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### Intercultural Communicative Competence in Pre-Service Language Teacher Education: A Scoping Review of Research Trends and Technology-Mediated Pedagogical Practices

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## Intercultural Communicative Competence in Pre-Service Language Teacher Education: A Scoping Review of Research Trends and Technology-Mediated Pedagogical Practices

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### ABSTRACT

Intercultural communicative competence (ICC) has become central in preservice language teacher education, as future teachers are expected to work with diverse learners using cultural sensitivity, critical awareness, and mediating skills. This review draws on a Web of Science search (2010–2024) using ICC-related keywords, which yielded 56 studies; 16 met the inclusion criteria. Conducted across varied educational contexts and published in multiple journals, these studies underscore the pivotal role of digital technologies in supporting intercultural learning and communication. Qualitative designs predominate, with online discussion forums, digital exchange platforms, and reflective documents serving as primary data sources. The studies mainly aim to introduce new pedagogical tools, support intercultural communication, and foster preservice language teachers' intercultural competence and awareness. Overall, the findings indicate that virtual exchange, virtual simulations, telecollaboration, and multimodal approaches promote ICC. The review also highlights the need for more methodologically diverse, theoretically precise, and longitudinal research on technology-mediated intercultural learning in preservice teacher education.

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Language teachers are expected to prepare learners for communication in linguistically, culturally, and digitally diverse contexts, given the increasing number of multilingual and multicultural student populations in their classes (Güngör et al., 2019). Intercultural communicative competence (ICC) has been growing in interest in preservice language teacher education (PSLTE) since these teachers are expected to teach the target language to these groups in their profession by showing sensitivity to cultural differences, recognising power and positionality in the workplace, and being able to mediate meaning across social boundaries. In response, ICC research, environments, and models provide preservice teachers with opportunities for sustained intercultural interaction, reflective dialogue, and professional learning that transcend national and institutional boundaries.

At the same time, recent research has problematised the ways in which ICC is conceptualised, operationalised, and enacted in PSLTE. While core models have provided effective frameworks for understanding intercultural development, they are criticised for their tendency to privilege skills-based, individualised, or nation-centred views of culture, often overlooking issues of power, ideology, and contextual contingency. Studies have, therefore, recently called for more pluralistic and reflexive approaches that conceptualise intercultural learning as dynamic, situated, and mediated by discourse, technology, and social interaction. In PSLTE studies, ICC increasingly intersects with sociocultural learning theories, critical pedagogies, discourse-oriented perspectives, and multiliteracies frameworks. However, despite this growing theoretical intersection, research so far has remained limited in terms of understanding how ICC is conceptualised, what ICC pedagogical models have been preferred in PSLTE, and what the future research holds for us in relation to certain dimensions, such as technology, which has been a core element in ICC research recently.

To address this, the present study employs a scoping review to systematically examine studies at the intersection of ICC and technology in PSLTE research published between 2010 and 2024. By

mapping the theoretical frameworks, conceptual orientations, and analytical lenses employed in the literature, this review aims to clarify the emerging conceptual landscape of intercultural learning in PSLTE. Accordingly, the study addresses the following research questions:

1. What are the characteristics of ICC studies?
2. What pedagogical approaches and models have been used to develop intercultural competence among pre-service language teachers?
3. What trends, gaps, and methodological patterns are identified across studies published between 2010 and 2024?

## 2. Literature Review

Intercultural communicative competence (ICC) literature hosts a number of review studies, the foci of which range from low-stakes settings to tertiary-level landscapes (Avgousti, 2018; Çiftçi, 2016; Guillén-Yparrea & Ramírez-Montoya, 2023; Heggernes, 2021; Mootoosamy & Aryadoust, 2024; Zhou et al., 2024). Studies on ICC in preservice language teacher education (PSLTE), particularly those mediated through technology, are rooted in a diverse and evolving range of theoretical frameworks (Aşık et al., 2026; Emir & Yangın-Ekşi, 2024). Rather than converging on a single dominant model, studies published between 2010 and 2024 and reviewed in this scoping review reveal a pluralistic theoretical landscape in which established ICC frameworks coexist with broader sociocultural, critical, discursive, and multiliteracies-oriented perspectives. Accordingly, this review outlines the conceptual diversity and positions ICC as a central, but not a dominant, reference point within the PSLTE field.

### 2.1. Foundational ICC Models in Preservice Language Teacher Education

A substantial proportion of studies conceptualize intercultural learning through established ICC frameworks, most notably Byram's (1997) model of intercultural communicative competence and Bennett's (1993) Developmental Model of Intercultural Sensitivity (DMIS). Byram's model, emphasizing attitudes, knowledge, skills of

interpreting and relating, skills of discovery and interaction, and critical cultural awareness, has been particularly influential in research examining preservice teachers' intercultural development, reflective capacities, and pedagogical preparedness. Widely applied across foreign language education and international exchange contexts, this model underscores the interdependence of linguistic proficiency and intercultural awareness in ICC development (Lisnychenko et al., 2022).

Similarly, Bennett's (1993) DMIS, which conceptualizes intercultural development as a progression from ethnocentric to ethnorelative orientations, has been employed to trace changes in preservice teachers' intercultural sensitivity over time (Husseın et al., 2025). Studies drawing on Bennett's and Byram's frameworks increasingly extend these models by incorporating critical and context-sensitive dimensions. For example, Eren (2023) demonstrates how telecollaborative interventions informed by foundational ICC models can foster PSLTs' intercultural knowledge and skills while also surfacing critical issues such as diversity awareness, pragmatic cultural positioning, latent intercultural tensions, and gender inequality. Within PSLTE contexts, these foundational models are frequently combined with pedagogical perspectives and digital tools that problematize static or essentialist understandings of interculturality, reframing intercultural competence as dynamic, situated, and pedagogically mediated.

## *2.2. Broadening ICC: Transnational, Symbolic, and Awareness-Based Perspectives*

While foundational ICC models provide an important conceptual starting point, several studies (Menard–Warwick et al., 2013) move beyond model-driven approaches to reconceptualize interculturality through broader theoretical lenses. Risager's (2007) transnational paradigm, for instance, conceptualizes culture as mobile, heterogeneous, and embedded in global flows, challenging nation-bound notions of culture that underpin earlier ICC frameworks. Similarly, Kramsch's (1993) notion of the "third place" and symbolic competence foregrounds meaning-

making, subjectivity, and symbolic power in intercultural encounters. Drawing on this perspective, Ollerhead et al. (2023) examine how virtual, dialogic, and transnational "third spaces" can support preservice teachers' intercultural development through multimodal and reflective practices. Their findings indicate that such environments promote nuanced understandings of self and other, foster critical reflection on monolingual assumptions, and enhance awareness of multilingualism as pedagogical resources.

