

REVIEW ARTICLE

Exploring the impact of massive open online courses on enhancing intercultural communication competence: A systematic literature review

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ABSTRACT

With the rapid advancement of globalization, intercultural communication has become increasingly essential in political, economic, and cultural contexts. In this context, online learning has emerged as a key avenue for fostering Intercultural Communication Competence (ICC), as it overcomes constraints of time, location, cost, and eligibility, promotes the sharing of high-quality courses and advances educational equity. However, currently limited research has systematically explored how ICC can be effectively cultivated through MOOCs, especially based on empirical evidence. To address this gap, this study aims to explore the relationship between MOOCs and ICC through a Systematic Literature Review (SLR). The review analyzes selected articles retrieved from Scopus, Web of Science (WoS) and Education Resources Information Center (ERIC) using predefined inclusion and exclusion criteria. The findings show that authentic task-driven learning, technology-supported interaction, and experiential learning are key pathways to enhancing ICC. By breaking down geographical and cultural barriers and offering authentic tasks within intercultural communication environments, MOOCs provide students with effective opportunities to enhance their ICC through the integration of practical, culturally interactive learning tasks. This study concludes that MOOCs have significant potential in enhancing ICC within higher education. The insights derived from this review may guide future research and practice in integrating ICC-focused strategies into online learning environment.

Keywords: online learning; intercultural communication competence; MOOCs; systematic literature review; higher education

1. Introduction

In today's increasingly globalized society, cultural diversity has become a norm in both educational and professional settings. In multicultural contexts, effective communication, cultural appreciation, and mutual respect are considered key factors for achieving collaboration and knowledge sharing^[1]. However, significant differences in language, values, and behaviors continue to create numerous barriers to intercultural communication in international learning and work environments^[2]. At the same time, the modern job market places growing importance on soft skills—such as communication and teamwork—which are often critical for employment but frequently underdeveloped among graduates. When students possess both technical

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knowledge and the soft skills needed by industry, their employability improves significantly^[3]. Therefore, Intercultural Communicative Competence (ICC) is regarded as an essential skill for addressing cultural differences and enhancing students' global competence.

As the pace of digitalization accelerates, research on ICC has been continuously expanding. Studies have shown that in higher education, the interaction frequency between domestic and international students remains insufficient^[4], and studying abroad is not an option that all students can afford or participate in^[5]. Online learning is now recognized as an essential component of modern education. It is believed to help learners generate content, collaborate with others through both synchronous and asynchronous virtual exchanges, assess each other's work, and engage in peer learning. Students are connected across spatial and temporal boundaries, fostering the development of ICC^[6]. In the search for appropriate methods, many scholars are turning to online learning approaches to foster ICC^[7].

There are many influential models of ICC in different disciplines, and the field has been developing continuously. Byram's model is one of the classical frameworks in this field. This model highlights that ICC goes beyond the mastery of grammar and vocabulary. Beyond linguistic competence, it involves the cultivation of learners' attitudes, knowledge, skills of interpreting and relating, skills of discovery and interaction, and critical cultural awareness^[8]. These elements together help people communicate appropriately and effectively with those from different cultural backgrounds.

Massive Open Online Courses (MOOCs) are considered a potential tool to enhance students' ICC due to their openness, flexibility, and high accessibility. MOOCs not only break down the resource and geographical limitations of traditional education but also provide a platform for presenting and sharing intercultural content^[8]. The United Nations Educational, Scientific and Cultural Organization (UNESCO) also emphasized in the Open Science Recommendations (2021) that open educational resources are a key approach to achieving equitable access to knowledge^[9].

However, few studies have employed keyword searches to review academic articles, especially collect and analyze empirical data specifically on teaching topics related to intercultural communicative competence through MOOCs^[1]. Therefore, this study aims to identify the characteristics of published scientific literature on this topic and explore emerging themes in MOOCs and ICC research. Additionally, this research will contribute valuable insights to the development of the literature system in this field.

2. Methods

A systematic literature review (SLR) was adopted as the methodology. A systematic literature review (SLR) is a methodology used to find and aggregate all relevant existing evidence about a specific research question of interest^[10]. The SLR method can deal with issues such as the lack of methodological references^[11]. Important decisions need to be made at several stages in the review process, including search of the literature, identification and selection of relevant primary studies. The focus is on high-quality publications to ensure the consistency and reliability of the data, thereby gaining a theoretical understanding of the research field's development^[12].

Using the SLR methodology, this study systematically reviewed and synthesized research related to online learning and intercultural communicative competence (ICC), particularly focusing on empirical studies conducted on students in universities and vocational colleges. This study consists of four stages, namely identification, screening, eligibility and inclusion. Articles are sourced from Scopus, WoS and the Education Resources Information Center (ERIC).

