
**RESEARCH ON THE INTERPRETATION OF ARTIFICIAL INTELLIGENCE IDIOMS
FROM THE PERSPECTIVE OF DIGITAL CHINA**

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ABSTRACT

The emergence of ChatGPT, a new generation of interactive artificial intelligence, has attracted wide attention and heated discussion among many scholars in International Chinese Education. This paper selects 393 four-character idioms in the Chinese Proficiency Grading Standards for International Chinese Education as the research object, and takes Chat GPT as an example to analyze the interpretation text of artificial intelligence idioms in detail.

Keywords: Artificial Intelligence; International Chinese Education; Idiom.

1. INTRODUCTION

With the further development of science and technology, global digital technology and education continue to deepen the integration. At the end of November 2022, Open AI launched a new generation of conversational artificial intelligence -- ChatGPT. Because of its interactive and generative characteristics, it was first applied to education, which brought great impact to the field of education.

International Chinese Education is an important foundation and premise to promote cultural exchanges, people to people and cultural exchanges and mutual learning between China and foreign countries. We should promote the deep integration and development of AI and educational theory and practice with a proactive and precise attitude of change, promote the high-quality development of International Chinese Education with digital transformation, and build a new ecology of International Chinese Education with technological change. Previously, a series of online education and digital education documents released by the Chinese foreign language exchange and cooperation center of the Ministry of education defined the development goals of International Chinese Education and pointed out the direction of transformation and innovation of International Chinese Education.

As an important and special existence in modern Chinese, idioms' formation and changes record the history, culture and customs of the Chinese nation in various periods, and are the "epitome" and "living fossil" of Chinese culture. In International Chinese Education, the teaching of idioms can not only help students better understand the charm of Chinese, but also help students understand Chinese stories and Chinese voices more clearly.

Taking ChatGPT as an example, this paper verifies whether the interpretation of four character idioms by AI can meet the basic needs of Chinese learners, effectively help to tell Chinese stories,

and enhance the dissemination and influence of Chinese civilization from the perspectives of interpretation form, vocabulary difficulty and cultural embodiment.

2. REVIEW OF AI AND INTERNATIONAL CHINESE EDUCATION

After the emergence of interactive artificial intelligence ChatGPT, different experts and scholars have put forward their own opinions on how to deeply integrate and develop it with International Chinese Education and how to deal with it. Yuan Xi and Wu Yinghui (2023) made a detailed analysis and elaboration on the opportunities, risks and Countermeasures of ChatGPT Plus for International Chinese Education from a macro perspective, and proposed that the International Chinese Education community should adhere to the attitude of openness, exploration and innovation on the basis of positive adaptation, so as to achieve "three strengthening". Jin Xuan (2023) focused on analyzing the natural functions, practical difficulties and Application Strategies of ChatGPT's deep integration into International Chinese Education, and advocated that International Chinese teachers should pay more attention to the sustainable development of the new generation of artificial intelligence, and be confident in its progress and future development, but not exaggerate its words. Xu Juan and Ma Ruizhen (2023) proposed that colleagues in the International Chinese Education community should build a "human-computer collaboration" smart education ecosystem based on ChatGPT. In general, scholars in the field of International Chinese Education believe that the emergence of ChatGPT is both an opportunity and a challenge. It has both risks and can help development. We should embrace new technologies with a positive and prudent attitude.

In addition, in "ChatGPT is coming: new opportunities and challenges for International Chinese Education" (Part 2), many scholars put forward their own views on ChatGPT and cultural communication and teaching of International Chinese Education. Li Baogui believed that ChatGPT lacked the cultivation of cultural cognition and creativity, and did not have a deep understanding of Chinese culture when dealing with problems. Zong Can&Yang Jianguo put forward that ChatGPT has natural advantages in the supply of cultural knowledge. In "the opportunities and challenges brought by ChatGPT to International Chinese Education -- a collection of experts' views on the Joint Forum between Beijing Language and Culture University and the American Society of Chinese teachers", Wang Jing analyzed the cultural meaning of ChatGPT and International Chinese Teaching from the perspectives of language, text and meaning. Chen Lixia and Du Jingzhe examined the support ability of ChatGPT for Chinese learners through experiments, and put forward five aspects that still need to be worked on in the application of ChatGPT in the field of International Chinese Education.