Baker's (2012) conceptualization of intercultural awareness has further informed studies prioritizing reflexivity, contextual sensitivity, and the dynamic negotiation of meaning, particularly in lingua franca and digitally mediated settings. For instance, Dugartsyrenova and Sardegna (2019), drawing on Baker's framework, illustrate how online telecollaborative projects can support preservice teachers' development of intercultural awareness by encouraging reflection on stereotypes and expanding cultural understanding beyond textbook representations. Although Hofstede's cultural dimensions are occasionally discussed in the reviewed literature (Lisnychenko et al., 2022), their use is typically instrumental and increasingly subject to critique for their essentializing tendencies. Collectively, these perspectives reflect a shift toward more fluid, reflexive, and process-oriented conceptualizations of interculturality in PSLTE.

## *2.3. Technology-Mediated Intercultural Learning and Telecollaboration*

Given the emphasis on technology integration, a significant body of research conceptualizes ICC development through frameworks related to telecollaboration, virtual exchange, and online intercultural interaction (Dugartsyrenova & Sardegna, 2019; Eren, 2023). In these studies, technology is not treated merely as a delivery tool but as a mediating environment that shapes the nature and quality of intercultural engagement. Telecollaboration is commonly defined as structured online intercultural communication among speakers of different languages (Belz, 2003)

and is increasingly conceptualized as a dialogic, discourse-based pedagogical practice.

Research in online PSLTE contexts demonstrates that telecollaboration can enhance preservice teachers' intercultural attitudes and perceptions (Yeh & Heng, 2023), intercultural competence (Eren, 2023), pedagogical development (O'Dowd, 2021), respect for cultural difference (Vu, 2022), motivation (Liaw, 2019), and engagement in authentic intercultural interaction (Wu et al., 2020). These studies highlight how online environments afford sustained intercultural contact, multimodal communication, and collaborative knowledge construction across geographical and cultural boundaries. As such, technology-mediated frameworks contribute to reconceptualizing ICC as situated, dynamic, interactional, and contingent upon the affordances and constraints of digital environments.

#### *2.4. Sociocultural Foundations and Social Learning Perspectives*

Another prominent theoretical strand in the reviewed literature is rooted in sociocultural theory, particularly Vygotskian perspectives that conceptualize learning as socially mediated and developmentally situated. Studies informed by social learning theory frame ICC development as emerging through interaction, scaffolding, and participation in socially organized activities. Core concepts such as mediation, the zone of proximal development, and guided reflection are used to explain how preservice teachers internalize intercultural understandings through collaborative tasks and technology-supported dialogue (Sun, 2024). This sociocultural orientation aligns closely with PSLTE contexts, where learning is understood as a process of becoming rather than mere acquisition. From this perspective, ICC is not viewed as a fixed outcome but as a dynamic capability shaped by social interaction, institutional contexts, and pedagogical design. Notably, only one study enacted sociocultural theory through sustained dialogic interaction, collaborative writing, and feedback practices in technology-mediated intercultural learning contexts (Sun, 2024).

#### *2.5. Critical and Reflexive Approaches to Interculturality*

A further strand of research adopts explicitly critical and reflexive theoretical lenses, challenging normative and depoliticized conceptions of ICC. Drawing on critical interculturality, critical cosmopolitan literacies (Sun, 2024), critical pedagogy (Angelini et al., 2024), and critical language awareness (Masson & Van Geel, 2024), these studies foreground issues of power, inequality, ideology, and epistemic injustice. Rather than treating intercultural competence as a neutral or universally desirable skill set, critical approaches interrogate whose cultures, languages, and identities are legitimized in intercultural encounters. In technology-mediated PSLTE contexts, such perspectives examine how digital spaces may both reproduce and disrupt dominant discourses, creating opportunities for preservice teachers to critically reflect on their own positionalities and professional identities.

#### *2.6. Language, Discourse, and Semiotic Perspectives*

Several studies conceptualize ICC through linguistically oriented frameworks that foreground discourse, pragmatics, and identity negotiation (Hilliker et al., 2021). Drawing on L2 pragmatics, positioning theory, and translingual negotiation, these studies analyze how intercultural meaning-making unfolds in interaction. Telecollaboration is frequently treated as discourse-in-action, where participants co-construct identities, negotiate norms, and align with or resist dominant positions across linguistic and cultural repertoires. In addition, culturally sustaining systemic functional linguistics and related semiotic approaches (Mizell, 2020) emphasize meaning-making across modes, languages, and cultural resources, particularly in digital and multimodal tasks. These perspectives position ICC as enacted through language use and semiotic choices rather than as an abstract or decontextualized competence.

## 2.7. *Multiliteracies, Arts-Based, and Multimodal Frameworks*

Finally, an emerging body of research draws on multiliteracies theory, arts-based pedagogies, and multimodal approaches to intercultural learning (Masson & Van Geel, 2024). These frameworks foreground creativity, affect, embodiment, and multimodal meaning-making as central to intercultural development. In technology-rich environments, such approaches broaden the conceptual scope of ICC to include visual, artistic, and digital literacies, highlighting alternative pathways for engaging with cultural difference beyond text-based interaction.

Taken together, the reviewed literature indicates that ICC-oriented frameworks occupy a central but non-dominant position in technology-mediated preservice language teacher education research. Rather than constituting a unified theoretical core, ICC models function as organising reference points within a broader conceptual ecology that encompasses sociocultural, critical, discursive, and multiliteracies-based approaches. This coexistence reflects an ongoing epistemic shift in the field toward more pluralistic, reflexive, and context-sensitive understandings of intercultural learning in PSLTE.