2.1. Identification

In a SLR, the identification involves the process of using systematic search strategies to identify relevant sources^[13]. Keyword selection is a critical step in a systematic literature review, directly impacting the efficiency of literature retrieval and the comprehensiveness of the review, and different researchers may use different terms to describe the same concept^[14].

In this study, the keyword ‘online Learning and ICC’ was selected by the authors to broaden the scope of the review and avoid potential omissions. This approach ensures a more comprehensive inclusion of studies related to the topic, regardless of the specific modality employed. Considering synonyms and variations, Boolean operators were used, and keywords were connected using AND and OR to generate detailed search results and inclusion criteria. **Table 1** below lists the search terms used in the study, while **Table 2** presents the eligibility and exclusion criteria in this research.

Table 1. Search terms for articles.

Database	keywords	Identified	Include
Scopus	ALL= ("online learning" OR "e-learning" OR "virtual learning" OR "digital learning")	986	19
WoS	AND ("intercultural communication competence" OR "intercultural competence" OR "cross-cultural communication" OR "cultural awareness")	121	4
ERIC	Using precise keywords, as well as Boolean operators, phrase searches, and field code functions (either collectively or individually) as necessary	297	9
Total		1404	32

Table 2. The eligibility and exclusion criteria.

Criterion	Eligibility	Exclusion
Type of literature	Research article	Book, book series, chapter in book, systematic review articles, conference proceeding
Language	English	Non-English
Year	2016 to 2024	2015 and earlier, or after 2024
Country	World	-

2.2. Screening

Screening plays a crucial role in a SLR by ensuring data relevance and quality. It helps to filter studies using clear inclusion and exclusion criteria, which significantly influences the validity of the review^[11].

2.3. Eligibility

Eligibility refers to the process conducted to determine whether the selected studies were appropriate and aligned with the predefined eligibility criteria of this research^[15]. This process involved identifying high-quality and relevant articles to be included in the SLR, thereby ensuring the accuracy, validity, and reliability of the findings.

2.4. Quality assessment of articles

Quality assessment was carried out to evaluate the methodological rigor, relevance, and reliability of the selected articles^[16]. This step aimed to ensure that only high-quality research was included in the final analysis, thereby enhancing the credibility and validity of the review’s findings. The study extracted data from selected articles, including methods, samples, findings, and viewpoints. Based on the search results using the method, a total of 1,404 items were found. Among them, 1,081 papers were excluded due to

inconsistent publication years, mismatch with the review type, or being written in a non-English language. Subsequently, 291 papers were disqualified due to duplicated records, irrelevance to the research topic, or incomplete literature, including studies that focused on teachers, non-tertiary students, primary and secondary education, or those unrelated to intercultural communicative competence. Finally, 32 papers met the research objectives and were selected for analysis. **Figure 1** below shows the flowchart of the research selection process.

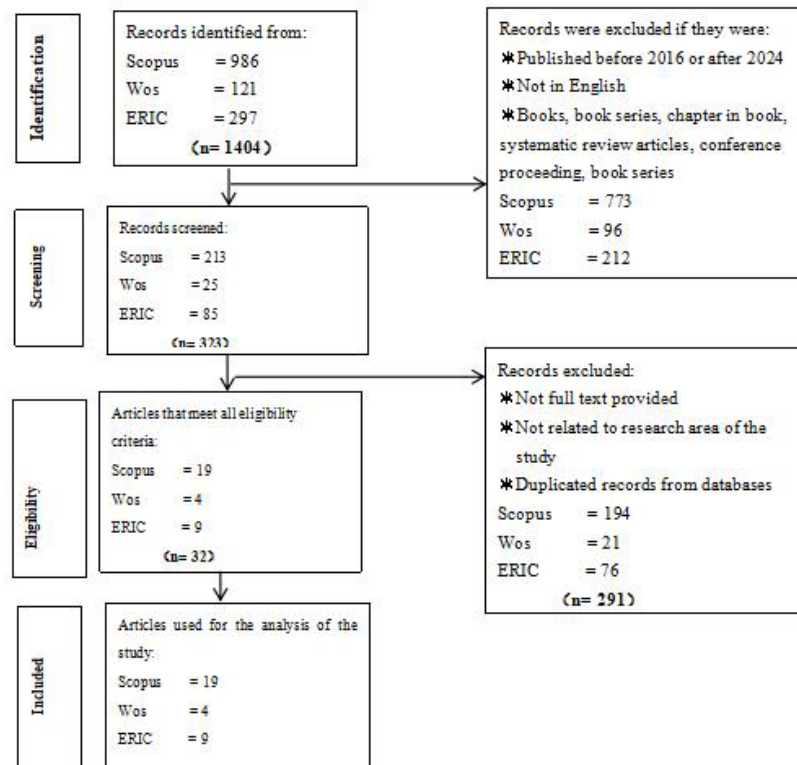


Figure 1. Flowchart of the study selection process.

