We sincerely appreciate the time and effort spent evaluating our manuscript. Your comments and suggestions have been extremely valuable in strengthening the scientific quality, clarity, and overall coherence of the work.

Below, we provide a detailed response to each comment, indicating the revisions incorporated into the manuscript and, where applicable, the justification for maintaining the original wording.

Comment 1

Methodological concerns The paper calls itself a “systematic literature mapping” (SLM) but applies PRISMA 2020, which is standard for systematic literature reviews (SLRs). These two approaches have different purposes and levels of rigor. If PRISMA is being used for an SLM, please explain how it was adapted and why it was chosen over mapping-specific frameworks.

Answer. We appreciate your comment regarding the use of PRISMA instead of a mapping-specific framework. While PRISMA 2020 was originally designed for systematic literature reviews (SLRs), its structured and transparent reporting format has also been recognized as useful for systematic literature mappings (SLMs), particularly when consciously adapted and properly justified.

In addition, we considered the methodological guidelines proposed by Petersen et al. (2015), which are widely used for mapping studies—especially in software engineering—but adaptable to fields such as education. Therefore, our methodological approach combines the structure and transparency of PRISMA with the classificatory and exploratory logic of the Petersen model. This decision is now clarified in the Methods section of the manuscript.

Text to be integrated at the beginning of the methodology.
Although PRISMA 2020 was originally developed for systematic literature reviews (SLRs), in this study it was adapted as a guiding framework for conducting a systematic literature mapping (SLM), due to its standardized structure and ability to ensure transparency in study selection. Additionally, methodological elements from Petersen et al. (2015) were incorporated; their mapping study guidelines are widely used in fields such as software engineering but are also applicable to educational research. Therefore, this study combines the methodological traceability of PRISMA with the classificatory logic of the Petersen model, enabling a rigorous and reproducible analysis of the scientific production.

Comment 2.

Confusion with coverage period vs. actual results
While the review covers 2005–2024, nearly 87% of the included studies are from 2019 onward. Was this due to a genuine lack of earlier research, or might the search strategy have favored recent publications? A short explanation would help readers interpret the temporal trends.

Answer. We appreciate your observation regarding the concentration of studies published since 2019, despite the review covering the 2005–2024 period. We agree that this requires methodological and interpretive clarification. After reviewing the publication data, we concluded that this concentration is not the result of search limitations or database bias, but rather reflects a genuine trend in academic production. Interest in intercultural competences supported by digital technologies has grown significantly in the past five years, particularly in the post-pandemic context.

This interpretation has been incorporated into the Results section to better contextualize the findings and avoid misunderstandings regarding the temporal scope of the study.

Text to be incorporated into results.

The temporal analysis revealed a significant increase in scientific production from 2019 onward, with 86.96% of the analyzed studies published in this period. The most productive years were 2023 (26.09%), 2022 (21.74%), and 2021 (17.39%), reflecting a growing interest in integrating digital technologies to develop intercultural competences, particularly in higher education settings. Earlier years showed minimal representation. This distribution appears to reflect a real academic trend rather than a limitation of the search strategy, as the databases were comprehensively queried for the entire 2005–2024 period (see Figure 2).

Comment 3.

PRISMA flow diagram promems The numbers don’t quite add up. You report 176 initial records and 5 duplicates removed, which should leave 171, but the screening stage starts with 155. Please check and correct the counts so the selection process is transparent.

Answer. We confirm that the initial 176 records represent the total number of studies retrieved from the databases consulted (Scopus, Web of Science, and SciELO). Subsequently, 5 duplicate records were removed prior to the screening process (pre-selection phase), leaving 171 unique records that proceeded to the screening phase.

During this phase, titles, abstracts, and keywords were evaluated by three independent reviewers. As a result, 16 studies were excluded for not meeting the inclusion criteria, leaving 155 studies that advanced to the full-text assessment stage.

This flow is consistent with the PRISMA diagram presented and has been clarified in the text to ensure greater methodological transparency.

Text to be integrated under the PRISMA Flowchart

During the identification phase, a total of 176 records were retrieved from the three selected databases: 16 from Scopus, 76 from Web of Science, and 84 from SciELO. Prior to the screening phase, five duplicate records were removed, resulting in 171 unique studies eligible for title, abstract, and keyword screening.

