Global trends and challenges in bilingual teacher education: A systematic review across sociocultural context

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ARTICLE INFO

ABSTRACT

As global interconnectedness increases, the demand for high-quality bilingual education and by extension, well-prepared bilingual educators, has grown significantly. This systematic review investigates global trends and challenges in bilingual teacher education across diverse sociocultural contexts. A total of 68 peer-reviewed studies published between 2005 and 2022 were analyzed using Saldaña's coding method, with data sourced from six major databases and selected through PRISMA guidelines. Thematic analysis revealed six core areas: global research trends in teacher preparation, evolving teacher competencies, identity formation and intercultural competence, pedagogical models, language policy, and implementation challenges. Findings show that successful bilingual teacher preparation programs are supported by culturally responsive pedagogy, robust policy alignment, and sustained professional development. However, disparities persist due to inadequate training infrastructure, restrictive policies, and lack of localized resources especially in underrepresented regions. The review underscores the need for teacher education models that are context-sensitive, equity-driven, and globally informed. It calls for expanded research in the Global South, integrative policy frameworks, and institutional commitment to build a resilient, inclusive bilingual teaching workforce.

1. Introduction

As nations become increasingly interconnected, the importance of bilingual education in fostering global citizens capable of navigating diverse cultural and linguistic landscapes is more apparent and important than ever. In today's globalized world, communicating in multiple languages is valuable and critical for economic, social, and cultural exchange [1]. The comparative study of bilingual education systems across different countries reveals varied approaches and methodologies, reflecting each region's unique sociopolitical, cultural, and educational contexts. Bilingual education involves teaching academic subjects in two languages, using both the native and a second language as mediums of instruction. The primary goal is to develop proficiency in both languages while mastering the subject content. Research in this area has emphasized its benefits in cognitive development, cultural awareness, and social integration [2]–[4]. However, the implementation and outcomes of bilingual

programs can vary significantly due to factors such as policy environments, teacher preparedness, and community attitudes toward bilingualism [5]–[7]. Research indicates that while bilingual education has the potential to enhance educational outcomes significantly, it often falls short due to inadequately designed and supported programs. For instance, in the United States, bilingual programs frequently struggle with issues of funding, teacher training, and long-term sustainability, which can hinder the effectiveness of these programs [8]. On the other hand, bilingual programs report higher success rates in regions like Scandinavia, where national governments robustly support language education policies [9]. These examples illustrate the critical role that systemic support and policy alignment play in the success of bilingual education. In line with it, there is a need to focus on the interrelation between bilingual education and societal attitudes. In some contexts, minority languages are marginalized, which can affect the implementation of effective bilingual education. Addressing this issue requires educational interventions and broader social changes to enhance bilingualism's status and perceived value in society.

A key issue highlighted in existing literature is the varying success rates of programs, often linked to differences in these external factors. This disparity in program success presents a challenge as it affects the expansion of bilingual programs, emphasizing the need to address these disparities to maximize the benefits of bilingual education. This systematic review proposes that successful bilingual education systems often share strong government support, well-trained teachers, and positive societal attitudes toward multilingualism. Additionally, it advocates for increased international cooperation in research and policy-making in bilingual education, enabling the sharing of best practices and resources [10]. Despite the growing body of research on bilingual education, a lack of comprehensive synthesis focuses specifically on how sociocultural and policy contexts across different regions shape teacher education. Previous reviews often focused on either policy or pedagogy in isolation, overlooking educators' intersectional challenges in multilingual settings [11]. This systematic review is especially timely given the increasing global demand for bilingual educators who can navigate diverse socio-political environments. By critically examining two decades of research, this review aims to illuminate how bilingual teacher preparation programs around the world have evolved in response to shifting linguistic landscapes, advancing technologies, and growing calls for equity. It seeks to uncover prevailing global research trends and address key challenges in bilingual education by highlighting how scholars and practitioners have worked to strengthen teacher readiness and effectiveness. The following are the questions to guide this review: (1) What are the current global research trends in bilingual education, specifically focusing on teacher preparation?; (2) What are the challenges in implementing bilingual education, and what best practices have been reported by scholars to address these challenges? The research questions were instrumental in shaping the article selection and analytical strategies employed in this systematic review. They provided a foundational framework for developing a coding scheme that emphasized critical areas such as teacher preparation, implementation challenges, and evidence-based practices in bilingual education. Each research question informed the identification of pertinent themes and subcategories—for instance, policy influences, instructional models, and teacher education programs—that emerged during the coding process. This deliberate alignment ensured that the thematic analysis remained systematic and directly responsive to the guiding research questions, culminating in findings that are both targeted and comprehensive.

2. Method

The literature included in this paper was identified through searches of EBSCO Host Databases, Eric, PsycINFO, Education Research Complete, Professional Development, and Ohio State Library. Furthermore, the search utilized websites such as ResearchGate, Google Scholar, and ScienceDirect. Terms used to search for relevant literature include Keywords search: Teacher Preparedness in Bilingual Education, Teacher Professional Development in Bilingual Education, Teacher Preparedness in Bilingual Education, Professional Development in Bilingual Settings, Bilingual Teacher Training Effectiveness, Challenges in Bilingual Education Training, Efficacy of Bilingual Teacher Programs, Bilingual Education Training Gaps, Teacher, Competence in Bilingual Classrooms, Professional Development Needs in Bilingual Education, Outcomes of Bilingual Teacher Education, Best Practices in Bilingual Teacher Training. Combined with Boolean operators like AND, OR, and NOT, these keywords help the authors narrow the search to the most relevant studies addressing their research gap. The results are narrowed to scholarly articles, conference proceedings, book chapters, and literature reviews that meet the following criteria.