## 3. Methodology

In the field of language education, research synthesis is not new; the number of meta-analyses published is growing. However, it is only recently that the field has witnessed more research syntheses, including, but not limited to, scoping reviews (Chong, 2025). Accordingly, a scoping review approach was adopted as the search strategy, as scoping reviews provide an overview of studies on a given topic, making them “an ideal tool to determine the scope or coverage of a body of literature” (Munn et al., 2018, p. 2). Aiming to showcase how the concept of ICC has been handled in connection with technology integration across a selection of studies situated in second language teacher education, this study turned out to be fitting for a scoping review, which is basically “a rigorous

and transparent method for mapping areas for research” (Arksey & O’Malley, 2005, p. 30).

Although scoping reviews are often confused with systematic reviews, they can serve as a preliminary form of research synthesis by helping researchers determine the feasibility of conducting a systematic review on a given topic (Chong & Plonsky, 2024b). Scoping reviews adopt a broader focus on the chosen topic, and they do not necessarily zero in on the quality of the studies reviewed, or they are not after providing an evaluation or a synthesis of the selected studies, which are tasks typically undertaken in systematic reviews (Arksey & O’Malley, 2005; Munn et al., 2018). With this perspective in mind, this study followed the steps Arksey and O’Malley (2005) outline in their pioneering work, i.e. “identifying the research question, identifying relevant studies, study selection, charting the data, collating, summarizing and reporting the results” (p. 22) in this exact order. Since scoping reviews differ from regular literature reviews due to their “explicit, transparent, peer-reviewed search strategy” (Munn et al., 2018, p. 6), the rigorous application of these procedures across all stages of this study was of utmost importance.

### 3.1. *Search Strategy*

This scoping review was performed using the Web of Science (WoS) database. The relevant literature on ICC was searched within this database, covering the period from 2010 to 2024. Studies published since 2010 were prioritized to highlight contemporary research findings, a decision also informed by the limited availability of empirical research from earlier periods. The search strategy was composed of four primary constructs and their associated synonyms. To refine the results, Boolean operators and truncation were used. Specifically, the OR operator was applied within each term set, while AND was used to link the sets. Additionally, truncation was employed to capture various lexical forms of the keywords.

Studies situated at the intersection of these four core elements were identified: ICC, preservice language teachers, language teacher education context, and

technology. In other words, the keywords (see Table 1) included sets of terms to describe: (1) ICC (e.g., intercultur\* OR cross-cultur\*); (2) participants (e.g., “pre-service teacher\*” OR “prospective teacher\*”; (3) context (e.g., “initial teacher education” OR “language teacher education”), and (4) technology (e.g., technology OR digital).

To ensure a comprehensive search strategy, core search terms for ICC were identified by drawing from keywords used in prior ICC-related review

studies (Al-Afifi, 2025; Avgousti, 2018; Goldstein, 2022; Heggernes, 2021; Hussain et al, 2025; Jin& Sercu, 2025; Kohli Bagwe & Haskollar, 2020; Luo & Chan, 2022). Given that the majority of these reviews included “neighbouring constructs of ICC” (Al-Afifi 2025, p.3), an inclusive approach was likewise adopted for the current search and the keywords in Table 1 were employed for the WoS search.

Table 1  
Core Search Elements and Associated Keywords Used in the WoS Database

Core Elements	Concepts
ICC	intercultur* OR "cross-cultur*" OR "cross cultur*" OR "multicultur*" OR "global competen*" OR plurilingual* OR multilingual* OR "intercultural communicative competence" OR "cultural competen*" OR "cultural aware*" OR "cultural sensitivit*" OR "cultural intelligenc*" (All Fields)
Participants	"pre-service teacher*" OR "preservice teacher*" OR "student teacher*" OR "teacher trainee*" OR "teacher candidate*" OR "prospective teacher*" OR "future teacher*" OR "pre-service EFL teacher*" OR "preservice EFL teacher*" OR "pre-service ESL teacher*" OR "preservice ESL teacher*" OR "pre-service language teacher*" OR "preservice language teacher*" OR "pre-service English teacher*" OR "preservice English teacher*" OR "pre-service foreign language teacher*" OR "preservice foreign language teacher*" OR "pre-service second language teacher*" OR "preservice second language teacher*" OR "TESOL student teacher*" OR "language teacher trainee*" OR "EFL teacher trainee*" (All Fields)
Context	"initial teacher education" OR "language teaching" OR "language education" OR "English language teaching" OR "TESOL" OR "language teacher education" OR "language teacher training" OR "language teacher preparation" OR "ELT" OR "SLTE" OR "FLTE" OR "English teacher education" OR "English language teacher education" (All Fields)
Technology	"technology" OR "digital" OR "virtual" OR "online" OR "telecollaborat*" OR "synchronous" OR "asynchronous" OR "ICT" OR "computer" OR "multimodal*" OR "multi-modal*" (All Fields)

### 3.2. Inclusion and Exclusion Criteria

Due to the importance attached to the “transparency, objectivity, and credibility” (Chong & Plonsky, 2024a, p. 1583) in a scoping review, certain inclusion and exclusion criteria were identified in the selection of the studies for this scoping review, which were as follows:

- a. Only empirical studies were included.
- b. The studies were required to be published in English.
- c. The studies published between 2010 and 2024 were considered eligible.

The initial search yielded 56 articles. Before the abstract screening procedure took place, the research team outlined its finer details such as the steps and the dimensions to be worked on (Mak& Thomas, 2022). The abstract screening was based on the abovementioned core elements, i.e. focus on ICC, participants, context, and technology integration. Following this stage, two researchers worked on abstract screening, first independently on their own, then in a joint evaluation session on the results of their individual selections. As a result of the full agreement reached by the two researchers, 32 empirical studies were identified as meeting the inclusion criteria.

### 3.3. Data Extraction and Analysis

Data extraction was carried out through a multi-staged procedure. First, 32 eligible articles identified in the previous abstract screening stage were subjected to detailed examination. During this phase, a deductive coding scheme with predetermined dimensions was employed. These dimensions were identified with previous scoping reviews carried out in the field in mind (Liu & Zhao, 2025; Soyooft et al., 2023; Wang & Curran, 2025) by all the authors, who reached a consensus on the following codes: (1) author, (2) publication year, (3) article title, (4) journal title, (5) country of the study, (6) study aim, (7) research questions, (8) theoretical framework, (9) field/discipline, (10) sample size, (11) study context, (12) core focus area in terms of ICC, (13) ICC constructs targeted, (14) type of technology used, (15) function of technology in the study, (16) level of technology integration, (17) purpose of technology integration, (18) type of the pedagogical intervention, (19) duration of the study, (20) platform used for the study, (21) research design, (22) data collection instruments, (23) reported

validity and reliability, (24) findings, and (25) reported limitations.

