



Exploring Moroccan Teacher Education: Pathways to Capacity Building, Networking, and Collaborative Professionalism

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Abstract

This study examines the incorporation of Professional Learning Networks (PLNs) into Moroccan pre-service Training (PST), addressing the urgent need for capacity building and collaborative professionalism in teacher education. Utilizing a qualitative case study methodology, the research explores how PLNs can address structural deficiencies in teacher preparation and facilitate the development of reflective, resilient, and professionally autonomous educators (Brown & Poortman, 2018; Hargreaves & O'Connor, 2018; Hargreaves, 2020). Drawing on data from semi-structured interviews with stakeholders at ENS and CRMEFs, the study identifies key themes, including discontinuity in training, the informal role of PLNs, and the necessity for institutional reform. A comprehensive overview of the research design is provided, employing Braun and Clarke's (2006) six-phase thematic analysis to interpret narratives from six participants deeply involved in teacher education. The findings are contextualized within current debates on teacher identity formation, digital professionalization, and collaborative learning in professional training-constrained systems. This work contributes original insights into the Moroccan teacher education landscape by proposing PLNs not merely as technological add-ons but as embedded ecosystems for professional growth. The study offers a novel perspective on how teacher training programs can leverage networked learning to foster continuity between pre-service preparation and in-service development. These findings have broader implications for rethinking teacher education policy, curriculum design, and institutional partnerships in African and under-resourced contexts. **Keywords:** Moroccan Teacher Education, Capacity Building, PLNs, and Collaborative Professionalism.

تحليل كفي لتكوين الأساتذة في المغرب: مسارات لبناء القدرات، والتشبيك، والاحترافية المهنية التعاونية

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الملخص: تبرز هذه الدراسة أهمية إدماج الشبكات المهنية للتعليم (PLNs) في التكوين الأساسي للأساتذة في المغرب، مع التركيز على الحاجة الملحة لبناء القدرات وتعزيز التعاون المهني في تكوين الأساتذة. وذلك من خلال اعتماد منهج دراسة حالة نوعية، بحيث تكشف هذه الدراسة عن دور الشبكات المهنية في تدارك أوجه القصور الهيكلية في تكوين الأساتذة، من أجل الإسهام في تطوير أساتذة يتمتعون بالقدرة على التفكير التأملي والمرونة والاستقلالية المهنية.

(Brown & Poortman, 2018؛ Hargreaves & O'Connor, 2018؛ Hargreaves, 2020).

واستنادًا إلى البيانات المحصل عليها من ست مقابلات شبه منظمة مع صناع القرار التربوي في المدارس العليا للأساتذة (ENS) والمراكز الجهوية لمهن التربية والتكوين (CRMEFs)، خلصت الدراسة إلى تحديد إشكالات محورية، من بينها:

- التكوين المتقطع

- الدور غير الرسمي للشبكات المهنية

- الحاجة إلى إصلاحات مؤسسية.

بناء عليه، فإن الدراسة تقدم تصورا شاملاً لتصميم البحث، مستندة إلى المنهج التحليلي الموضوعي المكوّن من ست مراحل لتحليل محتوى المقابلات. وتتمحور نتائجها في سياق النقاشات الراهنة حول تشكيل هوية الأساتذة، والاحتراف الرقمي، والتعلم التعاوني، ضمن أنظمة تعاني من محدودية التدريبات المهنية. هذا بالإضافة إلى أن هذه الدراسة تقدم رؤى جوهرية حول مشهد تكوين الأساتذة في المغرب من خلال اقتراح الشبكات المهنية للتعليم كنظم مدمجة تدعم النمو المهني. علاوة على ذلك، فهي تقدم منظورًا جديدًا حول كيفية استثمار برامج التكوين في التعلم التشابكي لتعزيز الاستمرارية بين الإعداد القبلي للخدمة والتطوير إثناءها. ما يجعل هذه النتائج تكتسي أهمية واسعة في إعادة التفكير في سياسات تكوين الأساتذة، وتصميم المناهج، والشراكات المؤسسية في السياقات المحلية.

الكلمات المفتاحية: تكوين الأساتذة في المغرب، بناء القدرات، الشبكات المهنية للتعليم، والاحترافية المهنية التعاونية.

Introduction

Globally, teacher preparation programs are being closely examined to evaluate their success in preparing future teachers not just with subject matter expertise but also with the professional attributes needed to maneuver through the ever-evolving educational environments successfully. (United Nations, 2020; Schleicher, 2016; Ennam, 2021). Within this framework, the Moroccan teacher education system, particularly its pre-service component, encounters persistent challenges related to program fragmentation, limited duration, and inadequate mechanisms for sustained professional learning. Although institutional training entities such as the Centres Régionaux des Métiers de l'Éducation et de la Formation (CRMEFs) and the Écoles

Normales Supérieures (ENS) have invested structurally in pre-service preparation, the Higher Council for Education, Training, and Scientific Research (HCETSR) identifies a significant disconnect between initial training and the long-term demands of classroom practice. The report indicates that Morocco's higher education system remains fragmented and lacks articulation pathways, severely restricting student mobility, recognition of prior learning, and opportunities for reorientation or professional advancement (HCETSR, 2018, p. 16).

Effective global teacher preparation must transcend transmission models and adopt more holistic frameworks of capacity building, where reflective inquiry, collaborative professionalism, and professional identity development are central tenets (Darling-Hammond, 2000; Scardamalia & Bereiter, 2005; Hargreaves & O'Connor, 2018). This evolution aligns with the increasing recognition of Professional Learning Networks (PLNs) as dynamic ecosystems for knowledge exchange, mentorship, and continuous growth. Defined as self-directed, goal-oriented communities of practice, PLNs provide teachers with sustained opportunities to engage with peers, share resources, and cultivate both technical and emotional competencies. Particularly in resource-constrained settings, they offer flexible, scalable alternatives to formal professional development structures (Brown & Poortman, 2018; Schnellert & Butler, 2021).

Despite their documented potential, the early integration of PLNs remains under investigation in Moroccan pre-service teacher education. To the best of the authors' knowledge, few programs explicitly incorporate PLN frameworks into their curricula, and even fewer address the structural conditions, such as digital access, institutional support, or mentor-facilitated engagement, necessary for meaningful implementation. Consequently, pre-service teachers often complete training programs with limited capacity for sustained collaborative inquiry or self-directed development. This gap is particularly significant given the growing need to prepare novice teachers for culturally responsive, technologically mediated, and community-embedded professional contexts. The challenge lies in equipping them with the

requisite skills to navigate current transitions (OECD, 2019; Schleicher, 2020; Hargreaves, 2020). This study addresses this gap by exploring how PLNs can be leveraged to build teacher capacity and promote collaborative professionalism in the Moroccan pre-service landscape. Anchored in a qualitative case study design, it draws on the perspectives of key stakeholders across ENS and CRMEF institutions to investigate three interrelated areas: (1) the structural and contextual limitations of existing pre-service training, (2) the feasibility and institutional conditions required for PLN integration, and (3) the psychosocial dimensions of PLN engagement, particularly concerning identity formation, emotional well-being, and resilience.