- The study reports on the resources for teacher professional development in bilingual education or settings from elementary to high school.

- The study offers a perspective on the teacher's professional development/preparedness in bilingual education.

- The study describes how teachers implement knowledge and skills in their actual classroom after taking teacher professional development in a bilingual setting.

- The setting of the study is located around the world.

- Research using qualitative, quantitative, or mixed methods assessed the effectiveness of teacher professional development in bilingual education for elementary school to high school teachers.

- Any research about the effectiveness, challenges, and benefits of teacher training/professional development in bilingual education.

The study must be published in English between 2005 and 2022. This timeline is used because it is difficult to situate everything on the topic while fully considering the thoroughness and comprehensive searching of data [12].

2.1. Screening and Selection Process

Following a systematic approach, the study adhered to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency and reproducibility in the review process. An initial search yielded 185 abstracts from six major databases. After removing 18 duplicates, 12 ineligible items by automation tools, and 30 irrelevant items, 125 records remained for full screening. After reviewing the full text, 68 articles met the inclusion criteria and were retained for analysis. These studies spanned 2005–2022 and focused on bilingual teacher education across diverse geographic and sociocultural contexts. Fig. 1 shows the PRISMA Flowchart for this systematic review and database.
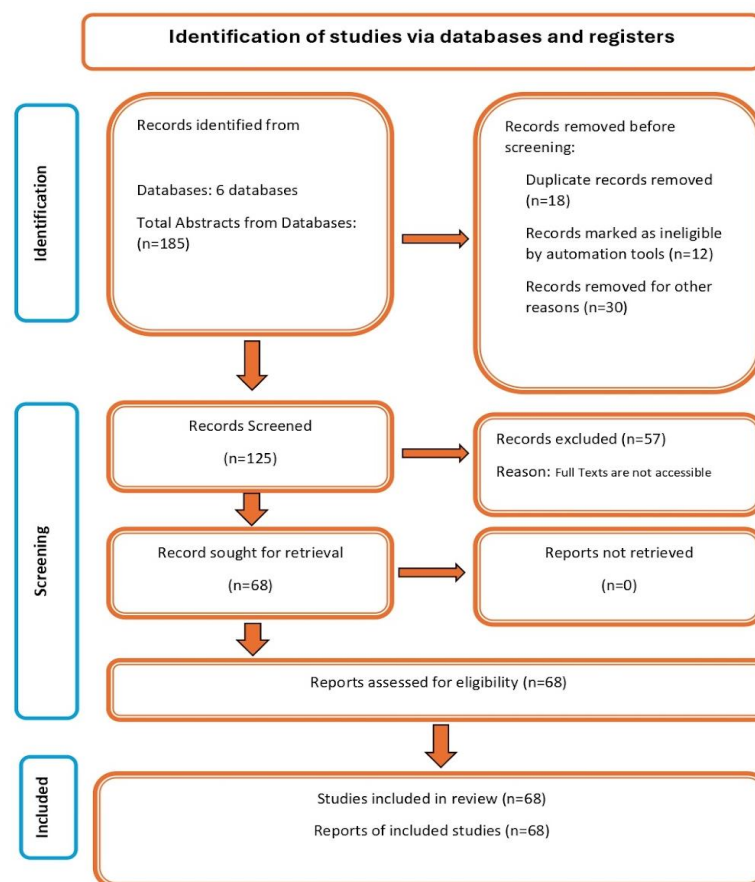

Fig. 1. PRISMA Flowchart for this systematic review and database

2.2. Coding and Data Analysis

The selected articles were analyzed using Saldaña's [13], three-step coding method: (1) Open coding was used to identify preliminary themes from the data; (2) Axial coding helped group the codes into broader categories, establishing connections among them; (3) Selective coding integrated and refined these categories into five core themes that aligned with the research questions. Two independent reviewers participated in the article selection and coding process. Disagreements were resolved through discussion until consensus was reached. Although inter-rater reliability was not quantitatively calculated, reviewer triangulation and memo-writing techniques ensured analytical rigor. All authors actively contributed to reviewing article relevance, resolving disagreements through reflective dialogue and iterative discussion, including scheduled Zoom meetings to ensure consensus. Microsoft Excel was used as the primary tool for organizing and managing data. The coding process involved structured annotation, frequency counts, and code tracking to support theme development and maintain consistency throughout the analysis.

3. Results and Discussion

The literature search resulted in a total of 185 abstracts. 125 relevant abstracts were selected using the inclusion criteria and required further examination. Of the 125 articles, 18 duplicate documents were excluded. After reading, analyzing, and synthesizing the full text of articles, a total of 68 articles were included in the review that fall into six categories: (1) Research Trends in Bilingual Teacher Preparation, (2) Evolving Competencies in Bilingual Education, (3) Teacher Identity and Intercultural Competence, (4) Pedagogical Models and Practices, (5) Language Policy and Its Impact on Teacher Preparedness, and (6) Challenges in Bilingual Education Implementation. These categories reflect both the thematic concerns and the broader patterns in the field. The first category highlights methodological trends, showing a predominance of qualitative approaches, along with fewer quantitative, mixed-methods, and review-based studies. It also captures the global distribution of research, indicating an uneven but expanding international engagement with bilingual teacher preparation. Together, these categories offer a comprehensive understanding of the scholarly focus and evolving priorities in the field.

