

A Study on Intercultural Communicative Competence of College Students in Online Learning Contexts

Manli Li

Tsinghua University, China
marylee@mail.tsinghua.edu.cn

Yan Gu

Tsinghua University, China
guy20@mails.tsinghua.edu.cn

Weitong Liu*

Shandong University, China
lwt@sdu.edu.cn

Abstract: *Intercultural Communicative Competence (ICC) is a crucial issue for the internationalization of higher education. In recent years, intercultural online learning has gradually become a new form of internationalization in higher education, which presents both challenges and opportunities for enhancing students' ICC. This study constructs an analytical framework for ICC within the context of online learning, drawing from existing research on ICC and classroom environment theory. Leveraging the "Global Integrated Classroom Learning Survey" by Tsinghua University's Global Integrated Classroom Teaching Research Group, 141 valid samples were collected and analyzed through descriptive statistics and regression analysis. Two main conclusions were drawn: (1) Students generally exhibit a relatively high level of ICC in online learning contexts, yet differences in ICC exist among different student groups; (2) Within online teaching, three contextual features—information literacy, instructional scaffolding, and technological support—significantly influence university students' ICC.*

Keywords: online learning; intercultural communicative competence; college student

Introduction

The further development of internationalization in higher education imposes new demands on Intercultural Communicative Competence (ICC). Internationalization stands as a crucial feature of contemporary higher education, fostering the development of internationally competent individuals equipped with global perspectives and capable of engaging in intercultural communication and international competition. This cultivation of internationally competent talents, equipped with a comprehensive understanding of global knowledge, holds significant importance for the profound advancement of higher education in various countries, institutions, and on a global scale.

Since the 21st century, online teaching has undergone rapid development, progressively becoming a significant instructional form. The shift in teaching environments has led to changes in classroom communication forms, communication themes, and communicative tasks. Studies indicate that strategies for enhancing ICC traditionally acquired in physical classrooms are no longer as effective (Leng et al., 2021). Moreover, the urgent need to enhance teaching quality in online classrooms often leads educators and learners to postpone or overlook the cultivation and improvement of ICC (Yang et al., 2021). Simultaneously, attempts in the realm of higher education to construct contexts that foster internationalization in online teaching are burgeoning. Initiatives such as Tsinghua University's Global Integrated Classroom project have enabled synchronous learning for domestic and international students, actively promoting online international student exchange and credit recognition (Wang et al., 2022). Leveraging online teaching, and localized internationalization in higher education becomes feasible. As intercultural online teaching becomes a new educational

norm, exploring the cultivation of ICC in classrooms and teaching, breaking spatial limitations for learners engaged in cross-cultural learning, holds undeniable importance in enhancing talent development and the quality of higher education.

In the instructional context spanning languages, cultures, time, and media, students' ICC directly impacts the efficiency and quality of communication within cross-cultural online classrooms. It profoundly influences curriculum development, student development, and institutional reputation. However, issues related to students' cultural backgrounds, communication patterns, and communicative development haven't received adequate attention within research and educational circles. Against this backdrop, this study focuses on the current state of ICC among university students in online teaching contexts, aiming to address the following two questions:

1. In the context of online teaching, what is the extent of ICC among university students, and are there discernible variations across diverse demographic groups?
2. In the context of online teaching, which factors impact the ICC among university students, and what mechanisms underlie these influences?

Literature review

Research on Intercultural Communicative Competence

The term "communicative competence" was first introduced by American sociolinguist and anthropologist Hymes (1972). He distinguished communicative competence from linguistic competence, focusing not only on the speaker's language abilities but also on the interaction between language

and its environment during language use. ICC is an extension and explanation of communicative competence within cross-cultural linguistic environments, referring to the ability to comprehend cultures, including one's own, and utilize this understanding to effectively communicate with individuals from other cultures. Currently, academia widely acknowledges that ICC is not an independent ability but a comprehensive skill comprising various capabilities. Definitions of ICC typically encompass the attitudes, skills, and knowledge essential for effective communication "when interacting across difference" (Deardorff, 2019; Heggernes, 2021).