Each article was independently reviewed by two researchers, and to enhance reliability, the researchers checked each other's coding and resolved any discrepancies through deliberation both with their research partner and the whole research team until full agreement was reached. The procedure resonated with applications such as including a third reviewer to resolve disagreements while carrying out scoping reviews as suggested by Mak and Thomas (2022); moreover, all six researchers were involved in resolving even minor ones so that "a level of agreement of 90% or higher" (Mak & Thomas, 2022, p. 563) can be achieved. Through this verification process, the final number of eligible articles was confirmed as 16. These remaining 16 studies were subsequently analyzed using qualitative content analysis and coding procedures. This rigorous analytical procedure enhanced the trustworthiness and credibility of the findings.

Table 2  
Studies Included in This Scoping Review

No	Author(s) (Year)	Title
1	Lisnychenko et al. (2022)	Facebook movie-based discussions: Bringing down intercultural barriers in English language education
5	Glimaeng & Sauro (2024)	Fostering glocal intercultural awareness through virtual exchange in TESOL teacher education
9	Eren (2023)	Raising critical cultural awareness through telecollaboration: insights for pre-service teacher education
15	Calvo & Hartle (2024)	Virtual exchange in teacher education programs from Brazil and USA: outcomes and challenges
16	Sun (2024)	Transforming pre-service EFL teacher education through critical cosmopolitan literacies: voices from Mainland China
19	Ollerhead et al. (2024)	Building a virtual transnational space for initial teacher education with Australian and German students
29	Mizell (2020)	Apprenticeship of pre-service teachers through culturally sustaining systemic functional linguistics
31	Barros et al. (2021)	Challenging monolingual ways of looking at multilingualism: Insights for curriculum development in teacher preparation
33	Angelini et al. (2023)	Perception of learning through virtual simulation in initial teacher education
34	Masson & Van Geel (2024)	A raciolinguistic exploration of pre-service ESL teachers' conceptualization of plurilingualism using drawings
37	López-Gopar (2014)	Teaching English critically to Mexican children
41	Hilliker et al. (2021)	Development of pragmatic competence among L2 learners: Examining compliment responses in intercultural virtual exchanges
49	Menard-Warwick et al. (2013)	Local and global identities in an EFL internet chat exchange
51	Porto et al. (2022)	Undoing inequalities: inclusive and transformative language practices in rural Argentinian Patagonia
53	Uzum et al (2024)	Teacher candidates' intercultural communication in telecollaboration: locating acts of positioning in translingual negotiations
56	Angelini et al (2024)	Virtual simulation in teacher education across borders

Figure 1 presents a comprehensive overview of the review process, outlining the stages of identification, screening, eligibility assessment, and inclusion in accordance with the predefined criteria.

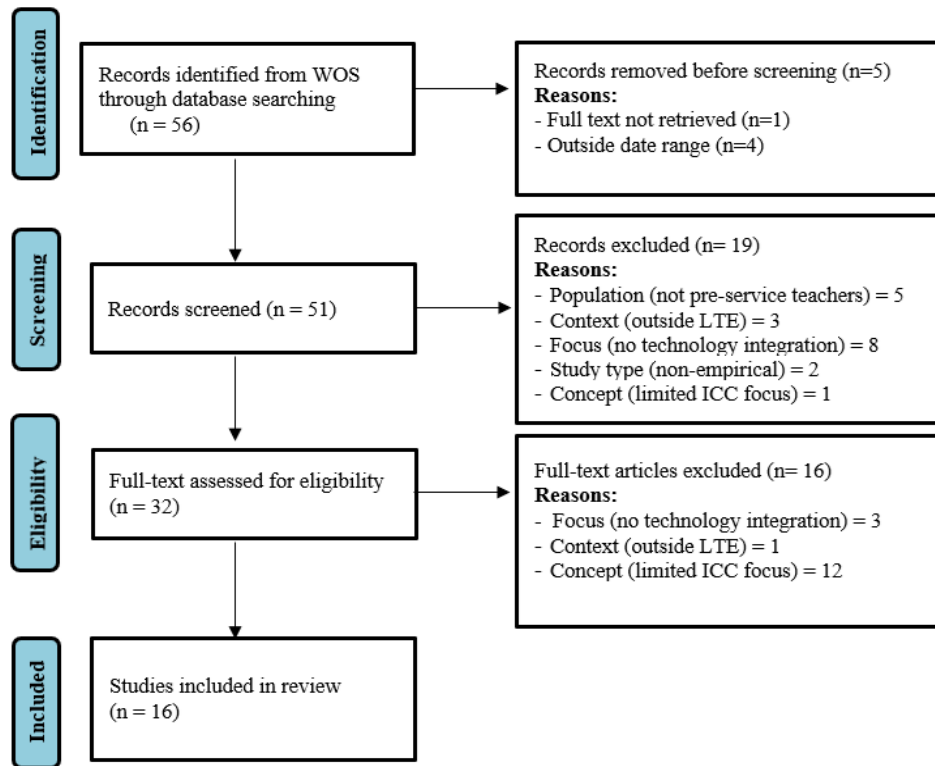


Figure 1  
Flowchart of the Review Process

## 4. Findings

### 4.1. Characteristics of ICC studies

#### *Publication Trends and Contexts*

The 16 studies in this scoping review illustrate a growing interest in technology-supported ICC development within pre-service second language teacher education. In the first half of the review period, from 2010 to 2019, research activity was minimal; however, publication numbers increased in the following years, with a notable rise in 2024. This pattern suggests that the integration of ICC and digital tools in pre-service language teacher education remains an emerging area, gaining momentum only in recent years. Figure 2 illustrates the distribution of papers by year.