3.1 Research Trends in Bilingual Teacher Preparation

1) Methodological Trends in Bilingual Teacher Preparation Research (2000–2024)

Current global research on bilingual teacher preparation demonstrates a clear preference for qualitative methodologies. Fig. 2 is the distribution of research methodology in systematic reviews. Based on the reviewed literature, 44 studies employed qualitative approaches such as interviews, case studies, classroom observations, and ethnographic methods. In comparison, only 9 studies used quantitative methods, often relying on surveys or standardized instruments to evaluate program effectiveness or teacher competencies. Additionally, 6 studies adopted a mixed-methods design to blend statistical analysis with in-depth qualitative insights. To synthesize existing knowledge and highlight gaps, 9 studies conducted reviews—this includes 4 labeled as "Systematic Review," 3 as "Literature Review," and 2 as "SLR" (Systematic Literature Review). For the purpose of visual clarity, these three review types were grouped together in the pie chart under one category: Systematic/Literature Review.
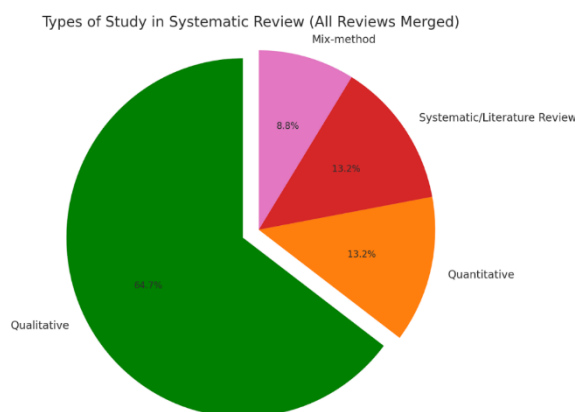

Fig. 2. Distribution of Research Methodologies in the Systematic Review

The chart illustrates the distribution of research methods employed in studies on bilingual teacher preparation over the last two decades. A significant majority of the studies (64.7%) adopted qualitative methodologies, indicating a strong emphasis on in-depth, context-rich explorations of teacher practices, experiences, and perceptions. In contrast, quantitative studies and systematic/literature reviews each constitute 13.2% of the total, reflecting a moderate engagement with numerical data and evidence synthesis. The mixed-method approach is the least represented, making up only 8.8%, suggesting that integrative methodological designs are less commonly used in this field. This trend directly addresses Research Question 1 by illustrating the dominant research approaches used to investigate how teachers are prepared for bilingual education. It demonstrates that scholars overwhelmingly turn to qualitative strategies to deeply examine teacher beliefs, practices, and development in bilingual education contexts, while also using quantitative and integrative approaches to expand the scope and rigor of inquiry.

2) Global Landscape of Research: Countries Leading the Field

Examining the geographic distribution of research on bilingual teacher preparation offers critical insight into the global scope and scholarly engagement within the field. Identifying where studies originate provides context for understanding the dominant perspectives and educational frameworks that shape current discourse. Also, it reveals potential regional disparities in research attention, highlighting both well-represented and underexplored contexts. Fig. 3 illustrates the spatial distribution of the studies included in this review, serving as a foundation for assessing the geographic concentration of scholarly contributions and informing future directions for more inclusive, globally representative research.
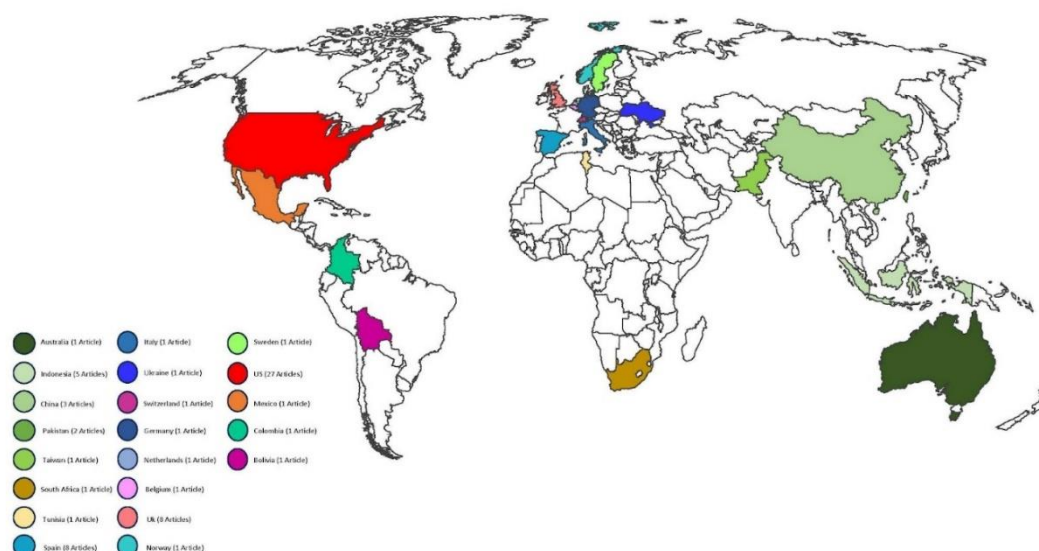

Fig. 3. Illustration of spatial distribution

Fig. 3 shows the geographical scope of current research on bilingual teacher preparation spans a wide array of countries, with particularly strong representation from the United States (27 articles), as visually emphasized by the bold red shading on the map. The United Kingdom (8 articles) and Spain (8 articles) also emerge as key contributors. Notable contributions also stem from Indonesia (5 articles), China (3 articles), and Pakistan (2 articles), alongside a diverse group of nations each represented by a single study—including Australia, Italy, Ukraine, Switzerland, Germany, the Netherlands, South Africa, Tunisia, Norway, Belgium, and others. The map visually depicts the predominance of research activity in the Global North, especially across North America and Western Europe. However, the presence of countries from the Global South—such as Indonesia, Pakistan, South Africa, and Tunisia—highlights a growing body of localized, context-specific scholarship. This global distribution provides a nuanced response to Research Question 1, offering insights into where academic attention is concentrated and reflecting the evolving, geographically diverse landscape of bilingual teacher education research.