Researchers have elaborated on the constituent elements of ICC from a more nuanced perspective regarding the occurrence of communicative behaviors. Chen (1990) identified personal attributes, communicative skills, psychological adjustment, and cultural awareness as constitutive elements, thereby delineating a four-dimensional model for ICC. Byram (1997) proposed that knowledge, skills (interpretation/ connection, discovery/ interaction), attitudes, and critical cultural awareness constitute intercultural competence, which, in conjunction with language, socio-linguistic, and discursive abilities, form ICC. Spitzberg (2000) further developed a model of ICC, involving an interplay between communicator-systems, episode-systems, and relationship-systems. Deardorff (2006) underscored the influence of internationalization in higher education through a process model highlighting the progressive nature of ICC development. The model suggests that attitude serves as the foundational element for ICC development, while knowledge, comprehension, and skills lay the groundwork for advancing to the subsequent stage, internal outcome. Through interactions, this internal outcome transforms into an external outcome, manifesting as

effective and appropriate communication and behavior in intercultural situations. The external outcome, in turn, feeds back into attitude, creating a continuous loop in the evolution of ICC. The models proposed by Byram (1997, 2021) and Deardorff (2006) have received extensive citations and act as a catalyst for the development of quantitative research instruments in the field. (Huang, 2021)

The introduction of ICC into classroom research has sparked extensive scholarly discussions. Since 2010, there has been a sustained surge in both domestic and international investigations focusing on ICC within educational settings, especially in EFL (English as a Foreign Language) learning and teaching field. (Ghasemi Mighani et al., 2020; Megawati et al., 2020). This proliferation of research reflects a growing recognition of the critical role played by intercultural competence in educational contexts and an increasing emphasis on its integration into pedagogical strategies. (Hoff, 2020; Iswandari & Ardi, 2022) These studies delve into various aspects encompassing the development, implementation, and assessment of pedagogical methods aimed at fostering students' proficiency in navigating cultural diversity within learning environments. The upsurge in scholarly attention underscores the evolving landscape of educational priorities, where educators are increasingly acknowledging the significance of cultivating intercultural competencies to equip students for a globally interconnected world.

Research on Intercultural Communicative Competence in Online Contexts

Existing studies on ICC in online environments have predominantly focused on discussions within language learning. Researchers have examined the status and development of ICC in online teaching based

on the concentrated field of second language learning. Chun (2011), drawing upon Byram's definition of ICC, analyzed how online communication contributes to the development of ICC among second language learners. Similarly, Jin (2015) used Byram's theoretical framework to explore how the online social media platform Facebook facilitates interactions between second language learners and native speakers of the target language. Belz (2003) approached intercultural discourse in German-American email exchanges from a linguistic perspective, providing a linguistic analysis of intercultural online communication. O'Dowd analyzed emails exchanged between English and Spanish second language learners, concluding that the effective use of email's key features can enhance learners' development of ICC. Furthermore, Lázár (2015) analyzed online collaboration among English second language learners, demonstrating the positive impact of online collaboration on students' enhancement of ICC. Litvinova et al. (2021) investigated the differences in ICC among students majoring in linguistics and medicine in an online learning environment. The study found that representatives of non-linguistic specialties are indeed less aware and interested in enhancing ICC in online learning.

A segment of researchers has recognized the complexity inherent in online environments. They argue against viewing online contexts as general communicative settings but instead, emphasize the identification and differentiation of specific factors within these contexts that influence ICC. Ware and Kramsch (2005) discussed the challenges posed by online teaching for educators. They highlighted situations where students encounter misunderstandings and disagreements in online interactions, emphasizing the role of educators in guiding students towards appropriate intercultural perspectives to facilitate the development of their intercultural competence. In a study

by Lee and Lina (2009) analyzing task-based cross-cultural remote collaboration, they found that instructional task design significantly influences classroom interaction and exploration of language and culture. Yang and Mao (2011) conducted a questionnaire survey among students engaged in cross-cultural collaborations, revealing that technological tools and learning resources provided by the curriculum exert a significant impact on students' course experiences and their ICC. Avgousti (2018) pointed out that telecollaboration can serve as a catalyst for promoting language skills development, intercultural communicative competence (ICC), and multiple literacies. The study delved into the impact of Web 2.0 tools, especially multimodality, on learners' development of ICC.

Analytical Framework

Currently, there is limited research on ICC within online environments. Most studies tend to analyze online contexts and ICC as a unified entity, providing findings that merely demonstrate their correlation without delving into specific factors, paths of influence, or offering substantial guidance for instructional practices (Bingzhuan, 2021). To delve deeper into ICC within online contexts, this study utilizes Moos et al.'s (1979) Classroom Environment Theory and ICC elements research to establish a framework for analyzing ICC in online teaching environments.