In the screening phase, three reviewers independently analyzed the 171 records. Based on the inclusion criteria, 16 studies were excluded at this stage. The main reasons included lack of relevance to the research questions or insufficient linkage to intercultural competence. Discrepancies in inclusion were discussed and resolved by consensus among the reviewers. As a result, 155 studies progressed to the full-text eligibility assessment.

Comment 4.

I Check inclusion criteria consistency Inclusion criterion IC5 requires that studies integrate technology into intercultural competence teaching. At least one included study (Ciftci & Savas, 2018) does not clearly meet this requirement. If exceptions are made, they should be explicitly justified.

Answer. We appreciate your comment regarding the consistency of inclusion criterion IC5, which requires that studies integrate digital technology into the teaching of intercultural competences. We agree that the study by Ciftci and Savas (2018) does not fully meet this requirement, as it does not report the use of specific technological tools. However, we decided to include this study due to its theoretical and contextual value: it offers a strong conceptual reflection on the benefits of technology in intercultural education, thereby enriching the field's theoretical foundation—even if it does not involve a specific digital intervention.

Therefore, we maintained this study as a justified exception, which is clearly marked in the text and treated as a methodological limitation regarding its comparability with the rest of the corpus. This decision is now explicitly explained in the results section to ensure full transparency.

Text to be integrated into the article in RQ2

Of the 23 studies included in this systematic review, 22 (95.65%) explicitly report the incorporation of digital technologies as part of their strategies for developing intercultural competences in higher education. The sole exception is the study by Ciftci and Savas (2018), which, although acknowledging the benefits of technologies in intercultural teaching, does not specify the use of concrete digital tools. Its inclusion was retained due to the conceptual contribution it provides in understanding the role of technology in intercultural contexts. However, this lack of specificity limits its comparability with other studies and is considered a methodological limitation in interpreting the results.

Comment 5.

Problem with percentage discrepancies For example, RQ3 states that "communication skills" is the focus of 42% of studies, but Table 4 lists 14 out of 23 studies (~61%). Please review all reported percentages to ensure they match the underlying data.

Answer. After a thorough review of the manuscript, we confirmed that the originally reported figure of 42% for "communication skills" was inaccurate. In fact, 14 out of the 23 studies in the corpus addressed this competence, which correctly corresponds to 60.87%. This and other percentage values have been recalculated and corrected throughout the manuscript, including tables, figures, and descriptive text.

Additionally, we have included a methodological clarification in both the methods section and the table legends, indicating that the analyzed categories are not mutually exclusive. As a result, a single study may have been classified under multiple dimensions, which explains why some totals exceed 100% and prevents misinterpretation of the findings.

Corrected text

The analysis of the 23 studies included in this systematic review reveals a broad diversity of focus areas regarding the use of digital technologies to foster intercultural competences in higher education. However, there is a clear predominance of research centered on the development of communication skills, with a total of 14 studies (60,87%). This category includes works such as those by Borger (2022), Wiesner-Luna et al. (2023), and Kosman et al. (2024), which highlight the importance of virtual environments in strengthening intercultural interaction among students from different cultural contexts. For their part, Guillén-Yparrea and Ramírez-Montoya (2023a) emphasize that language teaching, international experiences, and collaborative virtual environments are the most common contexts for fostering such communication skills in higher education.

In second place, technological adoption accounts for 21,74% of the studies (5 publications). This focus is linked to the strengthening of intercultural competences through both instrumental and critical mastery of ICT, including research such as that by Jørgensen et al. (2022) and Savelyeva & Sazonova (2024), who explore the integration and critical appropriation of digital tools in intercultural teaching-learning processes. Sociolinguistic and intercultural competences are addressed in 3 studies (13,04%), highlighting the need to understand linguistic and cultural codes in multilingual digital environments (Leiva et al., 2022; Guillen-Yparrea & Ramírez-Montoya, 2023a).

Other less frequent areas include teacher training (8,70%, 2 studies), curriculum internationalization (8,70%, 2 studies), and the development of cultural attitudes (8,70%, 2 studies), each reflecting specific lines of research focused on pedagogical design, cultural awareness, or the construction of global educational programs.Finally, categories such as critical thinking, pedagogy, learner autonomy, professional development in healthcare, and technical text translation each appear in only one study (4,35%), suggesting future opportunities to expand research in these less explored domains.

