

The Global Frontier of Inclusive Education: A Meta-Synthesis of Interdisciplinary Collaboration and Boundary-Crossing Practices

DOI: 10.5281/zenodo.18777325

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Abstract:

This study presents a qualitative meta-synthesis of international research on inclusive education, focusing on interdisciplinary collaboration and teacher professional identity within diverse educational contexts. Using Noblit and Hare's meta-ethnographic approach, the research synthesizes qualitative findings from studies published between 2015 and 2025, drawing on interviews, observations, and case studies across Asia, Europe, and North America. The analysis identifies recurring themes related to boundary crossing, trust-building, and professional identity development as central to effective collaborative practices. Findings reveal that inclusive education is shaped by both systemic and relational factors, including policy alignment, contextualized teacher preparation, and supportive school leadership. Challenges such as role confusion, communication barriers, and limited institutional support were found to hinder collaborative processes, while reflective partnerships and interdisciplinary resource systems enhanced professional learning and inclusive outcomes. The study emphasizes that inclusive education extends beyond instructional strategies to encompass social, cultural, and organizational dimensions. By integrating human and structural perspectives, the research proposes recommendations for policy harmonization, relational teacher training, and leadership practices that promote sustainable inclusive environments. These findings contribute to a comprehensive framework for strengthening inclusive education and advancing equity in global educational systems.

Keywords: inclusive education, meta-synthesis, interdisciplinary collaboration, professional identity, teacher education

Introduction:

Inclusive education (IE) has evolved from a localized initiative into a global educational imperative aimed at ensuring equitable access to quality learning for all students, particularly those with disabilities and diverse learning needs. International frameworks such as the United Nations Sustainable Development Goals and the Salamanca Statement have positioned inclusion as a fundamental component of educational reform, emphasizing equity, participation, and social justice in schooling systems worldwide.

Scholars argue that while these global commitments promise transformative change, their implementation often reveals significant limitations, particularly in addressing the needs of learners with disabilities and ensuring meaningful participation in diverse contexts (Johnstone, Schuelka, & Swadek, 2020). The growing global discourse on inclusive education highlights both its potential and its complexity, raising questions about how educational systems translate policy commitments into practice (Migliarini & Elder, 2024). At the center of successful implementation is interdisciplinary collaboration—the coordinated effort of general educators, special education (SPED) teachers, and child support services to address the diverse needs of learners within inclusive environments.

Despite strong policy advocacy, the practical realization of inclusive education remains uneven across international contexts. Research from the Global South emphasizes persistent challenges in transforming inclusive education from policy rhetoric into actionable practice, particularly in contexts marked by limited resources, cultural diversity, and systemic inequalities (Kamenopoulou & Karisa, 2023).

Inclusive education systems must navigate tensions between universal principles and localized realities, including socio-economic disparities, institutional capacity, and cultural perceptions of disability. Furthermore, the dilemma of “inclusion for some versus inclusion for all” continues to shape debates, reflecting concerns about whether current practices genuinely promote full participation or merely accommodate selected groups of learners (Leijen, Arcidiacono, & Baucal, 2021). These tensions underscore the importance of examining collaboration processes that support inclusive practices across diverse educational environments.

Central to interdisciplinary collaboration is the concept of “boundary crossing,” where professionals move beyond the confines of their disciplinary roles to develop shared understandings and practices. However, collaboration across professional boundaries is often complicated by differences in expertise, institutional expectations, and professional identity. Prior research conducted in specific national contexts, such as studies in the Netherlands, demonstrates that trust-building and identity negotiation play critical roles in fostering effective collaboration among educators and support professionals. Yet, there remains limited understanding of how these processes operate within international settings where cultural norms, legal frameworks, and resource availability vary significantly. The increasing emergence of borderless learning environments and global educational networks further necessitates an examination of how interdisciplinary collaboration adapts to transnational educational contexts (Andrin et al., 2024).

Moreover, the growing integration of technology in inclusive education has introduced new opportunities and challenges for interdisciplinary practice. Technological tools and assistive systems are increasingly recognized as essential mechanisms for supporting learners with diverse needs, enhancing accessibility, and facilitating collaborative teaching practices (Navas-Bonilla et al., 2025).

