



MODERN METHODS FOR INCREASING INTERCULTURAL COMMUNICATIVE COMPETENCE: A NARRATIVE REVIEW OF DIGITAL AND PEDAGOGICAL INNOVATIONS

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Abstract

Intercultural communicative competence (ICC) — the capacity to communicate effectively and appropriately with people of different cultural and linguistic backgrounds — has become a central learning outcome in language education, higher-education internationalization, and professional training. Traditional approaches to cultivating ICC, principally study abroad and classroom-based cultural instruction, reach only a minority of learners and are difficult to scale. Over the past decade, a range of digitally mediated and technology-enhanced methods has emerged to broaden access to intercultural learning. This review synthesizes recent empirical and review literature on six such methods: virtual exchange and telecollaboration, Collaborative Online International Learning (COIL), immersive virtual and augmented reality, generative artificial intelligence and conversational agents, gamification and digital game-based learning, and digital storytelling. Across these methods, the literature indicates that technology can meaningfully increase the attitudinal, cognitive, and behavioral dimensions of ICC, but that the technology itself is not the active ingredient: gains depend on structured task design, sustained interaction, explicit instructor facilitation, and guided critical reflection. The review also identifies persistent challenges, including unequal access to hardware and connectivity, the limits of self-report assessment, and open questions about whether artificial intelligence can model the relational and affective depth of authentic intercultural contact. It concludes with recommendations for blended, theory-grounded



designs and calls for longitudinal, mixed-method research that reports null and negative findings alongside positive ones.

Keywords: Intercultural communicative competence; virtual exchange; telecollaboration; COIL; virtual reality; generative artificial intelligence; gamification; language education.

Introduction

Higher-education institutions, language curricula, and multinational employers increasingly identify intercultural communicative competence (ICC) as a core graduate and professional attribute. The construct is generally understood not merely as cultural knowledge but as the integrated set of attitudes, knowledge, and skills that allow a person to communicate effectively and appropriately when cultural frames of reference differ (Byram, 1997; Deardorff, 2006). For several decades, the dominant institutional strategy for developing ICC has been physical mobility — study abroad, exchange semesters, and international internships. Yet evidence reviewed by Hackett et al. (2023) indicates that only around 10–13% of undergraduates in Europe and the United States complete a period of study or work abroad, leaving the majority of students without this experience. Mobility programs are also costly, logistically complex, and, as the COVID-19 pandemic underscored, vulnerable to external disruption.

These constraints have motivated a sustained search for alternative, more scalable pathways to ICC. Over roughly the past fifteen years, internet-mediated classroom partnerships, immersive simulation technologies, and — most recently — generative artificial intelligence have moved from experimental novelties to widely studied pedagogical methods. This narrative review brings together empirical studies, systematic reviews, and bibliometric analyses, most published between 2018 and 2025, to characterize six such modern methods, to assess the strength and consistency of evidence for each, and to identify cross-cutting conditions under which technology-mediated approaches succeed or fail to increase ICC. The review is organized as follows: Section 2 outlines the theoretical models of ICC that modern methods operationalize; Section 3 reviews the six methods in turn; Section 4 synthesizes cross-cutting success factors;



Section 5 considers limitations and risks; and Section 6 outlines implications for practice and future research.

Theoretical Foundations of Intercultural Communicative Competence

Several overlapping models underlie contemporary research on ICC, and more than twenty distinct conceptualizations have been catalogued in the literature (Spitzberg & Changnon, 2009). Three models recur most frequently in the studies reviewed here. Byram's (1997, 2021) model of ICC, developed specifically for foreign-language education, decomposes competence into five interrelated components: attitudes of curiosity and openness toward other cultures (*savoir être*); knowledge of social groups and their products and practices (*savoirs*); skills of interpreting and relating one culture to another (*savoir comprendre*); skills of discovering new knowledge and interacting in real time (*savoir apprendre/faire*); and critical cultural awareness, or the capacity to evaluate cultural perspectives — including one's own — on an explicit basis (*savoir s'engager*). This final component is frequently the one that distinguishes superficial cultural exposure from genuine competence gain in the studies reviewed below.