To sum up, the current relevant research focuses on the opportunities, challenges and coping strategies of the integrated development of AI and International Chinese Education. Most of the studies on the teaching and communication of International Chinese Education culture are simply mentioned as one of the research dimensions. The micro empirical research is relatively insufficient, and the research on the application of artificial intelligence to the teaching and learning of idiom culture is rare.

3. ANALYSIS OF THE PRESENTATION OF FOUR CHARACTER IDIOMS IN THE THREE GRADE STANDARD

Zong Can&Yang Jianguo (2023) believes that ChatGPT can not only provide reference interpretation of cultural words, but also assist teachers in the teaching design of cultural words. So whether ChatGPT can provide a reference interpretation of idioms, and whether it can truly understand the deep meaning and Chinese stories contained in idioms need to be further tested. Therefore, the four character idioms of different levels in the International Chinese Education Chinese level standard will be used in this paper¹Through exhaustive screening, 393 four character idioms were obtained, and their distribution in each level is shown in Table 1.

Table 1 Distribution of idioms in the International Chinese Education Chinese level standard

grade	Number of Idioms	Proportion (%)
Primary secondary	2	0.51
Medium level 4	1	0.25
Medium level 5	1	0.25
Medium level 6	3	0.77
Advanced level 7-9	386	98.22
total	393	100

As can be seen from the table, the overall distribution of Chinese four character idioms is higher, medium and elementary. Most of the four character idioms are relatively difficult, and they are at the advanced level 7-9, accounting for more than 98%. This result is consistent with the experimental results of Cheng Yan&Xiao Xiqiang (2020) on the number of idioms output in Interlanguage and the number of idioms input in textbooks, that is, with the improvement of students' level and the deepening of learning, the number of Chinese idioms output and input has increased significantly. It can be seen that for Chinese scholars, the learning of Chinese idioms is relatively difficult, and they need to have a certain Chinese foundation.

4. CHATGPT'S INTERPRETATION TEXT ANALYSIS OF FOUR CHARACTER IDIOMS

In order to reduce the impact of other possible factors on the interpretation of four character idioms output by ChatGPT, the idiom interpretation texts obtained by the author are all from the same chat window. "Hello, I am a Chinese learner from South Korea. I am learning Chinese idioms recently. Can you provide me with the meaning and usage of each idiom?" is the first instruction. After each interaction, there is no unnecessary prompt. Only input the four character idioms to be explained in the chat box, and then ChatGPT will answer.

4.1 Interpretation text language analysis

4.1.1 Linguistic representation analysis

According to the previous research on "Idioms" and the purpose of this paper, the author adopts a broader definition of idioms, that is, a fixed¹ phrase or phrase with idiomatic, concise and qualitative structure.

Idioms are an important part of Chinese and Chinese culture. Whether ChatGPT can provide accurate reference interpretation is very important for learners' idiom learning. This paper compares the definitions of idioms provided by ChatGPT with those in the dictionary of Chinese Idioms (Sun Mengmei&Yu Jinchun, Commercial Press) and draws the following conclusions:

First, from a formal point of view, the format of the interpretation text provided by ChatGPT is basically the same. First, judge whether the input word is an idiom, then explain its meaning, and finally explain the use of the expression. Lack of flexibility, showing obvious characteristics of machine language.

Second, from the perspective of accuracy, ChatGPT can make a more accurate interpretation of meaning and a clearer interpretation of usage. For example, ChatGPT defines "resourceful" as "used to indicate that a person is very smart, rich in wisdom, and has many smart strategies and ideas. This idiom is usually used to praise those who can skillfully solve problems and meet challenges."

Third, from the perspective of text length, the interpretation text is long, and even has some repetitive content, which is easy to make students feel tired of learning. The number of words and the average number of words in the four character idiom interpretation text at each level are shown in Table 2.