The importance of this study resides in its potential to inform both policy and practice. By identifying systemic barriers and latent opportunities within Morocco's current teacher education framework, the study seeks to offer actionable insights for integrating Professional Learning Networks (PLNs) into pre-service programs as foundational, rather than supplementary, components. In doing so, it positions PLNs not merely as digital innovations but as relational infrastructures capable of bridging the gaps between training and practice, isolation and connection, and formal knowledge and lived professional growth.

Ultimately, the study contributes to a broader understanding of how localized strategies can align with global shifts toward inclusive, reflective, and lifelong teacher development. It asserts that for professional learning to be sustainable, it must be embedded early, nurtured institutionally, and driven by the collective values of inquiry, care, and agency. In this context, PLNs emerge not only as tools for professional development but as frameworks for cultivating a resilient, collaborative, and future-ready teaching force.

Theoretical perspectives

This part outlines the key theoretical foundations that inform the present study. 2.1 introduces the case study approach as a means of exploring teacher education in real-world contexts. 2.2 focuses on capacity building in pre-service teacher education, highlighting how teacher preparation programs can develop essential skills, dispositions, and reflective practice. 2.3

explores collaborative professionalism and the role of Professional Learning Networks (PLNs) as dynamic environments for continuous professional growth. Together, these frameworks form the conceptual framework of the research. Subsequently, (2.4) presents the aim of the study and its guiding research questions.

Case study approach

This study employs a qualitative case study design to investigate how Professional Learning Networks (PLNs) contribute to capacity building, foster collaborative professionalism, and cultivate resilience in Moroccan preservice teacher education. Case studies are particularly well-suited for examining complex, real-world educational settings where theory and practice intersect. McAninch (1993) highlights that case methods in teacher education help bridge this gap by promoting inquiry rooted in workplace realities. Similarly, Merriam (2009) frames qualitative case study as an adaptable methodology informed by diverse theoretical traditions, offering tools for rigorous, practice-relevant research. Yin (2017) emphasizes its strength in producing in-depth, contextual insights rather than generalizations, while Stake and Johnson (1996) stress its ability to capture holistic, real-life complexity. Flyvbjerg (2006) further defends case study research against common critiques, asserting that single cases can produce theoretical advancements critical for educational understanding. Crowe et al. (2011) echo this, demonstrating that case studies offer multidimensional analysis, especially in under-researched domains, with clear guidelines for design and quality.

In teacher education, case study design has proven effective in fostering critical thinking, reflection, and decision-making (Ulvik et al., 2020). Torres et al. (2023) found that case-based approaches improved preservice teachers' instructional strategies and confidence, particularly for working with English Language Learners. While collaborative case analysis offers benefits, individual engagement may lead to deeper conceptual gains.

In summary, the case study framework aligns with the study's goals of examining PLNs as sites of professional growth. It supports the investigation of three interrelated themes:

capacity building (2.2), collaborative professionalism (2.3), and PLNs as developmental resilient ecosystems (2.4), providing a context-rich foundation for analyzing preservice teacher learning.

Capacity Building in Preservice Teacher Education

Capacity building in education involves enhancing the capabilities of individuals and institutions through the development of skills, knowledge, and resources (Eade, 1997). Beyond its technical dimensions, it is a transformative process grounded in collaboration, adaptability, and reflection. Scardamalia and Bereiter (2002, 2005, 2010, 2014, 2021) argue for embedding knowledge building, that defined as a collective, inquiry-driven process, into educational ecosystems. This approach aligns with the integration of Professional Learning Networks (PLNs) into preservice teacher development, where digitally connected, inclusive environments support shared learning and continuous growth.

Effective preservice teacher education must go beyond knowledge transmission to develop pedagogical adaptability, reflective habits, and collaborative engagement (Darling-Hammond, 2000; Cochran-Smith & Zeichner, 2005). Central to this are programs that integrate theoretical knowledge with authentic classroom experience. Field-based learning supported by mentoring, as emphasized by Zeichner (2010) and Grossman et al. (2009), equips teachers to refine their instructional practices within real contexts. Mentorship, especially when dialogic and sustained, provides both technical and emotional support, fostering professional identity and socialization (Orland-Barak & Wang, 2020; Anderson & Stillman, 2013). Reflection and collaboration are equally critical. Baran et al. (2017) and Oluk (2023) underscore that preservice programs should model and embed collaborative inquiry, allowing teachers to develop agency and professional autonomy. Such practices are often extended through PLNs, where educators continue reflective dialogue and knowledge exchange beyond formal institutions (Prenger et al., 2020; Binkhorst, 2018).

Responding to classroom diversity is another key domain. Lucas and Villegas (2013) argue that culturally responsive pedagogy must begin in preservice training, equipping future teachers with the dispositions and strategies to teach equitably across differences. Simultaneously, digital fluency has become imperative. Baran et al. (2017, 2019) show that engaging preservice teachers in authentic digital activities, such as simulations and visual tools, not only strengthens instruction but introduces them to networked professional communities through PLNs. Grounded in the knowledge-building theory of Scardamalia and Bereiter (2005, 2014, 2021), PLNs represent collaborative spaces where teachers co-construct understanding, share resources, and build relational trust. Schnellert (2020) and Schnellert & Butler (2021) emphasize that PLNs foster teacher agency, promote collective learning, and enable continuous development. However, their impact depends on structural support. Without institutional commitment, PLNs may remain marginal (Vaillant, 2019). Brown and Poortman (2019) argue that their effectiveness hinges on shared goals, leadership engagement, and sustained participation, particularly in resource-constrained systems.

In sum, capacity building in preservice education is multidimensional and interdependent. It entails mentored, field-based practice (Zeichner, 2010; Orland-Barak & Wang, 2020), reflective collaboration (Baran et al., 2017), and responsiveness to technological and cultural shifts (Ennam, 2020a; Lucas & Villegas, 2013; Baran et al., 2019). These domains converge within PLNs, which serve not just as tools but as embedded professional ecosystems. As Schnellert (2020) and Brown & Poortman (2019) note, PLNs cultivate resilience and collaborative professionalism, making them especially valuable in fragmented or underfunded educational settings. Aligned with global visions for inclusive and lifelong learning (UNESCO, 2022; Schleicher, 2020; Coolahan, 2002), PLNs offer a practical infrastructure for transforming teacher preparation. By embedding preservice education within such dynamic networks, future teachers are not only trained but empowered to thrive in a complex and evolving profession. Building on the transformative potential of PLNs, the focus now turns to explore collaborative

professionalism as a foundation that fosters shared responsibility, mutual learning, and sustained professional growth within and beyond institutional settings.

Collaborative Professionalism in Preservice Teacher Education

Collaborative professionalism is increasingly acknowledged as a fundamental principle in preservice teacher education, underscoring the significance of sustained, inquiry-driven engagement among educators. As articulated by Hargreaves and O'Connor (2018), it encompasses shared responsibility, evidence-informed dialogue, and solidarity ingrained in the culture of schools. These elements are crucial for preparing novice teachers to meet diverse and evolving educational demands. This framework aligns with Brown and Poortman's (2018) research on Professional Learning Networks (PLNs), which emphasize relational trust, joint inquiry, and reciprocal learning as mechanisms for systemic improvement. Their conceptualization of PLNs as embedded structures corresponds with collaborative professionalism's emphasis on fostering pedagogical agency, shared leadership, and continuous professional development.