Bennett's (1993) Developmental Model of Intercultural Sensitivity (DMIS) offers a complementary, developmental account, describing a trajectory from ethnocentric orientations (denial, defense, and minimization of cultural difference) toward ethnorelative orientations (acceptance, adaptation, and integration), in which difference is increasingly understood as a normal and navigable feature of human experience rather than a threat. Deardorff's (2006) pyramid model, widely used in higher-education assessment, links attitudes (respect, openness, curiosity, and discovery) and knowledge/skills to an internal outcome of adaptability, flexibility, and empathy, which in turn supports the external, observable outcome of effective and appropriate communication and behavior in intercultural situations. Chen and Starosta (1996) similarly synthesize the construct into affective (intercultural sensitivity), cognitive (intercultural awareness), and behavioral (intercultural adroitness) dimensions.

These models matter for the present review because the six modern methods discussed below do not introduce a competing theory of ICC; rather, each method operationalizes one or more components of these established frameworks through



a different technological affordance — sustained contact, simulated immersion, low-stakes rehearsal, or guided reflection. Most of the empirical studies cited use validated quantitative instruments such as the Cultural Intelligence Scale (CQS) or the Multicultural Personality Questionnaire (MPQ), typically supplemented with qualitative data from reflective writing or interviews, reflecting a broader consensus that ICC, given its multidimensional nature, is best assessed through mixed methods rather than any single measure (Hackett et al., 2023).

Virtual Exchange and Telecollaboration

Virtual exchange (also called telecollaboration) refers to sustained, internet-mediated partnerships in which two or more classes in different countries complete structured intercultural and linguistic tasks together over an extended period (O'Dowd, 2018). It is the oldest of the modern methods reviewed here, with empirical research accumulating since the early 2000s. A systematic review by Avgousti (2018) of studies on intercultural communicative competence and online exchanges concluded that computer-mediated communication can enhance both linguistic and pragmatic competence, while also noting that the modality through which learners interact — text, audio, video, or a mixture — shapes the kind of intercultural and multimodal competence that develops. A bibliometric analysis by Barbosa and Ferreira-Lopes (2021) documents the rapid growth of this research field and its increasing methodological diversity. In one of the largest implementations studied to date, Rienties et al. (2020) examined 23 virtual exchanges and found measurable impacts on participants' technological-pedagogical-content knowledge and foreign-language competence, lending support to the scalability of the approach across institutional contexts.

At the same time, the virtual-exchange literature consistently cautions that unstructured online contact alone does not reliably produce intercultural learning, and may even reinforce stereotypes if learners interpret isolated incidents as representative of an entire culture. The methodological emphasis across this literature on explicit task design — icebreakers, structured cultural questions, and culminating reflective assignments — anticipates a theme that recurs across every method reviewed in this article.



Collaborative Online International Learning (COIL)

COIL, a term coined by the State University of New York in 2006, extends virtual exchange by having two or more instructors at geographically separated institutions jointly design a shared syllabus, assignments, and learning outcomes, which mixed-nationality student teams then complete together over a period typically lasting four weeks to a full semester (Rubin, 2017). In one of the few controlled studies in this area, Hackett et al. (2023) randomly assigned 108 undergraduates at universities in the Netherlands and the United States to COIL or non-COIL sections of the same course and measured intercultural competence using the CQS and MPQ before and after a ten-week collaborative assignment. The U.S. experimental group showed a significantly larger gain in cultural intelligence than the U.S. control group (a moderate effect size, $d = 0.58$), with qualitative data from reflections and focus groups corroborating the quantitative result. Notably, the Dutch experimental group did not show a significantly larger gain than its control group, a pattern the authors attribute to those students already being enrolled in an internationally oriented program with substantial intercultural contact — a finding that illustrates how prior exposure can mask or dilute the measurable effect of a single intervention.