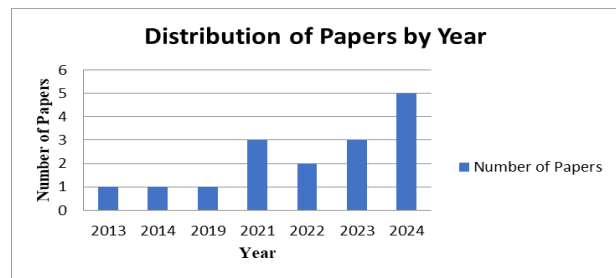


Figure 2  
Distribution of Papers by Years

These studies were published across a wide range of journals, reflecting the interdisciplinary nature of work at the intersection of ICC, technology use, and teacher education. Publication venues cover language education and applied linguistics journals (e.g., *ELT Journal*, *TESOL Journal*), technology-focused journals (e.g., *CALL*, *Education and Information Technologies*), as well as broader education and linguistics journals (e.g., *Teaching in Higher Education*, *The Modern Language Journal*).

The broad range of publication venues is mirrored in the geographical diversity of the studies. Research was conducted across various educational contexts, with several projects involving participants from multiple countries—often through virtual exchanges - linking settings such as Türkiye, the United States, Spain, and Poland. Other studies were conducted within single national contexts, including China, Russia, Mexico, Argentina, and Canada. Overall, this diversity suggests that work in this area spans various contexts, with cross-national collaboration playing a central role in many studies.

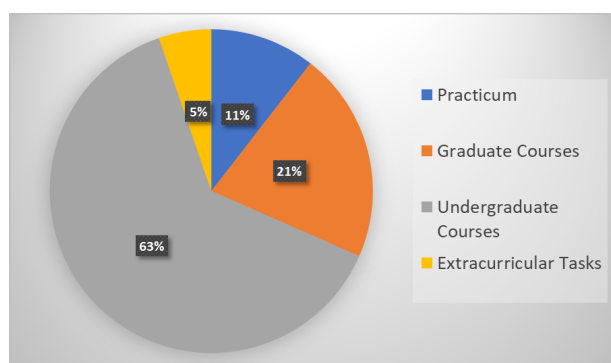


Figure 3  
Research Context

*\*As some studies are conducted in both undergraduate and graduate contexts at the same time, the total number of contexts is more than the number of articles.*

Most research articles (63%) were carried out within an undergraduate context ( $n = 12$ ), as demonstrated in Figure 3. Following that, MA and PhD classes ( $n = 4$ ) are the settings in which technology-enhanced ICC studies are conducted. Practicum ( $n = 2$ ) is the place in which pre-service teachers gain work-related experience, and two studies aim to implement ICC in this context. Additionally, one study was performed as part of an

extracurricular activity. The findings support the notion that undergraduate and graduate courses, particularly pre-service education, are a focus of ICC research.

#### Methodological Characteristics

All participants reported in this review are pre-service teachers. Figure 4 illustrates the sample sizes reported in the ICC studies. The highest sample size includes 106 student teachers, whereas some qualitative studies use data from only one or two participants. The average sample size is 42.

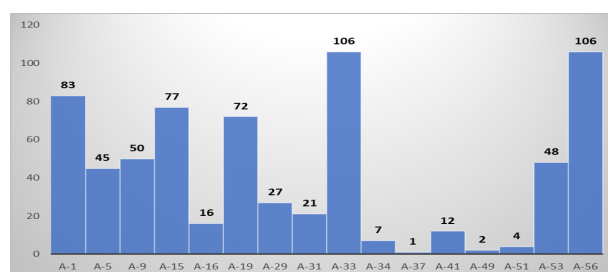


Figure 4  
Sample Size

Regarding the research designs listed in Table 3, the relevant studies can be categorized into three main sections: qualitative, quantitative, and mixed-methods. A significant number of research studies are grounded in qualitative methodology ( $n=11$ ). Case studies, grounded theory, multisite comparison, discourse analysis, and action research are the main research designs used to develop the qualitative data. Multiple linear regression and exploratory designs are employed for quantitative data ( $n=2$ ). Two studies used a mixed design, and one employed the convergent model for data collection.

Table 3  
Research Design

Qualitative Studies (n=11)	Quantitative Studies (n=2)	Mixed Studies (n=3)
<ul style="list-style-type: none"> <li>• Case study</li> <li>• Grounded theory</li> <li>• Multisite comparison</li> <li>• Discourse analysis</li> <li>• Action research</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple linear regression</li> <li>• Exploratory longitudinal study</li> </ul>	<ul style="list-style-type: none"> <li>• Convergent method</li> </ul>

Across qualitative, quantitative, and mixed-methods research, a wide range of data collection sources is used in ICC articles. Figure 5 shows the overall distribution of these sources in the studies. Online discussion forums, including various exchange platforms, and reflection documents are the most commonly used tools for collecting ICC-related data. Following these tools, questionnaires/surveys and recordings are largely used. Researchers also employed visuals, artefacts, interviews, observation, narratives, and field notes as data sources. Evaluation forms, scales, and e-portfolios are relatively less-used tools in ICC studies. The frequency of data courses is directly linked to the research methodologies. The high ratio of qualitative studies spotlights the use of more qualitative data sources.

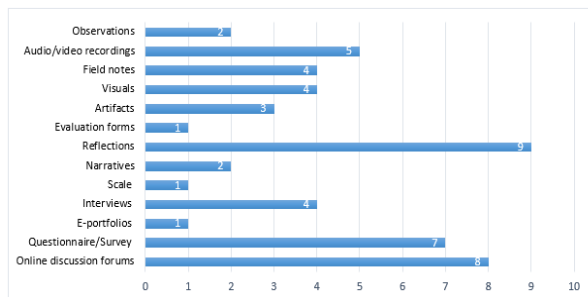


Figure 5  
Data Sources

As discussed in Table 4, ICC-related research articles primarily aimed to measure how intercultural communication and awareness are fostered in pre-service education (n = 4). Four studies attempt to introduce pedagogical models, approaches, or courses related to ICC (n=4). Similarly, some ICC tools are evaluated for their strengths and weaknesses in PSE. Three research

articles investigate pre-service teachers' intercultural experiences, and one study employs ICC tools to support the learning dynamics of PSE teachers.