The case of Morocco exemplifies the critical link between scientific research and national policy. As Ennam (2020b) argues, Morocco is a sovereign state with a vast higher education system; therefore, it must treat scientific research as an uncompromising priority, akin to safeguarding its territorial integrity. Despite its historic distinction as home to the world's oldest university, the country must actively foster a globally competitive research culture to advance its academic and developmental goals. Achieving this requires institutional strategies that mirror evidence-based collaborative frameworks, such as co-teaching and Professional Learning Communities (PLCs), which Kamens (2007) and Rigelman & Ruben (2012) identify as catalysts for inclusion, problem-solving, and professional identity. Similarly, collaborative action research models (Levin & Rock, 2003; Willegems et al., 2018) demonstrate how structured cooperation can cultivate inquiry-driven professionalism. Yet, as García-Martínez et al. (2020) and Lillo (2018) caution, such efforts risk becoming tokenistic

without deliberate institutional support. For Morocco to succeed, its policies must align with the principles of shared professional capital (Brown & Poortman, 2018; Hargreaves & Fullan, 2012), embedding collaboration within a broader framework of leadership commitment, resource allocation, and strategic goals.

The affective dimension is equally critical. Research indicates that emotionally supportive collaborative environments foster teacher resilience, risk-taking, and identity development (Willegems et al., 2018; García-Martínez et al., 2020). Further, Professional development is most effective when viewed as ongoing growth that builds on teachers' existing strengths, rather than as a corrective process based on deficiencies. It's about "creating a supportive and inspirational environment in which teachers can grow professionally and personally" (Mercer & Gregersen, 2020, p.19). In this context, PLNs function as communities of care, aligning with Hargreaves and O'Connor's (2018) notion of relational professionalism. Ultimately, sustaining collaborative professionalism requires systemic alignment. Field-based experiences, co-designed mentoring, and cross-institutional dialogue are essential for ensuring that the values of collaboration persist beyond training into early career practice (Willegems et al., 2018; Lillo, 2018). By integrating PLNs within this framework as both structural and cultural supports, preservice teacher education can cultivate reflective, autonomous, and resilient educators equipped for long-term professional learning.

Reimagining Teacher Preparation through Professional Learning Networks

Professional Learning Networks (PLNs) are increasingly recognized as transformative infrastructures for capacity building and collaborative professionalism in teacher education. They serve as relational, distributed spaces where preservice and in-service educators engage in sustained professional inquiry, peer learning, and reflective dialogue. Grounded in the knowledge-building paradigm (Scardamalia & Bereiter, 2005, 2014), PLNs enhance teacher agency by fostering self-directed learning, promoting resilience, and developing adaptive expertise across diverse teaching contexts (Schnellert, 2020; Hargreaves & O'Connor, 2018).

Brown and Poortman (2018) conceptualize PLNs as context-responsive ecosystems capable of bridging structural gaps in fragmented or under-resourced teacher education systems. Their research indicates that PLNs promote collaborative professionalism through co-constructed goals, trust-based interactions, and shared accountability for student learning. When effectively supported, PLNs do not merely supplement training; they embed a culture of collective improvement and sustained engagement. This aligns with earlier findings on capacity building that emphasize the integration of field-based learning, dialogic mentoring, and reflective practice as pillars of robust teacher preparation (Zeichner, 2010; Orland-Barak & Wang, 2020; Baran et al., 2017).

While PLNs offer significant promise as mechanisms for building teacher capacity and fostering collaborative professionalism, their integration into preservice education remains uneven and under-theorized. Challenges such as digital inequity, fragmented participation, and the absence of institutional scaffolding often limit their sustainability, particularly in resource-constrained contexts like Morocco. For instance, the lack of a structured PLN module within CRMEF programs illustrates how missed opportunities to embed collaborative norms early in teacher formation can undermine long-term professional growth. This gap invites critical examination into how PLNs might be more effectively integrated into preservice systems that prioritize relational learning, distributed leadership, and culturally responsive pedagogy (Lucas & Villegas, 2013; Lillo, 2018). Embedding PLNs is not merely about technological adoption; rather, it represents a shift in how professional identity, reflection, and community are cultivated from the outset of teacher education.

The literature thus frames PLNs as scalable infrastructures that can support preservice teachers in developing resilience, autonomy, and a sense of professional belonging, qualities essential for navigating complex educational environments. Yet realizing this potential depends on purposeful design: PLNs must be aligned with institutional objectives, supported by leadership, and integrated into pedagogical frameworks that value inquiry, collaboration, and

emotional well-being. It is within this conceptual space, between promise and practice, that this study positions its inquiry. Moving forward, the research aims to investigate how PLNs can be embedded meaningfully within the Moroccan teacher education system, and to what extent they may address persistent gaps in capacity building, research engagement, and collaborative professionalism.

Aim of study and research questions

Amid shifting educational demands that emphasize adaptability, collaboration, and sustained professional growth, this study draws on three intersecting theoretical strands to rethink preservice teacher training. The case study approach (McAninch, 1993; Yin, 2017) offers a context-responsive lens to explore PLNs within institutional and cultural settings. Capacity building, as articulated by Zeichner (2010), Darling-Hammond (2000), and Orland-Barak and Wang (2020), moves beyond content delivery to include mentorship, fieldwork, and reflective inquiry, key to fostering resilient and autonomous teachers. PLNs, grounded in knowledge-building theory (Scardamalia & Bereiter, 2005, 2021), provide distributed, relational, and digitally connected learning environments that promote teacher agency and mitigate professional isolation (Schnellert, 2020; Brown & Poortman, 2019; Hargreaves & O'Connor, 2018). However, as Vaillant (2019) notes, their efficacy hinges on structural alignment and leadership support. Together, these frameworks guide this study's examination of PLNs as a strategic lever to address fragmentation in Morocco's preservice teacher education system by enhancing identity, inquiry, and collaborative professionalism.

METHOD

Aim of the Study

This study aims to critically examine the potential of Professional Learning Networks (PLNs) as mechanisms for enhancing teacher capacity, fostering collaborative professionalism, and sustaining research engagement in the Moroccan pre-service teacher education system. It seeks to explore both the systemic gaps and the institutional possibilities for embedding PLNs within

current training structures, while considering their impact on teacher identity, resilience, and long-term professional learning.

Research Questions

1. How do institutional stakeholders within Moroccan teacher education conceptualize the role, value, and practical integration of Professional Learning Networks in pre-service training?
2. In what ways can PLNs facilitate the incorporation of educational research and action research into pre-service programs, and what structural or cultural constraints limit their application?
3. How do PLNs contribute to shaping collaborative professionalism, particularly through supporting professional identity formation of teachers and emotional well-being among early-career?

