

# Exploring the Impact of AI Technology on the Intercultural Communication Competence of Chinese University Students

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### **Abstract**

With the rapid development of artificial intelligence (AI) technology, its impact on education, especially on intercultural communicative competence, has attracted much attention. This study takes the students of J College as the research setting to explore the impact of AI tools on Chinese college students' intercultural communicative competence. By using quantitative research methods such as questionnaires, as well as qualitative research methods such as semi-structured interviews, how AI affects students' self-confidence, linguistic competence, and cultural comprehension in cross-cultural communication were analyzed. The results showed that AI tools have a positive effect on enhancing students' self-confidence, linguistic competence, and cultural comprehension in intercultural communication. The real-time translation and diverse cultural knowledge acquisition functions of AI help students better adapt to different cultural environments and enhance their willingness to participate in cross-cultural interactions. However, the study also points out that the role of AI in enhancing language fluency is limited, while over-reliance on AI may weaken students' independent learning and independent problem-solving abilities.

**Keywords**: Artificial Intelligence, Intercultural Communication Competence, College Students, Cultural Understanding, Self-confidence Enhancement

### Introduction

With the accelerating pace of globalization, intercultural encounters have become a routine part of academic, professional, and social life. For university students, in particular, the ability to communicate effectively across cultures is no longer optional but a vital competence for participation in international exchange and future career development. Intercultural communication competence (ICC), which encompasses linguistic skills, cultural

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knowledge, and intercultural confidence, has therefore emerged as a key educational objective in higher education (Byram, 1997; Deardorff, 2004).

At the same time, technological innovation, especially the rapid rise of artificial intelligence (AI), is reshaping students' learning, interaction, and communicative skills. Intelligent assistants, translation applications, and cross-cultural communication platforms provide students with immediate access to language support and cultural information, creating new opportunities to strengthen ICC. Prior studies have emphasized the value of AI in facilitating language learning, translation, and online collaboration (Lee, 2024; Wu, 2023). However, much of this research has remained at the level of theoretical models or general discussions of AI in education, without systematically examining its influence on students' intercultural confidence and performance in real communicative contexts (Yan & Zeng, 2023).

In the field of intercultural studies, scholars have long recognized that ICC extends beyond language proficiency to include cultural awareness, attitudes, and affective factors. Byram (1997) highlighted the role of cultural understanding and critical reflection, while Deardorff (2004) proposed a process-oriented model that emphasizes adaptability and engagement in authentic interactions. Chen and Starosta (2000) further argued that self-confidence and willingness to communicate are essential affective components of intercultural competence. Yet the role of AI technology in shaping these dimensions remains underexplored. In particular, it is not clear whether AI enhances not only students' knowledge and skills but also their confidence to engage in intercultural interactions, which represents a significant gap in the literature.

The present study addresses this gap by investigating how AI tools affect Chinese university students' intercultural communication competence, with a particular focus on confidence and communicative performance. Using a mixed-methods approach, the study combines survey data and qualitative insights to provide a comprehensive understanding of students' experiences.

The novelty of this research lies in its focus on the intersection between AI technology and intercultural communication competence. Unlike prior studies that have concentrated primarily on language acquisition or cultural knowledge, this study highlights the affective dimension of intercultural communication, namely, confidence, and examines how AI can shape students' readiness to interact across cultures. The findings contribute to the field of social sciences by offering empirical evidence on how emerging technologies transform interpersonal and intercultural communication (Wang & Zhang, 2023). Practically, the study provides guidance for educators on how to integrate AI into teaching in a way that supports not only language proficiency but also students' independent learning, cultural adaptability, and communicative confidence (Lee, 2024; Wu, 2023).

### **Literature Review**

With the rapid development of AI technology in recent years, its application in the field of education has become more and more extensive, which has had a profound impact on language learning and cross-cultural communication patterns. In the field of education, McCallum (2024) has emphasized ChatGPT's enhancement of students' cross-cultural communicative competence through tele-collaboration in the educational environment,

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stressing the importance of AI literacy for students and teachers to effectively improve their communication skills. As for the relationship between AI technology and intercultural communication, Yan Jing and Zeng Daojian (2023) explored the application scenarios, ethical risks and governance paths of AI in intercultural communication.

