USING EDTECH TO ENHANCE INTERCULTURAL COMPETENCE AS A TRANSVERSAL SKILL IN LANGUAGE EDUCATION

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Abstract:

Intercultural competence (IC), identified as a core transversal competence, has become an essential skill for 21st-century students and a foundation for effective performance at the global level. Enhancing intercultural competence is crucial in English Language Teaching (ELT), and educational technology (EdTech) has been identified as a key factor in achieving this goal. This paper attempts to identify and explore the literature published on integrating intercultural competence in EdTech-enabled ELT environments by systematically synthesizing and critically evaluating existing evidence, which is currently fragmented and lacks comprehensive practical insights. It systematically reviews peer-reviewed articles, case studies, and educational reports to identify and evaluate the effectiveness of different EdTech tools such as ICT, computer-mediated communication tools (CMC), social media, virtual exchange platforms, language learning apps, and AI-powered teaching and learning tools for developing intercultural competence in the language classroom. Consequently, emphasis will be put on the following main areas, including pedagogical approaches, the challenges encountered, and measurable improvements in the development of intercultural competence as a transversal skill. Through a rigorous systematic review process, the paper examines studies published over the last decade to identify and assess recent developments. The ultimate objective is to present a comprehensive synthesis of evidence related to the role that EdTech plays in enhancing intercultural competence within ELT. The findings provide insights into the most effective tools and strategies, identify research gaps, and provide scope for future studies; therefore, they provide practical recommendations to educators and policymakers on the ways these technologies should be integrated into ELT curricula.

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1. Introduction

The twenty-first century has ushered in substantial reforms within the educational field, with a globally recognized emphasis on the importance of remaining abreast of advancements in education. Rapid technological evolution has redefined the landscape, necessitating an expansion of intercultural competence (IC) across fields, particularly in education. Within English Language Teaching (ELT), fostering intercultural competence has emerged as a core objective as the intrinsic link between language and culture becomes increasingly prominent (Byram, 1997; Deardorff, 2006; Kramsch, 2013). Nevertheless, students of English as a Foreign Language (EFL) often encounter specific challenges arising from intercultural misunderstandings, which can impede both their language development and their capacity to communicate effectively in multicultural contexts (Kramsch, 2013). These challenges underscore the imperative of embedding IC as a core component of ELT.

The demand for intercultural competence (IC) in today's globalized workforce is increasingly acknowledged across various sectors, as highlighted by numerous reports and studies. The World Economic Forum's *Future of Jobs Report 2020* emphasizes that skills such as complex problem-solving, critical thinking, and cultural adaptability are crucial for individuals to succeed in an interconnected economy. Similarly, the British Council's *Culture at Work* report (2013) reinforces this view, revealing that, on average, 84.2% of employers across a range of countries—including Jordan, India, Indonesia, the UAE, China, South Africa, the UK, the US, and Brazil—deem intercultural skills essential for their employees. This reflects a broad, global consensus on the importance of IC within professional contexts. Research further suggests that employees who possess strong IC are better prepared to navigate cultural differences, thereby reducing misunderstandings and enhancing collaboration within diverse teams (Byram, 1997; Deardorff, 2006).

Recognized as a transversal skill —adaptable across fields and applicable in diverse settings — IC transcends disciplines and plays a vital role in equipping learners to communicate adeptly in diverse cultural environments (Deardorff, 2006; Voogt & Roblin, 2012; OECD, 2018). Such transversal skills, which include adaptability, critical thinking, and collaboration, are increasingly emphasized within educational frameworks worldwide (Ananiadou & Claro, 2009). Nevertheless, they remain underrepresented in traditional language curricula, where the emphasis often rests on linguistic precision rather than intercultural fluency (Liddicoat & Scarino, 2013). In response to these curricular gaps, the integration of educational technology (Ed-Tech) into ELT offers promising avenues for enhancing intercultural competence by facilitating innovative approaches to cross-cultural interaction and understanding (Blin & Munro, 2008; Dooly, 2010; O'Dowd, 2021).

Despite the acknowledged importance of both intercultural competence and Ed-Tech in ELT, there is limited clarity regarding the ways educational technology specifically enhances intercultural competence within this context. Educators frequently grapple with selecting and implementing digital tools that effectively foster intercultural learning, as existing research provides limited guidance on best practices (Pennycook, 2018). This study seeks to bridge this gap by investigating how Ed-Tech can be strategically employed to cultivate IC among EFL students. By systematically examining existing literature, this research intends to provide educators, curriculum designers, and policymakers with insights into the most effective strategies and tools for leveraging Ed-Tech to cultivate intercultural competence in ELT, ultimately enabling students to communicate and collaborate proficiently in a multicultural world.

2. Research Problem

The primary research problem centers on the limited understanding of how educational technology (Ed-Tech) can effectively cultivate intercultural competence (IC) within English Language Teaching (ELT). Although both IC and Ed-Tech are acknowledged as essential components of contemporary education, there remains a lack of concrete, evidence-based guidance on the selection and implementation of specific digital tools to achieve substantive intercultural learning outcomes. Educators frequently encounter practical challenges in identifying tools that meaningfully foster IC—such as virtual exchange platforms, online collaboration tools, and language learning applications—largely due to insufficient research on their effectiveness and best practices for integration.

Moreover, ELT programs often prioritize linguistic skills over transversal skills, such as critical thinking, adaptability, and intercultural awareness, resulting in an underrepresentation of IC within curricula. This gap underscores the need for systematic research to investigate how Ed-Tech can be leveraged to enhance IC in ELT, promoting a more comprehensive and culturally responsive approach to language education.