Primarily, this study delineates online teaching scenarios across three dimensions: personal, interpersonal, and systemic. Moos (1979) posits that any environment can be delineated across three dimensions: Personal development or goal direction dimensions, Relationship dimensions, and System maintenance and system change dimensions. Building upon Moos's framework, this study

transposes these dimensions to characterize features of online teaching scenarios. The personal dimension focuses on individual aspects such as students' self-regulation, efficacy, and ability to utilize information technology for learning, encompassing elements like self-regulated learning and information literacy. The interpersonal dimension centers on teacher-student and peer interactions, investigating teaching designs and strategies employed to foster interpersonal engagement, including aspects such as social presence, instructional scaffolding, and teaching interaction strategies. The systemic dimension centers on the online teaching environment, institutional frameworks, regulations, and external support mechanisms, such as instructional systems and technological support.

Moreover, this research develops an analysis framework for ICC based on attitude, knowledge, and skills. Regarding intercultural communicative attitudes, the study emphasizes examining whether university students adopt a positive and open attitude toward intercultural communication, considered fundamental for intercultural communicative behaviors to occur. Concerning intercultural communicative knowledge, the research emphasizes evaluating the objective information university students possess related to intercultural communication, such as language, culture, and communication knowledge. Intercultural communicative skills are the direct manifestations of intercultural communication. Assessing university students' proficiency in intercultural communication involves examining their flexible use of skills to achieve effective and appropriate communication goals as per the communication context.

Methodology

Instruments

This study employed the "Global Hybrid Classroom Learning Survey," developed by the Tsinghua University Global Hybrid Classroom Research Group. The survey is available in both Chinese and English versions, containing identical content, enabling respondents to choose based on their language preference. The questionnaire encompasses three sections: basic information, online teaching contexts, and ICC. (1) Basic information about the participants includes gender, age, educational institution, academic level, major, and nationality, among other factors. (2) The Online Teaching Context Characteristics Scale aids in elucidating the situational features of intercultural online classrooms. It includes three dimensions: the individual dimension comprises self-regulated learning and information literacy, the interpersonal dimension involves social immediacy, teaching scaffolding, and instructional interaction strategies, and the systemic dimension incorporates teaching systems and technological support. (3) The Intercultural Communicative Competence Scale is structured around three dimensions: intercultural communicative attitudes, intercultural communicative knowledge, and intercultural communicative skills. The questionnaire primarily consists of single-choice questions in the basic information section. The Likert five-point scale was applied for the Online Teaching Context Characteristics Scale (*Cronbach's* $\alpha=0.919$, *KMO*=0.831) and the Intercultural Communicative Competence Scale (*Cronbach's* $\alpha=0.949$, *KMO*=0.933).

Sample Population and Sampling Techniques

The target population for this study comprises students enrolled in Tsinghua University's Global Hybrid Classroom. Launched in the spring semester of 2021, this educational initiative represents Tsinghua

University's endeavor in educational reform. It enables Tsinghua students to attend classes concurrently with high-achieving students from overseas universities through live online sessions, with the option for credit recognition for completed coursework (Tsinghua University, 2021). The program offers 49 courses and has attracted more than 400 international learners, along with over 70 Tsinghua students.

In this study, questionnaires were distributed to all enrolled students, and subsequently, a total of 141 valid responses were collected through online surveys. Table 1 presents the demographic characteristics of the sample. In terms of gender distribution, males constituted 61.7%, while females constituted 38.3%. The age distribution primarily fell

within the 19-25 age range, aligning with the typical age of university students. Academic levels varied, with undergraduates accounting for 45.4%, master's students comprising 32.6%, and doctoral students making up 22%. Participants were categorized into two fields of study: Humanities and Social Sciences (41.1%) and Science, Engineering, Agriculture, and Medicine (58.9%). Regarding university distribution, 76.6% of the participants represented Tsinghua University, while the remainder hailed from institutions such as Nanyang Technological University, University of Chile, and Saint Petersburg State University, representing various regions across Asia, South America, and Europe. The distribution of demographic variables within the sample aligns with the overall population distribution.