Foreign scholars have conducted extensive research on intercultural studies: Deardorff (2004) proposed a theoretical model of intercultural communicative competence, emphasizing the importance of language proficiency in intercultural communication, and Byram's (1997) model of intercultural communicative competence emphasized the key role of cultural understanding and cultural awareness in intercultural communication. In China, scholars have also paid attention to the application of AI technology in language teaching. For example, Wen Qiufang (1999) proposed a model of intercultural communicative competence in her study, emphasizing the importance of linguistic, pragmatic and strategic competence. Zhang Hongling (2007) further refined the components of intercultural communicative competence, including the three dimensions of attitude, knowledge and behavior.

In recent years, scholars have come to realize that intercultural communication competence includes not only language skills and cultural understanding, but also emotional aspects such as self-efficacy and self-confidence. Among them, the "Intercultural Sensitivity Model" proposed by Chen and Starosta (2000) has become an important theoretical basis for measuring Intercultural Communication Confidence.

Chen and Starosta (2000) argue that the affective dimension of intercultural communication consists of three main elements: 1) Self-esteem, which is the recognition of one's own value as a cross-cultural communicator; 2) Self-efficacy, which is the confidence in one's ability to successfully communicate across cultures; 3) Willingness to communicate, which is the motivation to participate in communication in different cultural contexts. In the "Intercultural Communication Competence Scale" they developed, intercultural communication confidence is quantitatively assessed in the "communication motivation" dimension, which is mainly measured by: the level of nervousness when talking to people from different cultures; self-regulation in the face of cultural differences; linguistic fluency and psychological safety in cross-cultural situations; Confidence in communicating effectively without relying on others or tools.

Research has shown that intercultural communicative confidence is an important predictor of intercultural competence, which affects not only communicative effectiveness, but also whether communicators are willing to engage in authentic cultural interactions (Neuliep & McCroskey, 1997). Therefore, when analyzing the impact of AI on students' intercultural competence, it is necessary not only to pay attention to its auxiliary functions at the level of language and cultural knowledge, but also to explore whether it has a substantial improvement in students' confidence in intercultural communication. However, existing literature focuses only on the application of AI technology in education and the far-reaching impact of AI on cross-cultural communication and language teaching, which provide a theoretical basis for cross-cultural communication competence, but none of these studies delved into how AI technology affects college students' cross-cultural communication confidence.

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This study combines AI and intercultural communication, aiming to explore the role of AI technology in the development of intercultural communication competence, and to analyze in depth the impact of AI on the intercultural communication competence of college students, and how AI technology enhances the students' intercultural communication confidence, how this confidence translates into actual intercultural communication performance. Hence, the following two research questions were proposed:

Research Question 1: How does AI technology affect Chinese university students' intercultural communication skills?

Research Question 2: Has the use of AI technology improved students' self-confidence and actual performance in intercultural communication? If so, how did it improve?

Through systematic analysis, this study not only provides practical reference for English teaching in colleges and universities, but also improves the intercultural adaptability and confidence of college students in the context of internationalization and globalization, so that they can better cope with the challenges of the future.

# **Research Methodology**

Subject of the Study

In this study, college students from J University were selected as the research subject, including English majors (Business English) and non-English majors, in different grades from freshman to senior. A total of 150 questionnaires were distributed through printed questionnaires, with 143 valid responses collected for analysis, offering a sample with reasonable representativeness.

# Research Design

This study adopts a mixed-methods approach, combining both quantitative and qualitative research methods to explore how artificial intelligence (AI) tools influence the development of Intercultural Communicative Competence (ICC) among Chinese college students. The quantitative component is designed to measure the relationships between the frequency and type of AI usage and students' ICC, including their confidence and communicative performance. The qualitative part, aims to gain deeper insight into students' perceptions and experiences of using AI in intercultural contexts through open-ended questions.

### **Data Collection Instruments**

The questionnaire in this study was adapted from Byram's (1997) framework of intercultural communicative competence and the framework of technology-assisted language learning, and a research model was constructed to explore the impact of AI tools on the development of intercultural communicative competence among Chinese university students.