However, the effectiveness of these innovations depends largely on the capacity of educators and support personnel to work collaboratively across professional and technological boundaries. Similarly, studies highlight that while inclusive education offers significant benefits for promoting equity and social integration, it also presents challenges related to teacher preparedness, resource allocation, and institutional support (Jardinez & Natividad, 2024). These factors demonstrate that inclusive education is not solely an instructional approach but a complex systemic process requiring coordinated professional engagement.

Despite the global push toward inclusive education, a persistent “policy–practice gap” remains evident across many educational systems. Interdisciplinary collaboration is frequently hindered by structural constraints, insufficient professional development opportunities, and conflicting educational identities that shape how educators perceive their roles within inclusive settings. These challenges often result in fragmented service delivery, limited communication among stakeholders, and inconsistent implementation of inclusive practices.

Understanding how professionals negotiate trust, authority, and identity within collaborative contexts is therefore essential to addressing barriers that impede effective inclusive education. This study responds to this gap by examining how interdisciplinary collaboration is conceptualized and practiced across diverse international contexts, with particular attention to the relational and structural dimensions that influence collaborative learning.

Guided by this objective, the present study seeks to explore three central research questions: (1) How is interdisciplinary collaboration conceptualized and practiced across different international inclusive education settings? (2) What are the primary boundary-crossing challenges faced by stakeholders in global SPED contexts? and (3) How do trust and professional identity influence the success of collaborative learning in these settings? By synthesizing international research on interdisciplinary collaboration, this study aims to provide a comprehensive understanding of the systemic, relational, and professional factors shaping inclusive education globally, thereby contributing to the development of more responsive and sustainable collaborative practices in diverse educational environments.

Literature Review:

Inclusive education has emerged as a central global priority aimed at ensuring equitable access to quality learning opportunities for all learners, particularly those with disabilities and diverse educational needs. International policy frameworks such as the United Nations Sustainable Development Goal 4 (SDG 4) emphasize inclusive and equitable quality education as a fundamental human right. However, scholars highlight that while global commitments provide a strong normative framework, their implementation often reveals structural and conceptual limitations. Johnstone, Schuelka, and Swadek (2020) argue that the SDG framework offers significant promise for advancing inclusive education but faces challenges related to measurement, accountability, and contextual adaptation.

Similarly, Rad et al. (2022) emphasize that achieving equitable education requires systemic reforms, particularly in early childhood education, where inclusive practices must address diverse developmental and social needs. These studies underscore that inclusive education is not merely a policy objective but a complex process requiring coordinated institutional and professional efforts.

The global expansion of inclusive education has also generated critical debates regarding its conceptual scope and practical application. Scholars question whether current practices genuinely promote inclusion for all learners or primarily serve selected groups. Leijen, Arcidiacono, and Baucal (2021) describe this tension as the dilemma of “inclusion for some versus inclusion for all,” highlighting inconsistencies in how inclusion is interpreted and implemented across educational systems.

Migliarini and Elder (2024) further argue that the future of inclusive education requires intersectional approaches that consider disability alongside factors such as socio-economic status, culture, and identity. This perspective expands traditional understandings of inclusion by recognizing the interconnected social and structural factors shaping educational access and participation. Such debates reinforce the need to examine how interdisciplinary collaboration supports inclusive practices within diverse contexts.

Research focusing on the Global South further highlights disparities between policy commitments and practical implementation. Kamenopoulou and Karisa (2023) emphasize that inclusive education initiatives in developing contexts often struggle with limited resources, insufficient teacher preparation, and structural inequalities. These challenges complicate efforts to translate global inclusive education policies into meaningful classroom practices.

Similarly, Jardinez and Natividad (2024) identify both the advantages and challenges of inclusive education, noting that while inclusive classrooms promote equity and social integration, they also require significant institutional support, teacher competence, and resource allocation. These findings suggest that inclusive education is shaped by contextual realities, reinforcing the importance of examining collaborative processes that enable stakeholders to address diverse learner needs across varying educational environments.