Table 2 average number of words of four character idiom interpretation text at each level

grade	Number of four character idioms	Number of words in interpretation text	Average number of words
Primary level 2	2	117	58.5
Medium level 4	1	42	42
Medium level 5	1	33	33
Medium level 6	3	123	41
Advanced level 7-9	386	15855	41.08
total	393	16170	41.15

It can be clearly seen from the table that the interpretation text of primary level two four character idioms is too long. The average number of words in the interpretation text of medium four character idioms is generally lower than that of elementary four character idioms, which is relatively simple. The higher four character idioms account for the largest proportion and are the most difficult. The average explanatory words are higher than the medium average explanatory words, but slightly lower than the elementary average explanatory words.

To sum up, ChatGPT has a high degree of accuracy in the interpretation of four character idioms in the grade standard, and the usage interpretation is more accurate. However, the flexibility of form and conciseness of content are not well understood. Especially for relatively simple idioms,

the interpretation of ChatGPT may cause some trouble to learners; For words with high difficulty, ChatGPT can be used as a powerful learning aid to help learners understand and master the usage of Chinese idioms.

4.1.2 Lexical difficulty analysis

The lexical difficulty analysis is mainly to match the word segmentation of ChatGPT's Idiom interpretation text with the lexical level in the International Chinese Education Chinese level standard. At the same time, taking the corresponding idiom level as a reference, this paper calculates the "ratio of over words", that is, the proportion of explanatory words that exceed the idiom level. For example, if the level of an idiom itself is higher than the level of seven to nine words, the ratio of over words=over words/total words. The following is a detailed analysis of the difficulty levels of four character idioms at different levels.

Primary four character idioms only appear in primary level 2. The specific lexical levels of the interpretation text are shown in Table 3.

Table 3 vocabulary level of elementary (secondary) four character idiom interpretation text

grade	number	Proportion 1 (%)	Proportion 2 (%)
Primary level 1	49	41.88	41.88
Primary level 2	18	15.38	15.38
Primary level 3	17	14.53	42.74
Medium level 4	6	5.13	
Medium level 5	4	3.42	
Medium level 6	11	9.40	
Advanced level 7-9	11	9.40	
Supersyllabary	1	0.86	
total	117	100	100

It can be seen from the table that although there are only two four character idioms at the primary and secondary level, 42.74% of the explanatory words exceed the level of the idiom itself, and the excess words are relatively large. It is difficult for Chinese learners to understand, and they are prone to fear difficulties.

Medium four character idioms are presented in levels 4, 5 and 6. The vocabulary levels of the interpretation text are shown in Table 4.

Table 4 vocabulary level of interpretation text of medium four character idioms

Distribution grade	Medium level 4			Medium level 5			Medium level 6		
	number	Proportion 1 (%)	Proportion 2 (%)	number	Proportion 1 (%)	Proportion 2 (%)	number	Proportion 1 (%)	Proportion 2 (%)
Primary level 1	17	40.48	64.30	13	39.40	78.79	57	46.34	83.74
Primary level 2	5	11.91		2	6.06		19	15.45	
Primary level 3	5	11.91		9	27.27		16	13.01	
Medium level 4	4	9.52	9.52	2	6.06		4	3.25	
Medium level 5	3	7.14	26.18	1	3.03	3.03	7	5.69	
Medium level 6	2	4.76		0	0	18.18	4	3.25	3.25
Advanced level 7-9	2	4.76		2	6.06		10	8.13	13.01
Supersyllabary words	4	9.52		4	12.12		6	4.88	
total	42	100	100	33	100	100	123	100	100

It can be seen from the table that the lexical level of ChatGPT interpretation text is from level 4, level 5 to level 6, and the ratio of over words is significantly lower than that of elementary four character idiom interpretation text.

Higher four character idioms account for the largest proportion of all levels. The specific level of words in the interpretation text is shown in Table 5.