Participants and Context

This qualitative case study investigates the Moroccan preservice teacher education system, specifically focusing on two primary institutional settings: the Centres Régionaux des Métiers de l'Éducation et de la Formation (CRMEFs) and the Écoles Normales Supérieures (ENS). The participant group comprised six stakeholders, including directors, departmental heads, and academic trainers affiliated with these institutions. These individuals were purposefully selected for their strategic roles in shaping pedagogical practice, program implementation, and institutional leadership in teacher education across Morocco. Their perspectives offered a rich, insider-oriented lens into the systemic structures, opportunities, and constraints within preservice teacher preparation, especially regarding the potential integration of Professional Learning Networks (PLNs).

Table 1.

Participants of the study

Participants	Role	Institution
P1	Director of CERMF	CERMF
P2	TRAINER	ENS
P3	Head department of English studies	ENS
P4	TRAINER	ENS
P5	TRAINER	CERMF
P6	TRAINER	CERMF

Material

The primary dataset consists of six semi-structured interviews conducted in English, both in-person and via the Zoom platform. These interviews collectively spanned approximately 1 h. 40 minutes and were audio-recorded, transcribed verbatim. All participants were anonymized using alphanumeric codes (P1–P6) to protect their identities.

Data Collection and Analysis

The interviews followed a semi-structured format organized around three core themes aligned with the study’s research questions: (1) Structural Gaps in Pre-Service Training and perceptions On PLNs feasibility in preservice education, (2) Collaborative Professionalism and the Conditions for Effective upskilling, (3) Teacher Well-being, Identity Formation, and PLNs as Support Systems. Thematic analysis was employed using Braun and Clarke’s (2006) six-phase framework that consider the familiarization with the data, generation of initial codes, theme searching, theme review, theme definition, and final report writing. Analysis was both iterative and reflexive, with initial coding conducted manually and later managed using Microsoft software for better organization and pattern detection. Codes were clustered into higher-order categories to capture recurring themes and contradictions, guided by the study’s theoretical perspectives of this study.

Ethical Considerations

Before data collection, ethical clearance was secured from the relevant institutional review board. Participants were provided with detailed consent forms outlining the study's aims, voluntary participation, and procedures for maintaining confidentiality. All data were anonymized, and participants were informed of the interview protocol and their right to withdraw from the study at any point without consequence. Pseudonyms and coded references were used throughout data management and reporting to ensure anonymity and data security.

Methodological Reflections

The case study design was particularly suitable for capturing the contextual, systemic, and human-centered complexities of preservice teacher education in Morocco. By focusing on a bounded system, the national teacher training infrastructure under current policy and digital constraints, this design allowed for a context-sensitive examination of emerging innovations like PLNs. While not aimed at generalizability, the study offers thick description and theory-informed insights that may be transferable to similar low-resource or post-colonial education systems undergoing transitions and aiming at considering what hampers achievability in Moroccan educational reform (Ennam, 2023).

Limitations

As with all qualitative case studies, limitations include the bounded sample size and context specificity. The study was confined to public-sector institutions and did not include voices from private teacher training centers or national policymakers. Additionally, the sole reliance on interview data limits triangulation; the inclusion of document analysis or classroom observations could have strengthened the validity and depth of findings. Nonetheless, thematic saturation was achieved, and the data yielded a robust picture of the structural and cultural dynamics influencing PLN integration in Moroccan preservice teacher education

Results and Analysis

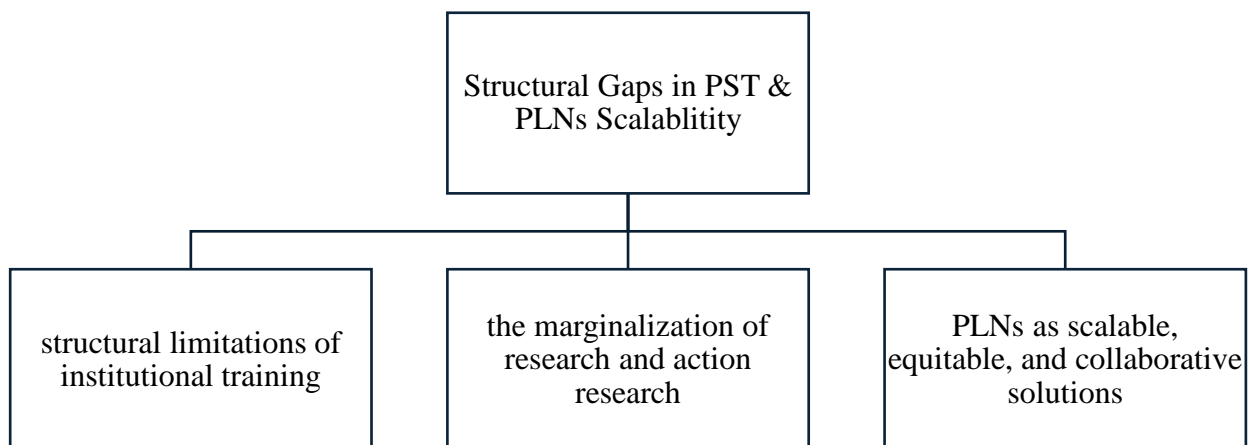
This section presents the findings derived from six semi-structured interviews, thematically analyzed following Braun and Clarke’s (2006) six-phase approach. Three interconnected themes emerged: (4.1) Bridging Structural Gaps in Preservice Teacher Training: The Scalability Potential of PLNs, (4.2) collaborative professionalism and the institutional conditions for effective PLN integration, and (4.3) the psychosocial role of PLNs in promoting teachers’ professional well-being and identity formation.

Bridging Structural Gaps in Preservice Teacher Training: The Scalability Potential of PLNs

Several participants highlighted the limited duration, logistical constraints, and fragmented nature of Morocco’s pre-service teacher education system. The participants collectively identify three interconnected sub-themes: (4.1.1) the structural limitations of institutional training, (4.1.2) the marginalization of research and action research, and finally (4.1.3) the latent potential of PLNs as scalable, equitable, and collaborative solutions. Figure 1 presents an overview of the first theme along with its emerging subthemes.

Figure 1

The Scalability of PLNs Amid Structural Gaps in Preservice Teacher Training.



Structural Limitations of Institutional Training. Participants questioned the practicality of Morocco’s nominal two-year preservice training program, emphasizing its compressed structure and lack of coherence. Participant 1 (P1) critiques the nominal two-year training structure, noting that *“we’re talking about two years of pre-service teacher training, but in fact it’s no more than six months,”* further adding, *“we cannot talk about the second year for pre-service training... few things can be done in this period.”* This discrepancy between policy and practice is described as endemic: *“In our case, we are an exception... but talking about it at the national level, we cannot talk about the second year for pre-service training».* The system is also constrained by calendar design, with some pre-service cohorts beginning in January and ending by July, which compresses learning time and reduces the feasibility of meaningful professional growth. The shortened and inconsistent training cycle, particularly in the absence of structured mentorship or practical application, limits novice teachers' opportunities to develop reflective habits and establish a professional identity. As P1 explains, *“Before they start serving, they receive some training for one year in the centers... to equip them with the prerequisites”.* This foundational training is acknowledged as necessary, but insufficient, as highlighted by P3: *“Pre-service or in-service training that is institutionalized... is never enough”.* This reinforces the broader perception that institutional training, while foundational, must be complemented by ongoing, practice-based learning to ensure sustainable teacher development.