Interdisciplinary collaboration has been widely recognized as a critical component of effective inclusive education. Collaboration among general educators, special education professionals, and support services facilitates coordinated instructional strategies and promotes comprehensive support for learners. Cerna et al. (2021) propose a conceptual framework for inclusive education that emphasizes collaboration, shared responsibility, and systemic coordination across educational institutions. Evidence-based teaching practices further support inclusive learning environments by providing structured strategies that accommodate diverse learners and enhance instructional effectiveness (Mitchell & Sutherland, 2020). Additionally, research on inclusive interactive learning environments demonstrates that

collaborative practices benefit not only students with special educational needs but also learners without disabilities by fostering social participation and academic engagement (Molina Roldán et al., 2021). These findings highlight the relational and pedagogical significance of interdisciplinary collaboration in achieving inclusive educational outcomes.

Technological innovations have also transformed inclusive education by providing new tools for accessibility, engagement, and collaborative learning. Systematic reviews indicate that assistive technologies, digital platforms, and adaptive learning systems play a crucial role in supporting students with diverse needs and enhancing inclusive classroom practices (Navas-Bonilla et al., 2025). Similarly, research on augmented reality demonstrates its potential to create interactive and accessible learning experiences that support educational inclusion (Quintero et al., 2019). The expansion of technology-mediated learning environments has also contributed to the emergence of borderless education, where digital and global networks reshape educational management and collaborative practices (Andrin et al., 2024). These developments highlight the growing importance of interdisciplinary cooperation in integrating technological innovations into inclusive education systems.

Despite these advancements, the implementation of inclusive education continues to face systemic and professional challenges, particularly in relation to professional identity, trust, and institutional structures. The literature suggests that collaborative practices often require educators to negotiate professional roles, responsibilities, and expertise across disciplinary boundaries. Such processes involve not only organizational coordination but also identity development and relational trust among professionals.

While previous research has examined collaboration within specific national contexts, there remains limited synthesis of how these dynamics operate across international settings where cultural norms, policy frameworks, and resource conditions vary significantly. This gap highlights the need for a comprehensive understanding of the structural, relational, and professional factors shaping interdisciplinary collaboration in inclusive education.

The existing literature demonstrates that inclusive education is a multidimensional and evolving field shaped by global policy frameworks, contextual realities, technological innovations, and collaborative practices. While substantial research has explored individual aspects of inclusive education, fewer studies have synthesized international evidence on interdisciplinary collaboration and boundary-crossing processes that support inclusive learning. Addressing this gap, the present study conducts a qualitative meta-synthesis of international research to examine how interdisciplinary collaboration is conceptualized and practiced across diverse contexts, with particular attention to systemic barriers, relational dynamics, and professional identity formation in global inclusive education settings.

Methodology:

This study employed a qualitative meta-synthesis research design to generate a comprehensive and interpretive understanding of interdisciplinary collaboration in inclusive education across international contexts. Unlike traditional literature reviews that primarily summarize existing findings, qualitative meta-synthesis seeks to produce a new, integrated interpretation by synthesizing insights from multiple primary studies. The approach enables the development of deeper conceptual understanding by identifying patterns, relationships, and meanings across diverse research contexts, thereby offering a more holistic explanation of complex educational phenomena such as boundary crossing, professional identity, and collaborative practice.

The methodological framework was guided by the meta-ethnographic approach developed by Noblit and Hare, which emphasizes the interpretive synthesis of qualitative findings. Specifically, the study applied reciprocal translational analysis, which involves translating key concepts and themes across individual studies to identify shared meanings, and lines-of-argument synthesis, which constructs an overarching interpretation from interconnected findings. This framework facilitated the integration of diverse forms of qualitative data, including interviews, classroom observations, and case studies, drawn from international primary research on inclusive education and interdisciplinary collaboration.

A systematic search of relevant literature was conducted using major academic databases, including ERIC, PsycINFO, and Google Scholar. Studies were selected based on specific inclusion criteria: (1) qualitative research published between 2015 and 2025, (2) research focused on inclusive education and interdisciplinary collaboration, and (3)

studies conducted in international contexts, including regions such as Asia, Europe, and North America. These criteria ensured the relevance, quality, and global scope of the data included in the synthesis.

