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Evaluation of the Quality and Efficiency of English Translation of AI in Chinese Dance

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Abstract: With the deep application of artificial intelligence technology in the field of translation. As an important carrier of traditional culture, the theory of Dance of China Dance has special requirements for machine translation due to its unique terminology system and aesthetic characteristics, it is urgent to establish a scientific evaluation system to examine the actual performance of existing AI translation systems in such texts. Taking an introduction to Chinese dance imagery as the research object, this study uses comparative analysis to evaluate the performance of ChatGPT and DeepSeek in the translation of professional dance texts. By constructing a four-dimensional evaluation system including language fluency, grammatical normalization, culturally-loaded word processing and original text fidelity. It is found that AI translation performs well at the level of basic language transfer. But at the same time, AI translation also presents such problems as simplification of cultural images, mistranslation of technical terms and loss of aesthetic features. Based on the empirical data, this study proposes the following suggestions to improve the quality of translation by building a professional terminology database and optimizing the context understanding algorithm.

Keywords: Artificial Intelligence, Chinese-English Translation, Dance of China, Cross-Cultural Communication, Chinese Traditional Culture

1. Introduction

With the development of Chinese traditional culture in the world, Chinese-English translation of Chinese traditional art plays a bridging role in communication and reference [1]. The Dance of China not only carries profound historical and cultural heritage, but also provides valuable research materials for international dance art. In the current context of globalization, scholars at home and abroad have paid increasing attention to cross-cultural artistic exchanges, their translation and dissemination play an irreplaceable role in conveying cultural connotation and shaping national image [2]. Through a systematic evaluation of the application of AI translation tools in the field of Dance of China, this study aims to explore how to better convey the artistic charm and cultural spirit of the Dance of China, and how to improve the quality of translation, to provide empirical data and theoretical support for the follow-up study. The quality of English translation of Chinese dance language is of great significance to the spread of Chinese culture, and it is also a major problem in translation. As artificial intelligence technology continues to evolve and natural language processing tools such as ChatGPT and DeepSeek become more common in the field of translation, this study aims to evaluate the translation quality and efficiency of ChatGPT and DeepSeek in the Dance of

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China of such books as a basic training course in English, which is not only beneficial to the improvement of the quality of English translation of related books and disciplines, but also to the improvement of the quality of English translation of related books and disciplines, moreover, it can provide reference for the translation work in the extended field, and promote the in-depth application of artificial intelligence technology in the field of translation and the international communication of Chinese excellent traditional culture.

2. Research methods and results

This study adopts the methods of experiment and comparative analysis, and selects the passages with certain translation difficulty and more professional vocabulary in the introduction to Chinese dance image and the history of Chinese dance, firstly, the English translation of Chat GPT and Deepseek is evaluated and improved in the first round, and the quality and efficiency of English translation of these two artificial intelligences are evaluated.

2.1. Research methods

2.1.1. Study design

This study takes the core literature of Chinese dance as the research object, and selects the passages with typical disciplinary characteristics in authoritative works such as the history of Chinese dance and introduction to Chinese dance imagery as the research corpus. This study adopts the control variable method to input the same text paragraph into two mainstream artificial intelligence platforms, ChatGPT and DeepSeek, for English translation processing, and evaluates their translation quality and efficiency through systematic comparative analysis.

This study divides its evaluation dimensions into language fluency, grammatical normativity, culture-loaded words, and source text fidelity, and explores the in-depth application of artificial intelligence technology in the field of translation from these four perspectives, promoting the international communication and exchange of China's excellent traditional culture [3]. Key aspects of the evaluation include:

First, language fluency, translation of whether there is content omission, information loss, or paragraph skipping, and other issues, the sentence should be smooth.

Secondly, grammar normalization, checking whether there are lexical, syntactic, tense, voice, and fixed collocation errors in the translation [4]. Thirdly, culture-loaded words can be translated by foreignization (literal translation, transliteration, loan translation), which can preserve the cultural characteristics.