3.2. Evolving Competencies in Bilingual Education

This theme refers to the expanding and increasingly complex skillset required of bilingual teachers in today's globalized educational settings. These evolving competencies include digital literacy,

pedagogical flexibility, linguistic awareness, and cultural responsiveness. The literature consistently emphasizes the need for bilingual educators to adapt to sociocultural and technological shifts, serve diverse learners, and foster inclusive, equitable classrooms. A growing body of research identifies that bilingual teachers are no longer viewed solely as language instructors, but as multifaceted professionals who must navigate linguistic variation, cultural pluralism, and emerging instructional technologies. Chien *et al.* examine the use of cyber-physical systems in Taiwan as a means to enhance online bilingual teacher training [14]. Their study demonstrates the importance of digital fluency and innovation in teacher preparation, especially in remote or technology-enhanced learning environments. Similarly, Kordíková & Brestenská [15] explore the perceptions of bilingual science teachers in Slovakia, revealing the need to strengthen both pedagogical and linguistic skills within bilingual content instruction. In the UK, Melara Gutiérrez & López [16] point out that the significance of inclusive practices, asserting that effective bilingual education requires teachers to be trained in intercultural understanding and differentiated instruction. Beyond the core competencies of language instruction, educators are increasingly expected to promote social equity and recognize the diverse identities students bring into the classroom. This includes a growing emphasis on intersectionality—how race, language, and socio-economic status influence learning. Deng *et al.* found that many U.S. teachers report feeling underprepared to address linguistic diversity and recommend course structures that value students' linguistic assets [17]. C. E. Zúñiga [18] emphasizes the need for teacher candidates to critically interrogate dominant ideologies and adopt culturally affirming pedagogies. In line with this, Aquino-Sterling & Rodríguez-Valls advocate for a curriculum in bilingual teacher education that builds Spanish language competencies through culturally and professionally relevant instruction [19].

Comparative research extends these findings globally. Terra [20] describes how teachers in Mozambique struggle with limited resources and dominant language ideologies, underscoring the need to strengthen indigenous language instruction. Conversely, Alfaro critiques U.S. policy environments that restrict bilingual teaching flexibility, arguing for more supportive institutional structures [5]. Benson & Plüddemann [21], through their work in Southern Africa, document the transformative impact of culturally grounded training programs, showing how educators can be empowered to integrate traditional knowledge and promote linguistic justice. In border regions like the U.S.-Mexico context, Zúñiga [18] illustrates how teacher candidates navigate bicultural and bilingual realities, drawing on their lived experience as pedagogical capital. Wang & Woolf [22] focus on bilingual education for special needs children, identifying additional layers of challenge in retaining ethnically diverse educators and ensuring that ongoing training meets real classroom needs. These global and regional insights converge around a central message: evolving competencies in bilingual education are multifaceted and must be addressed holistically. Teachers need more than language skills; they require deep sociocultural awareness, technical proficiency, and ideological clarity. As educational systems continue to diversify and globalize, teacher preparation programs must embed these evolving competencies at the core of bilingual teacher training. In summary, evolving teacher competencies are critical to the success of bilingual education worldwide. These competencies extend beyond language to include critical cultural knowledge, digital literacies, and equity-driven pedagogical practices. These findings directly respond to Research Question 1, showing major global trends in teacher preparation that prioritize responsiveness to diverse student populations and sociopolitical contexts.

3.3. Teacher Identity and Intercultural Competence

Another finding of this systematic review shows how bilingual educators construct professional identities while developing the intercultural competence necessary to teach in multilingual, multicultural classrooms. Teacher identity in bilingual education is not static; it evolves in response to social, cultural, and political contexts. Intercultural competence, meanwhile, involves the ability to interact respectfully and effectively with people from different cultural backgrounds. Together, these attributes shape a teacher's capacity to serve as a cultural mediator and advocate for equity in diverse learning environments. Across the reviewed literature, scholars emphasize that bilingual teachers are not merely transmitters of knowledge, but also cultural interpreters who must continuously negotiate their roles. Ali [23] and Zúñiga [18] emphasize that teacher identity is influenced by political and historical dynamics. In the U.S.-Mexico border context, Zúñiga describes how bilingual educators draw on transnational, bicultural experiences to develop hybrid pedagogical identities [18]. These lived experiences become pedagogical capital as educators incorporate Spanish and English not just as languages, but as cultural tools. Aquino-Sterling & Rodríguez-Valls support this by calling for non-deficit, additive approaches that affirm bilingual teachers' hybrid language identities [19]. Their work argues for culturally and linguistically sustaining preparation programs, where Spanish instruction is

aligned with professional teaching goals and supported by district and community structures. Similarly, Evans *et al*. [24] advocate for identity development as a core dimension of bilingual teacher education, particularly for educators working with historically marginalized populations. In South Africa, Benson & Plüddemann [21] document efforts to promote teacher empowerment through training that integrates local languages and reclaims traditional knowledge. Their study of the ToTSA program shows that bilingual educators often emerge from such initiatives with a stronger sense of purpose and agency. This aligns with Swanwick's [25] work in the UK, where sign bilingualism is positioned as a model for acknowledging students' diverse literacy experiences, particularly in deaf education.