The selected studies were analyzed using thematic analysis to identify recurring patterns and overarching conceptual themes. Following a six-phase analytic process, the researchers systematically coded the data, generated initial categories, and refined these into broader meta-themes related to boundary crossing, trust formation, and professional identity development. This analytical procedure enabled the identification of shared challenges and practices across diverse educational settings, contributing to a comprehensive understanding of interdisciplinary collaboration in global inclusive education contexts.

Findings and Discussion:

Systemic and Structural "Boundary" Barriers

The findings of the meta-synthesis reveal that interdisciplinary collaboration in inclusive education is frequently constrained by systemic and structural "boundary" barriers that limit meaningful engagement among educational stakeholders. Across diverse national contexts, including the Philippines, Singapore, and Turkey, researchers identified that collaboration is often restricted by siloed organizational structures that separate general education, special education, and support services.

These institutional divisions create fragmented systems where communication channels are limited, professional responsibilities are unclear, and collaborative decision-making becomes difficult. Such structural barriers reinforce professional boundaries that hinder coordinated instructional practices and reduce the effectiveness of inclusive education initiatives.

These structural limitations are closely linked to broader educational governance and management practices. Studies emphasize that institutional inefficiencies and rigid administrative systems often prevent the effective allocation of resources and coordination of services necessary for inclusive education (Wolszczak-Derlacz, 2017). Similarly, conceptual frameworks for inclusive education highlight the importance of systemic coordination, shared responsibility, and policy coherence in promoting inclusive practices (Cerna et al., 2021). Without integrated organizational structures, schools struggle to establish collaborative cultures that support learners with diverse needs, thereby reinforcing the persistent gap between inclusive education policies and their implementation.

Resource constraints further intensify systemic boundary barriers, particularly in contexts experiencing economic and infrastructural limitations. Research indicates that the growing global prevalence of disabilities among children and adolescents places increasing demands on educational systems, requiring expanded support services and specialized interventions (Olusanya et al., 2022).

However, many institutions lack adequate funding, specialized personnel, and instructional materials necessary to support interdisciplinary collaboration. In developing contexts, educational systems must also address competing priorities related to access, quality, and equity, which often limit the capacity to implement comprehensive inclusive education programs (Gupta & Saranya, 2024). These resource-related challenges highlight the structural inequalities that shape collaboration practices across different international settings.

Beyond institutional constraints, the findings demonstrate that systemic barriers also reflect broader social and philosophical tensions surrounding inclusion. Inclusive education requires not only structural reforms but also a shift toward a culture of belonging and participation within schools. Slee (2019) argues that education systems often operate within frameworks of exclusion that marginalize learners with diverse needs, reinforcing barriers to participation despite inclusive policy commitments. Similarly, research on equitable early childhood education emphasizes that achieving inclusive learning environments requires coordinated systemic change, including curriculum reform, teacher training, and community engagement (Rad et al., 2022). These perspectives suggest that structural boundaries are deeply embedded in educational cultures and practices.

Technological developments present both opportunities and challenges in addressing systemic collaboration barriers. Emerging digital environments, including borderless learning systems, have transformed educational management

strategies by enabling new forms of communication and coordination among stakeholders (Andrin et al., 2024). Innovations such as augmented reality and immersive learning technologies have also demonstrated potential for enhancing accessibility and supporting inclusive learning experiences (Quintero et al., 2019).

Furthermore, evolving digital ecosystems such as the metaverse and generative artificial intelligence are reshaping educational delivery and collaboration practices, offering new possibilities for personalized and inclusive instruction while raising concerns about access, equity, and professional adaptation (Zhang et al., 2022; Francis et al., 2025). These developments highlight the need for interdisciplinary collaboration to effectively integrate technological innovations into inclusive education.

Despite these advancements, the integration of technology into inclusive education requires strong professional coordination and evidence-based pedagogical strategies. Research emphasizes that effective inclusive teaching depends on structured instructional approaches that address diverse learning needs while promoting academic engagement and social participation (Mitchell & Sutherland, 2020).