A systematic review by Fukkink et al. (2024) of 56 COIL and virtual-exchange studies published between 2010 and 2022 offers a more tempered, field-wide picture: the majority of reported outcomes were positive (61.8%), but a meaningful share showed no effect (23.6%) or even negative outcomes (14.5%) on intercultural learning. Using the TPACK framework, the review attributes this variability to how well programs address pedagogical, content, and technological barriers and facilitators during preparation, execution, and evaluation — again underscoring that COIL's benefits are conditional on design quality rather than guaranteed by the format itself.

Immersive Virtual and Augmented Reality

Virtual reality (VR), augmented reality (AR), and 360-degree video offer learners simulated cultural encounters characterized by a sense of presence and immersion, allowing rehearsal of pragmatics, nonverbal communication, and perspective-taking in a controlled, low-stakes environment. A systematic review



of immersive technologies in foreign-language learning between 2001 and 2020 (Hein et al., 2021) and a follow-up review covering 2018 to 2022 (Hua & Wang, 2023) both document a sharp increase in research activity, particularly following the broader availability of consumer-grade VR headsets and 360-degree cameras. Findings on effectiveness are encouraging but nuanced. Airemionkhale (2025) implemented task-based VR activities in higher-education language classrooms and found high learner engagement, engrossment, and immersion, yet the study did not find VR to be statistically superior to mobile-application-based instruction for cultural learning outcomes, suggesting that affordances of presence do not automatically translate into measurable competence gains beyond those achievable through simpler tools. By contrast, Zhaleh et al. (2025) found that a VR application (ImmerseMe) produced significant gains in both intercultural communicative competence and willingness to communicate among EFL learners relative to conventional instruction, with qualitative interviews identifying increased confidence, positive emotional experience, and enhanced cultural awareness as benefits, alongside technical difficulties, limited opportunities for corrective feedback, and a risk of reinforcing cultural stereotypes as drawbacks. A parallel study using augmented reality with Chinese EFL learners likewise reported significantly higher intercultural competence and learning motivation in the AR group than in a traditionally instructed control group (Liu et al., 2023). Extending the technology to collaborative settings, Knutzen et al. (2025) compared international students attending an intercultural-communication seminar through desktop-based social VR combined with videoconferencing against a videoconferencing-only group, concluding that social VR was an engaging complement to online study but could not fully replace direct human contact, with experience quality strongly dependent on participants' technical equipment.

Taken together, the immersive-technology literature suggests the strongest, most consistent gains are in the affective and motivational dimensions of ICC — confidence, willingness to communicate, and engagement — with comparatively thinner and more mixed evidence that immersion alone produces durable gains in critical cultural awareness or behavioral competence beyond what other digital tools achieve.



Generative Artificial Intelligence and Conversational Agents

The public release of large language model chatbots since late 2022 has rapidly reshaped research on AI-assisted language and intercultural learning. Earlier rule-based or scripted chatbots were limited by predefined dialogue trees and small training corpora, often producing communication breakdowns when learners deviated from anticipated scripts; current generative AI systems are markedly better able to sustain natural, context-appropriate dialogue and to adopt varied interlocutor personas and cultural framings on demand. Dai et al. (2025), writing on professional communication training, argue that this flexibility addresses a long-standing scalability problem in intercultural education: instructors have historically struggled to provide every learner with practice across a sufficiently wide range of cultural practices and interlocutor profiles, a gap that on-demand generative role-play can help to close, particularly for learners with limited access to human conversation partners.