Table 1
Sample distribution

Demographic Variables	Type	Number	Percentage (%)
Gender	Male	87	61.7
	Female	54	38.3
Age	Below 18 years	3	2.1
	19-25 years	110	78
	26-35 years	21	14.9
	Above 35 years	7	4
Academic Level	Undergraduate	64	45.4
	Master	46	32.6
	Doctor	31	22
Field of Study	Humanities and Social Sciences	58	41.1
	Science, Engineering, Agriculture, and Medicine	83	58.9
University	Tsinghua University	108	76.6
	Nanyang Technological University	8	5.7
	University of Chile	5	3.5
	Chulalongkorn University	2	1.4
	Saint Petersburg State University	2	1.4
	Chinese University of Hong Kong	2	1.4
	Other	14	9.9

Analysis Method

This study employed descriptive statistical analysis and regression analysis methods. Initially, an examination was conducted to analyze the current status of ICC among university students within online teaching contexts. Additionally, the study investigated the ICC among university students concerning various demographic characteristics. Building upon this groundwork, regression analysis was employed, with university students' ICC as the dependent variable. This analysis aimed to explore the influence of diverse characteristics within online teaching contexts on ICC. Furthermore, several control variables such as age, gender, nationality, university, academic level, and field of study were incorporated to account for fixed effects. Both the descriptive statistical analysis and regression analysis were conducted using the SPSS software.

Results

ICC of College Students in Online Learning Context

In the context of online teaching, the average ICC of university students is 4.06, as indicated by a single-sample t-test that significantly exceeds the median of 3 ($p=0.000<0.01$). This suggests that, overall, university students in online teaching environments possess a relatively high level of ICC. Analyzing the results of individual measurement items for ICC, most students demonstrate a respectful and open attitude toward learners from other cultures, expressing

an interest in engaging with new cultures. The majority of students exhibit a keen awareness of cultural differences, recognizing how culture shapes their thoughts and behaviors. They are conscious of both the similarities and differences between themselves and other learners from diverse cultures. Moreover, students can transcend individualism and understand cultural differences from a cultural perspective, analyzing the variations in cultural styles, language use, values, ethics, and their impact on classroom performance. In general, university students in online teaching environments actively engage in interactions with learners from other cultures. They adjust their behavior to facilitate intercultural communication in the classroom, striving to act as communicators, coordinators, and facilitators in cross-cultural situations.

Based on the three dimensions of ICC, the data are classified and analyzed, as presented in Table 2. Notably, university students exhibit a prominent commonality of possessing an open intercultural communication attitude, a high level of intercultural communication knowledge, and essential intercultural communication skills. Intercultural communication attitude scores highest (mean=4.14), followed by intercultural communication knowledge (mean=4.050), with intercultural communication skills having the lowest mean (mean=3.99). This indicates that students' knowledge base and mastery of intercultural communication skills are slightly below their self-expectations, suggesting the potential for targeted learning and improvement.

Table 2

Statistical Overview of Intercultural Communication Attitude, Knowledge, and Skills

Dimension	Item	Content	Mean	Standard Deviation
Intercultural Communication Attitude			4.14	0.70
	Kwh1	I respect the ways people from different cultures behave	4.20	0.79
	Kwh2	I'm open-minded to learners from different cultures	4.25	0.77
	Kwh3	I'm interested in new cultural aspects (e.g., to understand the values, history, and traditions)	4.13	0.79
	Kwh9	I'm a culturally conditioned person with personal habits and preferences	3.96	0.90
Intercultural Communication Knowledge			4.05	0.69
	Kwh5	I understand cultural differences (e.g., regarding behaviours, values, attitudes, and styles) with learners from other cultures.	4.16	0.80
	Kwh7	I know differences and similarities across cultures of other learners and mine	4.10	0.08
	Kwh11	I think generalizing individual behaviors as representative of the whole culture is dangerous	3.84	0.09
Intercultural Communication Skills			3.99	0.71
	Kwh4	I'm willing to interact with learners from other cultures	4.17	0.76
	Kwh6	I adapt my behaviour to communicate appropriately with learners from other cultures	4.01	0.87
	Kwh8	I know varying cultural styles and language use, and their effect on class	4.10	0.81
	Kwh10	I perceive myself as a communicator, facilitator, or mediator, in an intercultural context	3.86	0.90
	Kwh12	I will analyze how my values and ethics were reflected in specific situations	3.84	0.09