Fourthly, the faithfulness of the original text ensures that the translation is faithful to the content and style of the original text, and ensures that the systematicity of dance theory is not destroyed.

2.1.2. Research implementation

First of all, in the specific data collection process, this study was strictly by the text representativeness and professionalism of the two criteria for sample selection. The selected text covers the terminology of classical dance, the historical background narrative, and the detailed description of dance imagery, ensuring a comprehensive reflection of the possible problems in the translation process. In the construction of the corpus, this study adopts the stratified sampling method to divide the text into several levels according to the difficulty and content characteristics, to facilitate the subsequent detailed analysis of different difficulties.

The experimental process strictly follows the principle of controlling variables, selects representative core paragraphs as experimental corpus, and inputs the latest versions of Chatgpt-4

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and DeepSeek for English translation In terms of evaluation indicators, for language fluency, this study combines expert subjective scoring with an automated detection tool for dual evaluation; in terms of grammatical normativity, the study finds that: For culture-loaded words, the balance between literal translation and free translation should be considered, and the connotation of Chinese dance terms should be preserved As for the evaluation of the fidelity of the source text, the methods of content consistency comparison and style matching are adopted to reflect the quality of translation comprehensively and objectively.

2.2. Results

First of all, the data shows that AI's translation of books and classical Chinese passages in the field of Chinese dance is of high quality and efficiency, for the four dimensions of language fluency, grammatical standardization, culture-loaded words, and original text fidelity, it has achieved good text processing, it is helpful for translation experiment research, cross-cultural communication and the quality of translation education, but it has not been applied in practice.

In addition, different results have emerged for different AI, and based on some of its algorithms/settings, there are some differences in the translation-assisted process. Although intuitive and expressive, readers unfamiliar with dance terminology may need further explanation to understand the specific meaning. Deepseek made some reservations about the cultural background, and gave an appropriate English interpretation, both professionals and general readers, is conducive to understanding. On the whole, through the comparative analysis of several texts, there is a certain deviation in the processing of culture-loaded words. ChatGPT retains the original words and makes a certain interpretation, while DeepSeek is more in-depth in the processing of culture-loaded words, providing a more detailed explanation while retaining the original word and keeping close to the original meaning.

From the analysis of the overall experimental results, the translation quality of ChatGPT and Deepseek is generally high, but there are still potential risks. For example, the balance of detail interpretation is relatively immature, in describing "Upright but not stiff, trembling but not erratic", ChatGPT translates without explanation as"Erect yet supple, vibrant undulations without abrupt shifts," while Deepseek translates it as"Erect yet supple, vibrant undulations without abrupt shifts." And further explained as"Postural Precision: 'Erect yet supple' torso alignment. Kinetic Nuance: 'Vibrant undulations without abrupt shifts'". For the dimension of culture-loaded words, Deepseek is more specific in dealing with this text than ChatGPT, and interprets it in different cultural backgrounds. However, for different target groups, such as professional readers, Deepseek's translation results may be preferred, while general readers may feel tired and lose interest in longer and more complicated translation explanations, perhaps they only need simple and clear sentence explanations to understand the text. Therefore, in dealing with culture-loaded words, these two artificial intelligences need to pay attention to the balance of detailed explanations, also can not be too lengthy, to ensure popular understanding, more conducive to the concept of cross-cultural exchange of Chinese dance.