The Marginalization of Research and Action Research. Beyond duration, participants highlighted a systemic undervaluing of research and inquiry within CRMEF and ENS institutions. Action research, while conceptually encouraged, remains sporadic and poorly institutionalized. Although research has been “insisted upon” in curriculum design, *“we insisted on including it as a course... and we are still insisting...” (P3),* P1 questioned its real-world application and authenticity: *“We talk about action research... but still, a lot can be said about*

it. Is it structured? Does it work? Signaling both a curricular void and a lost opportunity for research development. The Incomplete Architecture of Pre-Service Training highlights the fragile and fragmented design of Morocco's teacher training pathway, especially concerning the integration and continuity of research-based practice. P3 highlights a structural disconnect between faculty-based training (ENS) and CRMEF programs. He explains, ***“In the CRMEF, for example, they are supposed to finish to complete the takeover with more advanced issues related to teaching the methodology, and that would include the researcher.”*** However, he also admits uncertainty and ineffectiveness in practice: ***“What happens in these centers? I'm not sure. I know that it hasn't been very effective.”*** This reflects a broader theme of institutional fragmentation, where research components are inconsistently implemented and lack coordinated scaffolding across training phases. P3's statement suggests that the inclusion of research methodology remains largely substantive and should guarantee a pedagogical transfer or follow-through. He comments on the Lack of Post-Training Monitoring and Feedback Loops, saying that ***“After the students graduate and go to CERMF... we have no idea about that”***. This quote reinforces the theme of disconnection between pre-service education institutions and highlights the lack of a tracking system or sustained developmental support after graduation. It aligns with earlier concerns raised by P1 and P6, who emphasized ***“the absence of follow-up systems”*** to ensure that research training continues into professional practice. These insights support the emerging theme of PLNs as potential structures for bridging this gap.

Thus, while research is nominally embedded in Moroccan preservice teacher education, its implementation is uneven, and continuity is non-existent. This evidences a systemic vulnerability: a disconnection between what is taught, what is practiced, and what is sustained. These gaps validate the study's call to integrate PLNs as intentional platforms for long-term professional growth, bridging both structural and epistemic disjuncture across training stages.

PLNs as Scalable and Equitable Solutions. In response to these systemic gaps, participants found that PLNs are adaptive, relational frameworks for professional growth. These were not seen as technological trends, but as essential, scalable ecosystems for collaboration, mentorship, and reflective learning.

P6 highlighted the lack of curricular integration: *“There is no direct reference to the importance of PLNs in the pre-service training programs. There is no specific module dealing with PLNs in all CRMEFs of Morocco.”* The phrase “no direct reference” underscores the institutional omission of modern tools aligned with global best practices. Despite the absence of formal support, some educators act as change agents. P6 explained, *“I personally refer to PLNs when I discuss with my trainees reflective teaching and teacher professional development,”* indicating a proactive stance taken outside institutional mandate. Others see PLNs as active solutions to current deficiencies. P4 framed them as *“gap-fillers”*: *“These professional online learning networks are filling the gap.”* P1 added, *“They are actually functional, of course, provided that we can work on raising the number of teachers who could benefit from this gap-filling.”* Particularly for novice teachers, PLNs offer continuity where institutional training falls short. As P3 affirmed: *“It would be very effective in helping, especially novice teachers... updating their knowledge and their skills.”* P1 articulated a vision of how PLNs can be integrated early in professional life:

“Pre-service training programs can initiate teachers to what we mean by PLNs and raise their awareness about the importance of supporting each other... equip them with the tools to work collaboratively so that when they go into schools, they will have that habit of working together.”

P6 envisioned CRMEFs as central sites for institutionalizing this shift: *“Normally, CRMEFs are the right place where PLNs should be developed and presented to prospective teachers.”* He continued, *“This would instill prospective teachers with the importance of lifelong learning and professional development from the outset of teachers' careers.”*

PLNs, in this framing, are more than platforms; they are identity-shaping environments. As P6 noted, they enable teachers to develop essential 21st-century skills: *“Opportunities for pre-service teachers to develop collaborative skills, such as networking, communication, and teamwork.”* These, he added, can catalyze cultural transformation: *“This can easily foster, from earlier careers, a culture of collaboration and collective learning...”*. The culmination of this perspective was expressed in P6’s final statement: *“PLNs in pre-service training programs would necessarily empower pre-service teachers to become effective, reflective, and resilient educators from the outset of their careers.”*

However, the potential of PLNs is contingent upon structural and curricular support. As P2 warned: *“Sometimes the curriculum is constraining... You let teachers take the initiative, and here you are discouraged.”* Without institutional backing, PLNs risk remaining marginal. *“Prepare the logistics,”* P2 urged, stressing the need for dedicated time, leadership, and resources. P1 echoes the same idea, he encapsulates a strategic tension between structural constraints and pedagogical innovation. He affirms that *“PLN I think it has a place in the pre-service training offer, though, under the condition that the training year should start from September till the end of July. This is minimal.”* highlighting the value and relevance of PLNs within preservice teacher education, while simultaneously acknowledging the institutional barriers that prevent their effective integration. The phrase “PLN... has a place” reveals a belief in the potential of PLNs to enhance reflective practice, collaboration, and continuity in teacher learning. However, this potential is immediately qualified by a structural prerequisite: a full academic year, from September till the end of July. Finally, PLNs were framed as bridges across training phases. P1 envisioned a continuum: *“We will absolutely have a place for PLNs and therefore connect pre-service teacher trainees with experienced teachers... for discussion and interaction among them.”* In this sense, PLNs not only respond to present gaps but also forge a longitudinal professional identity, where collaboration and growth are sustained throughout teachers’ careers.

To sum up, the study reveals key structural challenges in Morocco’s preservice teacher training, notably a compressed timeline and weak implementation of research components, leading to a gap between theory and practice. PLNs emerged as scalable solutions to bridge these gaps by fostering collaboration, mentorship, and continuous learning. While some educators use them informally, broader impact requires formal integration, institutional backing, and adequate time. Without these reforms, the transformative potential of PLNs remains largely unrealized.

Collaborative Professionalism and the Conditions for Effective PLN Integration

While PLNs are increasingly recognized as tools for bridging gaps in teacher development, their effective implementation depends on the cultivation of collaborative professionalism, defined by Hargreaves and O’Connor (2018) as an ethos of shared inquiry, dialogic feedback, and solidarity among educators. This part examines Collaborative Professionalism as a key driver for improving preservice teacher education in Morocco. It focuses on three core dimensions: Early Integration of collaborative habits (4.2.1), the influence of Leadership and Institutional Culture (4.2.2), and the role of collaboration in Bridging Training Phases (4.2.3). Together, these subthemes highlight how structured collaboration can strengthen professional identity and continuity in teacher development (Figure 2).

Figure 2

Dimensions of Collaborative Professionalism in Preservice Teacher Education



Early Integration of Collaborative Professionalism. This subsection critically examines the early integration of collaborative professionalism as a structural and cultural imperative in preservice teacher education. Participants 2(P2), participant 3 (P3), and participant 6 (P6) emphasize that collaborative dispositions must be embedded at the initial stages of teacher preparation and sustained longitudinally throughout professional life. Rather than treating collaboration as a peripheral skill, they advocate PLNs for its systematic incorporation into curriculum design and institutional practice.