ICC Among College Students With Different Demographic Characteristics

This study conducted T-tests to compare the ICC among college students with different demographic characteristics. In terms of gender, the average ICC score for males was 3.94, while for females, it was 4.24. The average ICC score for females

was significantly higher than that for males ($P=0.009$). Concerning intercultural communication attitudes, males scored an average of 4.02, while females scored an average of 4.32, indicating that females exhibited a significantly more positive and open attitude toward intercultural communication than males ($P=0.013$). In terms of intercultural communication

knowledge, males scored an average of 3.95, whereas females scored an average of 4.22, demonstrating that females possessed significantly richer intercultural knowledge than males ($P=0.022$). Regarding intercultural communication skills, males had an average score of 3.88, while females had an average score of 4.19, indicating that females demonstrated significantly higher intercultural communication skills than males ($P=0.010$). This suggests that females exhibited a greater mastery of intercultural communication skills, enabling them to adjust their behavior more effectively to achieve appropriate communication objectives.

Undergraduate students (mean=4.07) and graduate students (mean=4.05) showed no significant differences in their intercultural communication competence across academic levels ($P=0.891$). Analyzing intercultural communication attitudes, knowledge, and skills separately for different academic levels revealed that undergraduate students (mean=4.17) and graduate students (mean=4.11) exhibited no significant differences in their intercultural communication attitudes ($P=0.584$). Similarly,

undergraduate students (mean=4.03) and graduate students (mean=4.08) showed no significant differences in their intercultural communication knowledge ($P=0.658$), while undergraduate students (mean=4.01) and graduate students (mean=3.99) also demonstrated no significant differences in intercultural communication skills ($P=0.891$). This suggests that, within the context of online teaching, students from different academic levels displayed comparable levels of intercultural communication competence.

Additionally, there were no substantial differences observed in the comprehensive intercultural communication abilities between students majoring in humanities and social sciences (mean=4.09) and those in science, engineering, agriculture, and medicine (mean=4.02, $P=0.586$). Furthermore, when examining specific dimensions such as intercultural communication attitudes ($P=0.348$), knowledge ($P=0.432$), and skills ($P=0.969$), there were no significant differences observed. This indicates that there were no apparent disciplinary disparities in ICC among university students.

Table 3

Analysis of ICC among University Students with Different Demographic Characteristics

Demographic Variables	N	Mean	Standard Deviation	P Value
Male	87	3.94	0.075	0.009
Female	54	4.24	0.078	
Undergraduate students	64	4.07	0.668	0.891
Graduate students	77	4.05	0.674	
Humanities and social sciences	58	4.09	0.651	0.586
Science, engineering, agriculture, and medicine	83	4.02	0.068	

The Impact of Different Features in Online Teaching Contexts on ICC

Descriptive analysis elucidates the overall characteristics of college students' ICC and variations across different demographic groups. Building upon this foundation, the present study controls for fixed effects such as age, gender, nationality, institution, academic level, and major. A regression analysis model is then constructed to analyze the impact of various features in online teaching contexts on the ICC of college students, with the results of the regression analysis presented in Table 4.

Model 1 illustrates the overall impact of online teaching contexts on ICC. Information literacy, instructional scaffolding, and technological support significantly affect the ICC of college students, with instructional scaffolding being the most prominent factor. Model 2 depicts the impact of online teaching contexts on intercultural communication attitudes, where information literacy, instructional scaffolding, and technological support exhibit significant influences, with instructional scaffolding having the most pronounced effect. Model 3 illustrates the

influence of online teaching contexts on intercultural communication knowledge, where information literacy, instructional scaffolding, and technological support all have significant effects, with technological support being the most prominent, while the impacts of information literacy and instructional scaffolding are relatively weaker. Model 4 demonstrates the impact of online teaching contexts on intercultural communication skills, with information literacy, instructional scaffolding, and technological support significantly influencing intercultural communication knowledge, and instructional scaffolding having the most pronounced effect.

From the three dimensions of online teaching contexts, factors influencing the ICC of college students are primarily individual-level factors such as students' information literacy, interpersonal-level factors like instructional scaffolding, and institutional-level factors such as technological support. Factors such as students' self-regulated learning, interpersonal-level social presence, teaching interaction strategies, and institutional-level teaching systems have no significant impact on college students' ICC.