3. Results and discussion

A total of 32 studies focusing on online learning and intercultural communicative competence (ICC) were included in this systematic literature review. The below **Table 3** presents 32 recent studies, highlighting their main findings and technologies, tools, or interventions employed.

Table 3. Summary of 32 studies on online learning and intercultural communication.

Author(s) and year	Main findings	Technologies, tools, or interventions employed
Akbaba & Başkan ^[17] , 2017	Students found the virtual learning environment meaningful, reporting that it enriched their understanding of Turkish politics and culture and fostered the development of intercultural skills through interaction with international peers.	Online discussion: Skype
Ambrose et al. ^[18] , 2017	Both groups enhanced their intercultural communicative competence through cultural exchange, relationship building, and exposure to diverse perspectives, despite differing experiences with the tools.	Intercultural peer group collaboration: Facebook, Skype, and Webchat 2.0

Author(s) and year	Main findings	Technologies, tools, or interventions employed
Asojo et al. ^[19] , 2019	It enhanced their intercultural communicative competence (ICC) by raising cultural sensitivity and stressing the need for in-depth cultural research. Diverse peer feedback further enriched their communication skills and learning experience.	Six-week collaborative online learning: WebEx online meeting platform, and online digital resources
Bachelor et al. ^[20] , 2022	Students in the online experimental group who participated in task-supported role-plays outperformed those in the control group, demonstrating that task-supported approaches can enhance ICC in online language learning.	Task-based online learning, online role-playing simulates real-life scenarios, and does not mention what digital platform is used
Cabedo-Mas et al. ^[21] , 2023	The study found that online learning, when combined with appropriate instructional strategies, can effectively promote students' ICC.	Music course: using LMS to provide pre-class materials and support asynchronous learning, along with video conferencing and other digital tools.
Chan et al. ^[22] , 2024	A case-based online flipped classroom, supported by a comprehensive set of activities, creates a rich digital learning environment and enhances students' intercultural awareness.	A range of online activities were integrated into the nursing curriculum, such as flipped classrooms featuring case studies, online workshops, virtual home assessment simulations, interactive forums, and quizzes.
Chen & Du ^[23] , 2022	Studies have shown that the experimental group performed better in the project, particularly in terms of intercultural awareness. The online collaboration component helped students gain deeper insights into inter culture knowledge.	Chinese language course: WeChat app
Collins ^[24] , 2022	Virtual exchange effectively enhanced students' ICC and critical reflection skills. Some students found online learning more impactful than traditional methods, while others perceived no significant change.	Five-week collaborative online international learning using tools like Canvas, Zoom, and WhatsApp, and create an online learning community.
Drajati et al. ^[25] , 2024	The findings indicate that effective English communication can be promoted, and learners' ICC can be developed through engagement in various forms of digital interaction.	A six-month informal digital English learning (IDLE) program involving video consumption, online communication, and reflective diary writing, supported by platforms such as Facebook, WhatsApp, and Moodle.
Ennis et al. ^[26] , 2021	Remote collaboration showed strong potential in enhancing language learning and ICC. Students found the experience meaningful, especially valuing peer interaction and feedback. The project deepened their understanding of intercultural communication, with suggestions to streamline future activities on a single platform.	Telecollaboration: Moodle and Zoom platforms
Howard et al. ^[27] , 2017	Both groups improved their intercultural communicative competence; abroad students gained greater global awareness, while online students demonstrated stronger intercultural sensitivity and social responsibility.	Collaboration and interaction: Adobe Connect and other web conferencing tools
Howard et al. ^[28] , 2023	Collaborative experiences provided students with skills and insights valuable for their future careers, enhanced their ICC, and improved their communication and leadership abilities in diverse settings.	Virtual classrooms, online international courses, started with OpenQWAQ, then Moodle and Zoom, for nine weeks per semester since 2014