3. Research Questions

Building on the rationale and research problem, this study seeks to address the following questions:
1) What are the key transversal skills that support the development of intercultural competence in ELT, and how can Ed-Tech facilitate these skills?
2) What are the perceived challenges and limitations of using educational technology to develop intercultural competence within ELT?
3) How can educational technology be effectively integrated into ELT to foster intercultural competence among learners?

The first research question seeks to identify the specific Ed-Tech tools, platforms, and methodologies that most effectively support the development of intercultural

competence (IC) in ELT, providing insights into best practices. The second question examines the transversal skills integral to IC—such as adaptability, critical thinking, and collaboration—and investigates the role of Ed-Tech in strengthening these competencies. The third question considers the potential challenges educators may face, including resource constraints, digital literacy, and data privacy concerns, which could hinder the successful integration of Ed-Tech in promoting intercultural learning.

4. Literature Review

4.1 Theoretical Foundations of Intercultural Competence

The prominence of intercultural competence (IC) within English Language Teaching (ELT) has grown significantly in response to the demand for global communication skills in an interconnected world. Scholars highlight the essential role of IC in enabling learners to navigate cultural boundaries effectively. Deardorff's (2006) model describes IC as a combination of cognitive, affective, and behavioral skills, incorporating aspects like cultural awareness, openness, and adaptable communication. Byram's (1997) influential framework further specifies IC's components, identifying key elements: attitudes, cultural understanding, interpretive and discovery skills, and critical cultural awareness. This framework has significantly influenced the discourse surrounding IC in ELT, offering a structured methodology for integrating cultural competence into language education.

Kramsch (2013) reinforces this perspective by emphasizing that language teaching without cultural context limits learners' ability to grasp the sociolinguistic nuances underpinning communication. Her perspective aligns with the communicative language teaching (CLT) approach, underscoring that cultural competence is a crucial component of language proficiency. Although integrating culture into ELT is essential, instructors often grapple with the selection of appropriate cultural elements for inclusion, especially given the wide-ranging backgrounds of English learners globally (Sercu, 2005). Recent literature acknowledges that linguistic accuracy alone is insufficient in a multicultural context where English functions as a global lingua franca (Liddicoat & Scarino, 2013). The shift toward incorporating IC in ELT reflects the recognition that language learning also involves a nuanced understanding and respect for diverse cultural perspectives, which are integral for meaningful cross-cultural communication.

Vygotsky's (1978) Social Constructivism also provides a pertinent theoretical framework, positing that knowledge is co-constructed through social interactions. Within ELT, this theory suggests that language and intercultural skills develop most effectively through collaborative exchanges, challenging learners within their Zone of Proximal Development (ZPD). Although Social Constructivism offers a strong theoretical rationale for leveraging educational technology to foster IC, it lacks guidance on how digital interactions diverge from in-person exchanges in promoting cultural understanding. For example, the absence of non-verbal cues in virtual settings may limit the depth of cultural

learning, a consideration often overlooked in Social Constructivist applications within EdTech.

Educational technology supports the implementation of Social Constructivist principles in intercultural learning, with digital tools like virtual exchanges, collaborative platforms, and social media enabling students to interact with peers from varied cultural contexts (Vygotsky, 1978; Lantolf & Thorne, 2006). These tools provide opportunities for learners to engage in authentic intercultural dialogues, allowing them to collaboratively construct cultural knowledge while honing their communication skills. Lantolf and Thorne (2006) argue that technology-enhanced language learning can serve as a bridge between learners, creating opportunities for cultural exchanges that would otherwise be limited by geographical constraints.

4.2 Transversal Skills and Their Relevance to Intercultural Competence

Transversal skills, also referred to as "soft skills," "21st-century skills," or "transferable skills," are competencies that are adaptable across various fields and applicable in a wide range of contexts (Ananiadou & Claro, 2009; OECD, 2018; Voogt & Roblin, 2012). These skills encompass critical thinking, problem-solving, adaptability, communication, collaboration, digital literacy, and intercultural competence (Binkley *et al.*, 2012; OECD, 2018). In contemporary education, there is a growing emphasis on transversal skills as they are viewed as essential for navigating the demands of a globalized workforce. Within the realm of English Language Teaching (ELT), transversal skills are crucial as they not only enhance language acquisition but also prepare students to engage thoughtfully and respectfully across cultural divides.

Among these competencies, intercultural competence (IC) stands out as a fundamental transversal skill vital for both personal and professional development. Wu and Marek (2018) argue for IC as a cornerstone of ELT curricula, suggesting it fosters student adaptability and supports participation in global discourse. Likewise, Byram (1997) asserts the importance of IC in shaping global citizens capable of meaningful intercultural dialogue, breaking down stereotypes, and building mutual respect. Wach (2015) further posits that incorporating IC within ELT as a transversal skill enables students to apply their cultural awareness and language skills in diverse real-world scenarios, thus enhancing their communicative versatility.

However, the integration of transversal skills, including IC, within ELT remains inconsistent, as many programs continue to emphasize traditional language skills, potentially underdeveloping these broader competencies. For example, while critical thinking is often cited as a desirable skill, there is limited guidance on how ELT instructors can actively cultivate it. In practice, instructors could foster critical thinking by utilizing culturally diverse materials that encourage students to examine different perspectives or by engaging them in problem-solving activities that simulate authentic intercultural interactions.

Similarly, adaptability and collaboration can be promoted through group projects and role-play exercises that require students to navigate cultural scenarios collectively.

For instance, an ELT instructor might implement virtual exchange projects where students from various cultural backgrounds collaborate on assignments. These activities not only develop language skills but also challenge students to adapt to different communication styles and work effectively across cultures, thereby reinforcing adaptability and intercultural competence.