Table 4

Regression Analysis of the Impact of Online Teaching Context Features on ICC

Variables	Model 1 ICC	Model 2 ICC-Attitude	Model 3 ICC-Knowledge	Model 4 ICC-Skills
Personal Dimension				
Self-regulated Learning	-0.062 (0.112)	-0.117 (0.112)	-0.032 (0.116)	-0.037 0.125
Information Literacy	0.178** (0.083)	0.002* (0.097)	0.169* (0.922)	0.193** 0.087
Interpersonal Dimension				
Social Presence	0.091 (0.092)	0.113 (0.097)	0.099 (0.011)	0.070 0.097
Instructional Scaffolding	0.333*** (0.125)	0.279** (0.130)	0.311** (0.147)	0.389*** 0.137

Teaching Interaction Strategies	-0.012 (0.143)	0.100 (0.150)	-0.078 (0.159)	-0.061 0.154
Systemic Dimension				
Instructional Systems	-0.060 (0.130)	-0.021 (0.140)	-0.176 (0.159)	-0.020 0.130
Technological Support	0.365** (0.147)	0.259* (0.148)	0.473*** (0.171)	0.384** 0.159
Control Variables				
Age	0.000 (0.009)	0.002 (0.010)	0.003 (0.010)	0.006 0.009
Gender	0.174 (0.130)	0.146 (0.133)	0.124 (0.147)	0.023 0.136
Fixed Effects	√	√	√	√
Constant Term	0.505 (0.554)	0.747 (0.620)	1.039* (0.604)	-0.008 (0.587)
Sample Size	139	139	139	139
R-squared	0.653	0.632	0.567	0.661

Notes: *** $P < 0.01$, ** $P < 0.05$, * $P < 0.1$. The fixed effects include country, institution, academic level, and major.

Discussion

Firstly, prioritizing information literacy empowers students to engage in online intercultural communication. In the digital era, information literacy is a fundamental requirement for online learning (Hu et al., 2020). The process of communication involves encoding, decoding, and translating information. Sensitivity to receiving information, flexibility in processing information, and proficiency in technological application are all crucial factors influencing students' intercultural communication in online teaching contexts. This study found that information literacy significantly influences college students' ICC. Therefore, cultivating students' information literacy enables them to use information technology as a mediator to assist intercultural communication activities, continuously enhancing their

online ICC. Instructors and administrators can raise awareness of the importance of information literacy for participating in intercultural communication through methods such as course explanations, lectures, and information literacy assessments. They can also help students identify areas of insufficient information literacy and provide targeted improvement. In teaching, consciously guiding students to use information technology tools for intercultural communication activities and offering more opportunities for online intercultural communication enriches students' online intercultural communication experiences.

Secondly, emphasizing instructional design enhances students' willingness and engagement in communication. Well-designed classroom teaching is a critical factor in effectively promoting students' intercultural

communication. In classrooms composed of students from diverse backgrounds, intercultural communication is evident throughout the entire teaching process. How to redesign instructional design to facilitate the organic integration of student classroom learning and intercultural communication is a key breakthrough in increasing students' willingness and engagement. This study found that online scaffolding significantly influences students' intercultural communication attitudes, knowledge, and skills. Therefore, teachers need to provide targeted instructional scaffolding based on the characteristics of online teaching contexts and intercultural communication. By appropriately setting instructional tasks and ingeniously integrating communication requirements into teaching tasks, instructors can enhance students' willingness to communicate. For example, designing classroom tasks or course assignments that highlight professionalism and collaboration, using online group tools to create more communication opportunities, employing a progressive questioning strategy, supervising the ongoing communication in the classroom, and encouraging students to engage in intercultural communication can be integrated into evaluation criteria.

Thirdly, providing technological support enhances students' communication experience and effectiveness. Currently, online teaching is shifting from being "technology-centric" to being "learner-centric," requiring the use of technology to support learning and providing more technological assistance to students. Research shows that the online teaching model of individuality, participation, and productivity is an ideal form of technology-supported learning (Zeng, 2013). This study found that technological support in online teaching contexts significantly influences college students' ICC, with the most prominent impact on intercultural communication knowledge.

Cultural and language knowledge are major obstacles to intercultural communication, and online tools can enable students to fully utilize their self-regulated learning abilities to find and use cultural and language knowledge conducive to their online intercultural communication. Additionally, technological support can expand channels for knowledge transmission, facilitate the transfer and reception of communication information, shift online intercultural communication from knowledge-centric to communication-centric, and enhance students' communication experience and effectiveness. Therefore, instructors and administrators should provide students with more intercultural communication knowledge resources and online tools, such as websites that specialize in cultural knowledge and differences, user-friendly translation tools, multimedia tools, and online collaboration tools, optimizing the functionality settings within online classrooms. Additionally, specialized technical training should be conducted, and dedicated information support teams should be equipped to timely and effectively address technical challenges encountered by students during communication processes.