Author(s) and year	Main findings	Technologies, tools, or interventions employed
Kiegaldie et al. ^[29] , 2022	It enhanced students' global engagement and ICC.	An online international cooperative learning program incorporating four intervention measures: the VGC Virtual Global Classroom, Microsoft Teams platform, and virtual reality/virtual simulation (VR/vSIM) scenario-based learning.
Krishnan et al. ^[30] , 2022	All American students and 80% of Indian students improved their ICC scores. The study suggests that virtual intercultural exchange could be a good alternative to traditional study abroad programs	Online communication and learning activities
Lee ^[31] , 2020	Most students believed that the course enhanced their practical English communication and intercultural communicative competence. They welcomed the opportunity to interact in English with peers from different cultural backgrounds.	A remote intercultural English course incorporating video conferencing, collaborative projects, and mixed-mode discussions, conducted through Waseda Moodle with support from LiveOn and Skype.
Li et al. ^[32] , 2024	Although no significant gains in intercultural competence were found in the quantitative data, qualitative findings showed that MOOC TA adapted students intercultural communication to engage with diverse participants. The program highlighted online learning as a valuable, low-cost way to develop global and intercultural skills.	MOOC
Lisa Law et al. ^[33] , 2019	Online platforms like SPOC can effectively promote students' intercultural learning and enhance their ICC.	Small Private Online Courses (SPOCs)
Louahala ^[34] , 2023	Online education proving potentially more effective than traditional methods in fostering ICC. students generally held positive attitudes toward online interaction, recognizing its role in developing intercultural competence. These exchanges supported language growth and cultural awareness.	Online exchange: Moodle, Zoom, facebook and whatsapp
Machwate et al. ^[35] , 2021	This study demonstrated that virtual exchange is a valuable tool for enhancing students' language skills, digital literacy and ICC.	Four-week online course on key intercultural topics: Students collaborated remotely through group discussions and projects using Moodle, with Zoom, WhatsApp, and Padlet as supplementary tools.
Min & Atan ^[36] , 2024	Integrating authentic e-learning strategies can significantly enhance students' performance and cognition in English intercultural learning. Students in the experimental group showed marked improvements across various indicators, including engagement, contribution, and task completion rates.	Thirteen-week online English intercultural course using the Chaoxing MOOC learning platform, featuring group discussions, information gathering, online interaction, and group reflection.
Nowak et al. ^[37] , 2023	The findings indicate that COIL can effectively foster students' sense of belonging and enhance their ICC.	Collaborative online international learning (COIL): uses interactive tools such as Padlet and MyMaps
Prosser et al. ^[38] , 2021	Low-cost online peer-mentoring education can effectively foster medical students' reflective abilities and ICC.	E-learning program with online discussions on mental health clinical cases.

Author(s) and year	Main findings	Technologies, tools, or interventions employed
Rezai ^[39] , 2023	Engaging in informal digital learning can enhance learners' ICC and their willingness to use English in conversations.	Social media and online games
Rodríguez-Arancón et al. ^[40] , 2023	The findings demonstrate that both language proficiency and intercultural competence can be improved.	Online course using Didactic Audiovisual Translation technology
Shen ^[41] , 2021	Students reported positive experiences in enhancing their ICC, highlighting the value of working in international teams and its impact on their understanding of different cultures.	A series of online tools and platforms including Moodle, Ding talk, MOOC, Wechat, BBS
Shih ^[42] , 2017	This approach allowed students to interact with peers from different countries and facilitated discussions on cultural topics. Students reported improvements in their ICC.	Intercultural communication course: EngSite platform
Siergiejczyk ^[43] , 2020	The program enhanced students' ICC while also promoting inclusivity and diversity within the learning environment.	Virtual international exchange project: using digital platforms such as MOOC, Zoom, and WhatsApp.
Sozer et al. ^[44] , 2024	E-learning offers significant benefits for intercultural learning among learners of Turkish as a foreign language, helping to enhance their intercultural awareness.	Ana Dil Turkce "platform, which offers free online Turkish education
Stahl et al. ^[45] , 2024	Both groups showed significant improvement in intercultural communicative competence (ICC). Asynchronous virtual learning can be as effective as traditional classroom instruction.	Virtual online language learning
Taskiran ^[46] , 2020	Studies have shown that remote collaboration enhances students' motivation and cultural understanding, while fostering the development of their language abilities and intercultural competence.	Five-week remote collaborative language learning project with Edmodo and WeChat
Zhang & Romero-Forteza ^[47] , 2024	Students held positive views about using social media to learn Spanish, finding it helpful for improving language skills and enhancing cultural awareness.	Social media platforms such as Red note and bilibili
Zheng et al. ^[48] , 2022	American students showed significant improvement in intercultural competence, demonstrating that virtual exchange programs can make a substantial contribution to students' intercultural learning.	Virtual exchange program

Table 3. (Continued)

3.1. Growing interest in online learning and ICC

Figure 2 below shows the distribution of 32 included publications from 2016 to 2024. The distribution of included articles shows a clear upward trend after the COVID-19 pandemic. This trend suggests a growing academic interest in the intersection.