Despite the acknowledged importance of transversal skills, research indicates that obstacles such as limited resources, rigid curricula, and insufficient professional development hinder their comprehensive integration within ELT (OECD, 2018). These challenges underscore the need for targeted policy support, enhanced professional training, and curriculum reforms to embed IC and other transversal skills effectively in ELT.

4.3 Educational Technology in ELT

The evolution of educational technology has significantly impacted language education, introducing new avenues for the development of both linguistic and intercultural skills. From the early adoption of Computer-Assisted Language Learning (CALL) in the 1980s to the growth of mobile learning and online platforms in the 21st century, educational technology has continuously reshaped language teaching and learning methodologies (Bax, 2003). CALL, initially developed in the 1980s, focused on vocabulary enhancement, grammar exercises, and reading comprehension, laying foundational support for the integration of technology in language classrooms. Although early CALL systems were limited in their capacity to promote intercultural competence, they set the stage for more advanced technologies. The emergence of Mobile-Assisted Language Learning (MALL) in the 2000s broadened access to language learning, allowing learners to practice linguistic skills on mobile devices in real-world environments (Kukulska-Hulme, 2012). Today's digital resources, including virtual exchange programs, interactive learning platforms, and artificial intelligence AI-aided tutors—offer enhanced opportunities for teachers to create enriched language learning experiences (Godwin-Jones, 2015; Guth & Helm, 2010), enabling learners to engage with diverse cultural contexts indirectly.

The advantages of educational technology in ELT are extensive. It supports individualized learning, promotes greater accessibility and flexibility, and contributes to the development of digital literacy alongside linguistic proficiency (Beatty, 2013). Furthermore, technology enables learners to engage with authentic materials and communicate in real-time with speakers of the target language, which is particularly advantageous for fostering intercultural competence (O'Dowd, 2021). Despite these benefits, challenges persist, including issues related to the digital divide, the necessity of adequate teacher training, and concerns surrounding data privacy and security (Pennycook, 2018).

Advances in Artificial Intelligence (AI) and emerging technologies continue to transform language education. AI-driven tools, such as chatbots and adaptive learning platforms, now allow for personalized language learning experiences, adjusting content to the learner's pace and individual needs. Godwin-Jones (2015) observes that AI-based

applications offer instant feedback and customized learning, addressing specific learner challenges and enhancing the overall educational experience.

The following section examines the intersection of intercultural competence, transversal skills, and educational technology, highlighting the synergies and potential benefits of integrating these domains within ELT.

4.4 The Intersection of Intercultural Competence, Transversal Skills, and Educational Technology

The integration of intercultural competence, transversal skills, and educational technology creates a dynamic intersection with transformative potential for English Language Teaching (ELT). When combined, these three domains offer language learners not only the ability to achieve linguistic proficiency but also to develop essential skills for global communication and collaboration in the digital age.

Intercultural competence is inherently connected to several transversal skills, including communication, critical thinking, problem-solving, and collaboration (Ananiadou & Claro, 2009). Given that transversal skills are transferable across contexts and disciplines, cultivating them within language education enhances learners' capacity to engage effectively in intercultural interactions (OECD, 2018). Effective communication, for instance—a key component of both intercultural competence and transversal skills, i.e., demands not only linguistic ability but also cultural sensitivity and adaptability to various communication styles in diverse cultural settings (Byram, 1997; Liddicoat & Scarino, 2013). In a similar vein, critical thinking and problem-solving are instrumental in addressing intercultural misunderstandings, fostering empathy, and promoting respect for diverse viewpoints (Baker, 2015).

Educational technology functions as a powerful conduit for integrating and amplifying these synergies. Through digital tools such as virtual exchange platforms, social media, and interactive online activities, learners engage in real-time interactions with diverse cultural communities, applying their transversal skills within authentic intercultural contexts (O'Dowd, 2021). These interactions provide learners with opportunities to practice critical thinking and communication while deepening their understanding of other cultures, thus reinforcing both their intercultural competence and transversal skills.
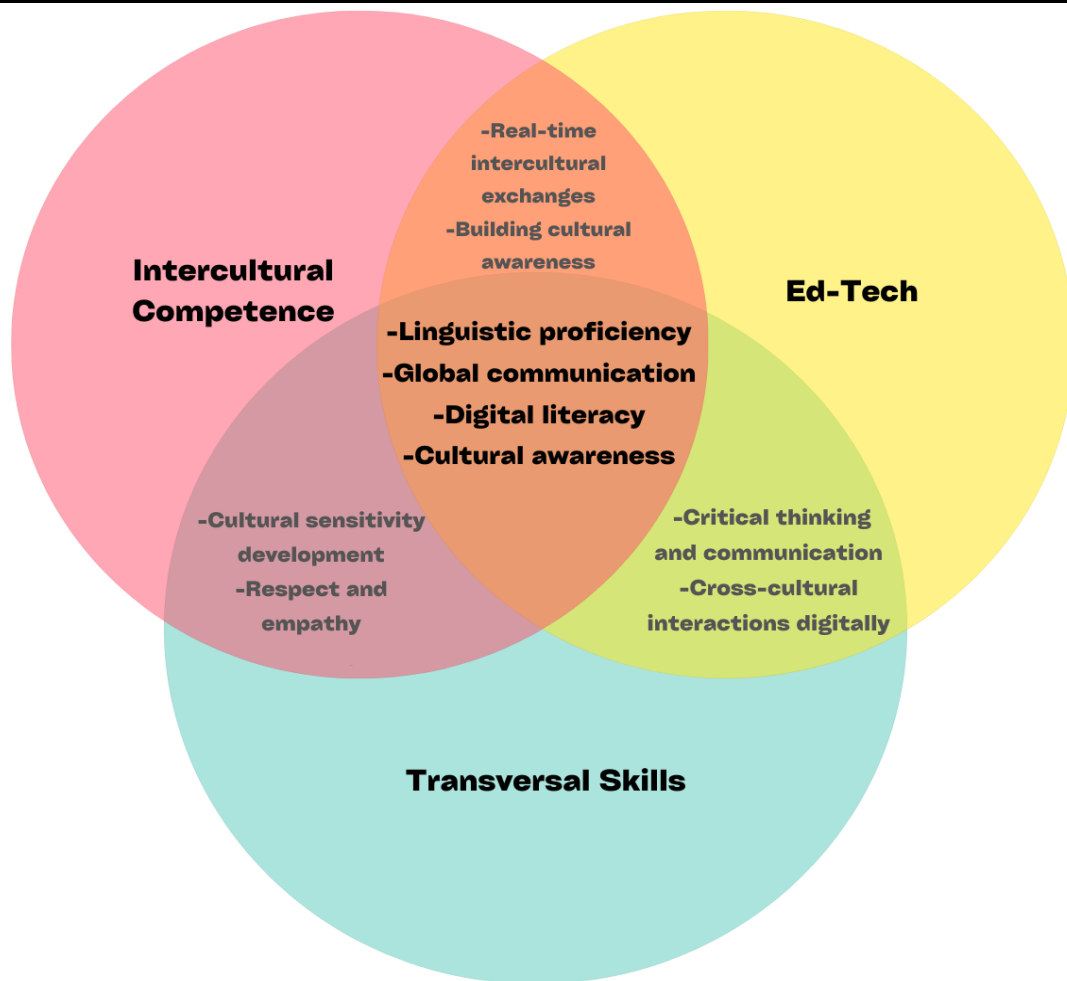
Figure 1: The Intersection of Intercultural Competence,
Transversal Skills and Educational Technology