This potential comes with caveats that are increasingly visible in the broader literature on AI and language learning. Because generative systems are trained on existing text corpora, they risk reproducing flattened or stereotyped cultural representations unless carefully designed and monitored. Researchers have also raised concerns about the emotional dimension of AI interaction — including the possibility that engaging, persona-driven chatbots could shape learners' affective responses in ways that are not always pedagogically intended — and about whether AI interlocutors can model the relational depth, accountability, and unpredictability of authentic human intercultural encounters. At present, the most defensible role for generative AI in ICC development appears to be as a scaffold for low-stakes pragmatic rehearsal that prepares learners for, rather than substitutes for, contact with human partners through virtual exchange, COIL, or in-person interaction.

Gamification and Digital Game-Based Learning

Gamification embeds game-design elements — points, badges, levels, leaderboards, and narrative framing — into otherwise conventional language and culture instruction, while digital game-based learning (DGBL) uses dedicated games or game-like applications as the primary instructional vehicle. Zhou (2024)



compared Chinese EFL learners using the gamified application Duolingo with a traditionally instructed control group and found that the gamified condition significantly increased learners' enjoyment and their "ideal L2 self" — the learner's imagined future identity as a successful user of the target language — both of which are theorized antecedents of sustained engagement with language and, by extension, with the cultural content embedded in language tasks.

The evidence base specifically linking gamification to measured ICC outcomes, as distinct from motivation and engagement more broadly, remains thinner than for virtual exchange, COIL, or immersive technologies. The mechanism most often proposed is indirect: well-designed game mechanics lower the affective barriers (for example, anxiety about making mistakes) that otherwise inhibit learners from engaging in the repeated, low-stakes intercultural practice that other methods in this review show to be effective, making gamification a plausible complement to, rather than a substitute for, the more directly intercultural methods discussed above.

Digital Storytelling and Multimodal Composition

Digital storytelling tasks ask learners to compose narrated, multimedia accounts of intercultural experience, often collaboratively and across institutional or national boundaries. Jao et al. (2024) studied cross-cultural teams composing bilingual digital stories together and found that the collaborative composition process itself — negotiating language choices, narrative structure, and cultural framing with partners from another country — supported intercultural learning beyond what either partner achieved working alone. Hřebáčková and Štefl (2022) similarly argue that collaborative digital storytelling in multicultural teams creates a safe, structured, and facilitated space in which learners can confront and work through the discomfort that often accompanies genuine intercultural communication, rather than avoiding it.

Because digital storytelling requires learners to externalize and justify their interpretation of an intercultural experience to an audience, it maps closely onto Byram's (1997) notion of critical cultural awareness and is frequently used as a capstone or reflective component layered onto virtual exchange or COIL partnerships rather than as a stand-alone method.



Cross-Cutting Factors in Effectiveness

Reading across the six methods reviewed in Section 3, a consistent pattern emerges that is, in many respects, more informative than the comparative effectiveness of any single technology. First, structured and scaffolded tasks consistently outperform unstructured contact: the virtual-exchange and COIL literatures both emphasize that explicit cultural questions, icebreakers, and culminating reflection assignments are what convert online contact into intercultural learning, and the Fukkink et al. (2024) review directly links variability in COIL outcomes to how well pedagogical and technological barriers are addressed in program design. Second, sustained duration and repeated interaction over multiple weeks appear more reliably effective than single-exposure events, consistent with the multi-week designs used in nearly all of the controlled studies reviewed here.

Third, explicit instructor facilitation and guided reflection are what connect raw intercultural experience to Byram's (1997) critical cultural awareness; without this facilitation, several studies note a risk that exposure to difference reinforces rather than dismantles stereotypes — a risk flagged explicitly in the literature on both virtual reality (Zhaleh et al., 2025) and generative AI. Fourth, mixed-methods assessment combining validated quantitative instruments such as the CQS or MPQ with qualitative reflection or interview data is the norm across the strongest studies reviewed, reflecting a broader recognition that self-report measures alone are an imperfect proxy for the behavioral and relational dimensions of competence. Finally, although direct comparative evidence remains limited, several of the methods reviewed here appear conceptually complementary rather than competing — for example, generative AI or VR rehearsal prior to a live virtual exchange or COIL partnership, or digital storytelling as a reflective capstone to either — suggesting that blended sequences of modern methods may compound the benefits that each produces individually. Across every method, the recurring conclusion is that the technology mediates the opportunity for intercultural contact and practice, but it is the pedagogy surrounding that technology — task design, duration, facilitation, and reflection — that determines whether ICC actually increases.