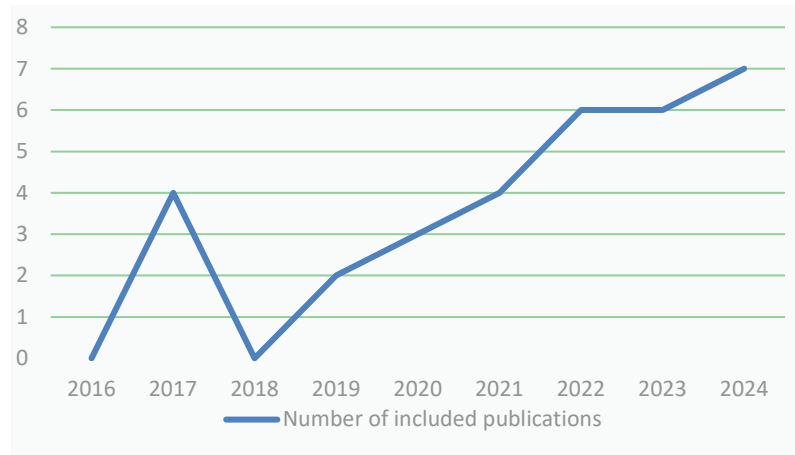


Figure 2. Distribution of publication years.

The majority of the studies focused on undergraduate students as their primary research participants, covering a range of second language learning contexts, including English, Spanish, Chinese, Turkish and Italian^[20,23,31,41,44-46]. In addition to language learning, several studies have embedded ICC into non-language-specific professional courses, particularly in disciplines such as nursing, design, politics and education^[17,19,21,22,25,29,38]. For example, ICC was integrated through cultural sensitivity training in healthcare service^[38], communication and coordination in global health collaborations^[29], and the promotion of cultural inclusiveness in teacher education programs^[25]. This trend indicates that ICC has gradually evolved from a concept exclusive to language education into a core competence across a variety of disciplinary and professional contexts.

While most studies involved undergraduates, a small number included postgraduate and doctoral students^[30,40], reflecting a growing recognition of ICC as a shared concern across disciplines and educational levels. Many of the projects adopted international collaborative formats, placing students from different countries in authentic intercultural interaction scenarios^[17-19,24,26,27,31,35,38,41,43,46,48]. This demonstrates a strong commitment to the practice of Internationalization at Home—enabling students to engage in meaningful intercultural experiences without the need to study abroad.

3.2. The effectiveness of online learning in promoting intercultural communicative competence

Most studies consistently indicate that online learning has a significant positive impact on the development of students' ICC. Well-designed online instruction and the integration of various platforms such as MOOCs and BBS can enhance intercultural knowledge and skills^[41]. Through interactions with peers from diverse cultural backgrounds, students enhance their understanding of cultural differences and develop greater cultural awareness and intercultural sensitivity^[19,22,23]. At the same time, the online environment provides authentic contexts for language practice, which supports improvements in language proficiency and fosters global engagement and a sense of social responsibility in intercultural communication^[20,23,25,27,32-36,39,43-47]. Additionally, research has shown that students engaged in virtual exchanges often demonstrate stronger critical reflection skills and greater adaptability in multicultural settings^[17,22-29,31,34,37,38,43,44,46,47].

These improvements are not only attributed to intercultural interaction itself but are also closely linked to the specific instructional activities embedded in course design. Strategies such as task-based collaboration and reflective writing have proven effective in promoting students' cognitive engagement and intercultural practice^[17,19,25,28,29,31,35,36,40,41,46]. Role-playing, in particular, allows students to simulate real-life

communicative scenarios and engage with cultural content from alternative perspectives, thereby enhancing their intercultural understanding^[20]. Meanwhile, open platforms such as MOOCs and SPOCs offer accessible and low-cost opportunities for students who are unable to participate in traditional study abroad programs, making them valuable channels for ICC development^[22,32].

3.3. Use of diverse tools and platforms in online ICC studies

In terms of intervention technology, the research shows a trend of multi-platform parallel use. Most studies employed a combination of collaborative platforms and communication tools such as Zoom, Skype, WhatsApp, Moodle, and Padlet to support synchronous and asynchronous activities, enabling intercultural communication and project collaboration^[18,25,28,34,35,41,43].

Virtual exchange and Collaborative Online International Learning (COIL) were adopted as key intervention approaches. These studies emphasized intercultural learning through authentic yet virtual settings^[24,25,34,35,43,48].