5. Methodology

5.1 Research Design

This systematic review follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure a transparent and replicable approach to examining the use of educational technology (Ed-tech) for enhancing intercultural competence (IC) in English Language Teaching (ELT) settings. The PRISMA framework was selected for its robustness in providing a standardized structure that enables researchers to systematically collate, assess, and synthesize findings from existing studies.

5.2 Inclusion and Exclusion Criteria

To ensure the relevancy and quality of studies included in this review, the following inclusion and exclusion criteria were established.

The **inclusion criteria** for the articles were as follows:

- **Population**: Learners in English as a Foreign Language (EFL) or English Language Teaching (ELT) contexts at all educational levels (elementary to tertiary education).
- **Intervention**: Utilization of educational technology or digital learning tools explicitly aimed at enhancing intercultural competence.
- **Outcomes**: Studies that report on intercultural competence or related intercultural learning outcomes.
- **Study Types**: Peer-reviewed empirical studies, including quantitative, qualitative, and mixed-methods research.
- **Language**: Articles published in English.
- **Time Frame**: Studies published between 2014 and 2024, focusing on literature from the past two decades to capture recent advancements in Ed-tech for intercultural competence.
  The **exclusion criteria** included:

o Studies not specifically focus on EFL and ELT contexts or intercultural competence.
o Articles discussing Ed-tech without explicit intercultural competence outcomes.
o Studies published in languages other than English.
o Non-empirical works, such as opinion pieces, book reviews, or theoretical papers.

Table 1: Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Population	Learners in English as a Foreign Language (EFL) or English Language Teaching (ELT) contexts at all educational levels (elementary to tertiary education).	Studies not involving EFL or ELT contexts, or studies conducted outside the specified educational levels.
Intervention	Educational technology interventions explicitly aimed at enhancing intercultural competence.	Studies using Ed-tech without focusing on intercultural competence.
Outcomes	Studies reporting intercultural competence or related intercultural learning outcomes.	Studies lacking intercultural competence outcomes.
Study Types	Peer-reviewed empirical studies (quantitative, qualitative, mixed-methods).	Opinion pieces, reviews, theoretical papers.
Language	Published in English.	Non-English publications
Publication Date	2014–2024	Studies published before 2014.

5.3 Literature Search Strategy and Data Sources

The literature search was conducted across multiple academic databases, including **ERIC, Scopus, JSTOR, Web of Science, Semantic Scholar,** and **Google Scholar**, to capture a broad range of relevant studies and comprehensive coverage of peer-reviewed studies in educational technology and language learning fields. The search strategy used a combination of keywords and Boolean operators (AND, OR) to capture relevant literature. Keywords were derived from both the research questions and prior knowledge

of the field. Primary search terms included: "educational technology," "intercultural competence," "English Language Teaching," "EFL," "ELT," "digital learning," and "computer-mediated communication." Additionally, the references of selected studies were examined to identify any pertinent studies that might not have been captured in the initial database search.

The search string was formulated as follows*: ("intercultural competence" OR "intercultural communication" OR "cultural competence") AND ("educational technology" OR "Ed-tech" OR "digital learning" OR "ICT" OR "online learning") AND ("English as a Foreign Language" OR "EFL" OR "English Language Teaching" OR "ELT")*

5.4 Study Selection, Data Extraction, and Synthesis

The study selection process, data extraction, and synthesis align closely with systematic review methodologies established to ensure rigorous analysis and transparency in research, as endorsed by the PRISMA guidelines (Page *et al.*, 2021).

5.4.1 Study Selection Process

This study adhered to the PRISMA framework for systematic reviews, incorporating phases of identification, screening, eligibility assessment, and final inclusion (Moher *et al.*, 2009; Page *et al.*, 2021).:

- **Identification**: Relevant articles were identified through searches in ERIC, Scopus, Web of Science, Semantic Scholar, and Google Scholar. The search results were imported into a reference management tool, and duplicates were removed to prevent redundancies that could bias findings (Moher *et al.* 2009; Liberati *et al.*, 2009).