Table 4  
Measured Outcomes

	f
To promote intercultural communication in pre-service education (PSE)	3
To examine pre-service teachers' intercultural experiences	2
To examine the strengths and weaknesses of ICC tools in PSE	3
To apply or assess a new pedagogical model/course related to ICC	4
To support/describe pre-service teachers' learning through ICC tools	3
To foster intercultural awareness among pre-service teachers	1

#### 4.2. Pedagogical Approaches, Models, and Trends in ICC Studies

##### Theoretical Frameworks

Across the included studies, intercultural communicative competence (ICC) and related forms of intercultural learning were conceptualized through a range of theoretical frameworks reflecting different orientations within technology-mediated teacher education. Some studies drew directly on established ICC frameworks, particularly Byram's (1997) model of intercultural communicative competence and Bennett's developmental model, mainly in research focusing on teacher education and competence development. Broader perspectives, such as Risager's (2007) transnational paradigm, Kramsch's notion of the "third place"

(1993), Hofstede’s cultural dimensions (2001), and Baker’s (2012) intercultural awareness, were also adopted in some studies. In addition, some studies drew on other theoretical lenses, including critical and reflexive interculturality, critical cosmopolitan literacies, culturally sustaining systemic functional linguistics (CSSFL), raciolinguistics, critical language awareness, art-based multiliteracies, telecollaboration as discourse, social learning theory (Vygotsky, 1987), L2 pragmatics, negotiation of identities, positioning theory, translingual negotiation strategies, and critical pedagogy. Overall, the reviewed studies indicate that ICC-oriented frameworks occupy a central but not dominant position, coexisting with adjacent theoretical approaches in the field.

Across the reviewed studies, the core focus of ICC-related outcomes centered primarily on the development of intercultural awareness and sensitivity, intercultural competence, and intercultural communication in virtual or technology-mediated contexts. One study explicitly targeted intercultural awareness, including global and glocal intercultural awareness, as well as global competence, drawing on the OECD Global Competence Framework as an analytical reference. Other studies focused on critical intercultural competence, intercultural mindedness, and aspects of global citizenship, although the development of ICC was not always the primary emphasis. Several studies addressed intercultural exchange and intercultural communication, emphasizing engagement with cultural identities, linguistic and cultural diversity, and participation in intercultural or transnational interaction. Overall, the mapped outcomes indicate that the reviewed studies approached ICC-related learning primarily through awareness, competence, and communicative engagement, rather than through a uniform or narrowly defined set of outcomes.

#### *Technological Component*

Across the reviewed studies, a wide range of digital technologies and platforms were employed to support intercultural learning and communication, most commonly within virtual

exchange and telecollaboration designs. These technologies included learning management systems (e.g., Schoology), video-conferencing tools (e.g., Zoom), synchronous and asynchronous communication platforms (e.g., WeChat, Facebook, voice-based CMC tools), collaborative writing tools (e.g., Google Docs), and multimodal digital resources. In terms of research design, the majority of studies, specifically those employing telecollaboration and virtual exchange, adopted an intervention-oriented approach, where technology was deliberately integrated into pedagogical tasks to facilitate intercultural interaction, dialogue, or exchange. Regarding the level of integration, most studies positioned technology as a core component of the instructional design, meaning that intercultural communication or ICC-related learning outcomes would not have been possible without the use of digital tools. A smaller number of studies treated technology as supportive, primarily for facilitation, documentation, or data collection rather than as the main driver of intercultural learning. Overall, the mapping indicates that technology functioned mainly as an enabling and structuring element for intercultural engagement rather than as a peripheral tool.

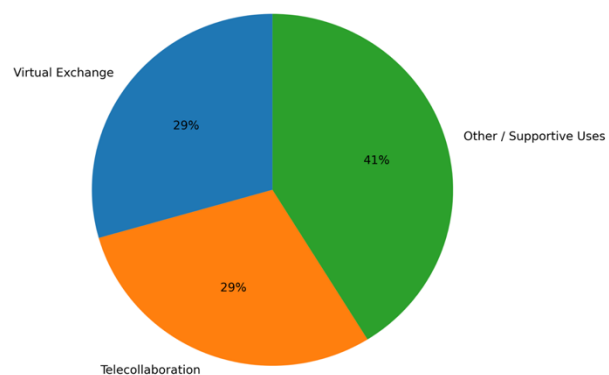


Figure 6  
Type of Technology Used in the Reviewed Studies

As noted earlier, all virtual exchange and telecollaboration projects included in the review were intervention-oriented (n = 10), with technology deliberately integrated into pedagogical tasks to foster intercultural learning and interaction. In

addition to these designs, one study employed Facebook-based movie club discussions to raise intercultural awareness, while another utilized virtual language biographies as a pedagogical tool to support the development of intercultural competence. To provide a clearer overview of the temporal scope of these initiatives, Table 5 presents the duration of both interventional and non-

interventional studies, highlighting the range of implementation periods across different technology-mediated designs.

Table 5  
Duration of Technology-Mediated Studies

Duration category	Description	Number of studies (n)	Articles
Short-term	≤ 6 weeks	3	31, 41, 53
Mid-term	7–9 weeks	4	5, 9, 15, 49
Semester-long	One academic semester	2	16, 34
Long-term / extended	≥ 10 months or multi-year	5	1, 19, 29, 33, 56
Not explicitly stated	Duration not reported	2	37, 51

As shown in Table 5, the duration of technology-mediated studies varied considerably, ranging from short-term implementations lasting a few weeks to extended projects spanning several months or years. Across these studies, a variety of digital platforms

and tools were employed to support technology-mediated intercultural learning. Accordingly, Table 6 presents an overview of the technological tools used in ICC-related studies.

Table 6  
Technological Tools Used in ICC-Related Studies

Technology category	Examples of tools	Number of studies (n)	Articles
Video-conferencing tools	Zoom, Google Meet, Teams	7	5, 9, 15, 33, 34, 41, 56
Learning management systems (LMS)	Edmodo, Moodle, Google Classroom, Canvas, UniCollaboration	7	9, 15, 56, 33, 49, 53, 56
Messaging & social media platforms	Facebook, WhatsApp, WeChat, RainClass, MSN Messenger	5	1, 5, 15, 16, 49
Asynchronous / voice-based tools	Voxopop, VoiceThread	2	15, 31
Collaborative/multimodal tools	Padlet	1	15
Data collection tools	Google Forms	1	19
No specific platform reported	–	3	29, 37, 51

As shown in Table 6, individual studies often employed multiple technological tools to support technology-mediated intercultural learning. Overall, whether implemented as part of interventional or non-interventional designs, and whether positioned as a core component of the instructional process or as a supportive tool,

technology-mediated practices across the reviewed studies aimed to foster multiple dimensions of intercultural communicative competence. These included the development of intercultural awareness, attitudes, knowledge, skills, and sensitivity, as well as critical intercultural awareness, tolerance toward difference, resistance

to dominant ideologies, and, in some cases, orientations toward intercultural citizenship.