Challenges and Limitations

Several challenges qualify the optimism of the findings summarized above. Access remains uneven: virtual exchange and COIL require reliable internet connectivity and compatible scheduling across time zones, while VR and AR additionally require specialized hardware that is unevenly distributed across institutions and households, raising equity concerns precisely for the methods often promoted as more inclusive alternatives to costly study abroad. Several studies reviewed above explicitly report technical difficulties and connectivity problems as barriers to learner experience (Hackett et al., 2023; Knutzen et al., 2025; Zhaleh et al., 2025).

Assessment validity is a second persistent limitation. Most studies reviewed here rely on short, single-semester pre-post designs and self-report instruments, leaving open questions about whether measured gains in attitudes or self-perceived competence translate into durable, observable behavioral competence in subsequent intercultural encounters. The Fukkink et al. (2024) systematic review is a useful corrective here: roughly a quarter to a third of studies in its sample reported null or negative findings, a reminder that publication and reporting practices in this field can understate the variability of real-world outcomes.

Generative AI introduces a distinct set of concerns beyond those of the other methods, including data privacy, the risk that culturally biased or stereotyped training data will be reproduced in learner-facing content, and unresolved questions about whether simulated interlocutors can support the affective and relational learning that human intercultural contact provides. Finally, every method reviewed here imposes a non-trivial preparation and facilitation burden on instructors, who must design tasks, coordinate with international partners, and guide reflection — work that institutions do not always recognize or resource adequately, and that may limit the methods' scalability even as the underlying technologies become cheaper and more widely available.

Implications for Practice and Future Research

For practitioners, the clearest implication of this review is that tool selection should follow from established ICC frameworks rather than from the novelty of



a given technology: a method should be adopted because it operationalizes specific attitudes, knowledge, or skills identified in models such as Byram's (1997) or Deardorff's (2006), and paired with the task structure, duration, and facilitation that the literature associates with success, rather than adopted simply because it is new. Blended designs that sequence methods — for instance, AI- or VR-supported rehearsal prior to a live virtual exchange, followed by a digital storytelling task for reflection — represent a promising but still under-researched direction suggested by the complementary strengths.

For researchers, three priorities stand out. First, the field needs more controlled, longitudinal designs that track competence beyond a single semester and ideally into subsequent real-world intercultural encounters, since nearly all of the strongest evidence currently available is short-term. Second, transparent reporting of null and negative findings, as modeled by the Fukkink et al. (2024) review, should be normalized rather than treated as a footnote, to give practitioners an accurate picture of how often these methods fail to produce intended effects and under what conditions. Third, as generative AI tools proliferate, research should examine not only their effectiveness but also the cultural content they generate, with particular attention to whether AI-mediated cultural representations are context-sensitive and equity-aware or whether they risk flattening culture into convenient but inaccurate stereotypes.

Conclusion

Modern methods for increasing intercultural communicative competence — virtual exchange, COIL, immersive VR and AR, generative AI, gamification, and digital storytelling — have substantially broadened access to intercultural learning beyond what physical mobility alone can provide. The accumulating evidence reviewed here supports cautious optimism: each method can produce measurable gains in the attitudinal, cognitive, or behavioral dimensions of ICC, and several appear to complement one another when combined. At the same time, no method examined in this review increases ICC automatically. The consistent thread across virtual exchange, COIL, immersive technology, and generative AI research alike is that careful, theory-grounded task design, sustained interaction, active facilitation, and guided critical reflection remain the determining factors



— a finding that should temper purely technology-driven adoption decisions and keep pedagogical design, rather than the tool itself, at the center of efforts to increase intercultural communicative competence.

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