- **Screening**: Titles and abstracts of the remaining articles were screened according to the inclusion and exclusion criteria. Studies that did not meet these criteria were excluded at this stage. This step reduces potential bias by filtering out studies that lack relevance or methodological rigor (Tricco *et al.*, 2018).

- **Eligibility**: Full-text articles of potentially relevant studies were retrieved for a comprehensive review. Studies that did not meet all inclusion criteria upon full-text examination were excluded. This step emphasizes methodological rigor by only including studies with comprehensive data necessary for synthesis (Page *et al.*, 2021)

- **Inclusion**: Studies that fulfilled all criteria were included in the final synthesis. This step is recommended to enhance reproducibility (Moher *et al.*, 2009).

Based on the inclusion and exclusion criteria established for this systematic review, a total of **13 research studies** fully met the criteria and were included in the final analysis [Chen & Yang (2014), Elboubekri (2017), Husniah *et al.* (2021), Pham (2023), Wach (2015), Wu & Marek (2018), Liaw (2019), Lee *et al.* (2023), Liepiņa & Ate (2023), Louahala (2023), Li *et al.* (2022), Al Khateeb & Hassan (2023), Peraza & Furumura (2022)].

These studies encompass a diverse range of educational technology applications within English Language Teaching (ELT) contexts, each explicitly aimed at fostering intercultural competence (IC) among learners at various educational levels. The selected studies cover interventions involving tools such as social media, computer-mediated communication, virtual environments, project-based learning, and blended learning approaches, providing comprehensive insights into the effectiveness of Ed-tech in IC development.

An additional 5 studies partially met the criteria, primarily due to their limited focus on digital tools or emphasis on teacher perceptions rather than student outcomes [Li, X. (2019), Liu, F. (2020), Lagou & Zorbas (2020), Banjongjit & Boonmoh (2018), Jiang, Q. *et al.* (2021)]. While these studies do not entirely align with the specified criteria, they offer valuable perspectives on the pedagogical approaches and challenges associated with integrating IC in ELT. These studies were therefore reviewed but excluded from the core synthesis to maintain a rigorous focus on studies that directly assess the impact of educational technology on intercultural competence within student-centered ELT settings.

Table 2: Study eligibility based on inclusion/exclusion criteria

Author(s)	Year	Meets Criteria	Notes
Chen, W., & Yang, S.	2014	Yes	Technology-enhanced projects; meets all criteria.
Elboubekri, A.	2017	Yes	ICT and social media integration in Moroccan EFL; meets all criteria.
Husniah, A., Suryani, A., & Fikri, M.	2021	Yes	Flipped classroom model in Indonesian EFL; meets all criteria.
Li, X.	2019	Partial	Focuses on structured classroom activities; limited use of Ed-tech.
Pham, T.	2023	Yes	Digital warm-up activities for young EFL learners; meets all criteria.
Wach, A.	2015	Yes	CMC for intercultural competence in EFL; meets all criteria.
Wu, Q., & Marek, M.	2018	Yes	Social media as a tool for intercultural competence in EFL; meets all criteria.
Liu, F.	2020	Partial	Film-based teaching in EFL; limited use of digital tools.
Lagou, F., & Zorbas, V.	2020	Partial	CLIL for intercultural competence; limited digital integration.
Banjongjit, B., & Boonmoh, A.	2018	Partial	Teachers' perceptions on IC in EFL; lacks focus on Ed-tech.
Liaw, M.-L.	2019	Yes	Social virtual environment in EFL; meets all criteria.
Lee, T.-Y., Ho, Y.-C., & Chen, C.-H.	2023	Yes	Online EFL classroom with IC focus; meets all criteria.
Liepiņa, K., & Ate, I.	2023	Yes	Blended learning to enhance IC in EFL; meets all criteria.
Louahala, N.	2023	Yes	Online exchanges for IC development in Algerian EFL; meets all criteria.

Li, C., Lo Kon, A. L., & Ip, H. H. Shing	2022	Yes	VR for enhancing intercultural sensitivity in EFL; meets all criteria.
Al Khateeb, A., & Hassan, M.	2023	Yes	Telecollaboration for intercultural competence; meets all criteria.
Jiang, Q., Soon, S., & Li, Y.	2021	Partial	Focuses on teachers' intercultural competence development, not EFL learners.
Peraza, A.V., & Furumura, Y.	2022	Yes	Project-based learning in virtual exchange; meets all criteria.

5.4.2 Data Extraction

Systematic data extraction using a standardized form ensures consistency, minimizing subjective bias (Popay *et al.*, 2006). Extracted data include variables critical to understanding the educational context and impact of Ed-tech on intercultural competence. Employing quality assessment criteria such as those from the Critical Appraisal Skills Programme (CASP) for qualitative research supports the robustness of the selected studies by focusing on relevance and methodological soundness (CASP, 2018).

5.4.3 Data Synthesis

The data synthesis approach combines thematic and narrative synthesis, allowing for a nuanced analysis of diverse data (Thomas & Harden, 2008). Categorizing studies by Ed-tech types (e.g., social media, flipped classrooms, computer-mediated communication) and intercultural competencies provides a structure that aligns with the varied nature of interventions and outcomes. Integrating quantitative data further substantiates themes, enhancing the credibility and depth of the synthesis (Sandelowski *et al.*, 2006).