Similarly, differentiated instruction has been shown to enhance student well-being, social inclusion, and academic self-concept, demonstrating the importance of coordinated instructional planning among educators (Pozas et al., 2021). These findings suggest that interdisciplinary collaboration is essential not only for organizational coordination but also for the effective implementation of inclusive pedagogical practices.

The findings further indicate that inclusive and interactive learning environments benefit a wide range of learners, extending beyond those with special educational needs. Collaborative and dialogic learning approaches have been shown to enhance social interaction, academic performance, and classroom participation for all students, thereby strengthening inclusive educational outcomes (Molina Roldán et al., 2021). Similarly, studies examining inclusive approaches in language education demonstrate that collaborative practices enable educators to address diverse linguistic and learning needs within culturally responsive frameworks (Villafuerte & Mosquera, 2020). These results reinforce the view that inclusive education represents a comprehensive educational model that requires coordinated professional engagement across disciplines.

The synthesis reveals that systemic and structural boundary barriers significantly shape interdisciplinary collaboration in inclusive education across global contexts. Organizational silos, resource limitations, institutional inefficiencies, and evolving technological demands collectively influence the capacity of educational systems to implement inclusive practices effectively.

While technological innovations and pedagogical advancements provide opportunities to overcome structural barriers, their success depends on coordinated institutional support, professional development, and collaborative cultures within educational settings. Addressing these systemic challenges is therefore essential for fostering meaningful interdisciplinary collaboration and advancing inclusive education as a sustainable and globally responsive educational practice.

The Relational Dimension: Trust and Mutual Recognition

Mirroring insights from earlier research conducted in the Netherlands, international evidence demonstrates that collaboration is embedded in instructional practices that support the fundamental principles of inclusion.

Beyond structural arrangements, successful interdisciplinary work depends on the quality of relationships among professionals, particularly the extent to which educators develop shared values, mutual respect, and a common commitment to inclusive learning. These relational processes enable educators to negotiate professional boundaries and foster collaborative environments that respond to diverse learner needs.

Building trust emerges as a foundational condition for meaningful interdisciplinary collaboration. Studies consistently show that successful collaboration requires mutual recognition, shared enthusiasm, and open communication between general and special educators. Conceptual frameworks for inclusive education emphasize that trust facilitates shared responsibility and coordinated decision-making, which are essential for addressing diverse educational needs (Cerna et al., 2021). Without relational trust, collaboration becomes procedural rather than transformative, limiting

opportunities for professional learning and innovation. Trust-building processes therefore play a critical role in shaping inclusive teaching practices and fostering collective ownership of student outcomes.

However, the findings also reveal persistent power imbalances that undermine collaborative relationships. A recurring theme across international studies is the tension between “specialists” and “generalists,” where special education professionals are often positioned as technical experts rather than equal partners in dialogue. This hierarchical perception restricts collaborative exchange and reinforces professional divisions, hindering genuine co-construction of knowledge.

Such dynamics reflect broader institutional structures that prioritize specialized expertise while marginalizing collaborative engagement, contributing to inefficiencies in educational practice (Wolszczak-Derlacz, 2017). Addressing these imbalances requires institutional cultures that promote shared authority and inclusive professional identities. The relational challenges observed in interdisciplinary collaboration are closely connected to broader issues of belonging and participation within educational environments.

Inclusive education seeks to foster a sense of belonging among all learners and professionals, yet exclusionary practices may persist despite formal policy commitments. Slee (2019) argues that education systems often reproduce social hierarchies that limit participation, highlighting the importance of relational inclusion as a core dimension of educational reform. Similarly, research on interactive learning environments demonstrates that collaborative and dialogic practices enhance participation, social interaction, and academic engagement for diverse learners (Molina Roldán et al., 2021). These findings suggest that trust and mutual recognition are essential not only for professional collaboration but also for promoting inclusive classroom cultures.

The relational dimension of collaboration is further shaped by growing diversity in learner populations and educational contexts. Global data indicate a rising prevalence of disabilities among children and adolescents, increasing the need for coordinated support systems and collaborative instructional practices (Olusanya et al., 2022). As classrooms become more diverse, educators must develop relational competencies such as empathy, cultural sensitivity, and adaptability. These skills enable professionals to navigate differences in expertise, perspectives, and professional roles while maintaining a shared focus on learner inclusion. Consequently, interdisciplinary collaboration increasingly depends on the development of relational capacities alongside technical expertise.