Table 4 summarizes these results, highlighting the authors, thematic area addressed, study frequency, and their percentage representation within the analyzed corpus.

Table 4

Research approaches to the integration of digital technologies in the teaching of intercultural competences

Authors	**Focus area**	**Frequency**	**Percentage**
Borger (2022); Wiesner-Luna et al. (2023); Carmona et al. (2019); McCloskey (2012); Munoz-Escalona et al. (2022); Jorgensen et al. (2022) ; Simoes & Sangiamchit (2023); Zakharova et al. (2019); Ciftci & Savas (2018); Dugartsyrenova & Sardegna (2019); Guillen-Yparrea & Ramirez-Montoya (2023a); Kosman et al. (2024); Louahala (2023); Rauer et al. (2021)	Communication skills	14	60,87%
Jorgensen et al. (2022); Munoz-Escalona et al. (2022); Dugartsyrenova & Sardegna (2019); Guillen-Yparrea & Ramirez-Montoya (2023b); Savelyeva & Sazonova (2024)	Technology adoption	5	21,74%

Leiva et al. (2022); Munoz-Escalona et al. (2022); Guillen-Yparrea, & Ramirez-Montoya (2023a)	Sociolinguistic and intercultural competences	3	13,04%
Sarmiento et al. (2021); Gómez (2010)	Teacher training	2	8,70%
Dugartsyrenova & Sardegna (2019); Guillen-Yparrea & Ramirez-Montoya (2023a)	Cultural attitudes	2	8,70%
Rauer et al. (2021); Woicolesco et al. (2022)	Internationalization of the curriculum	2	8,70%
Jorgensen et al. (2022)	Critical thinking	1	4,35%
Villasol (2021)	Pedagogy	1	4,35%
Kosman et al. (2024)	Professional development in healthcare	1	4,35%
Louahala (2023)	Autonomous learning in virtual environments	1	4,35%
Rubtsova et al. (2023)	Technical text translation and editing	1	4,35%

Note: Percentages exceed 100% because studies often address more than one category.

Comment 6.

Competence dimensions overlap In RQ4, many studies appear in multiple categories (e.g., communication skills and intercultural attitudes). This is fine, but the paper should clarify whether percentages are exclusive or overlapping so readers understand how totals are calculated.

Answer. We appreciate your observation regarding the need to clarify whether the reported percentages correspond to mutually exclusive or overlapping categories. Indeed, several studies in the corpus address multiple dimensions or competences simultaneously, meaning that the categories are not exclusive.

As a result, the percentages may exceed 100%, since a single study may be classified under more than one category. This has now been clarified in the text through a methodological note added in the methods section and in the relevant table legends.

Text to be integrated into the article at the end of paragraph 2.4 in the methodology section.

It is important to note that during data extraction, both the competences and focus areas explicitly stated in the objectives or methodological designs of the studies, as well as those that emerged as observed outcomes or later reflections, were recorded. This distinction was maintained in the analysis matrices, although not all studies clearly differentiated between these levels.

Similarly, the categorization of both intercultural competence dimensions and digital tools was non-exclusive. A single study could be associated with multiple competences and tool types. For instance, some technologies, such as COIL, were classified under more than one category due to their multifunctional use across various pedagogical purposes. This approach was methodologically intentional and aimed to more accurately reflect the versatility of digital tools in educational practice. As a result, some of the reported percentages may exceed 100%.

Text to add (in tables 3 and 4)

Note: Percentages exceed 100% because studies often address more than one category.

Comment 7.

Geographic mis-classification? Scotland is listed separately from the United Kingdom, which inflates diversity counts. Unless a study explicitly treats Scotland as separate from the UK, these should be merged for consistency.

Answer. Thank you for pointing out this inconsistency. We have corrected the geographical classification for consistency, consolidating Scotland under the United Kingdom.

Text to be corrected in the article.

Australia contributes 7% (n=2), highlighting the growing involvement of Oceania in this field. The United Kingdom also accounts for 7% (n=2), reflecting continued European engagement in the development of digital intercultural competences. Meanwhile, countries such as Turkey, Algeria, Portugal, Thailand, Chile, Colombia, Ecuador, Venezuela, Brazil, and Austria each present a frequency of 4% (n=1), reflecting emerging, albeit still limited, geographical diversity.