Table 3: Data Extraction Table

Author(s)	Year	Country	Educational Context	Intervention Type	Sample Characteristics	Methodology	Intercultural Competence Outcomes	Key Findings	Limitations
Chen, W., & Yang, S.	2014	Taiwan	Mixed education levels	Technology-enhanced intercultural projects	High school and university students	Mixed-methods	Positive attitudes towards intercultural learning	Projects positively impact IC attitudes and language skills.	Assumes attitudes correlate with learning; no long-term outcomes.
Elboubekri, A.	2017	Morocco	University	ICT and social media	University students	Quantitative	Increased IC through digital engagement	Social media aids cultural integration and IC in EFL.	Generalizability limited to Moroccan context.
Husniah, A., Suryani, A., & Fikri, M.	2021	Indonesia	Tertiary Education	Flipped classroom model	University students	Mixed-methods	Improved IC, linguistic and cultural engagement	Flipped classroom deepens IC content engagement.	Small sample; single institution focus.
Li, X.	2019	China	Secondary Education	Structured classroom activities	Secondary school students	Qualitative	Enhanced intercultural awareness and attitudes	Noticing, comparing, reflecting structure supports IC development.	Limited tech integration; small sample size.
Pham, T.	2023	Vietnam	International primary schools	Digital warm-up activities	Young EFL learners	Exploratory	Increased intercultural awareness	Digital warm-ups foster early IC literacy.	Age-specific sample; teachers' tech familiarity varies.
Wach, A.	2015	Poland	Advanced EFL learners	Computer-mediated communication (CMC)	Adult learners	Qualitative	Greater understanding of other cultures	Active ICT use increases cultural understanding; structured guidance needed.	Focus on advanced learners only.
Wu, Q., & Marek, M.	2018	China	Online learning communities	Social media for intercultural learning	University students in online settings	Qualitative	Improved IC via online community engagement	Social media enhances IC; identifies six effective instructional themes.	Relies on qualitative data, limiting generalizability.
Liu, F.	2020	China	University	Film-based intercultural teaching	College English students	Qualitative	Improved intercultural awareness through film	Using 'The Proposal' as a tool enhances cultural understanding.	Limited to film-based learning; focus on one film only.
Lagou, F., & Zorbas, V.	2020	Greece	Primary Education	Content and Language Integrated Learning (CLIL)	Primary school students	Mixed-methods	Enhanced IC through subject content integration	CLIL supports IC by combining language with cultural content.	Limited to primary education; CLIL may not generalize.
Banjongjit, B., & Boonmoh, A.	2018	Thailand	Secondary Education	Teachers' perceptions on IC in EFL	Secondary school teachers	Qualitative	Insights on teachers' role in promoting IC	Teachers see IC as essential but face implementation challenges.	Based on perceptions only; no direct student outcomes.

Liaw, M.-L.	2019	Taiwan	Secondary and tertiary education	Open social virtual environment	Secondary and university students	Qualitative	Increased intercultural communication skills	Virtual environments provide immersive opportunities for IC learning.	Limited by platform access and virtual interaction quality.
Lee, T.-Y., Ho, Y.-C., & Chen, C.-H.	2023	Thailand	Secondary Education	Online EFL classroom with IC focus	Secondary school students	Mixed-methods	Improved intercultural communicative competence	Online learning effectively supports IC through structured experiences.	Limited to single school; online setting may limit generalizability.
Liepiņa, K., & Ate, I.	2023	Latvia	Higher Education	Blended learning for language and intercultural skills	University students	Mixed-methods	Improved IC and language skills	Blended learning positively impacts both IC and language acquisition.	Limited to higher education context.
Louahala, N.	2023	Algeria	Tertiary Education	Online intercultural exchanges	Third-year university students	Qualitative	Enhanced intercultural communicative competence	Online exchanges facilitate IC in virtual language learning.	Sample limited to Algerian students.
Li, C., Lo Kon, A. L., & Ip, H. H. S.	2022	China	Higher Education	Virtual reality (VR) for IC	University students	Quantitative	Increased intercultural sensitivity	VR enables immersive experiences that foster IC.	High-tech requirements may limit accessibility.
Al Khateeb, A., & Hassan, M.	2023	Cross-national	Higher Education	Telecollaboration for language and IC	Language-exchange classroom students	Mixed-methods	Improved intercultural communicative competence	Telecollaboration enhances IC in language exchange contexts.	Cultural diversity among participants varies.
Jiang, Q., Soon, S., & Li, Y.	2021	China	Teacher training	Online technology for teacher IC development	In-service teachers	Literature Review	Improved teacher intercultural awareness	Highlights tech's role in developing teachers' IC for classroom use.	Focuses on teachers, not EFL learners.
Peraza, A.V., & Furumura, Y.	2022	International	Higher Education	Project-based learning in virtual exchange	EFL university students	Mixed-methods	Enhanced IC in virtual exchange contexts	Project-based virtual exchanges effectively develop IC.	Limited focus on higher education virtual exchanges.

6. Presentation and Discussion of Results

This systematic review analyzes the role of educational technology (EdTech) in promoting intercultural competence (IC) within English Language Teaching (ELT) environments. The results are organized around three main research questions that address effective EdTech integration, transversal skills supporting IC, and challenges in EdTech implementation.

6.1 Key Transversal Skills Supporting Intercultural Competence in ELT through EdTech

Several transversal skills are instrumental in fostering intercultural competence within ELT, and educational technology provides an effective medium for enhancing these skills, namely:

- **Critical thinking:** Wach (2015) emphasized that computer-mediated communication (CMC) cultivates critical thinking, as learners engage in reflective dialogue with culturally diverse peers. The study found that EFL learners develop critical perspectives, encouraging them to question cultural assumptions and approach intercultural exchanges with openness and analytical depth.
- **Adaptability:** Wu and Marek (2018) showed that social media promotes adaptability, a skill vital for successful intercultural interactions. Students participating in online cultural exchanges reported that they adapted their communication style to suit different cultural norms, which contributed to a broader cultural awareness and tolerance for diversity.
- **Collaborative skills:** Project-based virtual exchanges, as documented by Peraza and Furumura (2022), are instrumental in developing collaboration across cultural boundaries. These virtual projects required students to work with international peers, balancing linguistic skills with cultural sensitivity, which enhanced their collaborative abilities and intercultural understanding. Similarly, Al-Khateeb and Hassan (2023) reported that telecollaboration in language-exchange classrooms fostered a deepened intercultural communicative competence.
- **Digital literacy:** Liepiņa and Ate (2023) highlighted the importance of digital literacy in blended learning environments. As students gain familiarity with digital tools, they become more effective in navigating intercultural exchanges online. Digital literacy not only supports technical competence but also enhances students' ability to communicate in cross-cultural settings.