The independent variables in the questionnaire are the frequency and type of AI tool use; the mediator variables are the students' intercultural communicative confidence and attitude changes; and the dependent variable is the development level of intercultural communicative competence. The design of the questionnaire includes the following four dimensions: frequency of AI use, self-assessed intercultural communicative competence, self-

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confidence and attitude after using AI, and challenges and limitations of AI in intercultural communication. The questionnaire contains a quantitative part and a qualitative part, and the quantitative part measures students' confidence, competence, and feelings about using AI tools in intercultural communication. The qualitative section collected students' subjective perceptions through open-ended questions to provide in-depth insights for the study. After pilot study, the overall reliability of the scale used for data collection reached 0.91, which meets the criteria for data collection.

# Data Analysis Methods

The quantitative part used Likert scales and descriptive statistical analyses using SPSS 24.0, correlation analyses and linear regression analyses to measure students' confidence, competence and perceptions of using AI in intercultural communication. Responses to openended Items 17 and 18 were analyzed using thematic analysis and word frequency extraction. Core themes emerged, such as "confidence enhancement," "language support," "cultural understanding," and "risk of over-reliance," offering richer interpretation and validation of the quantitative results.

# **Analysis of Results**

The demographic information of participants of this study was summarized in the table below:

Table 1
Demographic Information of Participants

Sexes		Majors	Grade				
male	female	English Non-English 1		first-	second- third-		fourth-
		major	majors	year	year	year	year
36.36%	63.64%	29.37 %	70.63 %	46.85	22.38 %	25.87	4.9 %
				%		%	

From the table, it can be found that most of the participants were female and non-English majors college students. Nearly half of the participants were first year students, while fourth-years students were least.

Research question 1: How does AI technology affect the intercultural communication skills of Chinese university students?

# Quantitative Data Analysis

The following data was obtained by calculating the mean, standard deviation, etc. for Question 9, 10, 13, 14, 15, and 16 in the questionnaire observing the overall trend:

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Table 2

Descriptive analysis

No.	Item	Mean	SD	Median	Min	Max
9	Using AI tools has increased my confidence in communicating with different cultural groups		1.09	4	1	5
10	Al tools have helped me better understand the etiquette and customs of other cultures		1.06	4	1	5
11	I'm willing to communicate across cultures without AI assistance.	3.42	1.24	4	1	5
13	How does communication fluency change after using AI tools	3.51	1.03	4	1	5
14	How understanding of different cultures changes when using AI tools	3.79	0.98	4	1	5
15	How confidence in communicating in public has changed after using Al tools	3.55	1.05	4	1	5
16	How does the use of AI tools change the ability to cope with cross-cultural conflicts?	3.63	1.01	4	1	5

According to the data above, in general, AI played a positive role in increasing confidence in intercultural communication, understanding other cultures' etiquette and customs, improving communication fluency, understanding different cultures, improving confidence in communicating in public, and coping with intercultural conflicts. The mean values of all questions ranged from 3.42 to 3.86, and most of them were close to 4. This means that the students generally believed that AI had a positive impact on their intercultural communication skills to a certain extent, and rated AI positively to a high degree. It further suggests that AI not only improves students' language skills, but also increases their confidence in communicating with different cultural groups. However, the question of willingness to communicate interculturally without AI assistance had the lowest mean of all the questions. It shows that the students' willingness to communicate cross-culturally without AI assistance is relatively low, and some of them do not believe in their own strengths and levels and still rely on AI to communicate cross-culturally.

In addition, in order to explore the correlation between the questions, the Pearson correlation coefficient was used to identify the correlation:

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Table 3

Pearson correlation analysis

Pearson corr	eiatioi	<u>ı anaiysi</u>	5							
	average value	(statistics) standard deviation	9. Using AI tools has increased my confidence in communicating with different cultural groups.	10. Al tools have helped me to better understand the manners and customs of other cultures.	13、 How has your communication fluency changed after using AI tools?	14. How has your understanding of different cultures changed as a result of using AI tools?	15. How has your confidence in communicating in public changed since using AI tools?	16. How has the use of Al tools changed your ability to cope with cross-cultural conflicts?		
9. Using AI tools has increased my confidence in communicating with different cultural groups.	3.860	1.092	1							
10. Al tools have helped me to better understand the manners and customs of other cultures.	3.797	1.059	0.694**	1						
13. How has your communication fluency changed after using AI tools?	3.510	1.034	0.501**	0.462**	1					
14. How has your understanding of different cultures changed as a result of using AI tools?	3.790	0.985	0.693**	0.628**	0.673**	1				
15. How has your confidence in communicating in public changed since using Al tools?	3.545	1.046	0.647**	0.533**	0.698**	0.734**	1			
16. How has your ability to cope with cross-cultural conflicts changed as a result of using Al tools?	3.629	1.012	0.635**	0.574**	0.553**	0.692**	0.651**	1		
	* p<0.05 ** p<0.01									