Conclusion and implications

In conclusion, this study sheds light on the ICC of college students in online learning environments. On average, students demonstrate a high level of ICC, signifying their ability to engage positively with learners from diverse cultures. The three dimensions of ICC—intercultural communication attitude, knowledge, and skills—are generally robust, although students express a marginally lower mastery of skills, indicating opportunities for targeted improvement. Demographically, females exhibit significantly higher ICC scores than males, and academic levels and disciplinary backgrounds do not yield

significant differences in ICC, indicating consistent competence levels across undergraduate and graduate students and different majors. The impact of online teaching features on ICC is evident, with instructional scaffolding being a significant influencer across all dimensions. Information literacy and technological support also play vital roles, emphasizing the importance of individual, interpersonal, and institutional factors in fostering ICC.

This study is subject to limitations and shortcomings due to constraints in data, analytical methods, and the academic capabilities of the researchers. It is hoped that future research can address and improve upon these limitations. Firstly, the study focused on students participating in the global integrated classroom initiative launched by Tsinghua University in 2021. The participant pool was relatively small, and both the sample size and variables were limited. From the collected data, it is evident that the majority of students are from prestigious universities such as Tsinghua University and Nanyang Technological University, leading to a tendency towards homogeneity in the sample. As a result, the research findings may not fully represent the current state of ICC among college students in all online teaching contexts.

In future research, expanding the scope of the questionnaire survey would be beneficial, enabling quantitative research results to better represent the ICC of students from various types and levels of universities. Additionally, introducing more independent variables (such as the proportion of students with open cameras, the frequency of teacher questions, duration of classroom discussions, etc.) and control variables (such as course categories, class size, student language proficiency, etc.) would enrich the data collected. Gathering

more experiential data would allow for a more in-depth theoretical interpretation of the mechanisms influencing ICC among college students in online teaching contexts.

Acknowledgement

This research is supported by National Natural Science Foundation of China (Grant No.62277034).

References

- Avgousti, M. I. (2018). Intercultural communicative competence and online exchanges: A systematic review. *Computer Assisted Language Learning*, 31(8), 819-853. <https://doi.org/10.1080/09588221.2018.1455713>
- Belz, J. A. (2003). Linguistic perspectives on the development of intercultural competence in telecollaboration. *Language, Learning and Technology*, 7(2), 68-117.
- Bingzhuan, P. (2021). Intercultural communicative competence teaching and assessment based on modern information technology. *International Journal of Emerging Technologies in Learning (iJET)*, 16(7), 175-190. <https://doi.org/10.3991/ijet.v16i07.21369>
- Byram, M. (2021). *Teaching and assessing intercultural communicative competence: Revisited*. Multilingual Matters. <https://doi.org/10.21832/9781800410251>
- Chen, G. M. (1990). Intercultural communication competence: Some perspectives of research. *Howard Journal of Communications*, 2(3), 243-261.
- Chun, D. M. (2011). Developing intercultural communicative competence through online exchanges. *Calico journal*, 28(2), 392-419. <https://doi.org/10.11139/cj.28.2.392-419>
- Deardorff, D. (2006). Identification and assessment of intercultural competence as a student outcome of internationalization. *Journal of Studies in International Education*, 10(3), 241-266. <https://doi.org/10.1177/1028315306287002>
- Deardorff, D. K. (2019). *Manual for developing intercultural competencies: Story circles*. Routledge. <https://doi.org/10.4324/9780429244612>
- Ghasemi Mighani, M., Yazdani Moghaddam, M., & Mohseni, A. (2020). Interculturalizing English language teaching: An attempt to build up intercultural communicative competence in English majors through an intercultural course. *Journal of Modern Research in English Language Studies*, 7(2), 77-100. <https://doi.org/10.30479/jmrels.2020.11474.1426>
- Gudykunst, W. D. (1995). Anxiety/uncertainty management (AUM) theory: Current status. In R. L. Wiseman (Ed.), *Intercultural communication theory* (pp. 8-58). Sage Publications, Inc.
- Heggernes, S. L. (2021). A critical review of the role of texts in fostering Intercultural Communicative competence in the English language classroom. *Educational Research Review*, 33, 100390. <https://doi.org/10.1016/j.edurev.2021.100390>
- Hoff, H. E. (2020). The evolution of intercultural communicative competence: Conceptualisations, critiques and consequences for 21st-century classroom practice. *Intercultural Communication Education*, 3(2), 55-74. <https://doi.org/10.29140/ice.v3n2.264>
- Hu, X., Xu, H., & Chen, Z. (2020). An empirical study on the relationship between learners' information literacy, online learning engagement, and learning performance. *China Educational Technology*, 2020(03), 77-84.
- Huang, L. J. D. (2021). Developing intercultural communicative competence in foreign language classrooms—A study of EFL learners in Taiwan. *International Journal of Intercultural Relations*, 83, 55-66. <https://doi.org/10.1016/j.ijintrel.2021.04.015>
- Hymes, D. (1972). *On communicative competence*. Oxford University Press.
- Iswandari, Y. A., & Ardi, P. (2022). Intercultural communicative competence in EFL setting: A systematic review. *REFlections*, 29(2), 361-380. <https://doi.org/10.61508/refl.v29i2.260249>