#### 4.3. Main Findings and Limitations in ICC Studies

ICC studies yield a repertoire of findings that focus on promoting intercultural communication, competence, and awareness. Additionally, some

articles highlight the linguistic benefits achieved through ICC implementation. Virtual exchange, telecollaboration, simulations, and multimodal approaches are the main methods by which ICC is introduced to pre-service education. These tools not only foster intercultural understanding but also support pedagogical and language-related learning.

Table 7  
Main Findings in ICC Articles

	Article
• Virtual exchange promotes intercultural awareness, cultural knowledge and sensitivity, interactional skills, and pragmatic awareness.	5, 15, 41, 51
• Telecollaboration fosters the development of intercultural competence and linguistic awareness.	9, 31, 37, 56
• Multiliteracy practice and mentor guidance support communicative intercultural competence.	16
• The enhancement of language ideologies and linguistic repertoire is linked to the development of intercultural competence.	19, 53
• Multimodal and cross-cultural approaches and interventions help teachers and students raise an awareness of various cultural contexts.	1, 29, 49
• Virtual simulations support the development of an understanding of learning.	33
• There may be uncertainty in situating cultural dynamics within plurilingual contexts.	34

Table 7 summarizes the main findings from ICC articles and indicates which article provides the relevant result. Regarding the contribution of technology to ICC studies, four key themes emerge: data collection, exchange platforms, learning environments, and discourse analysis. Technology is commonly used for data collection purposes. In

some telecollaboration and virtual exchange projects, they serve as platforms for intercultural exchange, data collection, and analysis. For example, discourse is analyzed using technological tools. In terms of educational outcomes, technology is seen as a setting for learning.

Table 8  
Report Limitations

	<i>f</i>
Self-reported data collection	2
Time constraints	5
Technical issues	1
Small size of samples	2
Lack of empirical evidence	3
Inadequate coverage of models/approaches	2
Geographical and cultural varieties	2
Educational policies	1
Diversity in academic programs	1
Lack of synchronous engagement	1
Limited generalizability	2

Lastly, some limitations are reported in ICC articles as highlighted in Table 8. To begin with, time constraints are the major issues identified

across the five studies. Since qualitative research is commonly conducted, a lack of empirical data and evidence, limited generalizability, and small sample

sizes are also considered research limitations in some studies. Contextual, geographical, academic, and cultural differences may impede the interpretation of data analysis, according to some research. Regarding the technological aspects, the lack of synchronous participation and technical problems are perceived as limitations. Finally, some educational policies and the selection of models/approaches may limit researchers' ability to implement their research ideologies.

## 5. Discussion

### *R1. What are the characteristics of ICC studies?*

The publication trends identified in this review point to several noteworthy patterns in the development of the field. The findings of this review extend earlier review work on online intercultural exchanges and ICC by showing that the growing interest in technology-mediated intercultural learning, identified in applied linguistics contexts (Avgousti, 2018), also emerges more recently within pre-service second language teacher education. A similar upward trend is reflected in Jin and Sercu's (2025) literature review, which documents a growing body of research on technology-supported interventions for the development of intercultural competence in higher education. Overall, these patterns suggest increasing attention to ICC across educational research. As suggested by current research, this increased attention has been reflected across various journals and geographies. This finding is consistent with similar studies investigating ICC in relation to educational technologies (Avgousti, 2018; Çiftçi, 2016). In particular, the concentration of publications in 2024 suggests that the field may be approaching a more productive phase following years of gradual emergence. The interdisciplinary spread of publication venues further indicates that ICC in technology-mediated PSLTE draws the attention of scholars from multiple fields. Similarly, geographical diversity of the studies aligns with the nature of virtual exchange and telecollaboration as inherently transnational pedagogical practices.

The contexts where the reviewed studies are categorized are undergraduate classes, graduate courses (MA and PhD), practicum, and extracurricular events. ICC is mostly practiced as a part of undergraduate education (63%). In this regard, Sercu (2005) highlights that foreign language teaching is a form of instruction that naturally engages learners across various contexts. Considering this engagement, it is necessary for L2 language teachers to develop a sharper awareness of intercultural competence. Alptekin (2002) emphasizes that teachers support the development of learners' communicative competence by incorporating culture into language. Accordingly, English language teaching programs play a pivotal role in embedding intercultural communication in meaningful contexts (Sarıgöz, 2014); therefore, pre-service teachers gain practical experience through diverse multicultural dialogues during pre-service education.

### *R2. What pedagogical approaches and models have been used to develop intercultural competence among pre-service language teachers?*

The reviewed studies reveal a theoretically diverse landscape in which no single framework dominates the conceptualization of ICC in technology-mediated pre-service language teacher education. The findings of this review indicate that while Byram's (1997) model remains one of the most widely recognized reference points for ICC, it did not uniformly dominate the theoretical positioning of the reviewed studies. Instead, researchers appeared to selectively mobilize different frameworks to align with the contextual, technological, and critical orientations of their work. This pattern aligns with recent work indicating that, although foundational, established ICC models should be complemented by newer and more nuanced perspectives to remain responsive to contemporary educational contexts (Hoff, 2020).

Beyond theoretical frameworks, the diversity of ICC-related concepts identified in this review reflects a broader pattern in the field. This pattern is hardly surprising, given the diversity of theoretical frameworks and technological tools that shaped the

design and focus of the reviewed studies. This finding resonates with Romijn et al.'s (2021) review of professional development efforts targeting intercultural competences in teacher preparation programs, which similarly identifies a wide variety of definitions of what intercultural competences entail across studies. Collectively, these patterns point to the conceptual plurality that continues to characterize ICC research across educational contexts.