MOOCs and customized platforms were used to support large-scale or discipline-specific ICC learning, particularly in fields such as medicine, tourism, and language education^[32,36,40,41,43].

Social media tools were applied in informal or extracurricular learning environments. Platforms such as Facebook, WhatsApp, Bilibili, Ding Talk, and Rednote were used to enhance language practice and cultural awareness^[18,23,41,43,47].

Immersive technologies such as VR and vSIM were used to strengthen situational awareness. A small number of studies applied these tools to help students experience cultural differences in professional settings^[29].

Zoom was the most frequently used platform, followed by Moodle and MOOC/SPOC.

The below **Figure 3** and **Table 4** highlight the most frequently utilized tools and platforms used in online ICC studies.

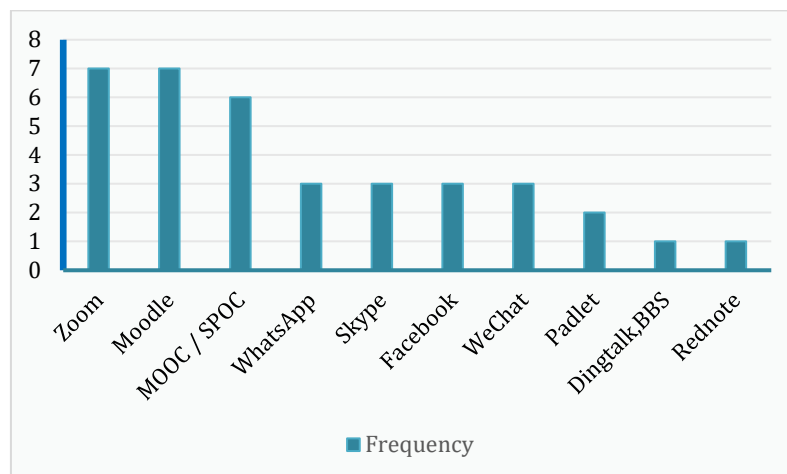


Figure 3. Frequently utilized tools and platforms.

Table 4. Most frequently used tools and platforms in online ICC studies.

Tools/Platforms	Frequency	Author(s) and year
Zoom	7	Collins ^[24] , 2022; Ennis et al. ^[26] , 2021; Howard et al. ^[28] , 2023; Louahala ^[34] , 2023; Machwate et al. ^[35] , 2021; Shen ^[41] 2021; Siergiejczyk ^[43] , 2020
Moodle	7	Drajati et al. ^[25] , 2024; Ennis et al. ^[26] , 2021; Howard et al. ^[28] , 2023; Lee ^[31] , 2020; Louahala ^[34] , 2023; Machwate et al. ^[35] , 2021; Shen ^[41] , 2021
MOOC / SPOC	5	Li et al. ^[32] , 2024; Min & Atan ^[36] , 2024; Rodríguez-Arancón et al. ^[40] , 2023; Shen ^[41] , 2021; Siergiejczyk ^[43] , 2020
WhatsApp	3	Collins ^[24] , 2022; Machwate et al. ^[35] , 2021; Siergiejczyk ^[43] , 2020
Skype	3	Akbaba & Başkan ^[17] , 2017; Ambrose et al. ^[18] , 2017; Collins ^[25] , 2022
Facebook	3	Ambrose et al. ^[18] , 2017; Drajati et al. ^[25] , 2024; Louahala ^[34] , 2023;
WeChat	3	Chen & Du ^[23] , 2022; Shen ^[41] 2021; Taskiran ^[46] , 2020
Padlet	2	Machwate et al. ^[35] , 2021; Nowak et al. ^[37] , 2023
Ding talk,BBS	1	Shen ^[41] , 2021
Rednote	1	Zhang & Romero- Forteza ^[47] , 2024

3.4. Research on MOOCs and ICC in online environments

Recent research has demonstrated that online environments are also effective in enhancing students' ICC, and that asynchronous virtual learning can be as effective as traditional classroom instruction^[45]. Although online learning has demonstrated significant potential, and many programs have adopted international collaboration models that place students from different countries in authentic intercultural settings, only a limited number of studies have explicitly examined open course formats such as MOOCs or SPOCs. Among the 32 reviewed studies, only five involved these formats^[32,36,40,41,43].

A study examined how Chinese and American university students enhanced their ICC through a global online service project based on a MOOC teaching assistant program. Although the quantitative surveys did not show significant improvements in ICC, qualitative interviews revealed that students, by interacting with learners worldwide in the MOOC environment, implicitly developed intercultural sensitivity and critical reflection skills through continuously adjusting communication strategies and overcoming cultural barriers. This implicit growth in ICC suggests that while MOOCs are virtual and decentralized in form, they still provide an important platform for intercultural learning by offering sustained, multicultural exposure^[32].