The reviewed literature also indicates the need for continuous professional development, dialogue, and reflection to support identity formation. Cabezuelo Gutierrez & Fernández Fernández [26] and Olsen & Buchanan [27] investigate how bilingual CLIL educators in Spain conceptualize their roles and the tensions they experience. Their findings suggest that teacher identity is shaped not only by external policy but also by internal beliefs, expectations, and the social meanings attached to bilingualism. Furthermore, training programs must foster intercultural awareness as a core competency. Pérez Cañado [28] identifies areas where bilingual teachers require greater support, including grammar, reading comprehension, and especially the cultivation of attitudes that promote tolerance, empathy, and the dismantling of stereotypes. These skills are essential for educators to build inclusive classroom environments that validate all students' linguistic and cultural resources. Comparative analysis shows regional nuances in identity construction. In South Africa, identity formation is influenced by decolonial goals and language revitalization, whereas in the United States, it often responds to immigration, racialized policies, and border politics. In Europe, identity work is driven by the integration of multilingual models within centralized education systems. Despite these differences, the literature agrees that intercultural competence and reflective identity development are central to effective bilingual teaching. In conclusion, teacher identity and intercultural competence are essential for equipping bilingual educators to succeed in complex sociocultural environments. These competencies not only support student learning but also foster more just, inclusive, and responsive educational systems. These findings address both Research Questions 1 and 2 by illuminating how teacher identity formation and intercultural skill development intersect with broader pedagogical goals and social justice commitments.

3.4. Pedagogical Models and Practices

This theme explores the teaching strategies, curriculum frameworks, and instructional innovations designed to support bilingual learners. Effective pedagogical models in bilingual education are context-responsive, culturally inclusive, and linguistically sustaining. They aim to empower educators to bridge theory and practice, accommodate diverse learning needs, and create inclusive multilingual classrooms. Across the reviewed studies, a strong emphasis is placed on innovative, responsive, and inclusive pedagogical strategies that align with the social and linguistic realities of bilingual learners. These models reflect a paradigm shift in bilingual teacher education—moving from generic methods to contextually embedded practices that support equity and academic rigor. To enhance instructional quality, teachers must be equipped with foundational pedagogical and linguistic skills, especially when navigating multilingual classrooms. Xerri [29] argues for early training in language proficiency and culturally aware pedagogy as essential prerequisites for bilingual educators. Ottogalli *et al.* echoes this through the concept of Pedagogical Content Knowledge (PCK), which integrates subject expertise with an understanding of student needs, curriculum design, and culturally relevant instruction [30]. Ongoing professional development is also central to sustaining effective pedagogical practices. Pérez Cañado [28] recommends focused training in pronunciation, listening, and Basic Interpersonal Communicative Skills (BICS), while Melara Gutiérrez & López [16] stress that evaluating pedagogical innovations over time is critical to improving teaching quality and student outcomes. Standardization in instructional materials has also emerged as a pressing need. Cabezuelo Gutierrez & Fernández Fernández [26] emphasize the importance of developing consistent and regionally tailored teaching resources, such as syllabi, in Spain's Autonomous Community of Madrid. Standardized yet flexible approaches offer guidance while still allowing local adaptation.

In addition to technical and curricular strategies, many scholars find the power of culturally sustaining pedagogy. Aquino-Sterling & Rodríguez-Valls [19] and Garza *et al*. [31] advocate for instructional practices that center students' cultural identities and hybrid language practices, helping learners feel seen and valued in their classrooms. Scherzinger & Brahm [32] add that inclusive pedagogy enhances learning outcomes and supports teacher retention. Collaboration also plays a

pivotal role in effective pedagogical models. Scherzinger & Brahm [32] and Wang & Woolf [22] emphasize that cooperative networks among teachers, families, and specialists are essential for meeting the complex needs of bilingual learners—especially those with special education needs. Regarding comparative insight, pedagogical modeling approaches vary significantly across contexts. Spain's Basque Country, as described by Doleschal [33], employs tiered bilingual education models (*A, B, D*) tailored to native and non-native speakers, promoting heritage language preservation. In contrast, U.S.-based programs like those studied by Garza *et al*. [31] focus more heavily on building culturally responsive curricula in Hispanic-serving institutions, often compensating for a lack of systemic language support. These comparative insights show that policy alignment, cultural grounding, and instructional adaptability are key components of pedagogical success in bilingual contexts. To summarize, pedagogical models and practices in bilingual education must reflect not only linguistic duality but also the sociocultural realities of students. The studies reviewed reinforce that inclusive curricula, professional development, collaboration, and culturally relevant instruction are foundational to bilingual teacher success. These findings directly inform Research Questions 2, highlighting global trends in pedagogical preparation and best practices for navigating classroom-level challenges in multilingual settings.

3.5. Language Policy and Its Impact on Teacher Preparedness

Based on the analysis, language policy and its impact on teacher preparedness emerge frequently in the articles particularly showing how national, regional, and institutional language policies shape bilingual educators' training, certification, and classroom preparedness. Language policy can serve as a structural foundation that enables high-quality instruction—or a constraint that limits access to appropriate resources and development opportunities. Supportive language policies are fundamental to effective bilingual education systems. They influence curriculum design, teaching materials, pre-service teacher training, and ongoing professional development. The literature features how policy implementation directly impacts educators' readiness to navigate multilingual, multicultural classrooms. In Sweden, Lundberg [34] illustrates how policy appropriation in a multicultural secondary school revealed critical gaps between national-level mandates and the practical support provided to teachers. Despite progressive objectives, implementation challenges undermined bilingual education outcomes, including limited training and misaligned expectations. Similarly, Menken and Solorza [35] analyze restrictive "English-only" policies in the United States, showing how such top-down mandates often leave school leaders and teachers ill-equipped, especially in contrast to educators in more flexible bilingual settings. Beyond identifying policy as a barrier, Menken and Solorza also call for reform in certification structures, suggesting that state-level criteria in places like New York fail to reflect the complex demands of bilingual classrooms [35]. Their findings link inadequate leadership preparation to weaker program outcomes—echoed by Melara Gutiérrez and López [16], who advocate for data-driven policy reform. By using empirical insights to shape training agendas, institutions can better align teacher development with the lived realities of bilingual learners.