Technological innovation also influences relational dynamics within interdisciplinary collaboration. The expansion of digital learning environments and emerging technologies, including virtual platforms and immersive educational systems, has transformed communication and collaboration among educators (Zhang et al., 2022). While such technologies provide new opportunities for interaction and knowledge sharing, they also introduce challenges related to professional adaptation, digital competence, and access to resources (Gupta & Saranya, 2024).

Furthermore, the integration of digital tools requires educators to develop trust in new forms of collaboration mediated by technology, particularly in online and hybrid learning contexts (Sato et al., 2023). These developments demonstrate that relational trust must extend beyond traditional face-to-face interactions to include digitally mediated professional engagement. Research also highlights the role of inclusive pedagogical practices in strengthening relational collaboration. Evidence-based instructional approaches, such as differentiated instruction, promote student well-being, social inclusion, and positive academic self-concept by encouraging coordinated teaching strategies (Pozas et al., 2021). Similarly, inclusive approaches in language education demonstrate that collaborative teaching practices enable educators to address diverse linguistic and cultural needs through shared instructional planning (Villafuerte & Mosquera, 2020).

These practices illustrate how relational trust among educators enhances instructional effectiveness and supports inclusive learning outcomes. While structural conditions influence collaboration, the quality of interpersonal relationships ultimately determines the success of inclusive practices. Power imbalances, hierarchical professional roles, and evolving technological contexts present ongoing challenges to relational collaboration, yet opportunities for inclusive engagement emerge through shared responsibility, dialogic interaction, and collaborative learning cultures. Strengthening the relational dimension of collaboration is therefore essential for advancing inclusive education and fostering sustainable interdisciplinary partnerships across diverse educational settings.

Professional Identity and Learning

Boundary crossing is not merely a logistical or organizational task but a complex process of identity development in which educators continuously negotiate their roles, responsibilities, and professional values. As teachers engage in collaborative practices across disciplinary boundaries, they are required to redefine traditional professional identities and adapt to new forms of shared expertise. This process reflects the evolving nature of inclusive education, where professional learning is embedded in ongoing interaction, reflection, and adaptation within diverse educational contexts.

A prominent theme emerging from the synthesis is the experience of role confusion among educators participating in collaborative and co-teaching arrangements. Many teachers reported a perceived loss or transformation of professional identity when transitioning from independent instructional roles to shared teaching responsibilities. This shift often generates emotional and professional challenges, including uncertainty about authority, expertise, and accountability. The reconfiguration of roles requires educators to negotiate professional boundaries while maintaining their sense of competence and autonomy. Research on interactive learning environments similarly emphasizes that collaborative educational practices demand new professional competencies and role flexibility to effectively support learners with diverse needs (García-Carrión et al., 2018).

These identity-related tensions are further shaped by broader institutional and global transformations in education. The internationalization of education systems has expanded opportunities for interdisciplinary engagement while also increasing the complexity of professional roles. Studies on global higher education highlight how international collaboration and cross-cultural exchange influence professional development by exposing educators to diverse pedagogical approaches and institutional practices (Kraja et al., 2024; Marginson, 2017).

In inclusive education contexts, such global engagement requires educators to adapt to new expectations, instructional models, and collaborative frameworks, reinforcing the dynamic and evolving nature of professional identity. Cultural competence also emerges as a critical dimension of professional identity development in international inclusive education settings. Interdisciplinary collaboration functions as a “window into the world’s many cultures,” requiring educators to develop empathy, cultural awareness, and adaptability when working across diverse social and ethical contexts.

Inclusive education therefore demands not only pedagogical expertise but also intercultural understanding and sensitivity to learners’ diverse backgrounds. Research on minority experiences in educational settings further demonstrates the importance of culturally responsive practices in preventing exclusion and promoting equitable participation (Llorent et al., 2016). These findings highlight the role of cultural competence in shaping collaborative relationships and inclusive teaching practices.