These studies illustrate that transversal skills like critical thinking, adaptability, and collaboration are integral to intercultural competence and can be effectively developed through Ed-tech interventions.

6.2 Challenges and Limitations of Using EdTech to Develop Intercultural Competence

While educational technology has significant potential to support intercultural competence, certain challenges limit its effectiveness, as follows:

- **Digital literacy and access:** Studies by Husniah *et al.* (2021) and Elboubekri (2017) point to the need for adequate digital literacy and consistent access to technology. In some educational contexts, learners and educators face obstacles due to limited resources or digital proficiency, which can hinder full engagement with Ed-tech tools.

- **Structured support in Ed-Tech environments:** Wach (2015) and Lee *et al.* (2023) emphasized the importance of structured guidance in digital intercultural exchanges. Without clear instructional support, learners may only engage superficially with intercultural content, missing deeper insights. Structured support is particularly beneficial for advanced EFL learners, enabling them to navigate complex cultural exchanges more effectively.

- **Contextual constraints and cultural differences:** Pham (2023) and Louahala (2023) noted that the impact of Ed-tech on intercultural competence may vary by cultural and educational context. For example, Pham's study on young learners in Vietnam revealed that inconsistent teacher training in digital tools affected the implementation of Ed-tech-based activities. Similarly, Louahala's study in Algeria highlighted that local attitudes toward technology can influence how Ed-tech tools are perceived and used in language learning.

- **High-Tech requirements and accessibility issues:** Advanced Ed-tech solutions, such as virtual reality, offer immersive learning experiences but often come with high technological and financial demands. Li *et al.* (2022) found that while VR facilitates intercultural sensitivity, it is less accessible for under-resourced institutions, which may limit the broader application of such high-tech solutions in ELT.

These challenges highlight the need for accessible, well-supported Ed-tech solutions that can be adapted to different cultural and educational contexts. Addressing these limitations is essential for maximizing the potential of Ed-tech in intercultural competence development within ELT settings.

6.3 Integrating Educational Technology to Enhance Intercultural Competence in ELT

Ed-tech has emerged as a promising approach to enhancing intercultural competence by offering authentic cultural engagement, fostering collaboration, and supporting flexible learning environments. The studies reviewed here reveal specific tools and instructional models that have proven effective:

- **Technology-enhanced learning projects:** Chen and Yang (2014) explore the integration of technology-enhanced projects rooted in real-life contexts. This approach enables students to apply both linguistic and cultural knowledge, improving attitudes toward intercultural understanding and fostering cultural awareness. The findings suggest that technology can serve as a bridge, bringing intercultural experiences into the classroom and allowing students to engage with diverse perspectives.

- **Blended learning models:** Elboubekri (2017) demonstrated the effectiveness of blending traditional classroom learning with digital tools such as social media and ICT in Moroccan EFL settings. The study highlights how digital tools facilitate intercultural exchanges, providing Moroccan students with opportunities to interact with peers from diverse cultural backgrounds. The blended model proved beneficial in enhancing students' adaptability and openness to different cultural perspectives.

- **Flipped classroom model:** Husniah *et al.* (2021) report positive outcomes from implementing a flipped classroom model in Indonesian EFL classrooms. By engaging with material on intercultural topics before class, students were better prepared for in-depth discussions and demonstrated greater cultural awareness. This approach encourages learner autonomy and positions students to take a more active role in their intercultural learning journey.

- **Social media and virtual learning environments:** The use of social media platforms and virtual environments has shown substantial benefits in cultivating intercultural competence. Wu and Marek (2018) found that social media enables students to engage in real-time, intercultural communication, creating a space for meaningful exchanges. Similarly, Liaw (2019) reports that virtual environments, such as VR programs, provide an immersive setting that promotes cross-cultural interaction, which is critical for intercultural skill development in language learners.

These findings underscore that educational technology tools, when applied strategically, can enhance intercultural learning experiences within ELT by fostering student engagement with cultural content and building vital intercultural skills (Chen & Yang, 2014; Wu & Marek, 2018).

This systematic review provides a comprehensive overview of how educational technology can enhance intercultural competence (IC) in English Language Teaching (ELT) contexts, exploring both its benefits and limitations. The studies analyzed reveal that Ed-tech tools, when thoughtfully integrated, support authentic cultural engagement, foster transversal skills crucial for IC, and offer flexible, collaborative learning environments that transcend geographical boundaries.

6.4 Key Transversal Skills Facilitated by Ed-Tech

The review indicates that transversal skills, such as critical thinking, adaptability, and collaboration, are foundational to developing intercultural competence and are effectively supported by educational technology. For example, Wu & Marek (2018) and Peraza & Furumura (2022) highlight that digital environments foster collaboration by requiring students to work with culturally diverse peers, thereby enhancing IC. These transversal skills, integral to navigating intercultural contexts, are cultivated as learners engage in structured, technology-mediated exchanges that simulate real-world intercultural interactions.

Furthermore, studies like those by Liepiņa & Ate (2023) demonstrate that digital literacy, a transversal skill that overlaps with IC, is critical in Ed-tech-based learning. By equipping students with the skills to navigate digital tools, educators not only enhance students' technical competence but also prepare them for effective intercultural communication in globalized digital settings. This skill development is crucial for fostering a generation of learners who can navigate and interpret culturally diverse digital landscapes.

