientific research field, and broaden their professional vocabulary reserves. The tool provides a large number of examples from scientific literature, allowing students to learn the correct usage of the term in different contexts. When translating long and difficult sentences, the tool can analyze the sentence structure to help students understand the logic of the original text, so as to organize the translation language more accurately. For example, for sentences like "By using advanced algorithms and high-performance computing, researchers can now simulate complex physical processes that were previously impossible to model accurately, which has led to significant breakthroughs in many scientific fields.", the AIGC tool can point out the master-slave relationship of the sentence, prompt students to pay attention to the expression of causal logic, and make students' translations more fluent and accurate.

After a period of teaching practice comparison, it was found that students who used the AIGC tool had obvious progress in language conversion ability. They can use the expression habits of the target language more flexibly and adjust the word order of the original text to make the translation more in line with the reading habits of the target language readers. In terms of logical thinking ability, students learned to use tools to sort out the logic of the original text during the translation process, and the translation was clearer. When faced with texts involving knowledge in multiple fields, students can

obtain relevant knowledge through the AIGC tool, better understand the cultural connotation of the original text, make appropriate cultural adaptability adjustments in translation, and improve their cross-cultural communication ability [5].

4.2 Translation Cases of Traditional Chinese Medicine

In the teaching of TCM translation, the application of AIGC tools presents a unique situation. Taking the translation of "Yin Yang", a typical TCM term, as an example, AIGC tools provide a variety of translations, such as "Yin and Yang", "Yin-Yang", "Negative and Positive Principles", etc. Among them, "Yin and Yang" is a more common literal translation, which is widely accepted internationally. Many popular readings introducing TCM culture often use this translation. It retains the pronunciation of the original Chinese word and helps to spread the unique concept of TCM culture. "Negative and Positive Principles" is a free translation. This translation method focuses more on explaining the relative and balanced concepts represented by "Yin Yang" to Western readers, making it easier for readers who are not familiar with Eastern culture to understand its basic meaning. However, AIGC tools are insufficient in explaining the profound philosophical thoughts and cultural connotations behind "Yin Yang". The concept of "Yin Yang" contains the cognition of the mutual relationship between all things in the world in traditional Chinese philosophy, involving the concepts of unity of opposites and mutual transformation of things. Although the tool can give a translation, it is difficult to fully convey these deep cultural meanings to the readers of the translation.

When translating "meridians", the AIGC tool recommends "Meridians and Collaterals", which is currently the most recognized translation in the field of international medicine and traditional Chinese medicine. Through the tool, students can understand the frequency and context of use of this term in international academic exchanges, and can also consult relevant English literature and see the specific application of this term in different studies, which is very helpful for students to accurately understand and use this translation. However, "meridians" have unique physiological and pathological significance in traditional Chinese medicine theory, and are closely related to the circulation of qi and blood and the functions of internal organs. The tool cannot deeply explain these cultural connotations, and it is difficult for students to fully understand the essence of "meridians" only from the translation itself [6].

For the translation of Chinese herbal medicine names, taking "ginseng" as an example, the AIGC tool gives two common translations: "Ginseng" and "Panax Ginseng CA Mey." "Ginseng" is a commonly used translation in daily life and general popular science, which is concise and easy to remember and well-known to the public. "Panax Ginseng CA Mey." is its Latin scientific name, which is used in professional medical and pharmaceutical literature, reflecting the professionalism and accuracy of the translation. In actual translation scenarios, if you are translating a Chinese medicine health article for the general public, "Ginseng" is more appropriate; if you are translating a professional scientific research paper, " Panax Ginseng C. A. Mey." is more appropriate. However, the AIGC tool is obviously lacking in introducing the rich Chinese medicine cultural value behind "ginseng", such as the effects of ginseng in replenishing qi and blood, strengthening the foundation and nourishing the essence in Chinese medicine, and the precious status of ginseng in traditional Chinese culture.

4.3 Potential Problems and Challenges

Students relying too heavily on AIGC tools in translation teaching have become increasingly prominent. For example, some students were asked to translate an article about traditional Chinese festivals in a translation assignment. They almost completely copied the translation generated by the tool without adjusting it according to the specific context and requirements of the article. This over-reliance has led to a gradual deterioration in students' independent thinking ability. Once they leave the tool, they will be at a loss when encountering content without ready-made translation references [7].

The problem of translation homogeneity has become more serious with AIGC tools. Since many students directly use the translations generated by the tool, many similar or even identical translations often appear in homework and exams. In a translation test on the theme of environmental protection,

many students translated some common expressions in exactly the same way, such as the relevant expressions of "sustainable development", which were the same from sentence structure to wording. It affects teachers' assessment of students' real translation level and hinders the formation of students' personalized translation style [8].

The AIGC tool has limitations regarding translation expertise and cultural adaptability. Errors are more likely when dealing with highly professional texts such as law and finance. When translating a clause in a legal contract that "Party A has the right to terminate this contract and demand compensation for losses if Party B breaches the contract", the AIGC tool may mistakenly translate "breach of contract" as "break the agreement". In contrast, "breach of contract" is a more accurate term in legal professional terminology. Regarding cultural adaptability, different countries and regions have unique cultural customs and language habits. When translating content with Chinese cultural characteristics, such as "Qixi Festival", the AIGC tool may translate it as "Qixi Festival", without considering the connotation and influence of Valentine's Day in Western culture. It can be considered to supplement explanatory information, such as "Qixi Festival, also known as Chinese Valentine's Day", but the tool often finds it difficult to make such cultural adaptability adjustments. In addition, students' over-reliance on tool translations also poses a serious risk of academic integrity. If students directly submit tool-generated translations as their homework or exam answers, once discovered, they will face severe academic penalties, affecting their studies and future development.

5. Conclusion

This study comprehensively analyzes the application of AIGC tools in translation teaching. It clarifies its positive role in improving teaching effectiveness, such as improving teaching efficiency and cultivating students' translation abilities. In addition, it reveals the problems in the application process, including students' over-reliance, translation homogeneity, academic integrity risks, and the tool's limitations.

To optimize the application of AIGC tools in translation teaching, teachers should improve their technical application capabilities and master using various AIGC tools to better guide students. Innovate teaching models and organically combine AIGC tools with traditional teaching methods, such as designing project-based teaching activities based on AIGC tools to enable students to learn to use tools reasonably in practice. When selecting and integrating tools, appropriate tools should be selected according to teaching objectives and student needs, and effectively integrated with teaching resources. In addition, a standardized use management mechanism should be established to clarify the boundaries and requirements for students to use tools, strengthen education on students' academic integrity, and guide students to treat AIGC tools correctly.

With the continuous development of AIGC technology, its integration with translation teaching will become more in-depth. In the future, researchers need to continue to pay attention to the development of AIGC technology, explore how to fully exploit its advantages, avoid risks, and provide strong support for translation teaching reform and translation talent training.

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