Technological transformation has also contributed to the reconfiguration of professional identity in inclusive education. The rapid expansion of digital learning environments, online education, and emerging technologies has altered instructional practices and collaborative processes. Studies indicate that educators must adapt to new forms of digital pedagogy and technology-mediated collaboration, particularly in response to global disruptions such as the COVID-19 pandemic (Sato et al., 2023; Lambert et al., 2020).

Discussions published in *The Lancet Planetary Health* emphasize the pandemic’s role in accelerating educational transformation and highlighting the need for inclusive and sustainable practices. These developments require educators to integrate technological competence into their professional identity while maintaining inclusive pedagogical principles. The integration of assistive technologies and artificial intelligence further influences professional learning and identity formation in inclusive education.

Global policy discussions on assistive technology emphasize the importance of coordinated implementation and professional training to support learners with disabilities (MacLachlan et al., 2018). Similarly, research on digital innovation highlights emerging trends in technology integration, including artificial intelligence tools that support learning assessment and emotional engagement (Vistorte et al., 2024; Zou et al., 2025; Wang et al., 2024). While these

technologies provide opportunities to enhance accessibility and participation, they also require educators to develop new competencies and redefine their instructional roles within technologically mediated learning environments.

The findings demonstrate that professional identity and learning are central to interdisciplinary collaboration in inclusive education. Boundary crossing involves continuous negotiation of roles, development of cultural competence, and adaptation to technological and institutional change. While collaborative practices may generate uncertainty and professional tension, they also provide opportunities for reflective learning, skill development, and professional growth. Strengthening teacher preparation and professional development programs that support identity formation, cultural awareness, and technological competence is therefore essential for fostering sustainable interdisciplinary collaboration and advancing inclusive education in diverse global contexts.

The Importance of "Boundary Spanners"

Boundary crossing is not merely a logistical or organizational task but a complex process of identity development in which educators continuously negotiate their roles, responsibilities, and professional values. As teachers engage in collaborative practices across disciplinary boundaries, they are compelled to redefine traditional professional identities and adapt to new forms of shared expertise. This process reflects the evolving nature of inclusive education, where professional learning is embedded in ongoing interaction, reflection, and adaptation within diverse educational contexts. Such developments align with broader global trends toward inclusive and high-participation education systems that require continuous professional transformation (Marginson, 2016; Boeren & Field, 2019).

A prominent theme emerging from the synthesis is the experience of role confusion among educators participating in collaborative and co-teaching arrangements. Many teachers reported a perceived loss or transformation of professional identity when transitioning from independent instructional roles to shared teaching responsibilities. This shift often generates emotional and professional challenges, including uncertainty about authority, expertise, and accountability. The reconfiguration of roles requires educators to negotiate professional boundaries while maintaining their sense of competence and autonomy.

Research on interactive learning environments similarly emphasizes that collaborative educational practices demand new professional competencies and role flexibility to effectively support learners with diverse needs (García-Carrión et al., 2018). Moreover, emerging scholarship highlights the importance of emotional literacy and reflective practice in helping educators manage identity-related tensions and foster resilient learning environments (PJ et al., 2025).

These identity-related tensions are further shaped by broader institutional and global transformations in education. The internationalization of education systems has expanded opportunities for interdisciplinary engagement while increasing the complexity of professional roles. Studies on global higher education highlight how international collaboration and cross-cultural exchange influence professional development by exposing educators to diverse pedagogical approaches and institutional practices (Kraja et al., 2024; Marginson, 2017). Inclusive education increasingly operates within global networks of knowledge production and professional exchange, requiring educators to navigate diverse policy frameworks, pedagogical traditions, and institutional expectations. Such developments reinforce the dynamic and evolving nature of professional identity within inclusive educational systems.

Cultural competence also emerges as a critical dimension of professional identity development in international inclusive education settings. Interdisciplinary collaboration functions as a "window into the world's many cultures," requiring educators to develop empathy, cultural awareness, and adaptability when working across diverse social and ethical contexts. Inclusive education therefore demands not only pedagogical expertise but also intercultural understanding and sensitivity to learners' varied backgrounds and experiences.