Crucially, language policy also intersects with issues of identity and cultural preservation. Benson and Plüddemann [21] describe a program in Southern Africa that integrates traditional knowledge systems and contemporary pedagogical practices. This dual approach empowers teachers, legitimizes indigenous languages, and positions educators as agents of change. In contrast, Butcher *et al*. critique the lack of policy clarity in some UK schools, where trainee teachers struggle to meet requirements for Qualified Teacher Status (QTS) due to unclear or inconsistently applied language policy frameworks [36]. Cross-regional studies reveal that while Mozambique's push to elevate Indigenous languages in schools [20] marks a step toward equity, a lack of systematic teacher training and material development hinders practical outcomes. In contrast, U.S. policy—dominated by high-stakes testing and accountability mandates—often sidelines bilingual education despite a growing multilingual student base. These examples show that effective policy must be context-sensitive, locally supported, and matched by robust teacher training mechanisms. In sum, language policy exerts powerful influence over bilingual teacher preparedness. Policy can strengthen bilingual education systems when responsive to sociocultural context and guided by empirical insight. Conversely, restrictive or incoherent policy landscapes perpetuate inequities and under-preparation. This theme responds to Research Questions 2, identifying both systemic barriers and strategic solutions for empowering bilingual educators through thoughtful, localized policy implementation.

3.6. Challenges in Bilingual Education implementation

This theme identifies the structural, institutional, and pedagogical barriers that hinder the effective implementation of bilingual education programs across diverse contexts. These challenges range from

insufficient funding and teacher training to policy fragmentation, limited curricular support, and high attrition rates among bilingual educators. The literature repeatedly emphasizes the systemic and institutional difficulties that impede the success of bilingual education programs. These challenges directly address both Research Questions in this review by highlighting the limitations in current bilingual teacher preparation systems and suggesting critical areas for reform. Common barriers include inadequate support structures, underdeveloped teacher education pipelines, and misalignment between policy and practice. Wang and Woolf [22] found multiple entry-level barriers that bilingual teacher candidates face in the U.S., including limited funding, unfamiliarity with university protocols, and the pressure of meeting licensure or English proficiency requirements. The conflicting demands of work, family, and academic preparation compound these barriers. Similarly, Alfaro stresses the need for bilingual teacher educators who are culturally and linguistically aligned with the populations they serve [5]. Without such representation, programs risk perpetuating exclusionary practices and under-serving educators and students. She also critiques restrictive language policies for their negative effects on Pre-K–12 students and the teacher workforce. Another significant issue involves the insufficient qualifications of many in-service instructors. Pérez Cañado [28] notes that numerous bilingual educators receive only basic linguistic upgrade training and lack access to advanced degrees or specialized CLIL programs. These limitations diminish the depth of instruction and may reduce long-term teacher confidence and classroom effectiveness. Quality and availability of teaching materials also surface as critical factors. Fauziah *et al*. [37], Ma [38], and Pérez Cañado [28] emphasize that poorly selected or under-contextualized instructional resources can hinder language acquisition and weaken learner engagement. Teaching materials must be linguistically appropriate and culturally relevant to enhance effectiveness, particularly in multicultural classrooms. Staff recruitment, retention, and ongoing support also emerged as recurrent challenges.

Zúñiga [18] argues for systematic recruitment and continuous follow-up with graduates as part of a full cycle of preparation and retention. He emphasizes that bilingual teacher preparation programs should incorporate language competency assessments and long-term engagement with program alumni to ensure effectiveness and continuity. To address some of these concerns, Kordíková & Brestenská [15] recommend introducing optional CLIL courses, such as science taught in a foreign language, to build bilingual content expertise and motivate pre-service teachers. While not a universal fix, such courses offer promise for integrating content and language instruction in a balanced and purposeful manner. Implementation challenges are often magnified in under-resourced and linguistically marginalized settings. In many U.S. contexts, high-stakes accountability systems and English-only mandates exacerbate teacher shortages and limit pedagogical flexibility. Conversely, European countries like Slovakia and Spain face different structural challenges—such as lack of advanced CLIL programs or uneven policy enforcement—but offer promising localized interventions like bilingual science tracks and regional language models. These comparisons emphasize that local resource availability and policy coherence are crucial to overcoming implementation barriers. Implementing bilingual education programs is challenging due to systemic inequities and program-level limitations. Addressing these challenges requires investment in teacher training, equitable recruitment and retention practices, and greater policy-practice alignment. These insights respond to Research Questions 2, confirming that effective bilingual teacher education must be embedded within robust institutional support systems, responsive policy environments, and culturally sustaining pedagogical frameworks.