- Jin, S. (2015). Using Facebook to promote Korean EFL learners' intercultural competence. *Language, Learning and Technology, 19*(3), 38-51.
- Lázár, I. (2015). EFL learners' intercultural competence development in an international web collaboration project. *The Language Learning Journal, 43*(2), 208-221. <https://doi.org/10.1080/09571736.2013.869941>
- Lee, L. (2009). Promoting intercultural exchanges with blogs and podcasting: A study of Spanish-American telecollaboration. *Computer Assisted Language Learning, 22*(5), 425-443. <https://doi.org/10.1080/09588220903345184>
- Leng, J., Fang, W., & Li, L. (2021). Analysis of cross-cultural communication abilities of college students in online environments—Reflections on a Sino-US virtual collaborative project in the post-pandemic era. *Modern Educational Technology, 31*(11), 111-118.
- Litvinova, T., Andriutsa, N., & Movchun, V. (2021). Developing students' intercultural communicative competence through online learning. *International Journal of Emerging Technologies in Learning 16*(8), 162. <https://doi.org/10.3991/ijet.v16i08.18947>
- Megawati, I., Widodo, P., Ashadi, & Triastuti, A. (2020). Teacher's cognition of intercultural communicative competence in Indonesia EFL context. *Elementary Education Online, 19*(2), 42-49.
- Moos, R. H. (1979). Educational climates. In R. J. Walberg (Ed.), *Educational environments and effects: Evaluation, policy, and productivity* (pp. 82-84). McCutchan Publishing Corporation.
- Moos, R. H. (1979). *Evaluating educational environments: Procedures, measures, findings, and policy implications*. Jossey-Bass.
- O'Dowd, R. (2003). Understanding the "other side": Intercultural learning in a Spanish-English e-mail exchange. *Language, Learning & Technology, 7*(2), 118-144.
- Spitzberg, B. H. (2000). A model of intercultural communication competence. *Intercultural communication: A reader, 9*, 375-387.
- Tsinghua University Lifelong Education Office. (2021, February 25). Tsinghua University launches global blended classroom project. [Online]. Retrieved from <https://www.tsinghua.edu.cn/info/1181/60131.htm>
- Wang, X., & Guo, S. (2022). Practices and implications of blended online-offline teaching at Tsinghua University. *Modern Educational Technology, 32*(04), 106-112.
- Ware, P. D., & Kramsch, C. (2005). Toward an intercultural stance: Teaching German and English through telecollaboration. *The Modern Language Journal, 89*(2), 190-205. <https://doi.org/10.1111/j.1540-4781.2005.00274.x>
- Yang, J., & Mao, Y. (2011). An empirical study of Sino-US cross-cultural network collaborative learning. *Journal of Distance Education, 29*(02), 56-61. <https://doi.org/10.15881/j.cnki.cn33-1304/g4.2011.02.005>
- Yang, Q., & Ma, W. (2021). Long-distance internationalization: An examination of the third type of higher education internationalization. *Higher Education Exploration, 2021*(11), 5-12.
- Zeng, W. (2013). Attention to 'knowledge creation': New demands for technology-supported learning. *e-Education Research, 34*(7), 17-21+52. <https://doi.org/10.13811/j.cnki.eer.2013.07.010>