Based on the data presented in Table 4.3, results show that using AI has increased my confidence in communicating with different cultural groups (Question 9) vs. AI tools have

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helped me to better understand the etiquette and customs of other cultures (Question 10), how has the fluency in communication changed after using AI (Question 13), how has the understanding of different cultures changed after using AI (Question 14), how has the How does confidence in communicating in public change after using AI (Q15), How does the ability to cope with cross-cultural conflicts change after using AI (Q16) The relationship numbers are 0.694, 0.501, 0.693, 0.647, 0.635, respectively, and the values of the relationships are all greater than 0, which means that there is a positive correlation between this question 9 and questions 10, 13, 14, and 15.

The correlation coefficients between question 10 and questions 13, 14, 15, and 16 are 0.462, 0.628, 0.533, and 0.574, respectively, and the correlation coefficients between question 13 and questions 14, 15, and 16 are 0.673, 0.698, and 0.553, respectively, and the correlation coefficients between question 14 and 15 are 0.734 and the correlation coefficients between question 15 and 16 are 0.651, respectively. This shows that there is a positive correlation between these data.

All this suggests that AI has a positive effect on subjects' intercultural communication skills and that there is a positive correlation between these effects in relation to each other. It suggests that AI has now become an effective tool for university students to enhance intercultural communication, and that using AI may help users to better understand other cultures, which in turn will improve their confidence in communicating in public and their ability to cope with intercultural interactions.

# **Qualitative Analysis**

In the qualitative analysis, a thematic inductive approach was mainly used to categorize the open-ended responses to Question 17 and extract themes about the positive or negative impact of AI on intercultural communication skills.

According to the responses, most students chose "none" or left the question blank, probably because they did not understand the question or did not think that AI tools play a special role in intercultural communication. However, some students responded that AI tools play a certain positive role in intercultural communication, such as facilitating communication and enhancing intercultural communication skills. In addition, a few students thought that AI tools might create a sense of dependency.

In summary, AI tools can enhance college students' confidence in communicating with different cultural groups, improve their language skills and enhance their cultural understanding. This suggests that AI technology, by providing immediate language support and communication aids and providing cultural background knowledge, can help college students better understand and adapt to different cultural environments and overcome language barriers, thus enhancing their confidence in communication and their willingness to participate in cross-cultural communication.

Research Question 2: Has the use of AI technology improved students' self-confidence and actual performance in intercultural communication? If so, how?

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# Quantitative Analysis

Means and standard deviations were calculated separately for questions 9, 13, and 15 (1 = strongly disagree, 5 = strongly agree) using a Likert scale to measure students' overall perceptions of confidence and performance improvement.

Table 4
Descriptive analysis of self-confidence after AI use

litem	Sample Size	Minimum	Maximum	lMean	standard deviation	median
<ol><li>Using AI tools has increased my confidence in communicating with different cultural groups.</li></ol>	143	1.000	5.000	3.860	1.092	4.000
13 . How has your communication fluency changed after using AI tools?	143	1.000	5.000	3.510	1.034	4.000
15. How has your confidence in communicating in public changed as a result of using AI tools?		1.000	5.000	3.545	1.046	4.000

Firstly, the mean for all three questions exceeded the median value of 3, which indicates that overall the students rated these questions positively.

Secondly, of the three questions, question 9 had the highest mean with a mean score of 3.860, indicating that most students felt that the use of AI significantly increased their confidence in communicating with culturally diverse groups. This may be due to the fact that AI provides accurate translation of functional and culture-contextual information, which helps students to better engage in intercultural communication. In contrast, Question 13 had the lowest mean score of 3.510, but was still above the median value of 3. This suggests that although a certain percentage of students perceived an increase in communication fluency as a result of using AI, the improvement was not as pronounced as the increase in confidence in intercultural communication. This may be because the improvement of communication fluency is not only dependent on the methods provided by AI, but also related to the accumulation of personal experience. However, it still shows a positive impact of AI.