Comment 8.

Another overlap - Technology category Some tools (e.g., COIL) are counted in more than one category, which can inflate category frequencies. Please define clear, mutually exclusive categories or explain why overlaps are reported.

Answer. We appreciate your observation regarding the classification of technological tools. Indeed, some technologies—such as COIL—have a multifunctional nature, as they are used for diverse pedagogical purposes across different contexts. For this reason, we adopted a non-exclusive coding strategy, allowing a single tool to be assigned to more than one category when its usage justifies it.

This decision was methodologically intentional, as it more accurately reflects the versatility of digital technologies in real teaching contexts. For clarity, we have added a methodological note in the relevant section and in the table legend to explain that the categories are not mutually exclusive.

Text to be added at the end of methodology section 2.4.

It is important to note that during data extraction, both the competences and focus areas explicitly stated in the objectives or methodological designs of the studies, as well as those that emerged as observed outcomes or later reflections, were recorded. This distinction was maintained in the analysis matrices, although not all studies clearly differentiated between these levels.

Similarly, the categorization of both intercultural competence dimensions and digital tools was non-exclusive. A single study could be associated with multiple competences and tool types. For instance, some technologies, such as COIL, were classified under more than one category due to their multifunctional use across various pedagogical purposes. This approach was methodologically intentional and aimed to more accurately reflect the versatility of digital tools in educational practice. As a result, some of the reported percentages may exceed 100%.

Note in table 7

Note: Categories are not mutually exclusive. Certain tools appear in more than one category due to their versatility in educational contexts.

Comment 9.

Mismatch between your results and conclusions
The conclusion states there is a “clear preference for structured teaching tools,” but 27% of studies use social media, which is not negligible. This should be discussed so conclusions reflect the actual distribution.

Answer. We acknowledge that the statement regarding a "clear preference for structured teaching tools" in the conclusion may be ambiguous if not properly contextualized. While tools such as COIL or formal virtual environments are indeed prominent, the use of social media—reported in 27% of the studies—represents a meaningful strategy, particularly in informal or emerging learning contexts.

In response, we have revised the conclusion to more accurately reflect the diversity of tools used, acknowledging the coexistence of both structured and flexible approaches in the technological integration of intercultural competences.

Improvements in the conclusions.

This systematic review demonstrates that intercultural competences mediated by digital technologies represent a dynamic and expanding field of research in higher education, particularly since the impetus generated by the pandemic. The dimensions of adaptation and management, intercultural knowledge, communication skills, and intercultural attitudes emerge as the most frequently addressed, reflecting the need to prepare professionals capable of performing effectively in global and multicultural environments. Nevertheless, significant gaps remain in areas such as innovative leadership and personal development, which deserve greater attention given their potential to transform educational processes toward genuine cultural inclusion.

The findings also reveal a marked geographical concentration in the Americas and Europe, which limits the global scope of the phenomenon. Future research should therefore investigate underrepresented contexts, integrate innovative methodologies such as immersive technologies, and promote longitudinal studies to assess the sustained impact of intercultural learning.

From a quantitative perspective, although structured teaching tools such as COIL, virtual classrooms, and learning management systems are widely represented, more flexible technologies, including social media platforms (27%), are also significant. This indicates a coexistence of formal and informal strategies in the digital mediation of intercultural competences, reflecting the diverse pedagogical approaches found across the reviewed studies.

Overall, this review contributes to a deeper understanding of how digital technologies are consolidating as key instruments for the development of intercultural competences, offering new opportunities to design inclusive and culturally relevant educational experiences in higher education.

Comment 10.

Peer review compliance issue Some included works (e.g., Munoz-Escalona et al., 2020) may not clearly meet the “peer-reviewed” criterion. Please verify the status of each study and remove any that do not meet IC2.

> **Answer.** All the included studies meet the IC2 criterion of peer review, as they are published in indexed journals (Scopus, WoS, Scielo) or in recognized academic publishers (Springer, SAGE, Elsevier, Taylor & Francis). In particular, the article by Muñoz-Escalona et al. (2020) was published in the International Journal of Mechanical Engineering Education (SAGE) as an “Original article” under DOI 10.1177/0306419020934100, which confirms that it underwent peer review and was accepted in accordance with international scientific standards.

Thank you

The authors