3. Discussion

3.1. Challenges and problems brought by artificial intelligence translation technology to the field of translation

With the rapid development of artificial intelligence technology, the field of machine translation is undergoing unprecedented changes. With its powerful deep learning ability and massive corpus training, the AI translation system shows significant advantages in translation efficiency and processing speed [5]. However, while this kind of technological innovation has brought convenience,

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it has also brought deep-seated challenges to the development of translation majors. For translation-related disciplines, different AI systems have different translation competence and focus. Therefore, for translation-major learners, who receive misleading information due to the lack of mature judgment and the influence of intermingled AI translation results, it is of great practical significance to improve the quality of translation studies, and learners tend to over-rely on AI in translation practice, which is not conducive to the development of professional skills [6]. However, although the current mainstream AI translation tools show high efficiency and certain accuracy in dealing with professional texts, there are still deficiencies in the transmission of translation details and cultural connotations. First of all, for some technical terms and implicit images, AI translation is often difficult to maintain the original style and take into account the expression habits of the target language, resulting in some details in the translation being slightly stiff or incomplete information. Secondly, when different translation engines process the same text, the differences in algorithms and models make the translation quality uneven, which can easy to cause misunderstanding or information distortion in practical applications. In addition, over-reliance on machine translation may leave practitioners short of professional judgment and cultural understanding, and there is an urgent need to strike a balance between technological progress and humanistic revision [7]. The in-depth discussion of these problems will help to put forward more effective improvement strategies in the follow-up study. In addition, the rapid rise of AI translation will also pose a potential threat to the translation profession. Based on the accuracy and efficiency of machine translation, AI translation will gradually replace traditional human translation, therefore, it has a bad effect on the employment and development of translation majors [8].

3.2. Development path and suggestions of translation major under the background of artificial intelligence

Although the continuous progress and development of AI translation has had a great impact on the translation profession and the translation field, it does not mean that the translation profession will gradually fade away in the future. This trend calls for the transformation of the translation major, which should take into account the diverse cultural backgrounds and overcome the technical bottlenecks in the humanistic directions such as cultural metaphors, historical allusions and emotional expressions. For example, by integrating the theoretical frameworks of Trans-cultural diffusion and cognitive linguistics. To study and form academic barriers, constantly adapt to the development of the times, continue to play an important role in the field of cross-cultural exchanges. In the current situation, the combination of AI translation and manual revision has become an important way to improve the quality of translation [9]. Some foreign universities and research institutions have tried to achieve the complementarity of technical advantages and artificial intelligence in multilingual translation systems by introducing experts in professional fields for post-editing. For example, in Europe and the United States, the translation of literary and artistic texts often uses AI to generate the first draft, followed by detailed polishing and cultural background supplementation by professional translators, it effectively improves the accuracy and appeal of the translation. Drawing on this experience, China can consider establishing a multi-level translation model that combines machine translation and expert review in the process of promoting the international dissemination of Dance of China and other traditional arts [10]. It not only gives full play to the efficiency of AI translation, but also ensures the accurate transmission of cultural connotation and artistic details [11].

4. Conclusion

The purpose of this study is to evaluate the quality and efficiency of the English translation of ChatGPT and DeepSeek in Chinese dance textbooks. It is found that AI has a positive effect on the

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translation and auxiliary understanding of dance expertise. It is verified that artificial intelligence has a certain learning assistance in the translation of subject terms with certain professional difficulty, and provides a strong example for the field of artificial intelligence translation, it also plays a positive role in the external dissemination of China's excellent traditional culture. At the same time, AI translation technology still has obvious limitations in dealing with culture-loaded words, technical terms and style features while maintaining a high translation speed when dealing with professional texts of Chinese traditional culture. Based on the findings, it is suggested that professional translation models integrating domain knowledge should be developed, and the accuracy of cultural transmission should be improved by constructing a Chinese dance terminology database and an annotation system of aesthetic features.

Future research should further expand the sample library and combine more types of translation tools to explore the differences in the performance of different tools in dealing with technical terms and cultural metaphors. In addition, strengthening interdisciplinary communication and absorbing the latest achievements in computational linguistics, cultural studies and other fields will help to build a more perfect translation evaluation system, it provides more solid data support and theoretical basis for the international dissemination of Dance of China and even the whole traditional art.

Authors contribution

All the authors contributed equally and their names were listed in alphabetical order.

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