P 2 underscores the need for a deliberate and structured model of training that prioritizes collective engagement over isolated learning: ***“For pre-service training, I think it's possible to organize and number the activities that will be involved... like participation, collaboration, and cooperation.”*** This is juxtaposed with a critique of the prevailing emphasis on individual performance in assessment and practice, which they argue undermines the social and dialogic nature of professional learning. Similarly, P 6 identifies PLNs as critical platforms for cultivating collaborative competencies: ***“PLNs support collaborative skill-building, networking, communication, and professional dialogue.”*** Here, PLNs are positioned as essential mechanisms for fostering professional identity, peer learning, and community-building from the outset. Further, P3 reinforces the idea that meaningful professional learning happens when it's connected to classroom practice through networks. P3 explained that ***“When they see or connect professional learning to the classroom...because the teacher would learn something when they are engaged in a certain network»***. These are foundational spaces and skills for professional socialization, not merely digital add-ons. Thus, the early integration of such frameworks represents a shift from individualistic to relational paradigms of teacher education that are anchoring collaboration as both a method and a mindset.

Leadership and Institutional Culture as Enablers of Collaborative Professionalism. While early integration of collaborative practices is essential, their sustainability depends heavily on the surrounding institutional culture and leadership structures. The following

explores how administrative vision, organizational climate, and logistical support shape the enactment of collaborative professionalism in preservice teacher training. Participant 2 highlights the gatekeeping role of institutional actors, noting that the success of PLN initiatives *“will depend again on the institution, the environment, the type of leadership that you have, a teacher or director who would help you with the organization.”* Despite teachers’ willingness to engage in collaborative innovation, systemic rigidity often impedes their efforts. As P2 observes, *“Sometimes the curriculum is constraining. You just let teachers take the initiative, and here you are discouraged.”* This points to a disconnect between individual initiative and institutional readiness. The phrase *“Prepare the logistics”* encapsulates the core requirement: collaboration must be systemically supported through time allocation, digital platforms, facilitative leadership, and aligned policy frameworks. Without these, collaborative professionalism remains aspirational rather than operational.

Bridging the Gap Between Training and Practice. Sustaining collaborative professionalism beyond the confines of preservice training requires intentional **continuity mechanisms** that bridge initial preparation with in-service development. Participants underscore a recurrent structural gap: the absence of systems that support ongoing professional dialogue, mentoring, and the application of research-informed practices after graduation.

P2 stresses the need for developmental continuity: *“Once they are in teaching, then obviously we go into another type of professional development. And the first one is if we could carry on with what was done.”* Yet in reality, such follow-through is rarely institutionalized. P3 illustrates this disjunction, stating, *“After students graduate... we have no idea about that,”* highlighting a broader disconnect between academic preparation and practical realities.

To counteract this fragmentation, P6 offers a future-oriented model: *“We will absolutely have a place for PLNs and therefore connect pre-service teacher trainees with experienced teachers and try to make a kind of platform for discussion and for interaction among them.”*

This vision positions PLNs as longitudinal infrastructures that support mentorship, sustain collaborative inquiry, and extend the professional learning continuum, transforming isolated training phases into a cohesive developmental journey.

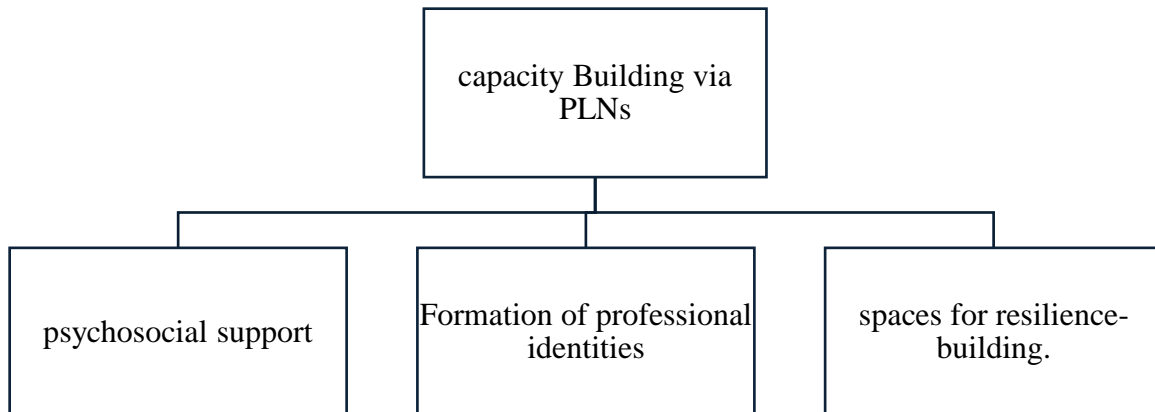
Overall, the findings illustrate that while Moroccan pre-service programs attempt to foster collaborative professionalism, their potential is undermined by fragmented institutional coordination, limited logistical planning, and the absence of follow-up in professional settings. To transform PLNs into true professional ecosystems, they must be embedded in curriculum (P2, P6), supported by leadership (P2), and extended through post-certification platforms (P3, P6). Importantly, such integration also requires recognition of the emotional and identity-based dimensions of teaching, as these affective conditions, such as belonging, safety, and professional confidence, are prerequisites for meaningful collaboration. Thus, the next thematic focus turns to how PLNs contribute to these psychosocial dimensions, supporting teacher well-being, resilience, and identity formation in the early career stage

Teacher Identity Formation, Well-being, and PLNs as a Support System.

This theme examines the psychosocial and identity-based dimensions of professional learning, focusing on how Professional Learning Networks (PLNs) function as emotionally supportive ecosystems in preservice teacher education. Participants consistently emphasized that PLNs extend beyond knowledge-sharing, they are critical for emotional regulation (4.3.1), identity construction (4.3.2), and resilience-building (4.3.3). These roles are especially pronounced in environments where formal training structures often neglect affective needs and mentorship. This section unpacks three subthemes that illuminate the affective architecture of PLNs: emotional well-being, identity formation, and systemic resilience support (Figure 3).

Figure 3

Emotional and Identity Dimensions of Professional Learning through PLNs



Emotional Support Structures. This section examines how teacher well-being, often overlooked in formal training systems, is increasingly recognized as essential to sustainable professional development. Drawing on participants’ insights, it highlights the importance of embedding emotional support and wellness into preservice teacher education, with PLNs emerging as informal yet effective spaces for fostering psychological safety, engagement, and care-driven professional identities.