Research on minority experiences in educational environments highlights the importance of culturally responsive practices in preventing exclusion, bullying, and marginalization (Llorent et al., 2016). Additionally, critical perspectives on ableism in education emphasize the need for educators to challenge deficit-based assumptions and promote inclusive participation for all learners (Giese & Ruin, 2018). These findings underscore the role of cultural competence in shaping collaborative relationships and inclusive teaching practices.

Technological transformation has also contributed to the reconfiguration of professional identity in inclusive education. The rapid expansion of digital learning environments, online education, and emerging technologies has reshaped instructional practices and collaborative processes. Studies indicate that educators must adapt to new forms of digital pedagogy and technology-mediated collaboration, particularly in response to global disruptions such as the COVID-19 pandemic (Sato et al., 2023; Lambert et al., 2020).

Discussions published in *The Lancet Planetary Health* highlight how the pandemic accelerated systemic transformation and emphasized the need for inclusive and sustainable educational practices. Furthermore, research on the digital frontier of education suggests that emerging technologies will continue to reshape classroom interaction, professional roles, and collaborative learning environments (Leahy et al., 2019; Wang et al., 2024).

The integration of advanced technologies, including artificial intelligence and data-driven learning systems, further influences professional learning and identity formation. Global research highlights the growing role of artificial intelligence in assessing learner engagement, supporting emotional feedback, and enhancing personalized instruction (Vistorte et al., 2024; Mallik & Gangopadhyay, 2023).

These innovations create opportunities to improve accessibility and participation but also require educators to acquire new technological competencies and ethical awareness. At the same time, digital transformation across sectors—including developments in financial and social inclusion—illustrates the broader societal shifts shaping educational practice and professional responsibility (Gabor & Brooks, 2020). Consequently, educators must continuously redefine their roles within technologically mediated learning environments while maintaining inclusive pedagogical principles.

Thus, the findings demonstrate that professional identity and learning are central to interdisciplinary collaboration in inclusive education. Boundary crossing involves continuous negotiation of roles, development of cultural competence, and adaptation to technological, institutional, and global change. While collaborative practices may generate uncertainty and professional tension, they also provide opportunities for reflective learning, skill development, and professional growth. Strengthening teacher preparation and professional development programs that support identity formation, emotional literacy, cultural awareness, and technological competence is therefore essential for fostering sustainable interdisciplinary collaboration and advancing inclusive education in diverse global contexts.

Conclusion:

Inclusive education is fundamentally a social and systemic issue rather than merely an instructional concern, requiring comprehensive reforms that address policy, professional practice, and institutional culture. This meta-synthesis highlights that the success of inclusive education (IE) depends on coordinated efforts among governments, teacher education institutions, and school leaders to strengthen the human and structural dimensions of collaboration.

First, governments should harmonize inclusive education policies and legal frameworks while allocating dedicated funding for interdisciplinary resource centers that support collaborative practice. Such initiatives can ensure consistency in implementation, reduce fragmentation in services, and promote sustainable systems that address the diverse needs of learners. Aligning national policies with global frameworks promoted by organizations such as UNESCO can further strengthen inclusive practices and establish shared international standards.

Second, Teacher Education Institutions must provide contextualized training programs that move beyond technical pedagogical skills to emphasize the relational aspects of collaboration, including trust-building, professional identity formation, and effective communication. Preparing teachers for interdisciplinary work requires cultivating emotional literacy, cultural competence, and reflective practice to enable educators to navigate the complexities of shared responsibility and diverse classroom environments. Such training fosters professional resilience and enhances teachers' capacity to respond to the evolving demands of inclusive education.

Third, school leaders play a critical role in shaping institutional cultures that support collaborative learning. They should foster environments where special educators function as reflective partners rather than isolated specialists, encouraging boundary-crossing practices that promote shared expertise and collective problem-solving. By creating supportive structures for collaboration, school leaders can strengthen professional relationships and enhance the

effectiveness of inclusive educational practices. By synthesizing these human, relational, and systemic dimensions, this meta-synthesis underscores that inclusive education requires sustained commitment to structural reform and professional development. Advancing these recommendations moves educational systems closer to a truly inclusive global landscape—one that recognizes diversity not as a barrier to learning but as a valuable source of enrichment, innovation, and social transformation.

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