Turning to the technological dimension, the reviewed studies consistently positioned digital tools as central rather than peripheral to ICC-oriented learning. Given the interaction-heavy nature of ICC-oriented learning, telecollaboration and virtual exchange provide particularly suitable pedagogical contexts for intercultural engagement when they are purposefully designed and integrated, as emphasized by Godwin-Jones (2019). Likewise, Emir and Yangın-Ekşi's (2024) review on telecollaboration in English language teacher education highlights its contribution to the development of pre-service teachers' intercultural competence through authentic interaction and cross-cultural engagement. The predominance of synchronous and asynchronous digital tools across these projects further reflects the infrastructural role technology plays in sustaining intercultural exchange. This pattern is consistent with previous review studies conducted in different settings and fields (Avgousti, 2018; Emir & Yangın-Ekşi, 2024; Jin & Sercu, 2025), which similarly document a variety of technological tools integrated into the design and implementation of ICC-oriented activities. The considerable variation in implementation periods, ranging from short-term interventions to extended multi-year projects, further suggests that there is no consensus on the optimal duration for technology-mediated intercultural learning, pointing to the need for more longitudinal research in this area.

*R3. What trends, gaps, and methodological patterns are identified across studies published between 2010 and 2024?*

Methodologically, most reviewed studies on ICC adopt a qualitative paradigm, grounded in research

designs such as case studies, discourse analysis, and action research. In the review conducted by Guillén-Yparrea and Ramírez-Montoya (2023), the number of selected qualitative studies exceeds that of other methodologies in the context of higher education in the ICC. Similarly, Heggernes (2021) accentuates that the relevant ICC review focuses more on qualitative studies than on other designs. These findings show that ICC-related studies are more often interpreted qualitatively.

Since the current review chiefly analyzes qualitative studies, more interpretive methods, such as narratives, discussions, reflections, and recordings, are used as data sources. In their review studies, Mootosamy and Aryadoust (2024) and Xiaoyan et al. (2024) describe the data collection tools and sources, highlighting language elicitation tasks and competence assessment scales/questionnaires.

The measured outcomes display that applying a new model/tool to the ICC context, assessing these tools, and enhancing pre-service teachers' intercultural competence, awareness, and experiences are the main incentives behind the reviewed articles. Similarly, Guillén-Yparrea and Ramírez-Montoya (2023) point out that intercultural communication, sensitivity, and responsibility are the main dynamics that are investigated in the context of higher education.

In pre-service language teacher education, the main ICC practices are delivered through virtual exchange, telecollaboration, simulations, and multimodal approaches. Jin and Sercu (2025) emphasize that these methods enable interaction among individuals "from different cultural backgrounds and allow them to collaborate and learn together" (p. 14). In a similar vein, Zhou et al. (2024) demonstrate that some ICC tools/methods constitute "more authentic communication settings" for learning (p. 8). Through the application of these methods, pre-service teachers become more aware of intercultural sensitivity, interactional skills, and cultural knowledge. ICC studies also indicate that individuals promote their language learning progress, especially by creating linguistic and pragmatic awareness.

On the other hand, this review highlights the main limitations of research on ICC. Since qualitative research is the main paradigm, a lack of empirical data and evidence, limited generalizability, and small sample sizes are the main limitations described in some studies, as noted by Guillén-Yparrea and Ramírez-Montoya (2023) and Jin and Sercu (2025). Analysis of the obtained data requires interpreting contextual, geographical, academic, and cultural factors. Technical issues are also worth noting, including a lack of synchronous participation, since technology-mediated practices are the means of intercultural communication.

## 6. Conclusion and Implication

Designed as a scoping review, this study aimed to map research at the intersection of ICC, pre-service language teacher education, and technology. To this end, it examined the general characteristics of studies conducted to develop ICC through technology in the context of pre-service language teacher education. After a rigorous data extraction procedure spanning the years 2010 through 2024, the analysis of the selected 16 studies revealed that focus on ICC research has intensified in recent years, which corresponds with other reviews on the same theme. The fact that most of the studies were conducted at the undergraduate level once again highlighted the surge of interest in the intersection of ICC, technology, and PSLTE research.

Another important finding is the diversity of the journals in which the research was published, with scopes ranging from applied linguistics to technology and mainstream education. Most studies adopted a qualitative design, resulting in similarities across the data collection instruments. The research aims of these studies were also diverse, ranging from developing pre-service teachers' intercultural awareness to applying new models in their education. As for the theoretical frameworks adopted in these studies, despite the variety of conceptual frameworks employed, Byram's (1997) model was found to be the most prominent one. It is also worth noting that the conceptualization of ICC varied across studies; some studies kept their focus on the development of intercultural awareness and

sensitivity, whereas some others turned their lens to global or glocal competence as a target concept. Technology was a core component in the majority of the studies analyzed, in that the ICC-related outcomes were found to be directly linked to the usage of technology, resulting from an interventionist approach in the design of the studies.

Virtual exchange and telecollaboration were the most common pedagogical contexts in these interventions, and were typically implemented through learning management systems, video conferencing tools, synchronous and asynchronous communication platforms, as well as collaborative writing tools and multimodal digital resources. Finally, half of the studies in this review concluded that virtual exchange and telecollaboration enhance intercultural awareness, cultural knowledge and sensitivity, pragmatic awareness, intercultural competence, and linguistic awareness, all of which were framed within the concept of ICC. The review also revealed some limitations reported in the studies, such as time constraints and the impossibility of generalizing the results, which were largely dictated by the qualitative nature of the studies analyzed.

The findings of this scoping review point to several directions for future research. First, there is a need for methodological diversity in the research of ICC and PSLTE in connection with technology, which can be achieved through the inclusion of mixed-method and quantitative designs in order to complement the predominantly qualitative evidence base and reach more generalizable conclusions. Second, clearer and more consistent conceptualizations of ICC are needed to clarify which phenomena are targeted by ICC and ensure stronger theoretical alignment across studies. Finally, future research may benefit from longitudinal designs that address time-related constraints and explore how technology-mediated intercultural learning experiences shape the long-term professional development of pre-service teachers.

This review has only searched for peer-reviewed articles in journals that revolve around ICC at pre-service level. Relevant books, book chapters, and

thesis are thus excluded. Also, in order to be able to manage the numbers of articles that will go through the data extraction, the year of publications, the database they are indexed in, and the research context have been limited to a ten-year period, WoS, and PSLTE respectively. It can be remedied in future studies with a broader time frame and indexing scope along with a focus on other contexts such as in-service language teacher education which can be explored through the lens of a scoping review.

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