Table 5 vocabulary level of higher four character idiom interpretation text

grade	number	Proportion 1 (%)	Proportion 2 (%)
Primary level 1	5945	37.50	89.41
Primary level 2	1871	11.80	
Primary level 3	3584	22.60	
Medium level 4	1044	6.58	
Medium level 5	1347	8.50	
Medium level 6	385	2.43	

Advanced level 7-9	1048	6.61	6.61
Supersyllabary	631	3.98	3.98
total	15855	100	100

As far as the ratio of over words is concerned, the ratio of over words in higher four character idioms is significantly lower than that in elementary and medium four character idiom interpretation texts, less than 5%. The levels of explanatory words are mostly concentrated in elementary and medium, that is, they are lower than the level of the idiom itself, which can play a better auxiliary role for Chinese learners.

Chen Lixia&Du Jingzhe (2023) found through the Chinese proficiency test that ChatGPT's support for Chinese learners is obviously insufficient because it mainly uses natural language corpus in training, and it can't output content that matches the Chinese proficiency level. This experimental result is consistent with the conclusion of this paper. At the same time, this paper finds that ChatGPT assisted Chinese idiom learning is more suitable for intermediate and advanced learners. For primary learners, the interpretation text provided by ChatGPT is not flexible enough, and the text is lengthy and difficult. It is not conducive to promoting learners' understanding and use of Chinese idioms, but may undermine learners' enthusiasm.

4.2 Analysis of cultural content of interpretation text

The myths, fables and historical stories contained in Chinese idioms are also important contents that can not be ignored in "telling Chinese stories and spreading Chinese voice". The author checked and analyzed the interpretation texts output by ChatGPT one by one, and regretted that the interpretation of ChatGPT did not involve the interpretation and explanation of cultural stories and cultural content, but only the source allusions. This form of presentation may avoid the cultural conflict caused by cultural differences, which has certain advantages. But the neglect of Chinese stories and Chinese culture is actually the omission of an important part of idiom culture, which obviously does more harm than good.

In view of the above situation, the author keeps the input instructions exactly the same, and uses the same way with Wenxin²Interact and compare the similarities and differences of the same type of AI at home and abroad in cultural communication. The comparison found that from the perspective of cultural content presentation, Wenxin Yiyao can accurately and comprehensively present the Chinese story in four character idioms to Chinese learners at the beginning, and also clearly explain the Chinese spirit. In contrast, ChatGPT mentions idioms and allusions, but there are omissions of key information, especially the Chinese culture embodied in it. However, it is worth mentioning that when interacting with ChatGPT, it always takes the first order as the

² "Wenxin Yiyao" is a new generation of knowledge enhancement big language model of Baidu and a new member of Wenxin big model family. Similar to ChatGPT, it can interact with people, answer questions, assist in creation, and help people acquire information, knowledge and inspiration efficiently and conveniently.

background of interaction, while Wenxin Yiyan only gives a relatively complete and accurate answer at the beginning, and then the answer becomes simpler and simpler.

To sum up, the current AI interpretation and usage of four character idioms are basically accurate, which can help Chinese learners understand the basic meaning of idioms to a certain extent. However, ChatGPT is not sensitive to language difficulty, formality and the choice of language style. It has a large number of words and a single answer form; Due to the lack of the ability of association and analysis, it is difficult to accurately analyze idioms containing Chinese stories, Chinese culture and Chinese spirit in combination with the cultural context, and it is unable to explain the cultural knowledge hidden in idioms for learners. Although Wenxin Yiyan can be properly integrated into relevant Chinese stories, Chinese culture and Chinese spirit, its continuity is insufficient.

The continuous development of artificial intelligence can assist the cultural teaching in the field of International Chinese Education to a certain extent, but it can only be used as a tool. To truly tell the Chinese story and spread the Chinese voice, we must embrace new technologies under the guidance of international Chinese teachers, promote the continuous development of special artificial intelligence for International Chinese Education, and better serve the dissemination of Chinese culture.

5. LIMITATIONS OF CHATGPT IN THE INTERPRETATION OF CHINESE IDIOMS

International Chinese Education is a discipline with Chinese characteristics and cultural confidence. ChatGPT can better assist Chinese learners in learning Chinese idioms because of its massive resources and timely interaction, but it also has many limitations.