An online English intercultural learning project was conducted in Chinese vocational colleges using the Chaoxing MOOC learning platform. The project, which involved 92 vocational students majoring in tourism over a period of 13 weeks, incorporated nine authentic e-learning elements to simulate real-world professional tasks (such as acting as travel consultants) and validated the positive impact of MOOCs on students' ICC development. Through the Chaoxing MOOC platform, students engaged in authentic scenario-based tasks, including group discussions, information gathering, online communication with Malaysian tourists, and group reflection activities. Using pre-tests, post-tests, and qualitative interviews, the study assessed improvements in both ICC and language application skills. Results showed consistent improvement in student engagement, contribution quality, and task completion rates across all activities. Group discussions and online communications were particularly effective in promoting active participation, while information gathering and reflection activities significantly enhanced deep thinking and critical expression

abilities. Surveys and interview data also indicated that students highly valued the authenticity of the tasks, believing that simulating real-world professional scenarios, such as playing the role of a travel consultant, strengthened the relevance of their learning, improved their English proficiency, and boosted their ICC. The study emphasized that closely integrating real-world tasks with intercultural communication can effectively enhance students' engagement, contribution quality, communication skills, and global literacy for future careers. Students also pointed out challenges they faced, such as language barriers, time management difficulties, and the complexity of integrating multiple perspectives during online communication^[36].

A study conducted in Spain utilized an online language learning environment based on the MOOC model. By designing Didactic Audiovisual Translation (DAT) tasks, the study verified the effectiveness of promoting ICC development among second language learners through online platforms like MOOCs. Compared to traditional language teaching, DAT tasks not only helped students improve their language skills but also enabled them to experience the diversity and complexity of cultures through practical activities, thereby enhancing their respect for different cultures. This case demonstrates that incorporating practical and culturally interactive tasks into MOOC learning can effectively foster intercultural awareness and critical thinking, making it a powerful approach for developing ICC^[40].

A study conducted in China implemented an online Intercultural Communicative Competence (ICC) training model among English majors during the COVID-19 pandemic. Drawing on platforms such as MOOCs, Moodle, DingTalk, and social tools like WeChat and BBS, the model integrated culturally meaningful tasks across four stages: attitude development, knowledge construction, skills practice, and critical reflection. Students engaged in real intercultural interactions and reflective activities, which not only improved their intercultural knowledge and communication skills but also promoted self-directed learning and cultural sensitivity. The study demonstrated that combining structured pedagogy with diverse online platforms can create authentic intercultural experiences, making online learning an effective tool for developing ICC^[41].

Some scholars explored the development of ICC among American and Uzbek students through a Virtual International Exchange (VIE) project. The study particularly highlighted the use of current digital education technologies, such as MOOC platforms for sharing learning content, and tools like Zoom and Skype for real-time community discussions. Although the project was categorized as a VIE, its instructional design fully integrated the open-resource sharing features of MOOCs with online communication environments. The findings showed that through real-time interactions and cultural discussions on platforms combining MOOCs and synchronous communication, students were able to break cultural biases and strengthen their intercultural empathy and adaptability. This research suggests that integrating MOOCs with synchronous interaction can effectively foster ICC, and that MOOCs are not only knowledge dissemination tools but also important systems supporting the development of ICC^[43]. **Table 5** below presents the studies on MOOC and ICC development.

Table 5. Overview of studies on MOOCs and ICC development.

Publications	Participants	Learning Activities	Approach to enhancing ICC	Key features
Li et al. ^[32] , 2024	Students as MOOC teaching assistants (China and USA)	Online teaching assistant services and global learner interactions	Enhancing ICC implicitly through real service experience and communication strategy adjustment	ICC development mainly reflected through qualitative changes, emphasizing self-adjustment and cultural adaptation in service

Publications	Participants	Learning Activities	Approach to enhancing ICC	Key features
Min & Atan ^[36] , 2024	Chinese vocational college tourism students	Authentic professional task simulations via Chaoxing platform	Deepening ICC through authentic tasks and reflective activities	Systematically integrated authentic elements, Significantly enhancing ICC and critical thinking linked to professional skills
Rodríguez-Arancón et al. ^[40] , 2023	Second language (L2) English learners	Didactic Audiovisual Translation (DAT) tasks	Promoting ICC explicitly through cultural research and reflection within translation tasks	Demonstrated clear growth in cultural awareness; practice-oriented learning effectively fostered ICC
Shen ^[41] , 2021	Second-year English majors at a Chinese university	Moodle learning, virtual online communication, reflection and practice tasks	Promoting ICC, and strong gains in intercultural knowledge and skills	Used diverse digital tools and platforms to create immersive and authentic intercultural experiences; focus on curriculum involvement
Siergiejczyk ^[43] , 2020	American and Uzbek students	Virtual International Exchange (VIE), real-time cultural discussions	Promoting ICC development through synchronous interaction and cultural exchange	Integrated MOOC resources with real-time exchanges, effectively strengthening students' ICC