6.5 Challenges and Limitations in Using Ed-Tech for IC

Despite these promising outcomes, certain challenges limit the effectiveness of Ed-tech in promoting intercultural competence. A common barrier is unequal access to technology and varying levels of digital literacy among students and educators, as noted by Husniah *et al.* (2021) and Pham (2023). These factors can restrict students' participation in Ed-tech-driven intercultural exchanges, particularly in under-resourced regions or institutions with limited digital infrastructure.

Additionally, the importance of structured guidance in EdTech environments cannot be overstated. Studies by Wach (2015) and Lee *et al.* (2023) emphasize that, without instructional support, students may not fully engage with the intercultural content or achieve the desired depth of understanding. Furthermore, high-tech solutions like virtual reality, though beneficial for immersive learning, often require significant financial and technical resources that may not be feasible for all institutions (Li *et al.*, 2022). These challenges underscore the need for accessible and adaptable Ed-tech solutions tailored to the diverse needs of ELT learners worldwide.

6.6 Effective Integration of Ed-Tech in Fostering IC

Educational technology has proven valuable for cultivating intercultural competence in ELT by facilitating meaningful, culturally rich interactions and promoting critical and adaptive skills. For instance, project-based and collaborative tools such as virtual exchanges, flipped classrooms, and social media have enabled students to gain real-time exposure to diverse perspectives, as seen in studies by Chen & Yang (2014) and Wu & Marek (2018). These findings align with the view that immersive, culturally diverse environments can enhance intercultural competence by encouraging students to reflect on and adapt to new cultural norms.

Additionally, blended learning and computer-mediated communication (CMC) tools encourage students to engage deeply with cultural content. Studies like those by Elboubekri (2017) and Wach (2015) underscore the value of digital platforms in allowing learners to interact beyond the confines of the traditional classroom, supporting skills essential for cross-cultural understanding. However, the effectiveness of these tools is contingent upon accessibility and proper instructional guidance, suggesting that thoughtful design is critical for maximizing Ed-tech's benefits in intercultural learning.

7. Implications & Recommendations

Based on these findings, several implications and recommendations for educators, curriculum designers, and policymakers emerge, namely:

7.1 Designing inclusive, accessible Ed-Tech solutions
To maximize Ed-tech's potential in fostering IC, educators and policymakers should prioritize accessible technology that considers varied resource availability. Low-cost or widely available tools, such as social media platforms or asynchronous discussion boards, can offer impactful intercultural learning experiences without imposing heavy technological demands.

72 Promoting Transversal Skills in Digital Learning Environments
Transversal skills like critical thinking and adaptability are pivotal for intercultural competence. Integrating Ed-tech in ways that encourage these skills can be highly effective. For example, adopting project-based or inquiry-driven digital exchanges can help students develop essential IC skills. Curriculum designers should consider embedding structured opportunities for transversal skill development within Ed-tech tools.

7.3 Teacher Training and Instructional Support
The need for trained educators to use EdTech effectively is critical. Teachers play a pivotal role in guiding students through culturally complex topics, especially in digital environments. Professional development programs focused on digital intercultural teaching strategies could enhance educators' competence in managing and facilitating intercultural exchanges in ELT.

7.4 Balancing Innovation with Feasibility
Policymakers should consider balancing high-tech innovations with realistic applications in diverse educational settings. While advanced EdTech, like virtual reality, has shown promise, ensuring these tools are feasible and adaptable to various institutional contexts is essential. A focus on scalable, flexible solutions will allow more schools and universities to benefit from technology-mediated intercultural learning.

7.5 Longitudinal Research on Ed-Tech's Impact
Finally, this review highlights a gap in longitudinal research on Ed-Tech's impact on intercultural competence. Future studies should consider examining the long-term effects of EdTech-based IC interventions, particularly to evaluate how sustained exposure to technology-mediated cultural learning impacts students' intercultural competence over time.

8. Conclusion

This systematic review highlights the transformative potential of educational technology (EdTech) in cultivating intercultural competence (IC) within English Language Teaching (ELT). Through an analysis of 13 empirical studies, the review demonstrates that, when integrated thoughtfully, EdTech can facilitate meaningful cultural engagement, support the development of essential transversal skills, and create collaborative learning environments. Tools such as social media, virtual exchanges, and blended learning models have been shown to offer invaluable opportunities for learners to cultivate adaptability, critical thinking, and intercultural communication—skills that are increasingly vital in an increasingly globalized world.

Nevertheless, the review also reveals significant challenges. Limited digital literacy, uneven access to technology, and insufficient instructional support often limit the effectiveness of EdTech-driven intercultural learning, particularly in resource-constrained environments. These obstacles underscore the urgent need for accessible, adaptable EdTech solutions that account for the varied technological capacities of ELT classrooms globally.

For educators, curriculum developers, and policymakers, this review offers several practical recommendations. Emphasizing inclusive EdTech practices, incorporating transversal skill development within digital learning, and prioritizing comprehensive teacher training are key steps toward maximizing the impact of technology on intercultural competence. Furthermore, achieving a balance between high-tech innovations and feasible solutions for diverse educational contexts will enhance accessibility and equity in ELT.

As educational paradigms continue to shift, future research should prioritize longitudinal studies to assess the lasting impact of EdTech on intercultural competence. These findings will contribute to a more nuanced understanding of how digital tools can be leveraged to equip learners with the intercultural skills essential for effective communication in multicultural settings. This review lays the groundwork for informed and practical advancements in ELT, promoting a culturally responsive and globally conscious approach to language education.

Conflict of Interest Statement
The authors declare no conflicts of interest.

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