Thirdly, in general, Chinese university students generally believe that using AI has a positive impact on their intercultural communication skills. In particular, the effect of AI was most pronounced in terms of increasing confidence in communicating with different cultural groups. Although the improvement in communication fluency was not as pronounced as in other areas, most students still perceived an improvement.

# **Regression Analysis**

In order to analyze the extent to which AI technology has improved students' confidence in intercultural communication, "confidence in intercultural communication" (question 9) was used as the dependent variable, and other related questions as independent variables to analyze the specific effect of AI on confidence.

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Table 5
Results of linear regression analysis (n=143)

	Unsta coeffi	ndardised cient	Standardised coefficient		<i>p</i> ?	Covariance Diagnostics	
	<i>B</i> ?	standard error?	Beta?	—t?		VIF?	tolerance level
a constant (math.)	1.360	0.267	-	5.087	0.000**	-	-
How has your fluency is communication changed since using the AI tool?  How has using AI tool changed your confidence is communicating in public?	d 0.101 s		0.096		0.287		0.513 0.513
$R^2$ ?	0.423						
Adjustment R 2 🖸	0.415						
F?	F (2,140)=51.346, p=0.000						
D-W value	1.640						

Note: Dependent variable = Using AI tools has increased my confidence in communicating with culturally diverse groups.

From the above table, it can be seen that the change in communication fluency and the change in confidence after using the AI tool were taken as the independent variables, while the degree of enhancement of confidence in communicating with different cultural groups after using the AI tool was taken as the dependent variable for the linear regression analysis.

From the above table, the model formula can be summarized as: Using AI tools enhances my confidence in communicating with different cultural groups = 1.360 + 0.101\*Change in communication fluency after using AI tools + 0.605\*Change in confidence in communicating in public after using AI tools, and the R<sup>2</sup> value of the model is 0.423, which means that "the change in communication fluency and the change in confidence in communicating in public after using AI tools". The R-square value of the model is 0.423, which means that "the change in communication fluency and the change in confidence in communicating in public after using AI tools can explain 42.3% of the change in "using AI tools has increased my confidence in communicating with different cultural groups. The F-test of the model was found to pass (F=51.346, p=0.000<0.05), which means that at least one of the two items, "Changes in fluency after using AI tools" and "Changes in your confidence in communicating in public after using AI tools" will have a significant effect on "Changes in my confidence in communicating with culturally diverse groups after using AI tools". That is to say, at least one of the two items will have an effect on the relationship between "Using AI tools has increased my confidence in communicating with culturally diverse groups". In addition, the test for multicollinearity of the model shows that all the VIF values in the model are less than 5, which means that there is no problem of covariance; and the D-W value is around the number 2, which means that there is no autocorrelation in the model, and there is no correlation between the sample data, which makes the model a good one. The final analysis shows that the regression coefficient of "change in communication fluency after using AI tools" is 0.101

<sup>\*</sup> p<0.05 \*\* p<0.01

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(t=1.069, p=0.287>0.05), which means that "change in communication fluency after using AI tools" does not have any effect on "change in communication fluency after using AI tools". This means that "Changes in communication fluency after using AI tools" does not have an impact on "Using AI tools has increased my confidence in communicating with culturally diverse groups".

The regression coefficient value of "the change of your confidence in public communication after using AI tools" is 0.605 (t=6.471, p=0.000<0.01), which means that "the change of confidence in public communication after using AI tools" will have a significant positive effect on "using AI tools increases my confidence in communicating with different cultural groups". This means that "Changes in confidence in communicating in public after using AI tools" has a significant positive effect on "Using AI tools has increased my confidence in communicating with culturally diverse groups".

To summarize, "Changes in your confidence in communicating in public after using AI tools" has a significant positive relationship with "Using AI tools has increased my confidence in communicating with culturally diverse groups". However, "Changes in your communication fluency after using AI tools" does not have an effect on "Using AI tools has increased my confidence in communicating with different cultural groups".