Participant 5 linked well-being directly to professional sustainability, stating, ***“I think the well-being of a teacher is number one, the responsibility of the teacher himself.”*** However, this was not presented as a purely individual matter. P5 critiqued the broader system’s neglect of teacher well-being, remarking, ***“Teacher should be supported instead of just assisting him all the time. Assessment, assessment...”***a statement that underscores a dominant culture of performance monitoring over care and mentorship. In response, P5 called for a reframing of supervisory roles: ***“They are not there to punish teachers, but they should be there to support them.”*** This reflects an urgent call for institutional and cultural shifts, where well-being is treated as pedagogical capital rather than personal luxury. This reorientation, P5 argued, must begin at the preservice level: ***“This can start... in the pre-service training centres... to remind teachers to take care of their well-being.”***The overarching

sentiment is that teacher well-being should be structurally embedded into training design, not left to personal initiative. As P5 asserted, “*Because the teacher is psychologically well and happy and satisfied, that will definitely have an impact on his teaching.*». Further PLNs were portrayed by participants as psychologically safe and supportive spaces that contrast sharply with the high-stakes, evaluative nature of traditional professional development (PD). Participant 4 described PLNs as “*very functional... and friendly,*” underlining their informal and approachable nature. This emotional safety was seen as foundational to teacher engagement and persistence, especially for novices.

Therefore, Participant narratives reveal that teacher well-being is not merely an individual responsibility but a structural and cultural imperative. Calls for supportive supervisory roles, emotionally responsive institutions, and early well-being education underscore the need for systemic reform. PLNs, described as accessible and non-threatening, offer practical alternatives to high-pressure CPD environments and serve as key vehicles for emotional sustainability, especially for novice teachers. To be effective, such support systems must be intentionally integrated into the fabric of preservice training.

PLNs and the Construction of Professional Identity. Professional identity is a dynamic, evolving process shaped by interaction and reflection. PLNs play a key role in this development, offering preservice teachers early exposure to professional dialogue and mentorship. Even passive engagement helps shape emerging identities by embedding teachers in authentic, practice-based communities.

P5 noted that even low-engagement practices such as “*reading lesson plans, browsing discussions*” within PLNs can stimulate reflective habits and professional growth. These seemingly peripheral activities are in fact instrumental in shaping how novice teachers perceive their roles, responsibilities, and alignment with professional norms. P1 highlighted the importance of early and sustained exposure to experienced educators, stating: “*PLNs enable*

connection between trainees and experienced teachers,” framing this interaction as a gateway to long-term, co-constructed professional identity. By engaging in shared discourse, novices begin to internalize the values and expectations of the teaching profession, cultivating a sense of belonging. This early identity formation is also relational. As Participant 5 observed, ***“They will have that habit of working together instead of working separately,”*** suggesting that collaborative habits formed in preservice stages lay the foundation for a peer-supported, community-oriented professional self.

PLNs facilitate the construction of professional identity by embedding novice teachers in ongoing communities of practice. Through mentorship, dialogue, and even passive observation, PLNs expose future educators to the ethos of the profession, helping them develop not only technical competencies but also a relational, reflective sense of self as teachers.

PLNs as a venue for Resilience and Autonomy. Beyond identity formation, participants emphasized PLNs as vital for building resilience and fostering autonomous professional growth. In contexts of isolation, weak institutional support, or rigid curricula, PLNs function as adaptive spaces that support emotional endurance and flexible learning.

P 6 emphasized the dual function of PLNs in promoting ***“resilience and autonomy,”*** especially for educators in under-resourced regions. He stressed that PLNs are ***“collaborative inquiry and reflective learning from the outset”*** they help teachers navigate both emotional and logistical challenges in early-career teaching. Here, PLNs are positioned as counterbalances to professional isolation, offering access to diverse practices and affirming peer support. P 3 underscored the importance of adaptability in a rapidly evolving educational landscape, noting that PLNs assist teachers in ***“updating their knowledge and their skills... trying to reach a better match of the emergent needs of this new generation of students.”*** This underscores the value of having resilient venues that foster lifelong learning and professional agility in response to change. P 1 reframed PLNs as tools for self-driven growth,

stating: *“With a little bit of effort, with more hard work, we can make the best use of it.”* This call to agency signals a shift from passive compliance to intentional, self-regulated learning, where teachers actively shape their development trajectories .PLNs serve as resilience-building infrastructures, providing emotional support and fostering continuous growth. They promote autonomy, reflection, and adaptability, helping teachers navigate systemic challenges and evolving classroom demands.

In summary, this theme highlights the essential role of PLNs in meeting the emotional and developmental needs of preservice teachers. They support well-being through safe, supportive spaces; foster professional identity through reflection and collaboration; and build resilience by promoting autonomy and adaptability. Far from being optional, PLNs are foundational to sustainable, human-centered teacher development, effective only when intentionally integrated, institutionally supported, and guided by emotionally intelligent leadership.

Synthesis

Across all themes, this study reveals deep structural limitations in Morocco’s preservice teacher education system, most notably, the disjunction between policy and practice in the compressed training duration and the marginalization of research-based inquiry. These conditions fragment the professional development continuum, hindering the cultivation of reflective and collaborative educators. Amid these gaps, PLNs emerge not as peripheral innovations but as core, scalable infrastructures for reimagining teacher education. Participants consistently emphasized their potential to bridge institutional divides by fostering mentorship, collaboration, and ongoing professional dialogue. However, this potential remains largely untapped due to the absence of systemic integration. Without formal curricular inclusion (P2, P6), logistical scaffolding, and consistent leadership support (P2), PLNs are reduced to informal, individualized efforts rather than institutionally supported ecosystems.

Critically, the findings illustrate that PLNs do more than fill structural voids; they also address relational and affective dimensions often neglected in traditional training models. As the thematic analysis shows, PLNs promote teacher well-being through emotionally safe environments, support identity formation via sustained professional interactions, and enhance resilience by enabling autonomy and adaptability in under-resourced or isolating contexts. These psychosocial conditions, such as belonging and safety, are not secondary benefits but prerequisites for effective, sustained professional learning.

In summary, PLNs should not be viewed as supplementary tools but as foundational infrastructures for human-centered, sustainable teacher development. To realize this vision, Moroccan teacher education must shift from fragmented, compliance-driven models to systems that value relational professionalism, emotional intelligence, and longitudinal learning networks. PLNs must be intentionally embedded across training phases, institutionally endorsed, and supported by leadership that prioritizes the emotional and developmental needs of future educators. Only through full integration can teacher education evolve into a cohesive, reflective, and resilient professional journey.

Discussion

This study set out to explore how Professional Learning Networks (PLNs) might address structural and pedagogical gaps in Moroccan pre-service teacher education, particularly by fostering capacity building, collaborative professionalism, and teacher identity formation. The results underscore three primary findings: the fragmented structure of pre-service training, the latent yet underutilized potential of PLNs, and the emotional and identity-based support PLNs offer novice teachers. These findings align with and, in some cases, extend the theoretical perspectives and international literature reviewed.

Firstly, the data confirms a significant structural shortfall in Morocco's pre-service teacher training, echoing Darling-Hammond's (2006) and HCETSR report's (2018) assertion that high-quality teacher preparation must integrate theory, practice, and reflective inquiry.