4. Conclusion

This systematic review of 68 peer-reviewed studies offers a comprehensive overview of bilingual teacher education across a wide range of sociocultural contexts. Drawing from research published over the past two decades, the review identifies six central themes that shape the field: current trends in teacher preparation, evolving teacher competencies, identity formation and intercultural competence, pedagogical models and practices, the role of language policy, and persistent challenges in implementation. Together, these themes provide a nuanced understanding of how bilingual education is being developed and reimagined globally in response to both local needs and broader systemic demands. The findings suggest important implications for policy, research, and practice. For policymakers, there is a clear need to design teacher education programs that are culturally grounded and linguistically inclusive. Institutional support and coherent language policies are essential to prepare educators for the complex realities of today's multilingual classrooms. For researchers, the review highlights ongoing gaps in geographic representation, especially in the Global South, and calls

for more focused attention on intersections with migration, digital pedagogy, gender, and equity. Future studies should also explore the long-term impacts of teacher preparation and the role of community partnerships in sustaining professional growth. In practice, this review points to a set of promising approaches—such as translanguaging strategies, culturally responsive pedagogy, and the formation of supportive professional communities—that have demonstrated effectiveness in diverse contexts. Innovative models that integrate both traditional knowledge systems and modern technologies also offer valuable pathways forward. While this review provides a rich synthesis of current scholarship, it is not without limitations. The selection of studies was limited to those accessible through major academic databases, which may have led to the exclusion of relevant research published in regional or non-English-language journals. As a result, some local insights and practices—particularly from underrepresented contexts—may not be fully captured. In conclusion, bilingual teacher education must be approached as a dynamic, holistic endeavor—responsive to context, grounded in cultural understanding, and supported by policy and institutional commitment. Preparing teachers for linguistically diverse classrooms requires more than technical training; it demands a sustained investment in equity, inclusion, and professional collaboration. By embracing this vision, education systems can help realize the transformative potential of bilingual education worldwide.

Acknowledgment

Declarations

References

[1] P. Pietrzyk-Kowalec, "Foreign Languages and Employability in the European Union," *Int. Sch. Sci. Res. Innov.*, vol. 17, no. 6, pp. 411–414, 2023.

[2] J. Fox, *Regression diagnostics: An introduction*. Sage publications, 2019.

[3] M. S. Schwartz, "Ethical Decision-Making Theory: An Integrated Approach," *J. Bus. Ethics*, vol. 139, no. 4, pp. 755–776, Dec. 2016, doi: 10.1007/s10551-015-2886-8.

[4] B. Ozfidan and M. Toprak, "Cultural Awareness on A Bilingual Education: A Mixed Method Study," *Multicult. Learn. Teach.*, vol. 15, no. 1, Jan. 2020, doi: 10.1515/mlt-2017-0019.

[5] C. Alfaro, "The sociopolitical struggle and promise of bilingual teacher education: Past, present, and future," *Biling. Res. J.*, vol. 41, no. 4, pp. 413–427, Oct. 2018, doi: 10.1080/15235882.2018.1540367.

[6] J. Parkes, T. Ruth, M. Anberg-Espinoza, and E. De Jong, "Urgent research questions and issues in dual language education," *Dual Language Education of New Mexico*. pp. 5–58, 2009.

[7] N. Hernandez-Nanclares and A. Jimenez-Munoz, "English as a medium of instruction: evidence for language and content targets in bilingual education in economics," *Int. J. Biling. Educ. Biling.*, vol. 20, no. 7, pp. 883–896, Nov. 2017, doi: 10.1080/13670050.2015.1125847.

[8] O. García, "En/countering Indigenous Bilingualism," *J. Lang. Identity Educ.*, vol. 8, no. 5, pp. 376–380, Oct. 2009, doi: 10.1080/15348450903305155.

[9] M. Källkvist and F. M. Hult, "Discursive mechanisms and human agency in language policy formation: negotiating bilingualism and parallel language use at a Swedish university," *Int. J. Biling. Educ. Biling.*, vol. 19, no. 1, pp. 1–17, Jan. 2016, doi: 10.1080/13670050.2014.956044.

[10] K. A. King and A. Mackey, "Research Methodology in Second Language Studies: Trends, Concerns, and New Directions," *Mod. Lang. J.*, vol. 100, no. S1, pp. 209–227, Jan. 2016, doi: 10.1111/modl.12309.

[11] M. Cioè-Peña, "The intersectional gap: how bilingual students in the United States are excluded from inclusion," *Int. J. Incl. Educ.*, vol. 21, no. 9, pp. 906–919, Sep. 2017, doi: 10.1080/13603116.2017.1296032.

[12] M. Tight, "The neoliberal turn in Higher Education," *High. Educ. Q.*, vol. 73, no. 3, pp. 273–284, Jul. 2019, doi: 10.1111/hequ.12197.

[13] A. Saldanha, T. Villa, R. K. Brayton, and A. L. Sangiovanni-Vincentelli, "Satisfaction of input and output encoding constraints," *IEEE Trans. Comput. Des. Integr. Circuits Syst.*, vol. 13, no. 5, pp. 589–602, May 1994, doi: 10.1109/43.277632.

[14] T.-H. Chien, Y.-L. Chen, J.-S. Wu, C.-Y. Siao, L.-R. Chien, and R.-G. Chang, "An Improved Method for Online Teacher Training Courses for Bilingual Education Based on Cyber-Physical Systems," *Appl. Sci.*, vol. 12, no. 5, p. 2346, Feb. 2022, doi: 10.3390/app12052346.

[15] B. Kordíková and B. Brestenská, "Bilingual science education: perceptions of Slovak in-service and pre-service teachers," *J. Biling. Educ.* 2020, doi: 10.1080/13670050.2020.1718590.

[16] F. J. M. Gutiérrez and I. G. López, "Uncovering Teachers' Needs in the Quest for Quality Bilingual Education," *J. Lang. Teach. Res.*, vol. 14, no. 4, pp. 1065–1072, Jul. 2023, doi: 10.17507/jltr.1404.25.

[17] Q. Deng, L. K. Kiramba, and K. M. Viesca, "Factors Associated With Novice General Education Teachers' Preparedness to Work With Multilingual Learners: A Multilevel Study," *J. Teach. Educ.*, vol. 72, no. 4, pp. 489–503, Sep. 2021, doi: 10.1177/0022487120971590.