# **Qualitative Analysis**

Word frequency analysis: high-frequency words were extracted from Question 17 and 18 to find out whether students mentioned confidence and performance gains. Most of the data showed that students believed that AI plays an important role in intercultural communication, especially in removing language barriers, facilitating intercultural communication, improving understanding of different cultures, and providing real-time translations, etc. AI has become an important tool for facilitating intercultural communication and exchange. Some students were also aware of its limitations and referred to the description "double-edged sword", suggesting that AI has both positive and potentially negative impacts. Negative impacts were mentioned by students who mentioned that students may become dependent on AI if they do not use it appropriately. Students should maintain autonomy and critical thinking when using AI. There is also a portion of students who may not have directly experienced the role of AI tools in intercultural communication or are neutral about it.

Based on the above high frequency words, the following three themes can be derived by applying thematic analysis:

# Confidence Improvement

How AI tools can enhance confidence: According to the theory of cross-cultural communication, the formation of confidence depends on the degree of mastery of unknown cultures (Cultural Intelligence), AI tools can make learners feel that the barriers to cross-cultural communication are partially eliminated through real-time translation, scenario simulation, and cultural knowledge popularization, thus enhancing their confidence. As mentioned in the students' responses, "AI tools can help students overcome language barriers, improve their understanding of different cultures, and enhance their communicative competence through language translation, cultural literacy, and communication skills training." This feedback suggests that the AI provided language assistance and cultural

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guidance, which reduced students' psychological stress in multilingual situations and significantly increased their communicative confidence.

# *Performance Enhancement*

How AI tools can enhance communicative performance: According to Vygotsky's Zone of Proximal Development (ZPD) theory, learners need assistive tools in order to develop their skills above their current level (Vygotsky, 1978). AI tools provide learners with support in the areas of linguistic translation, grammar correction, and expressive training, thus enhancing their communicative fluency and expressive skills. In their responses, students repeatedly referred to "improving communicative competence" and "overcoming language barriers". For example, "AI tools help students improve their understanding of different cultures and improve their communication skills." Thus, AI directly enhances students' intercultural communication performance by refining language expression (e.g., providing suggestions for diverse vocabulary and sentence patterns).

# Adaptation to Cultural Contexts

Students mentioned that AI is sometimes not precise enough to express specific cultures, which may affect the authenticity of their performance. For example, certain cultural connotations are lost in translation, resulting in less effective communication.

In summary, the use of AI improves students' self-confidence and actual performance in intercultural communication.AI helps students to better participate in intercultural communication by removing language barriers, providing real-time translation, and improving understanding of different cultures.

# Conclusion

This paper explored the impact of AI technology on the development of intercultural communication competence (ICC) among Chinese college students, using a case study of students from J University. The findings indicate that AI tools play a positive role in enhancing students' confidence in cross-cultural communication, improving certain aspects of language proficiency, and promoting cultural understanding. By providing immediate language support, communication aids, and a wealth of cultural knowledge, AI helps students better understand and adapt to different cultural environments, overcome language barriers, and become more willing to participate in cross-cultural communication (Lee, 2024; Wu, 2023).

However, the study also revealed the complexity of AI tool use. While AI tools increased students' communication confidence, their effectiveness in improving spontaneous language fluency was limited. This may be attributed to students' over-reliance on AI tools, which can fail to provide adequate practice for developing automaticity in language production (Yan & Zeng, 2023). This over-dependence aligns with concerns that technology can sometimes hinder the development of higher psychological processes if not scaffolded appropriately (Cole et al., 1978). Consequently, such dependence may impact students' long-term autonomous learning and problem-solving abilities (Wang & Zhang, 2023). Therefore, educators must guide students to use AI as a supplementary tool rather than a crutch to promote the development of their independent learning ability (Lee, 2024). Colleges and universities should integrate AI pedagogically to enhance students' independent learning

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ability while simultaneously cultivating critical thinking and problem-solving skills, ensuring students improve their ICC with AI's assistance rather than becoming passive users.

In addition, this study has limitations. The sample size was small and limited to the students of one university, which restricts the generalizability of the findings. Future research should involve a larger and more diverse sample from multiple institutions.

In conclusion, AI technology presents both significant opportunities and notable challenges for developing Chinese college students' intercultural communicative competence, a multifaceted skill set crucial for global engagement (Byram, 1997; Deardorff, 2004). Its ability to provide accessible, low-anxiety practice is a substantial benefit. However, its integration into the curriculum must be strategic and critical, designed to support the human elements of communication, autonomous learning, and critical cultural reflection.

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