Table 5. (Continued)

These five studies collectively demonstrate that with the advancement of globalization and digital education, MOOCs have provided valuable platforms for cross-regional and multicultural interaction, thereby having a positive impact on the development of ICC.

Although specific instructional design elements vary across studies, these studies share several common features in promoting ICC. First, they all emphasize the importance of authentic interaction and project-based practice. Whether through teaching assistant services, translation tasks, or project-based assignments, the focus consistently remains on real-world engagement rather than relying solely on traditional language instruction. Second, online technological platforms are shown to play a crucial role in supporting intercultural communication. Third, all five studies highlight the role of experiential learning in fostering progressive ICC development, moving beyond conventional input-driven approaches.

However, notable differences exist among the five studies. In contrast, one study emphasized self-reflection processes^[43], while another study systematically integrated nine authentic learning elements, closely linking the development of ICC with future professional applications^[36]. Furthermore, the third study reported implicit yet significant improvements in ICC, highlighting the importance of self-adjustment during service activities^[32]. The fourth study centers on the pedagogical design of course activities^[41]. Meanwhile, the fifth study concentrated on translation practices combined with cultural input and quantitatively detected growth in cultural awareness^[40]. Additionally, the target populations varied across studies: some focused on teaching assistants (TAs)^[32], others on L2 learners^[40,41], and some on students majoring in tourism^[36]. These differences in participant backgrounds led to variations in task design and learning outcomes. Despite such variations in practical approaches, all studies consistently underscore the significant potential of MOOCs in fostering ICC development.

Based on the studies reviewed, some challenges were reported, such as technical difficulties and unstable internet connections. In interactions among global students, attention also needs to be paid to problems related to time zone differences, difficulties in scheduling synchronous sessions, and language-related issues.

In addition, several common limitations are evident across the five studies. First, among various online platforms, the number of empirical studies on MOOC platforms remains limited. There is a lack of sufficient participants and empirical studies to validate the findings, as well as limited long-term tracking of individual cases.

Second, multiple learning platforms and tools were employed, but insufficient attention has been paid to exploring the unique contributions of MOOC platforms themselves. The use of multiple tools also requires mastering various technologies and overcoming additional technical challenges. Previous research has pointed out that future research could benefit from integrating activities onto a single platform to better explore its specific role in promoting ICC development^[26].

Third, relatively little research has focused on the instructional design of MOOC-based platforms. Effective course design is particularly important. Authentic tasks, technology-supported interaction, experiential learning, reflection journals have been widely used across these studies, further research could explore which specific instructional design elements are most effective in MOOCs.

4. Final considerations

This systematic review confirms that online learning plays an increasingly important role in developing students' ICC, particularly in higher education. A comprehensive combination of online activities helps create a rich digital learning environment.

However, current research still presents several limitations and gaps. First, most studies are based on short-term projects and primarily focus on language and healthcare-related courses. Future research should expand the sample scope to include students from a wider range of disciplines, countries, and cultural backgrounds, in order to gain a more comprehensive understanding of the differences and commonalities among various groups in online environments, particularly regarding the development of ICC through MOOCs.

Second, although current studies have integrated various online tools and platforms, further research is needed to explore the unique functions of MOOC platforms. And further research could further explore the effectiveness of specific instructional design elements in MOOCs.

Additionally, the lack of longitudinal studies limits understanding of the sustained development and long-term transfer of ICC, so future studies should explore how students apply ICC after course completion and assess its progression in real-world professional and social contexts. There is limited long-term tracking of individual cases, so further research in this area would be valuable.

While many studies demonstrate the effectiveness of virtual exchange and international collaboration in promoting ICC, limited attention has been given to the role of MOOCs. Among the few studies that do address MOOCs or SPOCs, most focus on their accessibility rather than their instructional design. As open and globally connected platforms, MOOCs have strong potential to foster intercultural learning, but their full capacity remains underexplored. Future research should focus on how to integrate targeted ICC strategies into large-scale, open online learning environments to better support global competence development.

Conflict of interest

The authors declare no conflicts of interest.

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