[18] C. E. Zúñiga, "Supporting 'pedagogical' Spanish language competencies," *Teach. Educ. Q.*, vol. 46, no. 3, pp. 79–98, 2019.

[19] C. R. Aquino-Sterling and F. Rodríguez-Valls, "Developing Teaching-Specific Spanish Competencies in Bilingual Teacher Education: Toward a Culturally, Linguistically, and Professionally Relevant Approach," *Multicult. Perspect.*, vol. 18, no. 2, pp. 73–81, Apr. 2016, doi: 10.1080/15210960.2016.1152894.

[20] S. E. L. Terra, "Bilingual education in Mozambique: a case-study on educational policy, teacher beliefs, and implemented practices," *Int. J. Biling. Educ. Biling.*, vol. 24, no. 1, pp. 16–30, Jan. 2021, doi: 10.1080/13670050.2018.1441803.

[21] C. Benson and P. Plüddemann, "Empowerment of bilingual education professionals: the training of trainers programme for educators in multilingual settings in southern Africa (ToTSA) 2002–2005," *Int. J. Biling. Educ. Biling.*, vol. 13, no. 3, pp. 371–394, May 2010, doi: 10.1080/13670050903373899.

[22] P. Wang and S. B. Woolf, "Trends and issues in bilingual special education teacher preparation: A literature review," *J. Multiling. Educ. Res.*, vol. 6, no. 1, p. 4, 2015.

[23] A. Ali, "Prospects and Challenges of Dynamic Bilingual Education in the Light of Pakistan's Language Policy," *IARS Int. Res. J.*, vol. 10, no. 2, Aug. 2020, doi: 10.51611/iars.irj.v10i2.2020.126.

[24] J. C. Evans, H. Yip, K. Chan, C. Armatas, and A. Tse, "Blended learning in higher education: professional development in a Hong Kong university," *High. Educ. Res. Dev.*, vol. 39, no. 4, pp. 643–656, Jun. 2020, doi: 10.1080/07294360.2019.1685943.

[25] R. Swanwick, "Policy and practice in sign bilingual education: development, challenges and directions," *Int. J. Biling. Educ. Biling.*, vol. 13, no. 2, pp. 147–158, Mar. 2010, doi: 10.1080/13670050903474069.

[26] P. Cabezuelo Gutierrez and R. Fernández Fernández, "A case study on teacher training needs in the Madrid bilingual project," *Lat. Am. J. Content Lang. Integr. Learn.*, vol. 7, no. 2, pp. 49–70, Oct. 2014, doi: 10.5294/laclil.2014.7.2.3.

[27] B. Olsen and R. Buchanan, "'Everyone wants you to do everything': Investigating the professional identity development of teacher educators," *Teach. Educ. Q.*, vol. 44, no. 1, pp. 9–34, 2017.

[28] M. L. Pérez Cañado, "Teacher training needs for bilingual education: in-service teacher perceptions," *Int. J. Biling. Educ. Biling.*, vol. 19, no. 3, pp. 266–295, May 2016, doi: 10.1080/13670050.2014.980778.

[29] D. Xerri, "Teaching English in a Multilingual Classroom: Addressing Challenges Through Teacher Education and Development," in *Multilingual education*, 2018, pp. 143–153. doi: 10.1007/978-3-319-92396-3_8

[30] M. E. Ottogalli and G. M. A. Bermudez, "A PCK-mapping approach to show the integration among components of the pedagogical content knowledge of elementary education teacher educators about biodiversity," *Teach. Teach. Educ.*, vol. 151, p. 104746, Dec. 2024, doi: 10.1016/j.tate.2024.104746.

[31] E. Garza, K. Espinoza, M. Machado-Casas, B. Schouten, and M. J. Guerra, "Highly Effective Practices of Three Bilingual Teacher Preparation Programs in US Hispanic-Serving Institutions (HSIs)," *Ehquidad Rev. Int. Políticas Bienestar y Trab. Soc.*, no. 14, pp. 95–128, Jul. 2020, doi: 10.15257/ehquidad.2020.0014.

[32] L. Scherzinger and T. Brahm, "A systematic review of bilingual education teachers' competences," *Educ. Res. Rev.*, vol. 39, p. 100531, May 2023, doi: 10.1016/j.edurev.2023.100531.

[33] U. Doleschal, "Good practices of bilingual education in the CoE countries." Ursula Doleschal, University of Klagenfurt, Austria, pp. 1–11, 2020.

[34] O. Lundberg, "Obstacles to bilingual education," *Apples - J. Appl. Lang. Stud.*, vol. 11, no. 3, pp. 29–54, Oct. 2017, doi: 10.17011/apples/urn.201712104583.

[35] K. Menken and C. Solorza, "Principals as linchpins in bilingual education: the need for prepared school leaders," *Int. J. Biling. Educ. Biling.*, vol. 18, no. 6, pp. 676–697, Nov. 2015, doi: 10.1080/13670050.2014.937390.

[36] J. Butcher, I. Sinka, and G. Troman, "Exploring diversity: teacher education policy and bilingualism," *Res. Pap. Educ.*, vol. 22, no. 4, pp. 483–501, Dec. 2007, doi: 10.1080/02671520701651102.

[37] N. Fauziah, S. Mirizon, and S. Silvhiany, "Bilingual Education Program: Teachers' and Students' Perspectives and Challenges," *J. Pendidik. Progresif*, vol. 11, no. 2, pp. 219–234, 2021, doi: 10.23960/jpp.v11.i2.202107.

[38] K. Ma, "The Challenges and Solutions in Bilingual Education," *Lect. Notes Educ. Psychol. Public Media*, vol. 24, no. 1, pp. 242–248, Nov. 2023, doi: 10.54254/2753-7048/24/20230740.