Participant testimony, particularly from P1 and P3, emphasized that institutionalized pre-service education is often “no more than six months”, despite being nominally two years. This echoes international critiques of truncated and inconsistent teacher preparation (OECD, 2019; Day, 2002). The absence of sustained mentoring, time for inquiry, and continuity between training phases impairs professional identity formation and knowledge integration (Zeichner, 2010). Moreover, as highlighted by P3, research is formally included in the curriculum but lacks follow-through mechanisms. “We insisted on including it... But we have no idea what happens after” revealing a deep disconnection between intended learning outcomes and practice. This aligns with previous findings by Willegems et al. (2018) and García-Martínez et al. (2020), who argue that institutional incoherence limits the long-term impact of collaborative learning.

Secondly, the role of PLNs as bridging tools is strongly validated in both theory and participant data. Echoing Schnellert and Butler (2021), participants saw PLNs as practical, accessible, and scalable tools for continuity in professional growth. P4 described PLNs as “very functional and friendly,” and P6 emphasized their power to “instill prospective teachers with the importance of lifelong learning.” (Coolahan, 2002). These findings reinforce Scardamalia and Bereiter’s (2010; 2021) vision of knowledge-building communities where educators contribute to shared learning. In line with the literature, participants highlighted PLNs not only as sources of pedagogical resources but as dynamic environments where novice teachers could engage in dialogic reflection, peer mentoring, and identity construction. While PLNs have been recognized in other contexts for promoting collective efficacy and professional agency (Brown & Poortman, 2019; Schnellert, 2020), this study shows their promise in contexts marked by institutional fragmentation and limited formal CPD structures.

However, a key divergence from the literature lies in the absence of structural and policy integration of PLNs in Moroccan teacher education. Whereas studies like Hargreaves and Fullan (2012) highlight systemic alignment as central to PLN success, participants here

emphasized a lack of institutional support. P2's comment, "You let teachers take the initiative... and here you are discouraged," captures a pervasive sense of systemic inertia. Without leadership support, logistical preparation, and curricular space, PLNs remain marginalized. This supports Vaillant's (2019) assertion that PLNs must be strategically embedded, not left to chance.

Finally, the study reveals a compelling psychosocial dimension of PLNs that is often underemphasized. Participants P5 and P6, in particular, foregrounded PLNs as emotionally sustaining environments. P6 emphasized that PLNs "empower pre-service teachers to become effective, reflective, and resilient educators," while P5 spoke to the importance of "support instead of just assessment." These insights mirror recent literature (Willegems et al., 2018; Oluk, 2023; Mercer & Gregersen, 2020) stressing the role of emotional safety and identity formation in professional development. Notably, P3 connected PLN engagement with adaptability, noting that it helps novice teachers "reach a better match with the emergent needs of students," thereby linking identity resilience with responsiveness to evolving educational contexts.

In sum, this study affirms the multifaceted potential of PLNs as bridges across fragmented training, as vehicles for collaborative professionalism, and as psychosocial anchors for teacher identity. It also surfaces critical gaps between theory and implementation, underscoring the need for policy reforms and institutional alignment. Future work might focus on designing PLN modules in CRMEFs and ENSs, longitudinal studies on PLN participation, and the role of mentorship in sustaining collaborative learning cultures.

Based on the study's findings, several actionable implications emerge for stakeholders in Moroccan teacher education. The research confirms that Morocco's preservice teacher training system suffers from fragmented structures, limited program duration, and poorly integrated research components, ailing to meet the implicit action standard of delivering coherent, reflective, and sustained professional preparation. In light of this, institutions should

consider formally integrating **PLNs** as core components of teacher education programs rather than treating them as informal or supplementary tools. Specifically, the study proposes a transferable institutional framework built on four interdependent pillars: policy alignment, research-practice cultivation and integration, capacity building, and professional wellness (Figure 4).

Figure 4

A Transferable Institutional Interdependent Pillars Framework



To strengthen Morocco's preservice teacher education, PLNs should be formally integrated into institutional frameworks that support policy alignment, research-practice integration, capacity building, and professional wellness. This requires developing curriculum-aligned modules on PLN use, embedding them across all training stages, and ensuring early

exposure to collaborative digital practices. Institutions should establish incentives and structural support for PLN engagement, including recognition in assessment systems, allocated time, and digital infrastructure. Leadership must also model and sustain networked learning. Critically, PLNs must be recognized not just as tools for knowledge-sharing but as engines for professional identity, emotional resilience, and sustained growth within a relational, reflective teacher education culture.

Conclusion

This study aimed to explore how Professional Learning Networks (PLNs) can serve as catalytic tools in bridging structural and pedagogical gaps in Moroccan pre-service teacher education. Through a qualitative case study involving key stakeholders across ENS and CRMEF institutions, the study examined the perceived role of PLNs in fostering capacity building, collaborative professionalism, and teacher identity formation. It sought to address persistent fragmentation within teacher training and explore sustainable strategies for supporting novice educators in increasingly complex educational contexts.

The findings reveal three key contributions. First, structural inconsistencies such as shortened program durations, fragmented coordination between ENS and CRMEFs, and weak institutionalized research components undermine the coherence of pre-service teacher education. Participants noted that foundational training often lasts no longer than six months, and research training remains largely performative rather than embedded. These challenges create discontinuities that inhibit reflective practice and professional growth. Second, PLNs emerged as promising alternatives and complements to traditional professional development models. Participants consistently emphasized their potential as relational, scalable, and context-sensitive learning environments that support mentoring, collaboration, and reflective dialogue. Notably, PLNs were identified not only as platforms for sharing resources but also as spaces for cultivating professional identity, emotional resilience, and autonomy. This aligns with broader literature positioning PLNs as engines of collaborative professionalism and lifelong learning.

Third, the study found that the institutional conditions for effective PLN integration are currently lacking. Despite educators' willingness to promote PLN engagement informally, no specific modules or policies exist to guide their implementation. The lack of systemic infrastructure, leadership support, and curricular integration poses a significant barrier. Participants noted that without institutional backing, PLNs risk remaining peripheral or underutilized despite their potential for transformation.

Practically, these findings highlight the urgency of embedding PLNs into the formal teacher preparation curriculum. Institutions should recognize PLNs as essential rather than supplemental, cultivating a culture that values digital collaboration, mentorship, and peer inquiry. This includes allocating time, technological infrastructure, and institutional recognition for PLN engagement. Additionally, developing pre-service modules focused on digital literacy, reflective teaching, and collaborative practice can scaffold early engagement with PLNs. Longitudinally, PLNs can also serve as continuity bridges between training and practice, ensuring that novice teachers are not left professionally isolated post-certification. Nevertheless, the study's scope is limited by its small, context-specific sample and its reliance on interview data. Perspectives from private training institutions, policymakers, and in-service practitioners were not included, which restricts the generalizability of findings. Furthermore, the absence of observational or longitudinal data limits the ability to assess PLN impact over time. Future research should include mixed methods of designs and broader geographic and institutional representation. It should also examine the effectiveness of specific PLN models and strategies for sustainable institutional integration in post-colonial or resource-constrained systems.

In a nutshell, this study contributes to the understanding of how PLNs can address deep-rooted challenges in teacher education by enabling professional continuity, relational learning, and pedagogical resilience. To fully realize this potential, however, institutional reform, policy

alignment, and cultural transformation are imperative. Only then can PLNs evolve from optional spaces to embedded ecosystems of professional growth.

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