In terms of form, the interpretation text of ChatGPT is relatively simple and inflexible. There are many kinds of Chinese idioms, and the interpretation of different idioms should be different. For example, in the dictionary of Chinese idioms, the explanation of adjective idioms is mostly in the form of "describe..."; Idioms with figurative meaning are presented in the form of "figurative..."; When there are relatively difficult words in idioms, there will be a separate explanation, such as "ingenuity" in "ingenuity"

From the point of view of meaning interpretation, it is difficult to match with the Chinese level standard of International Chinese Education. For Chinese learners, comprehensible input is the key factor in learning Chinese idioms. International Chinese teachers often use the words that students have learned to interpret. However, in the interpretation text of ChatGPT, the over word ratio of elementary idioms and medium idioms is relatively high, especially the over word ratio of elementary idioms is close to 45%, which makes it difficult for students to understand.

From the perspective of cultural connotation, the interpretation mostly stays on the surface, and the deep meaning of idioms and the cultural knowledge behind them are insufficiently understood, and the cultural content is rarely involved. The interpretation text of 393 four character idioms in ChatGPT grade standard basically does not involve the interpretation and interpretation of cultural content.

6. ENLIGHTENMENT OF AI ASSISTED INTERNATIONAL CHINESE EDUCATION AND CULTURE TEACHING

As international Chinese teachers, we bear the important mission of telling Chinese stories and spreading the voice of China. We should promote the deep integration of the new generation of AI and International Chinese Education with a positive attitude, and cautiously deal with the challenges and risks brought by AI to the development of International Chinese Education, so as to promote the win-win development of International Chinese Education and AI.

6.1 Integrating Chinese characteristics, ChatGPT empowers International Chinese Education and cultural communication

ChatGPT empowers the development of International Chinese Education, especially cultural teaching and communication, there are still many aspects that need to be improved, the most basic of which is to enable AI to tell Chinese stories and spread the Chinese voice. Increase the training of AI cultural content, promote the deep integration of AI and International Chinese Education, and improve its flexibility, so that when facing Chinese learners from different cultural backgrounds, it can properly integrate the content of Chinese culture and tell Chinese stories hidden in Chinese idioms.

Second, tell Chinese stories and Chinese culture that Chinese learners understand. In the language training of AI, various Chinese standards, Chinese dictionaries, major Chinese corpora, etc. are included in the AI training database to improve the support ability of AI for Chinese learning. Only when Chinese learners can understand the Chinese stories output by AI, can they be effective input, and can they achieve the ideal effect of telling Chinese stories and spreading Chinese voices, so as to better show the image of China to the world.

Finally, tell Chinese stories and Chinese culture that Chinese learners can accept. Combined with the characteristics of International Chinese Education, explore and develop proprietary AI products that serve the nationalization, personalization and characterization of International Chinese Education, so that more Chinese learners can cross the barriers of time and space and enjoy more accurate and rich customized services.

6.2 Clarify the dominant position of teachers and use new technologies to flexibly tell Chinese stories

In the face of the strong impact of the new generation of artificial intelligence, first of all, we should improve and strengthen the literacy and ability of international Chinese teachers from all aspects and multiple angles, promote international Chinese teachers to "go out", improve their international vision, exercise their comprehensive ability, tell the world the Chinese story and spread the Chinese voice in a real, three-dimensional and comprehensive way, so that more people in the world can understand, understand and share the Chinese spirit and Chinese value.

Secondly, as an international Chinese teacher, we should clarify our subjective status and assume the mission and responsibility of disseminating Chinese culture. Clarify and adhere to the concept of "people-oriented, supplemented by technology", promote the benign development of generative artificial intelligence in the field of International Chinese Education, and promote the development of wisdom and digital construction of International Chinese Education. Combined with real-time

data and real cases, it tells the Chinese wisdom and Chinese solutions, so that the world can more truly understand the image of China.

Finally, international Chinese teachers should actively embrace new technologies and make more efforts to improve their cultural communication ability in "depth" and "live". Create an open, inquiry and output Chinese learning classroom, help learners form a good knowledge map and thinking framework, and improve their ability to tell personalized, true and warm Chinese stories.

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